

Wildlife Conservation Society, China

Insights on Community-Based Conservation Planning in Amur Tiger Habitat

Analysis & Recommendations



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Summer 2011

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Preface and Acknowledgements

Preface

In the summer of 2011, a team of three interns worked with the Hunchun office of the Wildlife Conservation Society, China, to complete a community livelihood survey. The survey itself consisted of two main sections: 1) Questions designed to understand social and financial incentives for the pursuit of current and alternate livelihoods and 2) Questions designed to understand the efficacy of current human-wildlife compensation plans. This report only addresses the first topic. You may inquire with WCS for the second report on compensation, authored by Joshua Berger, at wschina@wcs.org.

This report was authored in large part by Jennifer Chin, a joint Master's degree candidate studying environmental management and business administration at Duke University. However, the survey itself was created jointly by Mr. Berger (AgroParisTech), Ms. Chin, Melissa Pettigrew (AYAD) and Liu Tong (WCS China). WCS China brought Ms. Chin to Hunchun in order to continue the work that a team from the Haas School of Business at the University of California, Berkeley, performed the previous summer. In order to shore up basic premises about the community in question, and to address a new priority for the organization, Ms. Chin designed a basic social survey that grew into the survey described above. Ms. Pettigrew managed the SPSS survey database and performed the more complex statistical analyses.

Based loosely on the framework of an entrepreneurial business plan, this report attempts to outline the main social and market forces that affect WCS China's work in and around the Hunchun Nature Reserve. This report is designed to help WCS China assess future project plans for areas of strength and weakness, in the hopes that it will lead to more successful project strategies.

In China, where conservation and community development are inextricably connected, WCS cannot ignore the human forces that define conservation's possibilities. My hope is that this study will not only assist WCS in its project management, but also help local and township-level governments to understand how they can 1) better protect the rare wildlife living around them and 2) improve the livelihoods of their constituents.

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Xie Yan, Country Director of the Wildlife Conservation Society, made sure we had the resources to carry out this project. She has been our advocate and provided endless support throughout the summer.

Melissa Pettigrew, from the Australian Youth Ambassadors for Development program, was instrumental to the development of this report – managing our database, running the more complex statistics, and assisting in every step of the way. This report would not exist without her contributions.

The Hunchun Wildlife Conservation Society China office consists of Liu Tong, Ren Yi, and Tang Jirong. These three took care of us from start to finish, transporting us between villages, giving feedback at every step of the survey, administering surveys and helping with translation work. I am grateful for their time, energy and friendship.

Joshua Berger from AgroParisTech was a core member of the survey team, and deeply involved in every aspect of survey development and administration. Shana Starobin has been a tireless advisor and expert for the survey's development long before we arrived in Hunchun and later data analysis. Without their contributions, this report would not have been possible.

I would also like to thank Lang Jianmin from RARE, Li Zhixing from the Hunchun Tianhe Siberian Tiger Protection Society and Mr. Xie from the Hunchun Nature Reserve for their time in helping us to visit and understand the local communities.

Other people who I'd like to thank are: Aili Kang from the Wildlife Conservation Society office in Tibet for her encouragement and advice; our Beijing volunteers Li Chunlin (who also assisted with translation work), Xiao Wenhong, Zhu Jiawei who helped administer surveys; and the Beijing WCS China office members Gan Minfang, Liu Bin, Wang Jingjing and Xiao Junfeng; my inspiring and fantastic academic advisor, Dr. Norm Christensen at the Nicholas School for the Environment at Duke University, whose sagacity keeps me grounded; Dr. Stuart Pimm, also of the Nicholas School, who has cultivated and directed me in my development as a big cats conservationist. Last and most, I'd like to thank my dear friends in the United States for keeping me sane, satisfied and bold; especially, I thank my family, who supports me with love and advice in my every endeavor.

