



SANREM CRSP

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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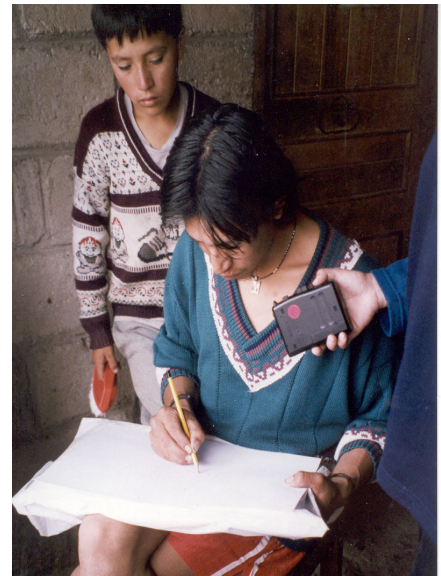
SCENARIOS OF SUSTAINABILITY: SCIENTIFIC AND LOCAL VISIONS OF DEVELOPMENT IN A BIODIVERSITY HOTSPOT (ECUADOR)

How can we elicit the deep-seated principles that structure the ways local people's assess and manage the environment? Is it possible to integrate community perceptions of desirable development with scientific modeling of landscape changes?

'Sustainability' has been a core concept in development approaches in the 1990s. Even so, it has been largely defined in biophysical terms, such as rates of erosion, deforestation, or biodiversity loss. When human dimensions are considered, it is often limited to quantifiable indicators such as levels of income, migration rates, market access, etc.

Simulation modeling, remote sensing and GIS make it possible to represent complex human-environment interactions. By enabling the visualization of 'if-then' hypotheses (i.e. if a road is built, x% of forest in the area will be lost) these models can assist local planners to understand the consequences of resource management decisions. But such tools are generally developed by outside scientists and do not reflect local people's values and visions.

This brief showcases an innovative research approach to overcome those limitations. It was developed by University of Georgia anthropologists Virginia Nazarea-Rhoades and Robert Rhoades and their colleagues, and tested in the SANREM CRSP Ecuadorian site. The scientists combined ethnoecological and landscape planning techniques into a methodology that allows them to identify underlying local interpretations of development and to integrate them with scientific predictive models.



Visualizing the past and future

BACKGROUND

The Nanegal region in the Ecuadorian Andes has been identified as one of 25 biological "hotspots" in the world. It lies within the buffer zones of 4 major ecological reserves, which

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support dozens of endangered species of mammals and birds. The area is the target of several foreign-funded environmental projects, including a Global Environmental Facility (GEF) project that aims to create a biological corridor connecting these reserves. The communities where the SANREM research was carried out is within the planned corridor.

These communities are inhabited by smallholder farmers, many of whom who have migrated into the area in search of land and jobs. Migration has dwindled since the 1980s and the area has evolved from an agricultural frontier to a more settled landscape, including forests and brush (*chaparral*), annual crops (maize, beans) perennial crops (sugar cane, banana), pasture-livestock operations, and agro-industrial enterprises based on sugar cane processing. Mining, floriculture, and poultry production are also making inroads into the local economy.

METHODOLOGY

Scientific en-visioning

To construct a models of land use changes in the Nanegal area the project built on a 24-year land use study by the Ecuadorian NGO and SANREM partner Centros de Datos para la Conservación (CDC). By using aerial photographs and satellite photographs, the modeler (David Stewart) composed pictures of vegetative cover and land use at two points in time (1966 and 1990). The photos were analyzed along with information on roadways, waterways, and community boundaries to identify the role of human factors in land management. 'Transition rates' of observed changes between 1966 and 1990 were used to project a future scenario in 2014 (24yrs from 1990).

Based on previous research, Stewart assumed that roads are to provide access to agricultural resources and pastures. The model showed a clear relationship among road layout and forest cover and validated the hypothesis that road building lead to shrinking of forested areas. Spatial patterns of forest disappearance were also correlated with the length of settlement. In recently established communities forest loss was greater near roads, while in older settlements it occurred further from the road, because all resources near the road had already been exhausted.

This analysis enabled scientists to derive general principles of land use change that can be applied to build future landscape scenarios. In general analysis of

the data confirmed that land use follows the pattern of converting nearby forest into cropland and pasture and that there is reason to believe that the process of deforestation will continue.

