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ABOUT SANREM CRSP

SANREM's mission is to assist in the analysis, creation and successful application of decision support methods, institutional innovations and local capacity approaches to support participatory sustainable agriculture and natural resource planning, management and policy analysis at local, municipal, provincial and national levels.

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SANREM CRSP RESEARCH BRIEF

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CAPITAL, COMMUNITY, AND COLLECTIVE ACTION: SOCIAL FOUNDATIONS OF SUSTAINABILITY IN AN ANDEAN BUFFER ZONE (ECUADOR)

Is there a relationship between the way various types of capital are distributed and a community's organizational capacity? Does the patterning of community networks and leadership relate to the potential for environmental collective action? Do diversity and inclusiveness as aspects of public life promote sustainability?



Development approaches have traditionally emphasized material resources, ignoring the less tangible forms of capital. But sustainable development, especially in relation to land use and production systems, calls for an integration of environmental, economic, human, and social capital. Emphasis on only one type of capital can in fact undermine sustainability.

This brief reports on findings from a research project, implemented by Iowa State University rural sociologists Jan Flora and Cornelia Butler Flora and Ecuadorian collaborators, Mary Garcia and Segundo

Andrango. By examining the interaction of different kinds of capital in four buffer zone communities, the study identifies features of economic, social, and political organization that are positively related with the potential for building environmental capital.

BACKGROUND

The four research sites (Palmitopamba, Playa Rica, Chacapata, and La Perla) are located near and within the buffer zone of the Cotacachi Cayapas Ecological Research. An agricultural frontier until ten years ago, the area is now a stable settlement zone inhabited by smallholders who have moved in from other parts of the country in search of land and work.

Residents draw their livelihood from the exploitation of natural resources, primarily for agriculture and livestock production. Cropland is divided between permanent crops (mainly sugar cane, but also plantain and fruits) and annual crops (maize and beans). The latter are associated with intensive land use, greater soil exposure, and application of chemical inputs.

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METHODOLOGY

The study was based on the following datasets, supplemented with participatory observation and individual interviews with community leaders:

* Quantitative data from a participatory census conducted by community members in 1996, from which indicators of environmental, economic, and human capital were derived and measured for each community;

* Qualitative data from community-leader workshops, during which various participatory research tools were applied to develop a consensus view of community organizations and leadership.

Typology of community capitals

Drawing from the participatory census data, the four research communities were ranked on the basis of the four types of capital:

Environmental capital

Two indicators were used in ranking communities in terms of environmental capital.

* In relation to cultivated land, the sustainability indicator was the percent of land dedicated to permanent crops, which protect the soil and require less chemical inputs than annual crops.

* In relation to non-cultivated land, the ratio of brush (*chaparro*) land to forest, which indicates the extent of cleared land that has been degraded and has not been rehabilitated.

Human capital

This refers to physical and non-physical capacities of human beings. In physical terms, human capital is calculated as the mean number of adult men and women per household (number of potential workers per household). As colonization zones become more settled, non-physical factors, such as literacy and numeracy become more important than labor, as they allow residents to take advantage of marketing options and non-farm employment. Therefore both demographic and education indicators were considered.

Economic capital

An asset index was developed, which included variables such as land tenure, home ownership, and sugar-cane mill ownership, production per year, number of cattle

owned, machinery owned. The index was used to rank households in five categories (very poor, poor, vulnerable, medium, and wealthy). Level of economic inequality within communities was calculated on the basis of the variance from the mean index score.

Social Capital

Social capital is defined as the social norms and networks that facilitate cooperation for communal benefit. Entrepreneurial social infrastructure (ESI) is a concept that operationalizes social capital in terms of measurable variables and predictive relationships. It is that aspect of social capital that can be changed through explicit collective effort, that fosters horizontal over vertical relations, and incorporates diversity and inclusion both within the community and in relations with the outside.

Measuring Entrepreneurial Social Infrastructure

Organizational networks

For each community, the existence of local organizations and of functional and leadership ties among them were mapped during workshops. Maps expressed whether these ties are horizontal or vertical. Relationships among internal and external organizations, most of which were hierarchical linkages to state agencies, were also charted.

The analysis was based on the following measures:

* Network density: the number of ties between distinct pairs of organizations divided by the number of ties possible ($[n-1]$, which means $[n-1] + [n-2] + [n-3] \dots + 1$, where n = the number of organizations in the community).

* Hierarchy index: the number of direct ties of the most central organization (that is the one with most direct ties), divided by total number of distinct ties between organizations. A larger number indicates greater hierarchy.

Community leadership

Receptivity to innovative approaches, such as those related to sustainable natural resource management, entails the acceptance of diverse ideas and groups within a community. Two measures of inclusiveness were considered, and generally found to be related:

* Diversity of organizational leadership: based on a comparison of the representation of women, youth, and poor families in leadership positions and in the general population of each community;



Functional linkages among organizations in the four Nanegal communities. Note the relatively higher connectedness of Palmitopamba and Playa Rica (Source: Participatory community/ leader workshops, 1996)

* Openness of institutional linkages: based on the number of individuals (“gatekeepers”) who control access to and information from outside institutions.

