A Systematic Test of an Enterprise Strategy for Community-Based Biodiversity Conservation

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Abstract: *A commonly held belief is that if people can benefit financially from enterprises that depend on nearby forests, reefs, and other natural habitats, then they will take action to conserve and sustainably use them. The Biodiversity Conservation Network brought together conservation and development organizations and local communities to systematically test this hypothesis across 39 conservation project sites in Asia and the Pacific. Each project implemented one or more community-based enterprises such as setting up an ecotourism lodge, distilling essential oils from wild plant roots, producing jams and jellies from forest fruits, harvesting timber, or collecting marine samples to test for pharmaceutical compounds. Each project team collected the biological, enterprise, and social data necessary to test the network's hypothesis. We present the results of this test. We found that a community-based enterprise strategy can lead to conservation, but only under limited conditions and never on its own. We summarize the specific conditions under which an enterprise strategy will and will not work in a decision chart that can be used by project managers to determine whether this strategy might make sense at their site. We also found that an enterprise strategy can be subsidized and still create a net gain that pays for conservation. Based on our experiences, we recommend developing "learning portfolios" that combine action and research to test other conservation strategies.*

Prueba Sistemática de Estrategias Empresariales para la Conservación de la Biodiversidad Basada en la Comunidad

Resumen: *Una creencia comúnmente difundida es que la gente se puede beneficiar financieramente de empresas que dependen de bosques, arrecifes, y otros hábitats naturales cercanos y por lo tanto llevarían a cabo acciones para conservar y usarlos sostenidamente. La Red de Conservación de la Biodiversidad juntó a organizaciones de conservación y desarrollo y a comunidades locales para probar sistemáticamente esta hipótesis en 39 proyectos de conservación en sitios de Asia y el Pacífico. Cada proyecto implementó una o más empresas basadas en la comunidad, tales como el establecimiento de alojamiento para ecoturismo, destilación de aceites esenciales a partir de raíces de plantas silvestres, producción de jaleas y mermeladas de frutas del bosque, tala de madera, o la colecta de muestras marinas para probar compuestos farmacéuticos. Cada equipo de trabajo colectó los datos biológicos, empresariales y sociales necesarios para probar la hipótesis de la red. Nosotros presentamos aquí los resultados de esta prueba. Encontramos que una estrategia de las empresas basadas en la comunidad puede conducir a la conservación, pero solo bajo limitadas condiciones y nunca por sí sola. Resumimos las condiciones específicas bajo las cuales una estrategia empresarial trabajaría o no en un diagrama de decisiones que puede ser usado por administradores para determinar si esta estrategia tendría sentido para su sitio. También encontramos que una estrategia empresarial puede ser subsidiada y aún crear una ganancia neta que pague por la conservación. En base a nuestras experiencias, recomendamos desarrollar "portafolios de aprendizaje" que combinen acciones e investigación para probar otras estrategias de conservación.*

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Introduction

Addressing the twin challenges of biodiversity conservation and economic development are among the most difficult problems facing humanity (McNeely et al. 1990; Wilson 1992; Pimm et al. 1995; Myers et al. 2000). A typical conservation project takes place in a complex system that involves biological habitats, human-caused threats, and a variety of intervention strategies implemented by various institutional actors (Salafsky & Margoluis 1999*b*). A critical need exists to use scientific principles to determine the specific conditions under which various intervention strategies are effective (Pérez & Byron 1999; Ostrom & Wertime 2000).

One common strategy is using community-based, environmentally linked enterprises to promote conservation (a bibliography of different examples of this strategy is available at www.BCNet.org/learning/biblio/bib.htm). The core hypothesis behind this strategy is that if a viable enterprise is linked to the biodiversity of a site and generates benefits for a community of stakeholders who have sufficient capacity, then the stakeholders will act to counter the threats to the resource (Fig. 1; Salafsky & Wollenberg 2000). The Biodiversity Conservation Network (BCN) was established in 1992 to test this hypothesis by funding 39 community-based project sites in Asia and the Pacific. Each project site included one or more enterprises such as setting up an ecotourism lodge, distilling essential oils from wild plant roots, producing jams and jellies from forest fruits, harvesting timber, or collecting marine samples to test for pharmaceutical compounds (BCN 1999). A key feature of the overall BCN program was that each project team worked in conjunction with BCN staff to collect the biological, enterprise, and social data necessary to test the hypothesis (Salafsky et al. 1999).

Methods

Project Selection

Our sample of projects was selected through a competitive process. The BCN received over 400 proposals, from which 20 projects were selected for funding. Project proposals were evaluated by an outside panel of experts according to a number of criteria, including the potential viability of the enterprise, the degree of local community participation in the project, and the ability to conduct quality monitoring. This selection process had two important implications in terms of extrapolating our results to potential conservation and development projects. First, because our sampling frame was restricted to the pool of projects that applied for funding, and because BCN was prohibited by the U. S. Agency for International Development from funding for-profit entities, few private-sector firms played major roles in the projects funded. In effect, we ended up testing whether conservation and development nongovernmental organizations can implement an enterprise strategy for conservation and not the broader question of whether any organization can implement an enterprise strategy for