But to what extent is it a concern for local residents? Are they willing to change their management practices and forego development goals to safeguard or restore the environmental integrity of the watershed?

Cultural in-visioning

Unlike scientific modeling, which addresses biophysical impacts of human-environment interactions, ethnoecological methods aim to understand the cultural, moral, and aesthetic values that shape the way local people perceive and manage natural resources. This approach is referred to as *in-visioning* to stress the place-centered, micro-level dimension of the cultural models in question.

To elicit conscious and subconscious attitudes and aspirations concerning land use changes, the SANREM anthropologists designed culturally relevant story completion tests, by using elements of local folktales and narrative traditions. They constructed two story lines that project respectively into the past and into the future. After translating the story completion tests into Spanish and pre-testing them, interviews were conducted with 15 male and female community residents of different ages and socioeconomic standing.

Story 1 : The widow and the two brothers

Two brothers meet a needy widow who is begging. One offers her some food, the other insults her. The kind brother, who had been suffering from a limp, is healed. The other loses his senses and gets lost.
He returned to the village after 30 years.

He noticed the road and other changes: He saw that the forest had... He saw that the pasture land had...He saw that the sugar cane had... He saw that the chaparral had...He saw that the people had...

Story 2 : The wise president and the infallible guesser

A much beloved president is growing older and people begin to worry about what will happen after his death. They consult a village sage who has a reputation of accurately predicting the future. But, rather than giving them an answer, the sage decides to learn what is on people's mind and what concerns them. This is what he finds out:

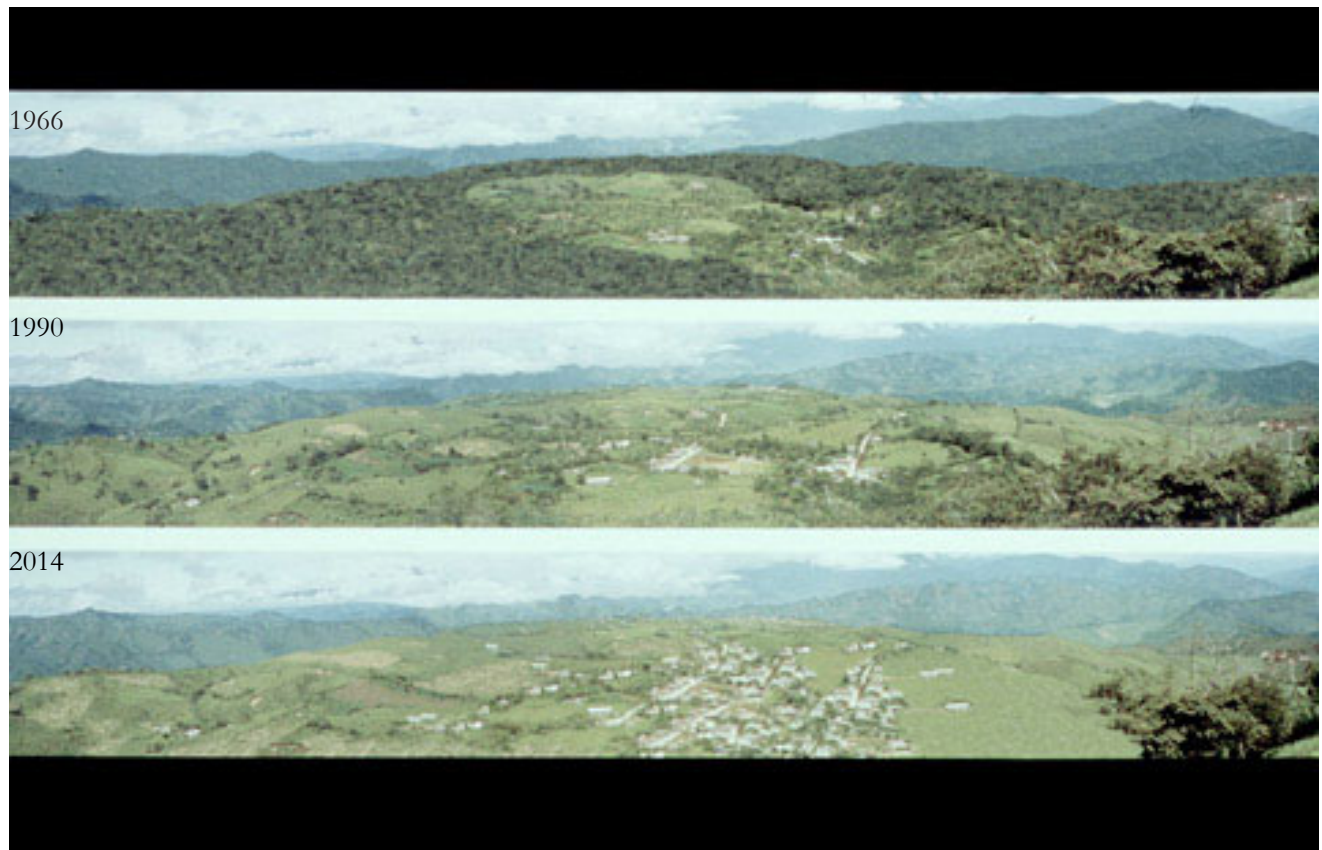
The people are most concerned aboutWhat they want most of the land isThey work hard becauseIf something could be changed for the better, they would... They feared the new president would not understand

