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The Whole Village Project: A Platform for Evaluating Rural Development Projects

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Abstract: The Whole Village Project, a joint undertaking of Savannas Forever Tanzania (a Tanzanian NGO) and the University of Minnesota, offers a cost-effective platform for evaluation of development projects. Detailed baseline longitudinal data are collected in a large number of rural villages and can be shared among a large number of projects for evaluation or research. The baseline can be supplemented with project-specific modules. This model enables good quality evaluations for a wide range of development projects and offers significant economies of scale.

Keywords: rural development, evaluation, surveys

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In recent years the funders of development projects have become more insistent that careful evaluation of projects be integrated into project design. However, randomized assignment—the gold standard for project evaluation—is costly and not always even conceptually feasible. The Whole Village Project (WVP), jointly undertaken by Savannas Forever Tanzania (a Tanzania-based NGO) and the University of Minnesota, offers a cost-effective evaluation tool for projects undertaken at the scale of a small number of rural villages. This paper describes the conceptual foundations of the WVP and some details of its implementation in rural Tanzanian villages.

The central idea of the WVP is to collect detailed baseline data from a large number of rural villages, then return to the same villages every two to three years, creating longitudinal data that will be valuable for project evaluation, as well as being a general source of information about rural Tanzania.

The number of villages that have been studied currently stands at 55, and is expected to grow to about 90 by the end of 2010, with an ultimate objective of 200-300 villages. At present, the villages are all in northern and central Tanzania. In each village a team of 8 field researchers conducts a multi-part study including an inventory of institutions operating in the village (local government, schools, clinics, NGOs, and so forth), interviews with local leaders, several focus groups, a household survey covering a variety of subjects, and an anthropometric survey of children under age five.

Core data and methods

Tanzanian villages

A rural Tanzanian village usually has a village center, but the population of the village is often spread over a wide area. It is, in fact, more akin to an American township than to the small cluster of dwellings that would typically be called a village in North America or Europe. The village is a legal entity and village governance is the most decentralized level of Tanzanian government. An recent initiative for Decentralization by Devolution (Local Government Reform Programme II) envisages increasing autonomy and self governance at the village level. Villages vary widely in population, geographical size, ethnic composition, and economic base.

Content and procedures

SFTZ is granted permission to conduct research by the Tanzanian Council for Science and Technology, under the umbrella of Tanzania Wildlife Research Institute. Most of WVP's activities in Tanzania, including field research, are undertaken by a team of university-educated researchers employed by SFTZ.

After the appropriate local permissions are in place, the WVP research team first meets with various District officials before scheduling the 5-7 day visits to the villages selected for research in the District. On returning to a village on the specified day, the team meets with key village leaders (villages throughout Tanzania have similar governing institutions), conducting "expert interviews" with members of the village government, the school headmasters, health officers, and the village resource committee to obtain descriptive data on the extent and quality of services available in the village, and specific challenges.

The next step is focus groups. Approximately 10 adults are invited to participate in groups assessing women's issues, men's issues, farming and livestock. Care is taken to include knowledgeable people of different ages and from different subvillages. Finally a larger focus group is assembled and Participatory Rural Assessment methods are used to assess the strengths and weaknesses of village institutions, such as school, church, mosque, village government committees, local enterprise organizations, and local NGOs.

The largest component of the WVP is a detailed household survey conducted in about 70 households per village. This survey covers a wide range of topics:

- Basic demographic information for every household member
- Main economic activities for individuals age 10 and older
- School enrollment status and educational attainment of every household member age 5 and older
- Agricultural practices, output and sales
- Livestock holdings, losses, and sales
- Income from animal and natural resource products (skins, honey, etc.)
- Income from employment or small businesses
- Household nutrition
- Food security

- Sources of drinking, household, and agricultural water
- Fuels used and/or collected by the household
- Household assets and characteristics of these assets
- Global Positioning System coordinates of the household and village center (the former are treated as confidential)
- Civil-society indicators
- Human-wildlife interactions and consumption of bushmeat
- Perception of the benefits/costs associated with local protected areas, hunting and photographic tourism companies

An "under-five" module consists primarily of anthropometry for children under age 5 in the households selected for the household survey.