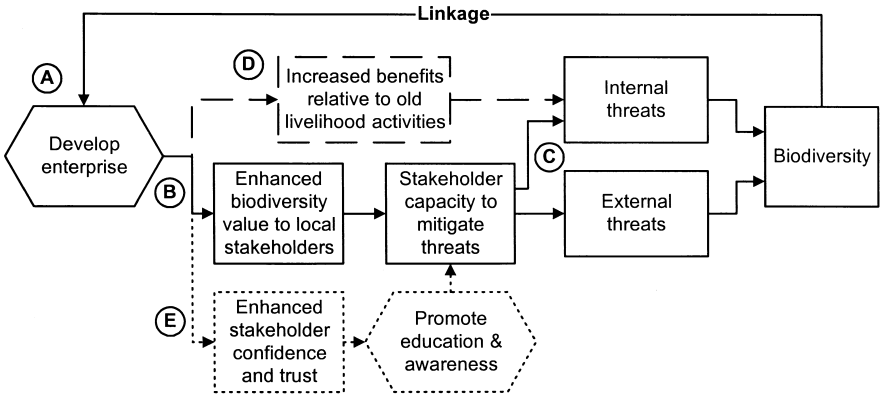

Figure 1. The core hypothesis of the Biodiversity Conservation Network (BCN) states that if local communities receive sufficient benefits from a viable enterprise that depends on biodiversity, then they will act to counter internal threats*, caused by stakeholders living at the project site, and* external threats*, caused by outsiders, to that biodiversity. The three main conditions of the hypothesis are that if an enterprise approach to community-based conservation is going to be effective, then there must be (a) linkage between a viable enterprise and biodiversity (enterprise must be financially viable and depend on the in situ biological resources of the region; enterprise will fail if this biodiversity is significantly degraded); (b) generation of short- and long-term benefits (enterprise must generate benefits, financial, social, and/or environmental, for a community of stakeholders); and (c) stakeholder involvement (enterprise must involve members of the local community who are stakeholders in the enterprises and the biodiversity of the area and have the capacity to take action to counter threats to biodiversity). (d) Dashed lines represent an alternative pathway (technically, an economic substitution strategy) by which the enterprise can also help mitigate internal threats by providing alternative sources of income to residents currently engaged in livelihood activities that damage biodiversity, such as swidden agriculture. (e) Dotted lines represent a revised version of the BCN hypothesis (see Discussion section).*

conservation. Second, from this pool, the panel deliberately attempted to select those projects that (1) seemed most likely to achieve enterprise and conservation success and (2) would enable us to develop a portfolio of projects that spanned the range of key criteria and characteristics. This potential bias required us to take care in extrapolating our results. A listing of the specific projects that BCN supported and additional information about each project and the overall BCN program can be found at www.BCNet.org.

Site Definition

Each project team worked at one or more sites at which they developed one or more enterprises, for a total of 39 sites and 48 enterprises. These project sites were our basic unit of analysis, and we defined each site with respect to four dimensions. A site was defined spatially as the core area of natural habitats the project wanted to conserve, which was functionally equivalent to the area the stakeholders had the ability to manage or influence, either positively or negatively. Stakeholders at the site were defined as the population of local residents who had a direct actual or potential effect on the biodiversity of the site. The enterprise at the site was defined as the specific steps in the production of a good or service being implemented by the stakeholders. Finally, the temporal dimension was defined as the period over which we assessed the effect of the enterprise. In most cases, this period was roughly 4 years.

Analytical Design

Testing the BCN hypothesis involved examining the relationship between a series of enterprise, benefit, and social factors and biodiversity conservation, our primary dependent variable. We found, however, that biodiversity conservation was extremely difficult to define, let alone measure in the context of a specific site, especially over the brief 3- to 4-year period within which we worked. Despite strong encouragement and extensive support, most of our project partners did not collect sufficient baseline biological data, such as area of habitat, densities of key indicator species, ecosystem functioning, required to assess the state of the biodiversity at the site. Furthermore, in the few cases where these biological data were collected, they proved insensitive to changes in the state of the system. Thus, we developed an indicator of conservation success, the index of threat-reduction assessment (TRA), which assessed the percentage of identified threats at each project site addressed over the life of the project (Salafsky & Margoluis 1999*b*). As an intermediate dependent variable for some analyses, we also developed an indicator of enterprise success that assessed the likelihood that an enterprise would be profitable over the medium term.

The factors that can potentially affect a project's success can be divided into four broad categories, three that correspond to the conditions of the BCN core hypothesis—enterprise, benefit, and stakeholder factors—and a fourth set of "other factors" (Table 1). We examined the relationship between each of these factors and the TRA index (Table 1 & Fig. 2). We also considered the relationship between enterprise factors and enterprise success (Table 2 & Fig. 3).

Data Collection

Data for analyses came from many sources, including project-team monitoring reports, BCN staff reports, inspection of project records, and key informant interviews. An initial list of key variables, predicted subhypotheses, and potential methods for collecting data on each variable were developed in 1995 at a series of workshops with BCN project teams. We (the BCN program staff) then refined this list in consultation with the project teams. The final analytical framework was then sent to all project partners, who used it in writing their 6-month technical reports. In 1997 we began meeting with each project team during site visits to fill in the data for the framework. Final data were collected in 1998.