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Introduction and Overview

I. Executive Summary

China's rate of economic development has skyrocketed in the last few years. Habitat loss due to development is one of the greatest global threats to species. Already, an estimated 40% of China's ecosystems have been destroyed, and 15-20% of its species are highly threatened¹. Bordered by the steppes of Mongolia, the East China Sea, the jagged Himalayas and the lush tropics of southeast Asia, China encompasses so many ecosystems that it is easily one of the most biodiverse regions of the world. China is home to 450 mammal species, 1200 bird species, 340 reptile species and 25,000 insect species – it may be argued that the most charismatic of these is the Amur tiger (*Panthera tigris altaica*), the largest of the tiger subspecies.

Tiger numbers in China declined sharply in the 1950s with the government's decision to wipe out "The Four Pests." Tigers were one of those pests, and people set out in droves to kill any tigers they came across. It's believed that 75% of China's tiger population was lost between 1951 and 1981². Today, over 20 reserves for the tiger have been established in China, and experts believe there are more tigers bred in captivity than there are in the wild³.

There are only a few last remaining areas of habitat in China for the Amur tiger. One of these is the Hunchun Nature Reserve in Jilin Province. Like many of the nature reserves in China, it was created after farmers began settling there. Even the core zone of the reserve has several hundred households living within it⁴. For this reason, community-based conservation – in which conservation projects involve local populations as key stakeholders – is becoming a requisite tool to save tiger populations in Hunchun.

The Wildlife Conservation Society, China, is known for its science-based policy advocacy and its rigor in research. However, it too has begun to realize that the biggest barrier to tiger conservation near the Hunchun Nature Reserve is not a lack of scientific data, but rather the pressure on habitat arising from economic development in and around the reserve. Recognizing that they don't yet have the expertise to holistically address their greatest conservation challenge, WCS China is actively looking for information on how to lessen the effects of development on tiger populations.

Social surveys have long been used in many types of research. They are the launching point for almost any community-based conservation project. Social surveys help conservation practitioners understand what communities will and won't do – these limitations guide key decisions about how projects should be structured and operated.

In the summer of 2011, WCS China supported a community survey of 113 households in 7 villages to examine the social and financial incentives of rural villagers living in and around the Hunchun Nature Reserve. Currently, the husbandry of free-ranging cattle within the reserve is one of the greatest factors in habitat encroachment and destruction. The government in northeast China has announced that the beef industry is a target growth area – a development that could cause the Amur tiger to be extirpated from this reserve. WCS China hopes that insights from the survey can be used to alter the government's development plans in a way that is good for the environment and for the economy. This survey turned up several key results:

¹ (Ma, 2004)

² (Coggins, 2003)

³ (McBeath, 2006)

⁴ (Quach, 2010)

- 71% of cattle-owners are willing to cooperate to keep each other's cattle from being eaten by tigers
- 62% of cattle-owners said they did not trust other cattle-owners to look after their cattle
- Over 90% of the cattle-owners surveyed already keep their cattle in a fenced-off part of the forest
- 75% of cattle-owners make less than 10% of their income from cattle
- Rural villagers are involved serially in 3-4 types of income-generating activities, with farming (raising crops) generating the majority of their income.
- 45% of households said they would be unlikely to participate in a plan to stall-fatten their cattle, while 48% said they would be likely to participate. The remaining 7% had no opinion.
- Villagers in Lanjia had a stronger resistance to participation in a stall-fattening program than all the other villages. Lishugou villagers showed the strongest willingness to participate.
- Hulutougou villagers showed the strongest willingness to participate in a program that would help them raise honeybees. Again, Lanjia villagers showed the greatest resistance to this program.

From these findings, four main projects have been recommended and detailed:

1. Build fences near other villages to enclose cattle, and hire a keeper to monitor them for injury or disease.
2. Force farmers to sell cattle to the village government, support a stall-feeding program, and give former-cattle-raising farmers stock shares in the program.
3. Create a Tiger Protection Team to help track and monitor tiger movement near key villages, to watch for people setting snares, and to maintain good relationships between WCS and local villages.
4. Train village women to educate other villagers on practices that benefit the environment.