Most of the data described above are entered directly into hand held PDAs. Various quality checks are conducted in the field, including repeat visits to random households to confirm responses to a small subset of the questions. At the University of Minnesota, data are cleaned and information that would allow identification of particular households is removed.

Sampling

The WVP household surveys use a multi-stage sampling strategy with the goal of producing data that can be used for comparisons among a small number of villages. It is not designed to produce national estimates.

Most of the villages already surveyed were chosen by early funders of the WVP. The long-term goal, however, is to employ a probability sample of 200-300 villages, stratified by region and proximity to main roads and urban areas.

The village administration maintains a roster of village households. The overall sample of about 70 households, is divided among the sub-villages in proportion to their population. The sampled households in each sub-village are drawn randomly from the village roster.

Unlike surveys designed to answer a single research question, there is no simple answer to the question of whether the WVP sample is "large enough." In this context, it should be noted that there is generally no reason for an evaluation to be restricted to a single

village or pair of villages, i.e., 70 households is not "the" sample size. We address this issue further below.

Village profile activity

WVP has a unique approach to encouraging village cooperation. Within a few months of the first visit, data collection teams return to the village to present villagers (and their leaders) a “village profile” based on the findings. The profile includes comparisons with nearby villages.

Most villages are enthusiastic about this effort. There appear to be two main reasons: First, it is interpreted as a sign of respect; two-way communication about research is extremely unusual in rural Tanzania. Second, presentation of the village profile provides systematic information that generates discussions about village issues. Thus the presentation could be interpreted as a tool that enables evidence-based civic engagement, and this is evidently valuable to the villages.

The WVP evaluation framework

The term "evaluation" is used in conflicting ways by the development community. What is meant here by "evaluation" is the measurement of changes in people's lives that result, either directly or indirectly, from a project. Thus the evaluation of a project to build clinics does not involve simply checking whether the clinics were built to specification, but whether lives change in the villages: Do health outcomes improve? Do educational outcomes improve with healthier children?

Even if a project directly affects only some village residents, it is important to think about evaluation at a village scale because of potential spillovers from participants to other villagers and because characteristics of a village can influence the outcomes. (Spillovers between rural villages are possible, but likely to be much smaller.)

From a purely methodological point of view, the most important aspect of the design of the WVP is that it will generate longitudinal data from a broad cross-section of villages. The data are longitudinal at both the village and household level—each village will be revisited at two to three year intervals. The panel of households within a village will rotate over time to maintain representative demographics, but the exact pattern will depend on the level of attrition, which has not yet been observed.

The longitudinal design allows simple before-and-after comparisons, however tracking villages not involved in the project being evaluated enables a more sophisticated quasi-experimental methodology sometimes known as difference-in-differences. The role of the difference-in-differences approach is to help make a compelling case that projects impacts are due to the project, rather than to other influences that happen to coincide with the implementation of the project.

To understand the benefit of using comparisons both over time and across villages, it is important to recognize that even isolated rural villages are not static systems, so outcomes of interest to a project may change even in the absence of project activities. For example, a program might provide an HIV/AIDS education program to a particular set of villages in 2010. A survey in 2012 might find that awareness of transmission risks and protective measures has improved in these villages. But if awareness has been increasing throughout rural Tanzania because of programs in the schools, the before-and-after comparison confounds the two sources of increasing awareness.

The key to the difference-in-differences approach is to use a set of villages that did not receive the HIV/AIDS education program, but are otherwise similar to those who received the education program (the "treatment" in the terminology of experiments). This comparison group ("control group") can be used to estimate the background changes, which are then subtracted from the simple before-and-after difference to get a better estimate of the program's effectiveness (thus "difference-in-differences").

The challenge of finding comparison villages

Finding an appropriate comparison group is perhaps the most challenging part of this approach to evaluation of development projects. The comparison villages are meant to represent what would have happened in the project villages if no project had been implemented. Ideally, therefore, the comparison villages are as similar to the project villages as possible (except for the project). They should have similar demographic composition, a similar economic base, similar micro-climate, similar exposure to previous development projects, and so forth. The sheer diversity of villages makes this a difficult standard to meet. Of particular concern is the fact that villages have been exposed to a wide variety of development efforts—by NGOs, foreign governments, and

the Tanzanian government—and some of these efforts may have had goals similar to the project being evaluated. However, using good but imperfect comparison groups is greatly superior to using no comparison group. To some extent imperfections in the comparison group can be mitigated by the customary practice of embedding the difference-in-differences methodology in a regression framework.