Ideally, all project teams would have used identical methods to collect data on each variable. We wanted, however, to make sure that the project teams first and foremost collected data that would meet their management needs, so teams used a range of methods. Furthermore, because some project teams did not collect data for all variables, we worked with the teams to collect additional data for some variables. In particular, it proved difficult to collect quantitative data for many variables; in these cases we relied on expert rankings that we made in consultation with the project teams. Rankings were made according to strictly defined criteria, and efforts were made to apply them in a standardized fashion across all sites.

Limitations of Analytical Design

The difficulties inherent in working with conservation projects forced us to scale back our research from what we wanted ideally to what we could realistically accomplish. For example, ideally we would have run a quantitative multivariate analysis so as to examine systematically the interactions between variables. Owing to data constraints, however, we could not do this quantitatively and instead conducted a series of bivariate analyses and qualitatively examined the interactions between factors. Likewise, ideally we would have specified our working subhypothesis about the relationship between each variable and conservation success at the start of the program and then collected baseline and follow-up data

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Table 1. Key factors potentially affecting conservation success at project sites.[a]

Variable type and variable[b]	*Initial subhypothesis*[b]	*Variable measurement*[c]	*Observed association*[d]	*Additional results and comments*
Dependent conservation success		index of threat-reduction assessment (TRA) (%)	–	average TRA index significantly higher for projects facing external threats vs. internal threats ($t = 2.77$, df $= 37$, $p = 0.009$)
Independent				
enterprise factors				
enterprise success	if enterprise success increases, then conservation increases	5-pt. scale ranking of enterprise success	weak positive association, $n = 39$, $\chi^2 = 3.09$, $p = 0.079$	profitability had no association and was hard to define; no association across enterprise types
local enterprise ownership	if local ownership increases, then conservation increases	10-pt. scale ranking of degree of local ownership	positive association, $n = 38$, $\chi^2 = 6.76$, $p = 0.009$	strong association with local management, indicating these are not independent results
local enterprise management	if local management increases, then conservation increases	10-pt. scale ranking of degree of local management	positive association, $n = 39$, $\chi^2 = 4.51$, $p = 0.034$	strong association with local ownership, indicating these are not independent results
enterprise linkage with biodiversity	if enterprise linkage increases, then conservation increases	10-pt. scale ranking of degree of linkage[e]	no association,[f] $n = 39$, $\chi^2 = 2.09$, $p = 0.148$	service enterprises associated with higher linkage compared with product enterprises ($n = 39$, $\chi^2 = 7.50$, $p = 0.006$)
benefit factors				
distribution of cash benefits	if benefit distribution increases, then conservation increases	stakeholder households receiving benefits (%)	no association, $n = 37$, $\chi^2 = 0.01$, $p = 0.942$	qualitative results indicate little evidence to suggest that individual benefits are a good predictor of conservation outcome[g]
amount of cash benefits	if amount of benefit increases, then conservation increases	contribution to total income of average household (%)	no association, $n = 35$, $\chi^2 = 0.35$, $p = 0.557$	average excludes those households receiving zero benefits
variability in cash benefits	if benefit variability increases, then conservation increases	10-pt. ranking scale of degree of variability	no association, $n = 38$, $\chi^2 = 0.00$, $p > 0.999$	variability difficult to measure; most projects distribute benefits directly to people participating in enterprise
timing of cash benefits	if timing of benefits decreases, then conservation increases	no. of months from start of enterprise until first benefit received	no association, $n = 38$, $\chi^2 = 0.96$, $p = 0.328$	qualitative results indicate that projects must show some results (not necessarily cash) in first year[g]
frequency of cash benefits	if benefit frequency increases, then conservation increases	no. of months per year benefits received	no association, $n = 39$, $\chi^2 = 0.02$, $p = 0.882$	anecdotal evidence indicates trade-off between frequency and size of payments
noncash benefits	if noncash benefits increase, then conservation increases	10-pt. ranking scale of amount of noncash benefits	positive association, $n = 39$, $\chi^2 = 11.30$, $p = 0.001$	qualitative results indicate that all sites with high conservation success also had substantial noncash benefits[g]
stakeholder factors				
strength of formal stakeholder group	if group strength increases, then conservation increases	10-pt. ranking scale of strength of group	no association	rankings difficult to apply
leadership of stakeholder group	if leadership increases, then conservation increases	10-pt. ranking scale of strength of leadership	positive association, $n = 39$, $\chi^2 = 9.39$, $p = 0.002$	qualitative evidence indicates that leadership transition is difficult[g]
resource governance	if local control increases, then conservation increases	10-pt. ranking scale of degree of local resource ownership	no association, $n = 39$, $\chi^2 = 0.63$, $p = 0.429$	South and Southeast Asia with limited tenure; Pacific with strong tenure, but success mixed across all regions
community policing	if local policing increases, then conservation increases	10-pt. ranking scale of degree of local policing ability	positive association, $n = 39$, $\chi^2 = 11.35$, $p = 0.001$	significant results for both internal and external threats; somewhat tautological with TRA measurement
stakeholder homogeneity	if homogeneity increases, then conservation increases	5-pt. ranking scale of local homogeneity	no association, $n = 39$, $\chi^2 = 0.82$, $p = 0.365$	anecdotal evidence indicates that it is difficult to set up enterprises with different community subgroups

continued

Table 1. (continued)