Before embarking on ambitious projects, organizations should look hard at their own resources. Some organizations are more equipped to be successful at certain types of projects. WCS China is no exception. This report encourages the following considerations:

- Competitors – other projects seeking the same resources of time, money and attention from WCS China's key stakeholders
- Political Environment – some government entities will be more important to obtain support from, others may turn out to be surprising allies. Aligning project goals with government goals may lead to stronger success in the field.
- Management Strategy – to accomplish the right work in the right way, staff should be given the appropriate power and skillset. Additionally, an organization must recognize its inherent strengths and weaknesses, and build partnerships accordingly.
- Project Management Options – the final goal of the project, and its long term outlook, often define today's project planning. One option always makes more sense, for a given organization, than other options.

WCS China's long-term goal is to double the number of Amur tigers in the Hunchun Nature Reserve region before the end of 2020. It's three main "issue" areas are:

1. Impact of Local Cattle Industry
2. Impact of Developing Tourism Industry
3. Impact of Small-Scale Natural Resource Extraction

This report focuses solely on the first issue, but its methods and framework can be utilized for the other two. As China takes a higher seat on the wider global stage, many conservation organizations

will begin to incorporate successful community-based models into current approaches.⁵ WCS China has an opportunity to play a leading role in this new wave, and to prevent the Amur tiger from disappearing out of China.

II. Conservation Background

WCS's Global Conservation Program saves wildlife and wild places by understanding critical issues, crafting science-based solutions, and taking conservation actions that benefit nature and humanity⁶. WCS China has offices in Beijing, Lhasa, Guangzhou and Hunchun, and has become a premier source of scientific information on China's biodiversity. However, as conservation solutions today expand beyond simple wildlife management, WCS China also engages in programs to educate and train local community members in methods to help monitor and reduce human-wildlife conflict. As WCS China continues to develop in sophistication and scope, it seeks greater involvement in both community-based projects and environmental policy development.

WCS China – Hunchun serves as the base for all of WCS China's Amur (Siberian) tiger (*Panthera tigris altaica*) research and conservation work. Currently there are solitary males who pass through and hunt within the Hunchun Nature Reserve, causing human impact. Until this pressure can be alleviated, the Hunchun Nature Reserve is unlikely to be able to support a stable population of Amur Tiger.⁷

WCS China hopes to resolve three major issues:

1. Impact of Local Cattle Industry
2. Impact of Developing Tourism Industry
3. Impact of Small-Scale Natural Resource Extraction

WCS China's first priority is to implement projects that will mitigate the Impact of the local cattle industry (Xie Yan interview). There are over 10,000 cattle in the Chunhua region of the Hunchun Nature Reserve (Joshua interview). In some towns, the cattle are kept indoors during the winter, while in others the cattle roam freely around the village. In the green months of summer the cattle are released into the forests of the nature reserve and allowed to forage freely. Their presence encourages human incursion deeper into the nature reserve as roads to their pastures are built⁸, but also is likely to decrease the availability of primary production available to native prey of the Amur Tiger⁹. Thus, the assumption has been made that as cattle populations in the Hunchun Nature Reserve increase, ungulate/Amur Tiger prey density then decreases.¹⁰

Habitat degradation is the number one cited reason for loss of biodiversity, and modeling has shown that "habitat degradation (related to prey scarcity) had much greater impacts on tiger population dynamics" than other factors such as habitat loss or habitat fragmentation¹¹. Additionally, prey depletion has been cited as the primary cause for the decline of the tiger population in India¹². For this reason, WCS has placed priority on programs that contribute to creating high-quality habitat within the Hunchun Nature Reserve.

⁵ (Harris, 2008)

⁶ (Wildlife Conservation Society, 2011)

⁷ (Tian, 2011)

⁸ (Young, 1994) (Ovando, 2008) et al.