Furthermore, with baseline data for a large number of villages, WVP offers the important advantage of being able to provide a larger selection of possible comparison villages. But why are comparison *villages* needed? To see why, consider an evaluation design that is a true experiment (and feasible with the WVP data collection framework). Suppose the treatment and control groups were two random samples of households from several villages. Since the treatment and control groups both cross the same village boundaries, and the problem of finding comparison villages does not arise: the effects of village-specific factors tend to cancel when comparing the treatment and control groups because both groups are spread across all the villages. This is the key value of controlled experiments.

The experimental design just outlined could be useful for evaluating certain kinds of projects, but for many development projects undertaken by governments and NGOs it presents practical problems. First, the projects are often at the village scale—providing safe drinking water, for example. Second, even if the project can logically be limited to a subset of village households, villages are small places, so significant spillovers from treatment to control group are possible. If the treatment were the introduction of an agricultural innovation, for example, control group farmers might well choose to adopt it if their neighbors brag about bigger harvests. Such spillovers are much less likely across villages than within them.

The village profile activity discussed in the previous section sometimes raises a concern that the WVP itself might influence the outcomes it measures, thus contaminating evaluations performed with WVP data. (Conceptually, the same criticism applies to the common practice of offering monetary compensation for participation in a study.) However, since the activity is performed in every village and in the same way, any effects it might have will be approximately the same in the project and comparison villages, as long as the comparison group is sufficiently similar to the project group. In

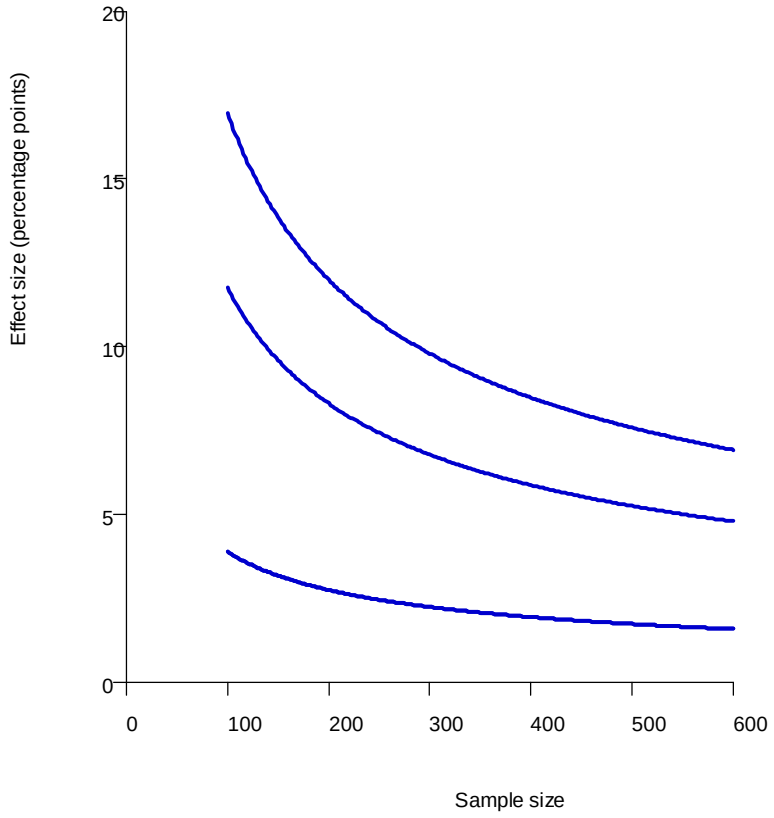
other words, the effect of WVP shows up with a positive sign in one part of the difference-in-differences calculation and a negative sign in another part. This issue highlights again the importance of finding appropriate comparison villages.