RESEARCH FINDINGS

The analysis of responses concurs with the modeling results in that roads figure prominently in peoples' perceptions of a changing landscape and corroborates the derived land use change principles. But, unlike scientists and environmentalists, most respondents perceived the conversion of forest to cropland and pasture as a positive development. The forest was not considered a resource to be preserved but one that must be managed for the benefit of the community. In their views, it is lack of care and attention, rather than a conservation motive, that allows for land to revert back to forest. Labor is seen as a more salient factor than proximity in driving forest conversion, its allocation being driven by livelihood priorities.

The data suggests that local people's concerns focus on livelihood issues. Green programs are not local agendas. Families' main concern is finding work or increasing productivity and profitability of local enterprises, especially sugar cane production and processing. Work is seen key to progress, which is understood in terms of better schools, health facilities, and government services.

Landscape visioning plates



A community planning tool

Once scientifically derived principles are 'ground-tested' against local people's perceptions and priorities, the next step in the methodology is to use the information as a platform for community-based planning.

In order to stimulate community debate around something concrete, the SANREM researchers built photo-simulated scenarios of the landscape. A parallel visual anthropology research initiative had assessed that panoramic views are more easily understood than other images (aerial photos, maps, drawings, etc.). This finding informed tool development, which occurred as follows:

- A series of panoramic photos, representing the current landscape, were taken from a well-known viewpoint above the community;
- Plausible scenarios for past, present and future moments in time were constructed, by using land use change maps and information from ethnoecological research and oral history workshops.
- Two different scenario of future states were produced: one reflecting a regulated and balanced approach to development, the other uncontrolled growth and disregard for the environment.



Dr. Rhoades discusses visioning plates with residents of the Cotacachi community.

CONCLUSIONS

Science can play an important role in facilitating local stakeholders' and resource managers' decisions by identifying and illustrating tradeoffs and impacts. However they cannot determine the values and goals that shape those management decisions. Moreover, while scientists understand change in terms of factors that can be measured and modeled, local people are motivated to act upon those factors that matter the most.

The future visioning methodology pushes forward current land planning approaches that use visual simulation techniques to project landscape appearance under different land management options (USDA 1995, McDonald 1966). But the case study presented goes beyond scientific interpretations to integrate land use scenarios based on modeling with local visioning based on cultural values projecting the resulting scenarios through time.

Besides its heuristic value for research purposes, the methodology constitutes an enabling tool for community participation in land use planning. Because of its public and interactive

nature, this process also provides a viable framework for the representation of multiple agendas, the identification of common ground and potential conflicts, the negotiation of policy alternatives, and, ultimately, the mobilization of community commitment and consensus about a sustainable future.

References

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This brief draws from articles by Robert Rhoades, Virginia Nazarea-Rhoades, Maricel Piniero, and David Stewart in *Bridging Human and Ecological Landscapes: Participatory Research and Sustainable Development in an Ecuadorian Hillside Frontier*. Edited by Robert Rhoades, Kendall/Hunt, Dubuque, Iowa, 2001.

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