Variable type and variable[b]	*Initial subhypothesis*[b]	*Variable measurement*[c]	*Observed association*[d]	*Additional results and comments*
other factors				
chaos	if chaos increases, then conservation decreases	incidents of tidal waves, volcanoes, droughts, political, and economic turmoil	many projects beset with natural and human-caused disasters	anecdotal evidence indicates that disasters can bring a team together
project effectiveness	if effectiveness increases, then conservation increases	institutional arrangements and funding levels	high funding not correlated with conservation success	large consortia of groups unwieldy

[a]*For each factor, we present our initial subhypothesis, the variable we used to assess the factor, the observed degree of association between the factor and the index of threat-reduction assessment, and additional quantitative or qualitative results.*
[b]*Enterprise refers to the production of one or more goods or services by stakeholders at the site.*
[c]*For 5-pt. scale rankings, 1 = low end of factor; 5 = high end of factor. For 10-pt. scale rankings, 0 = low end of factor; 9 = high end of factor.*
[d]*Based on 2 × 2 contingency tables formed by dividing both the factor and our dependent variable into low and high groups at their median value. The chi-square statistic is then calculated in comparison to an expected random distribution.*
[e]*See Salafsky and Wollenberg (2000).*
[f]*In this case, if anything, the data hint at a negative association.*
[g]*Quotations from a qualitative study of BCN results available at www.BCNet.org.*

Table 2. Factors pertaining to the enterprise and their association with enterprise success at project sites.

Variable	*Initial subhypothesis*	*Variable measurement*	*Observed association*	*Additional results and comments*
Enterprise linkage with biodiversity	if enterprise linkage increases, then enterprise success increases	10-pt. scale ranking of linkage	weak positive association, $n = 48$, $\chi^2 = 2.88$. $p = 0.090$	our sample does not represent universe of low-linked enterprises
Local enterprise management	if local management increases, then enterprise success decreases	10-pt. scale ranking of degree of local ownership	positive association, $n = 48$, $\chi^2 = 5.38$, $p = 0.020$	result may be a function of a correlation between local management and simple enterprises*
Market establishment	enterprise success highest in moderately established markets	10-pt. scale ranking of degree of market establishment	graph (Fig. 3) shows inverted ∪ shape consistent with prediction	not possible to test statistically given sample size
Product perishability	if perishability increases, then enterprise success decreases	5-pt. scale ranking of degree of perishability	no association, $n = 48$, $\chi^2 = 0.99$, $p = 0.753$	only one product enterprise with more then moderate perishability was successful
Green market potential	if green market increases, then enterprise success increases	5-pt. scale ranking of green market potential	no association, $n = 48$, $\chi^2 = 0.715$, $p = 0.398$	anecdotal evidence indicates that green market potential is limited overall and at best enables development of market share

**We found a significant negative association between enterprise complexity and degree of local management* ($n = 48$, $\chi^2 = 6.23$, $p = 0.013$). *We also found a significant negative association between enterprise complexity and enterprise success, indicating that simple enterprises were more likely to be successful* ($n = 48$, $\chi^2 = 4.196$, $p = 0.041$).