Sample size and statistical significance of findings

As mentioned above, the relationship between sample size and statistical significance depends on the question under consideration, and the WVP surveys are intended to be used to assess many different outcomes. However, to benchmark the WVP sample size, consider a hypothetical program intended to encourage adoption of a new agricultural technique. One outcome measurement would be a simple indicator of whether a household uses the technique. Four outcomes are possible: the household does not use the technique before the program, but *adopts* it; the household uses the technique before, but drops (*de-adopts*) it; the household never uses the technique; and the household uses the technique both before and after the program. The baseline probabilities of the first two outcomes (adoption and de-adoption) determine the relationship between sample size and statistical significance.

Figure 1 shows the relationship between sample size and the statistical significance of a difference-in-differences impact estimate under three assumptions about the baseline adoption rate. The curve labeled "1%", for example, says that when the sample size is 280—corresponding to two project and two comparison villages if all village households farm—a change of 2.3 percentage points over and above the 1 percentage point change in the comparison group is required for statistical significance. If the background adoption rate is 10 percent, the middle curve indicates that the program needs to accelerate adoption by 7 percentage points (i.e., to 17 percent) to reach statistical significance.

Figure 1: Size of difference-in-differences impact estimate required for statistical significance. Significance level of 5%. Assumes sample is split equally between project and comparison villages and that the de-adoption rate is zero.



comprise activities that affect entire villages, it is important to be able to measure outcomes at the village level. The WVP surveys a substantial number of households in each village, making it possible to characterize the village with reasonable precision on many dimensions.

For example, the impacts of an HIV/AIDS educational program may differ along several dimensions: poor versus prosperous households, agricultural versus pastoral livelihoods, Christian versus Muslim families, proximity of the village to an urban area. These differences have implications for project implementation, allowing refinement of methods and approaches.

Another example lies in development and conservation projects that may create unintended benefits or problems. For example, a program that helps villagers conserve timber for lucrative but sustainable commercial production might jeopardize the charcoal earnings of the village poor. Similarly, a program that helps children to reach secondary school may encourage migration to urban areas, with a complex array of consequences for the village. On the one hand, some of its most talented youth are leaving. On the other hand, they may send remittances to their families or return later with new ideas and enough capital to help the village diversify its economy.

The WVP surveys collect a wide spectrum of information about the village, which will allow evaluators to observe many of these collateral outcomes. But, in addition, the qualitative tools, being more open-ended, provide an opportunity to spot emerging trends (though obviously no guarantee).

The WVP is interdisciplinary

Since development is a complex process involving nearly every aspect of people's lives, a single disciplinary perspective is likely to miss important aspects of village experience. The WVP team currently includes Tanzanians, Americans and Europeans with advanced training in business, ecology, anthropology, economics, medicine, public health, demography, GIS, and social work. Similarly, the research tools gather both qualitative and quantitative data thus exploiting different methodological traditions.

The WVP is modular

The core instruments of the WVP described above provide general information about the village, but since the field teams are experienced in handling several research tools, it is possible to design specialized modules for clients, which can be linked to the core information. For example, the United States Agency for International Development has funded a survey of knowledge and attitudes about HIV/AIDS to support evidence-based HIV/AIDS curriculum development (which is undertaken separately by SFTZ and the Tanzania's National Institute of Medical Research). Combining information from the HIV/AIDS survey with baseline data allows the curriculum to be adapted to account for pre-existing knowledge and attitude differences associated with cultural and socio-economic factors.

Partners for Development (PFD), a Tanzanian NGO, commissioned a special survey module studying jatropha cultivation. (Jatropha is a potentially important bio-fuel crop.) PFD plans to use the baseline survey to help design a program to promote jatropha cultivation and harvesting in a subset of these villages. The jatropha module will administered again when WVP returns to the villages to measure outcomes associated with the intervention. Data from the jatropha module can be combined with core data to explore whether there are any unintended negative consequences of jatropha cultivation. For example, nutritional outcomes could deteriorate due to reallocation of land away from food crops.

The modular design of the WVP offers a key cost advantage in evaluating small-scale development programs because the cost of collecting and maintaining core baseline data, such as demographics, is shared among many organizations. The baseline data, excluding information that would allow identification of individual households, will become a public resource after data cleaning is completed.