Tolerance of diversity

The capacity to defuse potential conflicts with groups that hold values that differ from the mainstream is also a measure of organizational capacity. For instance, alternative groups, such as Pentecostals, were found to be more marginalized in communities that had less dense networks and less inclusive leadership.

Level of network density and horizontality, inclusiveness of leadership, and tolerance of diversity in each community were found to be consistent. On the basis of these scores, Palmitopamba and Playa Rica appeared to have the most viable civic life (Table 1).

The guiding hypothesis for the study was that sustainability-oriented activism is more likely to arise in communities that have dense and horizontal networks and diverse and open leadership. To verify this hypothesis, ESI should correlate with indicators of social mobilization, such as:

* collective action, measured by: a) proportion of families participating in communal work days and local organizations, and b) citizen involvement in festivals; to gain official government recognition of the community).

* organizational capacity, measured by: a) rapidity with which community leaders obtained signatures and did paperwork for obtaining official recognition of their communities by the Ministry of Social Wellbeing b) the ability to involve citizens, generate funds, and enlist outside assistance in improving services for the two most important civic organizations (Community Improvement Board and Parents Committee), and c) the organizational capacity of community schools, measured by % of youth 13-17 years of age who had completed primary school .

In terms of overall social mobilization, leadership diversity emerged as an important factor, but its impact varied according to which groups were represented. For instance, in La Perla, the most active community, households belonging to the intermediate economic ranks were over-represented in leadership. They might have been more effective in mobilizing those ranking above and below them than wealthier or poorer households. Women representation in leadership also correlated with higher levels of social mobilization.

TABLE 1: SUMMARY RANKINGS

ESI Measure	Chaca.	Palmito.	La Perla	Playa Rica
Density of networks	4	2	3	1
Horizontality of networks	4	1	3	1
Inclusiveness of leadership	3	1	3	2
Tolerance of diversity	3	1	3	1
Summary of ESI Ranking	4	1	3	1
Collective mobilization	4	2	1	3
Organizational capacity	4	1	2	3
Mobilization/Capacity Sum	4	1	1	3

Note: 1 = highest rank; 4 = lowest.

Relations between types of capital

A final goal of the project was to explore the correlation of environmental, human, and economic capital with ESI indicators and mobilization capacity within a community.

* Environmental capital: Chacapata, the least 'developed' community, ranked first in conservation, but last in ESI. La Perla, which scored first in social mobilization, had the least environmental capital. This discrepancy between environmental and social capital might be due to the fact that in frontier communities social capital is directed to conquering rather than protecting the environment.

* Human capital: the more recently established Chacapata ranked first in physical capacity but low in education: it was also last in ESI and social mobilization. On the other hand, the oldest community, Palmitopamba, was last in physical capacity but high in education: it was also high in ESI and social mobilization. Education appears to be key factor enabling community organization and mobilization.

* Economic capital: the poorest community, La Perla, had the lowest inequality and highest representation of the poor in leadership: it ranked first in social mobilization. The wealthiest community, Playa Rica, had the highest inequality and representation of middle and upper strata in leadership: it scored low on social mobilization, but high in ESI. But Palmitopamba (where middle and upper strata are likewise over-represented in leadership, but inequality is low) scores high on ESI and social mobilization. Degree of inequality appears to play a greater role in determining levels of social mobilization than does ESI.

The analysis indicates that ESI enables, but does not guarantee, a community's capacity for organization and mobilization for sustainability goals. Other features contributing to that capacity are:

- * Levels of development (i.e. predominance of modern agriculture)
- * Levels of education in the population
- * Relative economic equality

CONCLUSIONS

There are many reasons for environmental degradation in areas of agricultural colonization. For frontier families, who tend to be young and poor, selling trees is an easy way of generating economic capital while they clear land for agriculture. Trees, unlike many agricultural products, are non-perishable, which is an advantage given that frontier areas are generally distant from markets. They also provide construction materials to build settlements.

Furthermore, most colonization zones are environmentally sensitive and settlers possess more physical human capital than educational human capital. Only with the disappearance of the frontier, the development of markets, and the establishment of basic services can environmental values come to the fore, particularly in the absence of government policies that favor more ecological approaches to settlement.

As a frontier zone becomes more settled, interventions should be directed to areas that are positively correlated with collective action towards sustainability. For instance:

- * Strengthening schools, esp. environmental education programs
- * Increasing efficiency of and communication among local organizations
- * Developing horizontal alliances and ability to negotiate with external organizations
- * Increasing women's capacity for and representation in leadership

This brief draws from an article by Jan Flora, Mary Garcia Bravo, Cornelia Butler Flora, and Segundo Andrango Bonilla in *Bridging Human and Ecological Landscapes: Participatory Research and Sustainable Development in an Andean Hillside Frontier*. Edited by Robert Rhoades, Kendall/Hunt, Dubuque, Iowa, 2001.

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