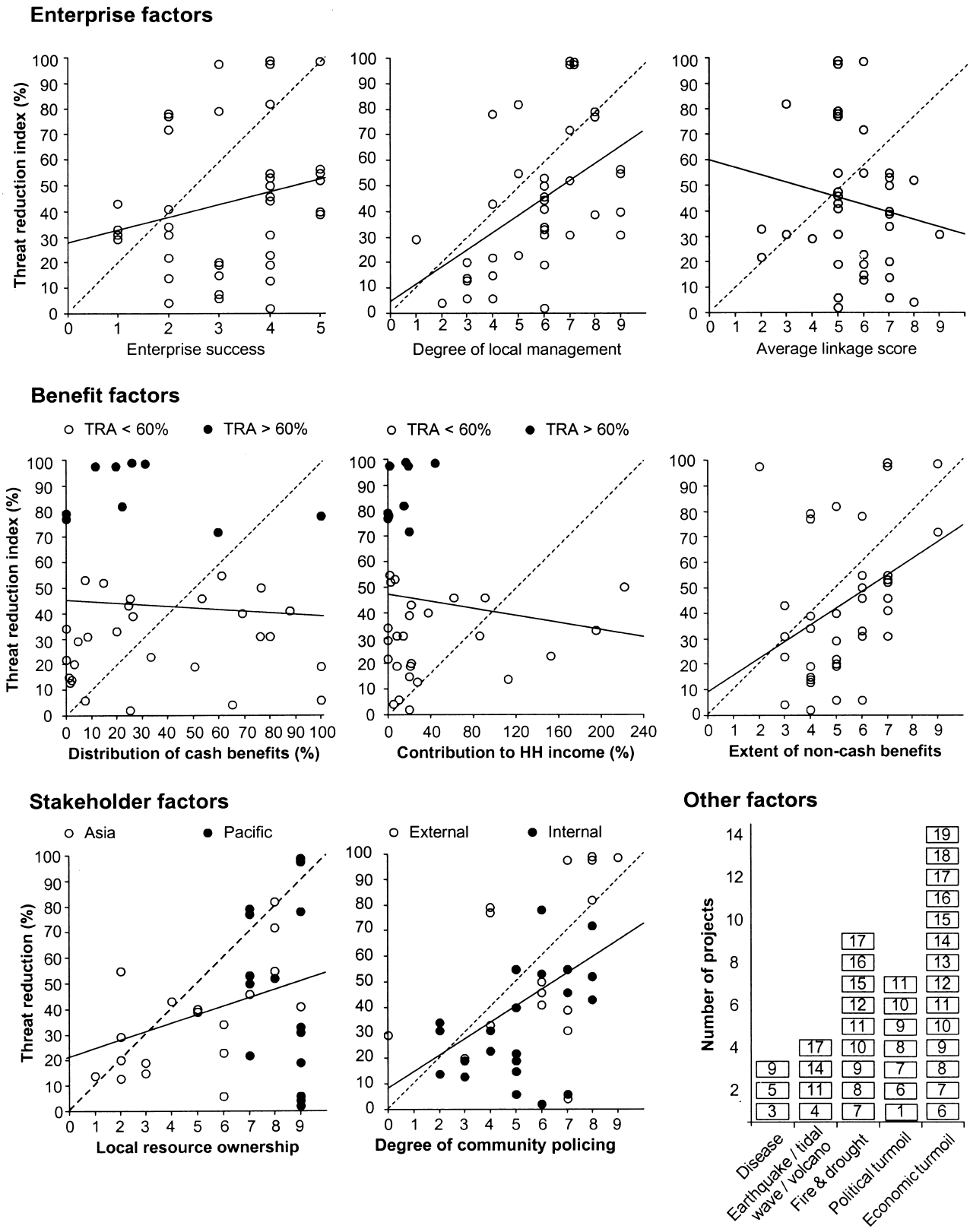

Figure 2. Selected enterprise, benefit, stakeholder, and other factors affecting conservation success. Variables used to measure each factor are defined in Table 1. The x-axis scales without units are points on a qualitative scale as defined in Table 1. Dashed lines indicate our working subhypothesis before the analysis began. Solid lines are the results of an ordinary least-squares regression, which are presented only for visual guidance of the direction of the association; no statistical inference can be made about the slope of the line. Numbers in boxes in "other factors" graph are the projects' numerical codes (see www.BCNET.org).

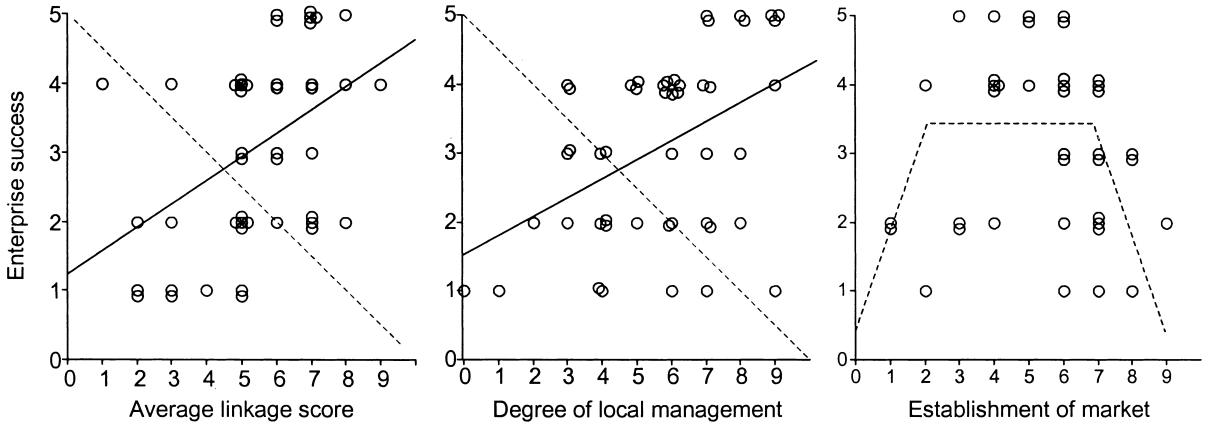

Figure 3. Factors affecting enterprise success. Variables used to measure each factor are defined in Table 2. Conventions are the same as for Fig. 2.

to test these predictions. Because the analysis was initiated after the program started, however, we were only able to specify our subhypotheses midway through the program. The lack of true baseline data means that we conducted a cross-sectional and historical prospective analysis rather than a true prospective analysis, which limits our ability to make inferences about causality.

Results

Each of the three parts of the BCN core hypothesis (Fig. 1) can be thought of as a necessary but not sufficient condition under which an enterprise strategy will work to promote conservation.