Comparison to other data sources

Several large and well known surveys such as the Living Standards Measurement Studies (LSMS) or the Demographic and Health Surveys (DHS) superficially appear to be close substitutes for the WVP, but they have different objectives, which result in some key differences: First these surveys typically use nationally or regionally representative

samples that do not ordinarily have a large concentration of respondents in any single village. The new Tanzania National Panel Survey (TNPS), for example, covers both urban and rural areas and averages only eight households per cluster. The 1993 LSMS for Tanzania targeted 20 to 25 households per village in rural areas (Ferriera and Griffin, 1996), and the 2004-2005 DHS for Tanzania selected 22 households in each village in rural areas (NBS and ORC, 2005).

Second, large-scale surveys such as the LSMS normally do not collect detailed qualitative information about the village's economic, political, and geographical context (the TNPS Community Questionnaire is an exception). Third, and most importantly, they usually do not collect data longitudinally (exceptions are the LSMS panel in the Kagera region and, subject to sufficient funding, the TNPS).

At the other end of the spectrum, academic and policy researchers often conduct in-depth studies of a small number of villages. WVP's tracking of a large number of villages offers cost and methodological advantages, as explained in the previous section.

Case studies from the baseline

Longitudinal data are not yet available on the scale required to conduct an example evaluation, but a sense of the potential of WVP data can be illustrated with data from 2009 baseline data along with a small amount of data from some 2006 pilot villages.

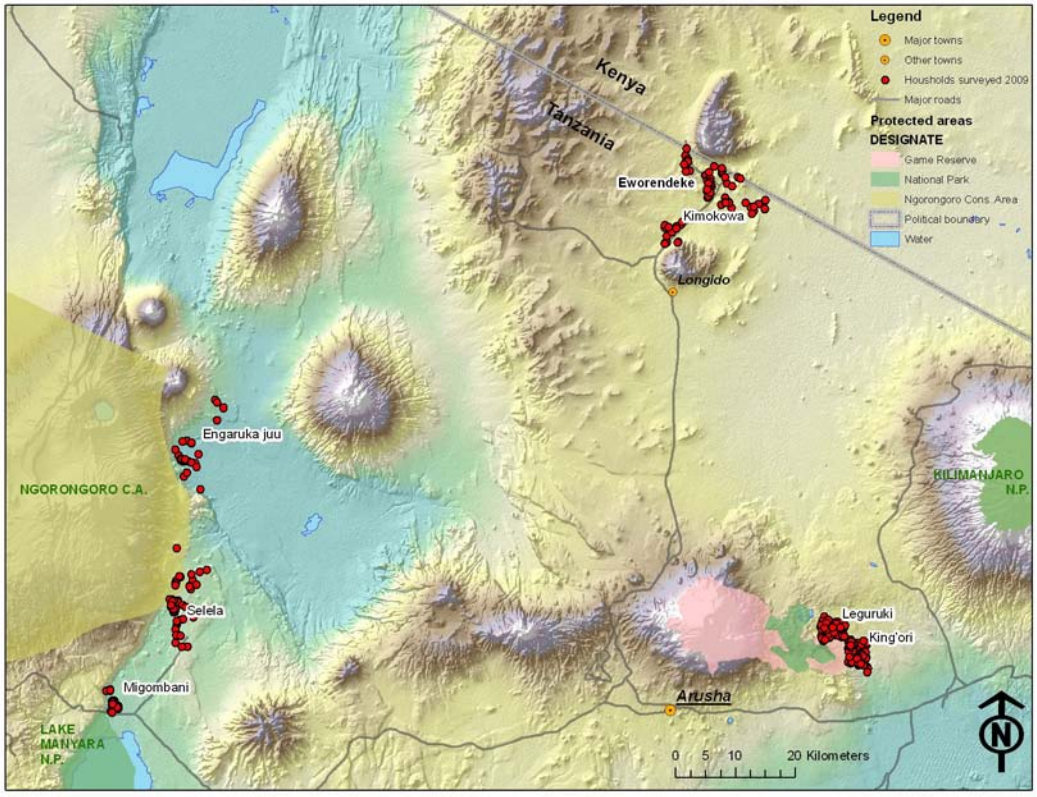
The 2009 drought

The 2009 drought in northern Tanzania offers an opportunity to see the value of the WVP approach. Northeastern Tanzania normally experiences two rainy seasons each year. The "short rains" normally fall during November and December, and the "long rains" usually happen during March and April. In 2009 the "long rains" were almost nonexistent. (The drought area in northern Tanzania was the southern edge of a much larger drought area that extended through several countries in East Africa.) By August many crops had failed, and forage was exhausted in all but a few areas.

