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Responses to Innovation in an Insecure Environment in Rural Nepal

Humla District in Nepal is a very remote area, prone to food shortages and characterized by a harsh environment. The livelihoods of agropastoralists in this district became much more vulnerable during the recent Maoist insurgency, and this vulnerability was particularly acute in some areas. As a result, people in different villages responded quite differently to an externally funded holistic community development project—one of the only projects the Maoists allowed to proceed with in Humla during the height of the unrest. Villagers' responses to this health- and conservation-oriented development project seem to correlate most closely with socioeconomic status and ability to extract resources from the local environment, as well as with the nature of the relationship with the local Maoist cadres. Villagers' perceptions of the risks of becoming involved in the holistic community development projects in this area, and their ability or willingness to take part in them, are analyzed here, drawing on anthropological analyses of perceptions of risk and the diffusion of innovations. We conclude with brief recommendations based on this evidence and our experience in the field.

Agropastoralists: "conservative"?

Development workers' understanding of subsistence farmers' and herders' reluctance to adopt new technologies has been informed for several decades by a focus on the perception of risks and on patterns of diffusion of innovations. People living on the produce of their own land and herds have been described as "risk-averse" and culturally "conservative," and as preferring not to adopt new technologies and farming or husbandry methods that might negatively impact their ability to make it through the next dry or cold season. We have been living and working with agropas-



FIGURE 1 Simiko, Humla District Headquarters; the project site is within a 1-day walk. (Photo by Alex Zahnd)

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toralists in the Humla District in northwest Nepal since 1995 (Figure 1), running small-scale community development projects with them that aim to conserve resources and improve human health and sanitation. Our experience has made us aware that farmers' perceptions of the risks involved in change are far from uniform even in apparently similar contexts, and has led us to reflect on why this is so.

Vulnerable livelihoods in Humla District

Nepal's poverty is well known, but even in this context Humla District stands out. With a per capita GDP of US$ 72 and one of the highest infant mortality rates in the country, Humlis live in dire straits. One contributing factor is the fact that Humla is a permanent food shortage area, with little trade, next to no cash economy, high elevation, and a short growing season.

Health and environmental concerns

Our surveys show that some 65% of Humla's children under 5 years of age are seriously malnourished. Nearly all inhabitants are subsistence farmers or herders, using farming and husbandry methods that are ancient and adapted to the local climate and elevation (2700–3000 m). Homes are small and unhygienic, and settlements are extremely dense. Water is drawn from streams or stream-fed unfiltered tap stands, and there is no local custom of human waste disposal, so trails in and around the villages are typically polluted by human waste. Indoor air pollution is extreme; in combination with malnutrition and the lack of hygiene and sanitation described above, this plays a large role in the high mortality rate. Open fires burn in fire pits in each home (Figure 2), for cooking and heat, and house interiors are lit by a resin-rich, smoky wood known locally as *jharro* (chir pine, *Pinus roxburghii*).

Traditional fuel (biomass) consumption in Nepal represents 93% of total energy use nationwide, and constitutes 100% of energy use in remote mountain areas such as Humla. This means that households in our project area devote up to 40 hours per week to collecting firewood (Figure 3). When they are not collecting firewood, villagers are engaged year-round in tasks associated with crop production and livestock husbandry—some at home while others practice transhumant pastoralism, moving animals between pastures at lower and higher elevations depending on the season. Nearly everyone winters at home in the village, with the animals packed into the livestock area on the first level of the home and humans above, usually gathered around the hearth in the common room. Women are required by customary Hindu beliefs about ritual and bodily pollution to leave the common area and refrain from using tap stands during menstruation. In some households, traders leave Humla in winter and head south to trade in Kathmandu or elsewhere.



FIGURE 2 Indoor air pollution in a typical Humli home. (Photo by Alex Zahnd)

Most households do not produce enough food for the year; on average,

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FIGURE 3 Collection site for *jharro*, the resin-rich wood traditionally burned to provide indoor light. (Photo by Alex Zahnd)

households can feed members from the fruits of their own labor for only 6 months in our project area. When they run out of food, they borrow from wealthier members of the community, or head south to the district headquarters (Simikot) to get subsidized rice at the government rice depot. Sometimes the pass to Simikot is closed by snow, or villagers arrive only to find that rice supplies are exhausted, and they return home empty-handed.