Enterprise Factors

The first condition of the BCN core hypothesis states that there must be a financially viable, linked enterprise. Despite the financial and technical assistance provided by BCN staff, these community-based enterprises were difficult to establish. Out of the 37 enterprises for which we had usable financial data, 4 had no revenues, 3 had minimal revenues, 13 covered only their variable costs, 10 covered their variable and fixed costs, and only 7 made a profit. Most of the remaining 11 enterprises for which no financial data were available were at best making only minimal revenues. In particular, it was hard for these businesses to pay for the high-level management skills necessary to make them viable. Nonetheless, we found that some of the BCN enterprises were able to make progress toward long-term viability. Key factors that influenced enterprise success included good management and bookkeeping skills, an established but not-too-competitive market, good market research, and a simple enterprise that used skills and technologies that local community members already possessed. There was a strong association between enterprise success and the degree of local community involvement in the ownership and management of the enterprise.

Overall, there was a weak association between enterprise success and conservation success, but a strong association between local involvement in the enterprise and conservation success. Despite the initial emphasis BCN placed on trying to fund only projects with highly linked enterprises (Fig. 1, line A), many of the businesses were not highly linked. It was particularly difficult to develop product-harvesting businesses that were dependent on the biodiversity of the site. Furthermore, conservation occurred regardless of whether or not the enterprise was linked. One possible explanation for this result is that the communities' perception of linkage was more important than actual linkage. Alternatively, this result could imply that linkage is not necessary for conservation, at least in the short-term. Over the long-term, however, if there is no linkage between the enterprise and biodiversity, then, by definition, a linked enterprise strategy will not work. In effect, without linkage, the enterprise approach becomes simply an economic substitution strategy that cannot address external threats (Fig. 1, pathway D).

Benefit Factors

The second condition of the BCN core hypothesis is that the enterprise must generate benefits for stakeholders in biodiversity. In this case, contrary to our expectations, conservation occurred regardless of the percentage of stakeholder households receiving cash benefits or the average amount of benefits each household received. On the other hand, we found that conservation was associated with high levels of noncash benefits. These results imply that, although cash benefits are not important in influencing stakeholders' willingness to counter threats, stakeholders do need some incentives to take action. In particular, noncash benefits seem to be effective in promoting trust and cooperation between key stakeholders and project staff.

Stakeholder Factors

The third and final condition of the BCN core hypothesis is that there must be a community of stakeholders who have the capacity to counter internal and external threats to biodiversity. It was clear that the group needs strong, though balanced, leadership. With regard to tenure, conservation occurred when some level of access to the resources was more important than having full legal control. It was also particularly important for communities to have the ability to enforce these rights against both internal and external threats, although an enterprise strategy seemed more effective in countering external threats. Countering internal threats seemed more difficult when the stakeholder group was heterogeneous and/or when there was a high degree of conflict between factions of the community.

Other Factors

In addition to the conditions directly related to the BCN core hypothesis, the projects were affected by other conditions. Of particular importance were severe natural disasters, including earthquakes, tidal waves, volcanic eruptions, fires, and droughts, and human-caused turmoil, including political revolutions and economic crises, that struck many project sites. Another set of factors relates to the effectiveness of the alliance of institutions implementing the project (for details see Margoluis et al. 2000).

Discussion

Conditions under Which Enterprise Strategy Leads to Conservation

Our results indicate that an enterprise strategy will not lead to conservation at all sites. Instead, at any given site, a series of enterprise, benefit, stakeholder, and other conditions influence the probability that the strategy will lead to conservation. Our ultimate purpose in testing the BCN core hypothesis was to inform conservation practitioners and managers about the specific conditions under which it might make sense to adopt an enterprise strategy and, just as important, the specific conditions under which it might not. There is no definitive answer guaranteed to work across all sites. We can, however, sum up our findings in a decision chart that will enable practitioners to determine for themselves whether it makes sense to use this strategy at a given site (Fig. 4). The flow chart begins by assuming that practitioners develop an initial conceptual model of the situation at the project site before the project begins (Margoluis & Salafsky 1998). Practitioners can then compare their situation to the biodiversity conservation network enterprise strategy guide in Table 3) to see if the strategy makes sense for their site.

In some cases, conservation occurred even when all of the conditions of the BCN core hypothesis were not met. For example, none of the projects that were most successful in terms of conservation had a highly linked enterprise. Several of the most successful projects did not have successful enterprises. Most of the successful projects did not generate high cash benefits for local stakeholders. How can we explain these apparent contradictions?

One explanation is that the enterprise strategy expressed by the BCN core hypothesis does not happen in a vacuum in which a project team uses only this strategy and no other. Instead, a project generally uses a variety of conservation strategies such as direct protection, management and restoration, policy and advocacy, unlinked incentives, and education and awareness. Our results indicate that education and awareness and a good project staff are particularly important. Evidence supporting the importance of education and awareness include the fact that community participation in the enterprise was significantly associated with conservation. Noncash benefits, such as enhanced community confidence, were also significantly associated with conservation, and, as shown by anecdotal evidence, communities took action in support of conservation in sites where they had good working relationships with project staff members.