Obviously, a drought of this magnitude had a dramatic effect on every rural village in the region, but village-by-village analysis reveals a much more nuanced picture of the crisis, though an earlier wave of data is available for only one village. WVP collected data in seven villages between August and October of 2009 (see map in Figure 2). Three of

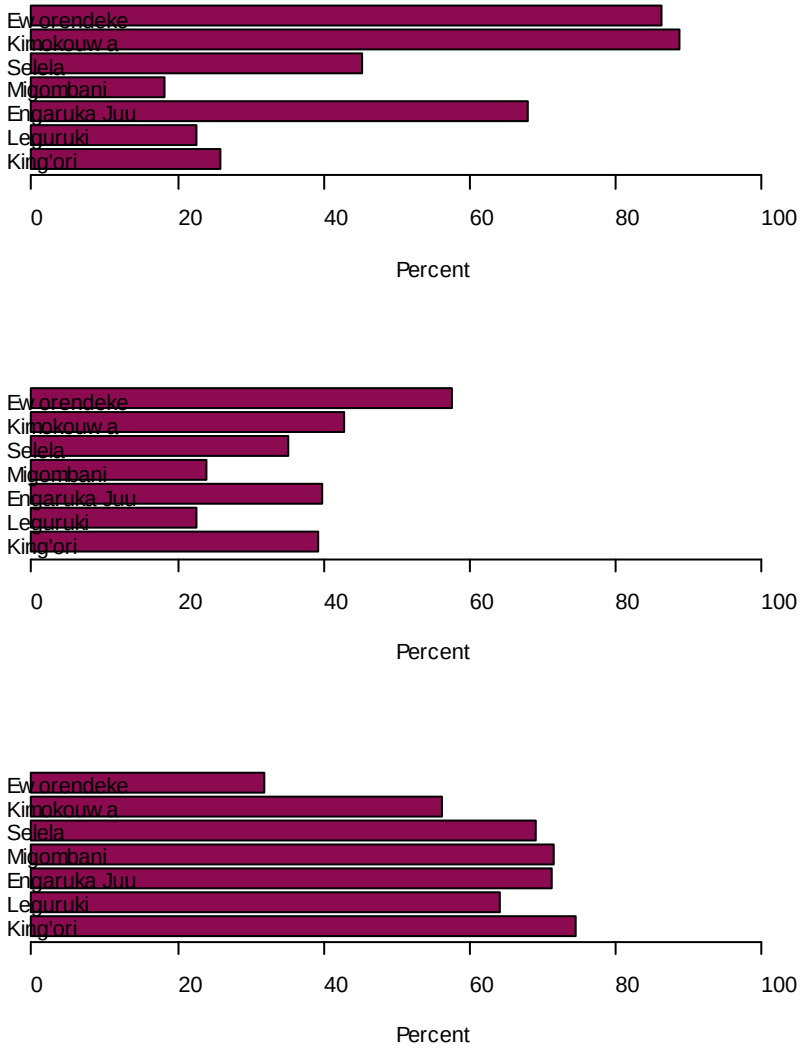
these villages (King'ori, Leguruki, and Migombani) are primarily agricultural, while the economies of the other four villages revolve around raising livestock.

Figure 2: Location of the seven villages surveyed in September and October 2009.



As Figure 3 illustrates, all types of livestock were hit hard in all seven villages. Most of these losses, particularly of cattle, sheep, and goats, were probably related directly or indirectly to the drought. Losses of cattle were devastating in Kimokouwa, Eworendeke, and Engaruka Juu. Because the people of these villages are mostly traditional Maasai herders, who do very little or no farming, the economic base of these villages is minimally diversified, making the economic impact on the communities even more devastating.