The Maoist insurgency

This was the situation into which the cadres of the Maoist insurgency entered. They were engaged in a struggle against the ruling government and ancient systems of land ownership, debt inheritance, caste, and gender discrimination. The Maoists added to the situation of extreme poverty and constant uncertainty about crop failure, wintertime food shortages and mortality by bunking with villagers and consuming resources that were always in short supply, demanding time from already pressed villagers during the short growing season for educational 'camps,' requiring villagers to have written permission to travel outside of the village boundaries, and by engaging in violence. Sometimes violence was perpetrated by individuals who would enter villages and homes in search of insurgents or people thought to be aiding and abetting the cadres.

Due to the unrest and the demands imposed on development by the circumstances relating to the insurgency, most development efforts in Humla were brought to a standstill during the insurgency. One organization—the one with which we worked—continued to function, bringing a multi-pronged, holistic community development approach to the region, designed to address some of the environmental and human health challenges described above.

The comprehensive "Family of 4" concept

While living and working with local communities, we found that villagers defined their most urgent household and health-related needs as minimal electric indoor lighting, a smokeless stove for cooking and heating, a toilet located near the home, and clean drinking water. This is how the "Family of 4" concept used in the projects came into being (Box 1).

A demand-driven package

The "Family of Four" is a set of innovations that are installed, as a group, in each home in a target village. It includes:

1) Elementary lighting (tapping local solar or water energy resources),
2) A smokeless metal stove,
3) A pit latrine, and
4) Access to a safe drinking water system.

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Villagers participate in the details of project planning and determine the pace and nature of the project, attend non-formal education classes about the basic thinking behind each part of the project, and are involved in all follow-up and trouble-shooting activities, and in ongoing technical support. Individual contributions to each project component include labor and materials, as well as a small payment in cash for the subsidized stove.

By and large, although considerable behavior change is required for villagers to successfully integrate each of the new technologies into their lives, this approach has met with considerable success and popularity in the region. Measurements of stove efficiency show that the stoves use up to 40% less firewood than the traditional open fires; moreover, in combination with solar lighting, stoves decrease PM_{10} (particulate matter ≤10 microns) levels very substantially (peak PM_{10} measurement with open fire: 20 mg/m^3, with smokeless stove and solar lighting: 1.4 mg/m^3) (Figure 4).

These benefits to environmental and human health are the most obvious ones and are easily appreciated, contributing, we believe, to the popularity of the project approach. People from villages where we have not worked sometimes walk all the way down the valley to the project office to ask that we work in their village next.

Unexpected differences between responses to innovation

Consequently, it was interesting to find considerable non-uniformity in participation rates in the projects. The villages in the region, though culturally and linguistically similar and largely lacking in socioeconomic status differentiation, were by no means a homogenous whole and did not respond in the same manner to the idea of innovations being introduced. This variation is most obviously captured by comparing one village, Bhajgaon (a pseudonym), with our experience elsewhere. In this village, chosen due to its proximity to other target villages, we found very substantial reluctance about the idea of participating in the projects. We were surprised to find this, since our initial view was that this village differed very little from the others—on the surface, caste, poverty level, subsistence system, and other indicators did not in any way distinguish this village from the rest.

The influence of the degree of poverty

Based on our reading of literature on the diffusion of innovation and the perception of risk, however, we decided to analyze baseline data from Bhajgaon to help us understand the resistance we were encountering. Recent work in this field has emphasized that people living in 'peasant' societies cannot be lumped together as a uniform whole, despite past theorizing that all people living in subsistence farming communities are reluctant to change and therefore resist innovation. Instead, analysts have shown more recently that it is often the case that poorer families are later adopters, waiting instead to follow the lead—and successful experience with a new technology—of a wealthier household. Additionally, social perception of risk will influence people's willingness to adopt change; people living in environments that are inherently riskier will be less likely to adopt a change than people living in less risky places.

Informed by this understanding, we analyzed our cultural, socioeconomic, and attitudinal data from the baseline studies we conducted in a village prior to enter-



FIGURE 4 Photovoltaic panels for solar energy close to a village in the project area. (Photo by Alex Zahnd)

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FIGURE 5 Interior of a traditional Humli home after introducing a smokeless stove and solar lighting. (Photo by Alex Zahnd)



"It is difficult to warm ourselves in the winter [with the new stove]." (Bhajgaon male farmer's answer to a question about the impact of a smokeless stove)

"The new stove does not produce smoke [in the house] and uses less firewood." (Non-Bhajgaon male farmer's response)

ing the project planning stage in that village. The results showed a remarkable resemblance to what might have been predicted by the theorists of the diffusion of innovation and perception of risk: villagers in Bhajgaon did differ in some very substantial ways from other villages, despite bearing a surface resemblance to others in the area. Bhajgaon was substantially poorer than other villages, with fewer herd animals and less land under cultivation per household. There was also less variability in wealth—the vast majority of households were in the lowest wealth category, whereas in other villages there were many more households in a higher wealth category (ie households that could be appealed to for help in times of scarcity).