Taken together, these observations suggest that an alternate pathway by which an enterprise strategy can lead to conservation (Fig. 1, pathway E) may occur when a conservation organization comes in and establishes an enterprise. The enterprise gives the project staff members entry into the community. Community members participate in the enterprise and develop enhanced confidence in themselves. They also come to know and trust the project team and become more receptive to the conservation ideas that the team members introduce. If the project promotes education and awareness, then the stakeholders may be more willing to listen and take actions to counter both internal and, especially, external threats. In this model, the enterprise does not have to be linked to biodiversity; indeed, unlinked enterprises that are easier to implement and more profitable may actually be more effective. If the enterprise is linked, however, then the primary path can work as well. Whether or not this alternate pathway works in all cases, the broader point is that any one conservation strategy will not work by itself. Instead, projects need to have the appropriate mixture of strategies tailored to meet local conditions.

Enterprises and Payment of Conservation Costs

One of the main ideas behind BCN was to see if enterprises could not only achieve conservation but also help

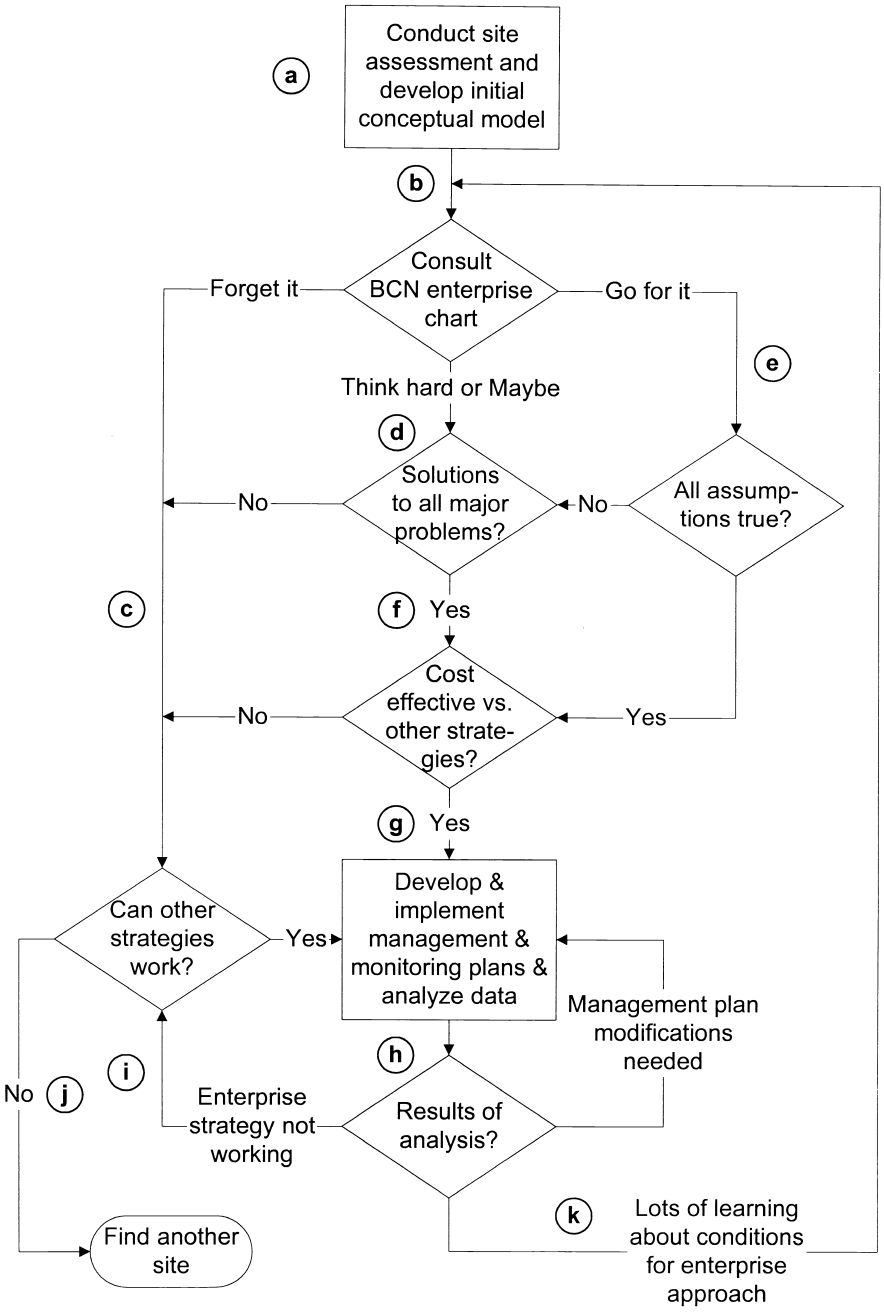

Figure 4. The Biodiversity Conservation Network (BCN) enterprise strategy decision chart for determining whether this strategy makes sense at your site. Starting with (a) an understanding of the situation at your site, (b) use the "BCN Enterprise Strategy Guide" (Table 3) to see if the strategy makes sense. To use this guide, compare the conditions at your site with the factors listed in the far left-hand column. If there is even one entry in the "forget it" column, then following (c), you will have to devise another strategy. If most of the criteria are in the "think hard" or "maybe if. . ." columns, then following (d), consider the comments in the far right column. If the problems are not resolvable, then (c) you will have to devise another strategy. Finally, if most of the criteria are in the "go for it" column, then following (e), check to make sure all your assumptions are valid. Next, (f) determine if the enterprise strategy will be cost-effective relative to other approaches. If it is, (g) develop management and monitoring plans for the project and implement them. Collecting and analyzing data (h) will facilitate testing of assumptions and modification of the management plan. If things do not work out, (i) try another strategy, or even (j) consider moving to another more tractable site. No matter what the outcome is, (k) sharing lessons learned with others contributes to our collective understanding about the conditions under which it is possible to use an enterprise strategy to achieve conservation.