Figure 3: Livestock losses during previous 12 months. Herd size at the start of the reference period is approximated by current size plus sales plus losses. It does not account for births or purchases.

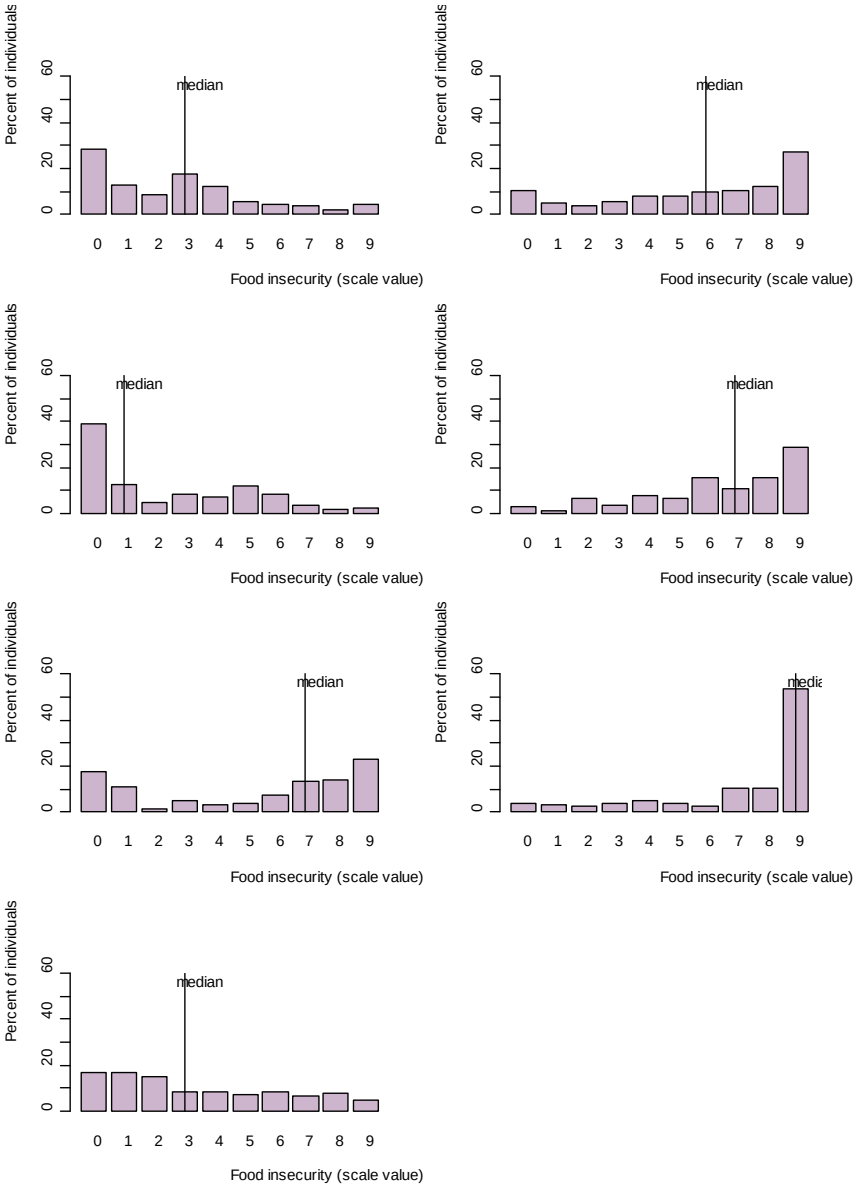


The agricultural villages, King'ori, Leguruki and Migombani, reported the highest loss of poultry. Even though a large proportion of chickens were lost in these villages, the economic impact was not as devastating because of their reliance on agriculture as well as livestock.

The dichotomy between the farming and livestock-keeping villages manifests in measured levels of food insecurity as well. The contrast displayed in Figure 4 is stark: In the three farming villages the histograms go downhill from left to right—higher levels of

food insecurity are reported by fewer people. In the pastoralist villages the histograms go uphill instead.