⁹ (Dave, 2011) (Graham, 2010)

¹⁰ (Kramer, 2006)

¹¹ (Tian, 2011)

¹² (Karanth, 1999)

Past assertions about the industry of stall-feeding would remove cattle from forest pastures. Currently, cattle graze in the forest for three summers (until age 3-4), when they grow large/heavy enough to be sold to middlemen, who then sell the cattle to the beef industry. Evidence shows that some cattle, however, may not be sold for up to 8 years.¹³ Forest grazing is cheap and easy for local villagers – with the exception of villagers who pay a small annual fee to graze in a common fenced pasture, there is no financial burden. Stall feeding causes the cattle to reach the same weight in half the amount of time (2 years) but is more labor intensive (ie. The cattle must be fed). Thus, WCS invested in a project with RARE and WWF to build a stall in XiaCaoMao. They hoped that villagers would utilize the stall rather than grazing cattle in the forest. The project relied on rotational labor (villagers taking turns

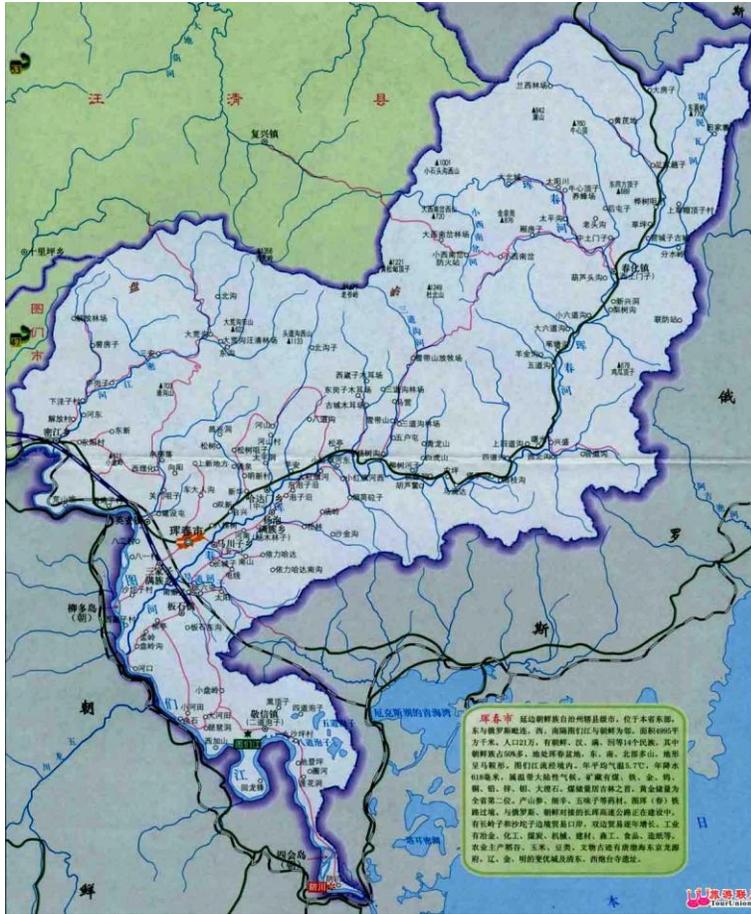


Figure 1. Map of Hunchun (浑春), Chunhua (春化) and surrounding villages . To the east is the Russian border, to the south is the Democratic Republic of Korea border.

to feed the cattle). Unfortunately, it was found that the villagers did not trust each other to feed one another's cattle, and so there are currently only three families who ended up using the stall.¹⁴

In informal interviews with local farmers, they felt that due to the current sales volume and sales cycle of most villagers, stall-feeding was unlikely to decrease the amount of cattle in the forest¹⁵

In order to fund successful projects, WCS China must first understand the social and financial incentives that currently cause community members to pursue cattle grazing. In the summer of 2011, WCS Hunchun interns and staff developed and administered a multi-part survey to 113 respondents living in and around the Hunchun Nature Reserve.¹⁶

Following the overview of survey and environmental factors, this report proposes three projects with high potential to remove cattle from the forest.