pay for the costs of conservation. The premise is that if an enterprise leads to conservation and the enterprise is self-sufficient, then conservation is being paid for without the need for outside subsidies. If the BCN experience is any guide, it will at best take a number of years for most community-based enterprises to become self-sufficient. In many cases, it may be hard for the enterprise ever to cover all its costs. In particular, it may be necessary to pay for good-quality management and monitoring activities. Thus, the most common scenario might be one in which an outside subsidy is perpetually required to pay for the true costs (especially for management and monitoring) of the enterprise. The challenge is to avoid situations where the enterprise is not covering its variable costs and is thus losing money.

Although BCN's initial goal was to develop enterprises that could cover 100% of their operating costs within a 3-year period, we realized over time that this goal was

Table 3. The Biodiversity Conservation Network enterprise strategy guide.[a]

Factor	*Conditions at site*				*Comment on maybe if. . . column[b]*
Enterprise					
potential profitability	< variable costs	< fixed costs	> fixed costs	Costs+profit	if have management subsidy
market demand	none	low	high	medium	if overharvesting can be controlled
infrastructure	poor	marginal	okay	good	if low-weight, high-value product
local enterprise skills	none	few	some	lots	if people can be hired and trained
complexity	extreme	high	medium	low	if sufficient support is available
linkage	none	low	medium	high	if community perceives linkage
Benefits					
cash benefits	none	few	high	moderate	if they do not cause conflict
noncash benefits	none	few	some	high	if they are meaningful to community
timing	long wait	unknown	short	immediate	if at least some initial quick benefits
distribution	very wide	elites only	limited	targeted	if to resource-use decisionmakers
Stakeholder					
stakeholder group	not present	very new	present	established	if groups shows interest
leadership	none	weak	strong	balanced	if leader is respected by people
resource access	none	ill-defined	some	full	if not clear how important
enforceability	none	limited	some	strong	if community can defend its rights
stakeholder homog.	low	minimal	moderate	complete	if can compartmentalize businesses
conflict	constant	frequent	occasional	rare	if enterprise/project not involved
threat source	all internal	most internal	most external	all external	if external threat pays cash
Other					
chaos	constant	frequent	some	unlikely	if you can adapt to it
project alliance	unwieldy	none	strategic	experienced	if alliance has complementary skills
Implication	forget it	think hard	maybe if. . .	go for it	

[a]*See Fig. 4 legend for description of Biodiversity Conservation Network.*
[b]*These comments apply if the condition winds up in the "maybe if. . ." column as shown on the bottom of the table.*

not only unrealistic but also unnecessary. There is nothing inherently magical about the idea of an enterprise covering 100% of its costs—especially if it provides environmental or social benefits (F. Seymour, personal communication). An enterprise contributing to conservation that covers only 50% of its costs is still paying for conservation. If we view the glass as being half-full, then this 50% that an enterprise is able to recover can be seen as a "return" that helps pay for conservation. In effect, this money can be taken and used to fund a second site, thus doubling the amount of conservation that occurs for a given level of investment.

Learning Portfolios for Testing Conservation Strategies

The key principle behind the decision chart in Fig. 4 is that effective conservation action depends on practitioners having the information that they need to make critical management decisions. Practitioners need to understand the specific local conditions at their project site, both at the start of their project and as they change over time. They thus need to be able to collect the right information, analyze it, use it, and learn from it. At the same time, practitioners also need to know more generally about the costs and benefits of each conservation strategy under different conditions. They thus need to be able to draw on the experience and learning of other practitioners.

Perhaps the most important lesson from the BCN experience was the utility of using an adaptive management process at a programmatic level to formally test assumptions, adapt, and learn from the results (Lee 1993; Gunderson et al. 1995). The BCN was one of the first "learning portfolios" that systematically evaluated a specific conservation strategy by both supporting projects using the strategy and working with them to collect the data necessary to test it (Salafsky & Margoluis 1999*a*). We found that by combining action and research at a project level we were able to help our partners enhance their conservation impact and develop as learning organizations. At a program level, furthermore, the lessons we were collectively able to generate about an enterprise strategy helped produce a whole that was greater than the sum of its parts. Although learning portfolios require more staff, more money, a willingness to experiment and value failure, and a necessarily narrow focus, we believe that ultimately they lead to improved knowledge, cross-project learning, and improved partnerships (Salafsky & Margoluis 1999*a*).

Based on our experiences, we highly recommend that a learning portfolio approach be used to test other conservation strategies. Our experiences have convinced us that if we are collectively going to solve the challenges of conservation and development, we must find ways to assist practitioners in using scientific principles to learn what works, what doesn't, and why. In particular, we must continue to help practitioners (1) to define conser-

vation and objectively measure their success in moving toward it, (2) to discover and refine guiding principles for using enterprise-based and other strategies for conservation, and (3) to capture the knowledge they have gained in learning institutions.

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