Figure 4: Food insecurity scale. Higher values indicate less food security. The food insecurity scale is based on responses to questions about household food availability during the previous four weeks. The questions range over nine food insecurity scenarios

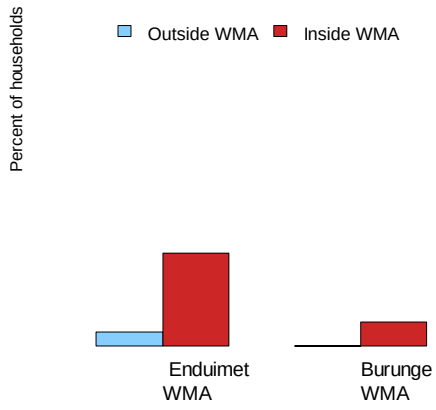


Evolution of attitudes toward protected areas

In cooperation with the World Wildlife Fund, WVP has worked to measure the challenges facing the wildlife management areas (WMAs), which have recently been

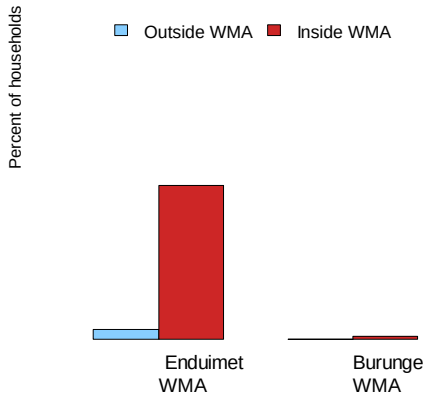
established in Tanzania. These WMAs are intended to encourage local support for conservation by engaging local communities in natural resource management. However, Figure 5 shows that people living inside the WMAs face greater conflicts with wildlife, including greater risk of injury, more loss of livestock to wild carnivores, more crop damage, and more problems with the managers of these areas.

Figure 5: Problems with WMAs, 2009. Matched comparisons of villages inside and adjacent to Enduimet and Burunge WMA's. Two villages inside and two villages outside each WMA were surveyed. Data show the proportion of households reporting (A) injuries to family members from wild animals, (B) losses of domestic stock to wildlife, (C) crop damage from wildlife, and (D) problems with the management of the nearest protected areas.



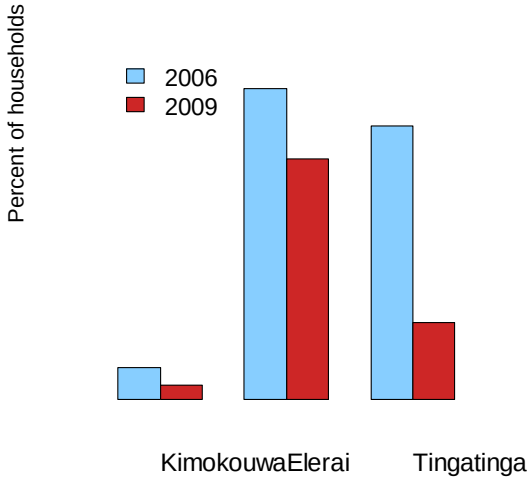
(including natural resources, as well as cash, schools, dispensaries) are not uniformly higher in the WMAs than in the neighboring villages (Figure 6C). Thus it is perhaps not surprising that a higher proportion of WMA households state that they would be happy if the special status of the protected areas were removed ("de-gazetted") (Figure 6D).

Figure 6: Benefits of WMAs and opinion about continuing WMA, 2009. Proportion of households reporting (A) benefits from photo-tourism, (B) benefits from hunting companies, (C) benefits (such as raw materials and natural resources from the WMA and (D) that they would be happy if the protected areas were de-gazetted.



sentiments increased with declining benefits. Changes between any two single years are likely to be influenced by external events in either year, such as the 2009 drought and fluctuations in tourism from the global recession; and the 2006 sample sizes were quite small; but the apparent link between benefits and attitudes illustrates the potential value of longitudinal data.

Figure 7: Changing benefits and attitudes, 2006-2009. Proportion of households in three villages that (A) perceived benefits from photo-tourism and (B) reported that they would be happy if the protected areas were degazetted. Kimokouwa is near the Enduimet WMA; Elerai and Tingatinga are inside the Enduimet WMA.



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