¹³ (Villager, 2011)

¹⁴ (Quach, 2010)

¹⁵ (Entrepreneurs, 2011)

¹⁶ (Berger, 2011)

Survey Analysis

III. Key Findings: A Summary of Quantitative Analysis

Community household surveys were administered in 10 villages in and around the Hunchun Nature Reserve in Northeast China between May-June, 2011. The data analyzed is for 113 households representing 321 people. This section provides key findings from the statistical analysis performed on the survey results. These are high-level findings only; please see section IV for details.

i. Demographics

The majority of households are led by males in their mid-40s to mid-60s, with an average size of 3.8 people. 70% participate in household labor, with an even split of literacy rates. The most common methods of income are growing crops (86.7%), gathering NTFP (62.83%) followed by raising cattle (57.5%)

ii. Motivation for Livelihoods

Respondents are evenly split on their primary reason for raising cattle, with the largest percentage saying "It is easy income" (30%). Those who don't raise cattle are also fairly evenly split, with the largest saying it that raising cattle takes too much time (19%). Reasons for selling cattle were varied, people would sell their cattle when they reached the right age (26%) and when they needed money (23%), but these results are also very evenly split.

Respondents who raised cattle were indifferent to participating in a stall-feeding program, but were willing to work on a snare patrol and to raise fewer cattle of a better breed if it was equally profitable to do so. There was a very strong unwillingness to participate in a stall-feeding program in Lanjia (兰家).

In contrast, 60% of people not raising cattle were willing to participate in a program that helped them raise bees.

There was no difference in responses from those who do and don't receive more than 10% of their annual income from raising cattle. Only in Lanjia (兰家) was there a trend against participation

iii. Community Rapport

The highest score for all groups was willingness to accept training from experts to change the way they raise cattle or honeybees (0.7 out of 1).

Respondents with cattle were unwilling to trust others to take care of their cattle (-0.3 out of -1), but were willing to cooperate to protect their cattle from tigers (0.4 out of 1). Respondents without cattle exhibited slight willingness to trust others (0.1 out of 1).

Income group and gender did not affect willingness to trust.

Village type did not affect willingness to accept training (82% for cattle owners), nor willingness to participate in a snare patrol (75% for cattle owners).

iv. Organizational Capacity/Management Capabilities

The majority of cattle owners in just three villages cited the existence of a community-based project leader: Lanjia (兰家), Madida (马滴达) and Shuguang (曙光). A very slight majority (50-60%) of cattle

owners cited the existence of someone with negotiation potential in Hulutougou (葫芦头沟), Madida (马滴达) and Xiaomaomao (下草帽).

The majority of non-cattle owners cited at 50% the existence of a community-based project leader in just one town, Chunhua (春华), however, the sample size (n=5) is too small to draw any conclusions.

In all other cases, the overwhelming majority stated a lack of management capability in their village, sometimes at a rate of 100%, or stated that they did not know. Gender did not change awareness of leadership potential, negotiation potential, or willingness to trust others.

IV. Social Environment: Household Factors

“The only possible conclusion the social sciences can draw is: some do, some don’t.”

– Ernest Rutherford (1871-1937)

This quote by Rutherford reaches to the heart of why it is so important for conservation organizations to understand the communities in which they work. “Some do” and “some don’t” – but who are those groups of people, and how are they different? Some people may be more willing to help make a conservation project successful, others may be strongly against changing their lifestyle. Knowing who those people are and how to target them, can help an organization to achieve success. When organizations attempt projects that rely on mistaken assumptions about cultural beliefs or financial incentives that organization usually ends up throwing away thousands of dollars. Social surveys help us prevent these types of catastrophic financial outlays.

The sections that follow give a broad overview of the demographic characteristics of our survey population, as well as other descriptive statistics. We then break our respondents into segments and compare them against each other, looking for groups that we’d be more or less likely to target with conservation projects.

I believe it important to also note at this time that the Wildlife Conservation Society China itself is in the early stages of understanding community-based conservation. We *strongly* encourage WCS China to find experienced social scientists or other conservation organizations who can partner with them and help guide them in their community-based conservation work.

i. Demographics

Demographic data can be used in program planning to address needs of a certain population, or to determine the target population that should be served by a given program¹⁷ A person’s stage of life and lifestyle will influence his or her behaviors and choices.¹⁸ The following demographic information is for descriptive purposes only, and will be used to illuminate conclusions made later in this report.