Households in Bhajgaon carried a much higher than average debt load, too. Some of this was generations-old debt that people had inherited from their forefathers. Food security was also slightly worse than in the rest of the region. Households were producing less of the food they needed to feed their families than in the other villages where we had worked, and were more reliant on loans and the government subsidized rice available in winter. Anecdotally, we also knew—though we did not collect any data on this topic—that the villagers of Bhajgaon had an antagonistic relationship with the local Maoist cadres, more so than in other villages in the region, and had experienced many anxiety-provoking interactions with them.

Drawing on the attitudinal data we had collected, we analyzed the ways in which the villagers of Bhajgaon responded to questions about the expected impacts of specific project components. We found that they were much less likely to imagine any impact at all than villagers in other villages, and more likely to imagine negative impacts when they answered specifically. Furthermore, when queried about the long-term changes to the village as a result of the "Family of 4" approach, they were much more likely to give neutral answers, whereas in other villages, people answered specifically and concretely about the positive changes they anticipated. For instance, in other villages, people would answer that new stoves would save wood, save time, and cook faster (Figure 5) at a much higher rate than villagers in Bhajgaon, while in Bhajgaon, villagers were much more likely to answer that the stoves would be unsafe.

In other villages, people named benefits to safe drinking water and latrines such as increased cleanliness and overall health outcomes, while in Bhajgaon, people were more likely not to be able to identify any benefit. In describing the sources of stress that they had felt most keenly over the last decade, people in Bhajgaon were much more likely to cite the lack of resources, while villagers in other places answered that poor health and educational opportunities were problematic.

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Given that our results showed substantial differences between Bhajgaon and the other villages, we found the resistance of villagers there quite understandable. If they felt they were being harassed by the Maoists, it made sense that they would want to hunker down and avoid the assumption of any additional risk by associating themselves with outsiders, with an internationally funded development project, and with change itself. Given the more severe poverty in Bhajgaon, it was also understandable that people might fear the addition of practices that could strain a situation that was already very difficult. For instance, if the new stove stopped working, used more rather than less firewood, set the house on fire, or otherwise malfunctioned, villagers who were already pressed to the limit and had little hope that other villagers might assist them would naturally be reluctant to adopt change.

Advantages of a holistic and iterative approach

These differences highlighted 2 lessons for us: the first was the importance of doing baseline studies of communities targeted for development projects, in order to appreciate the existing parallels between and points of divergence from other communities. This helps us understand the ways in which our work will be received by the people with whom we are hoping to collaborate, and anticipate areas needing extra care or consideration.

The second lesson was that even in a seemingly homogenous group of villages—where homogeneity is perceived by local people, not just the project staff—important differences are likely to exist, and responses to the innovations to be introduced in the project framework will differ accordingly.

Based on our experience, we would offer the following recommendations to community development project designers and implementers:

- Holistic, long-term, and culturally nuanced projects that honor local priorities and social hierarchies and prioritize local participation have a good chance of long-term success. Projects that address only one part of a complex problem and that do not take into account local socioeconomic variations, different understandings of development, and people's own development goals and expectations will not succeed.
- Target 'easier' villages first and develop model households/wards/villages; then move on to poorer, more stressed villages and apply awareness training, support, education, and implementation, with commitment to a period of intensive follow-up support.
- Project planners and implementers must have updated information about sources of stress and perceptions of risk within the target community, and deal with these factors in a culturally appropriate fashion.

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FURTHER READING

McKay KH. 2003. Challenges to health care access in Maoist Nepal. *Himalaya* 22(2):43–46.

Wharton CR. 1971. Risk, uncertainty, and the subsistence farmer: Technological innovation and resistance to change in the context of survival. *In:* Dalton G, editor. *Studies in Economic Anthropology.* Washington, DC: American Anthropological Association.

Zahnd A, McKay KH. 2005. A simple, optimized PV system for a remote Himalayan village. Invited refereed paper. *In: Proceedings of the 43rd annual conference of the Australian and New Zealand Solar Energy Society, Dunedin, 28–30 November 2005.* Available from the authors of this article.

Zahnd A, McKay KH. 2007. Pico-hydro: la centrale électrique de sanitarium pour l'éclairage élémentaire comme la partie d'un projet de développement de communauté holistique dans un village éloigné et appauvri de l'Himalaya dans Népal. *Revue Tracés* 24/2007.

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