Household Head Age

Heads of households tend to be older people. This doesn’t mean that there isn’t a younger person

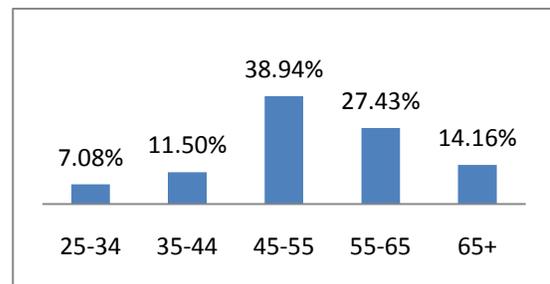


Figure 2. Distribution of age in household heads

¹⁷ (Lilley, 1982)

¹⁸ (Coffey, 2003)

(perhaps a son or daughter) living in the same household, but they are usually not considered to be the household head until the father dies, or the child marries and moves out. Sometimes the father is still considered the head of household, even though they are no longer able to work and their son handles the household finances.

From figure 2, we see that most heads of the household are in older age categories, from 45-55. While some reported that their children were living nearby, most said that their children had left the village to work in a larger city, or to attend school.

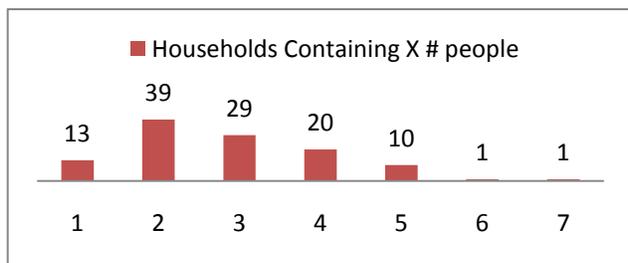


Figure 3. Distribution of household size

Household Size

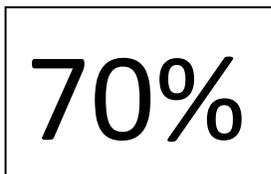
Average household size was calculated based on how many other people were within that home's economic sphere. It was not based on *houkou* (government registered address). Again, these household size numbers shows us that 113 respondents represent a larger population of 321 people.

Literacy Rate

Although one source¹⁹ said that "almost everyone in the Hunchun region is literate," we in fact found that only 57% of household heads in the survey villages were literate. This discrepancy may be due to the fact that respondents tended to be older, but may also reflect differences between rural and more urban areas of Chunhua. WCS China should thus be cautious of statements based on broadly gathered data that represents the Hunchun region, as some numbers may not represent their target population.

Yes	No
57.41%	42.59%

Figure 4. Whether or not respondents were capable of reading and filling out a form.



Percentage Participating in Household Labor

This was calculated based on the number of people who were able to perform "work" – meaning physical labor such picking NTFP or working in the fields. This percentage includes the household head.

People who were not able to perform work were either hindered by physical ailments or by age. Some of these older people raised honeybees and helped with household tasks such as cleaning, cooking or caring for young children. Apart from the elderly, the only other group of people unable to perform work was that of young children.

Involvement in Economic Activity

Households were almost always involved in multiple methods of income acquisition. In a few exceptions, a single individual living by himself only raised crops or was living on government subsidy.

¹⁹ (Quach, 2010)

Some of the “Other” methods of acquiring income were extremely lucrative. While these respondents were reluctant to disclose exactly how much they made, we know from past reports that it is easily over 10,000 RMB per household involved²⁰. On the other hand, some “Other” methods had little effect on overall income – perhaps a member of the household rented his tractor out to other farmers.

Another important note is that Income types are acquired mainly in a serial, rather than parallel, fashion. For example, when farmers are plant crops, they do not harvest NTFP or watch their cows. Generally, they begin the summer by planting, and then harvest NTFP while they wait for their crops to sprout. Once the crops sprout, they are deeply involved in turning their soil, or guarding crops against wild boar attacks.

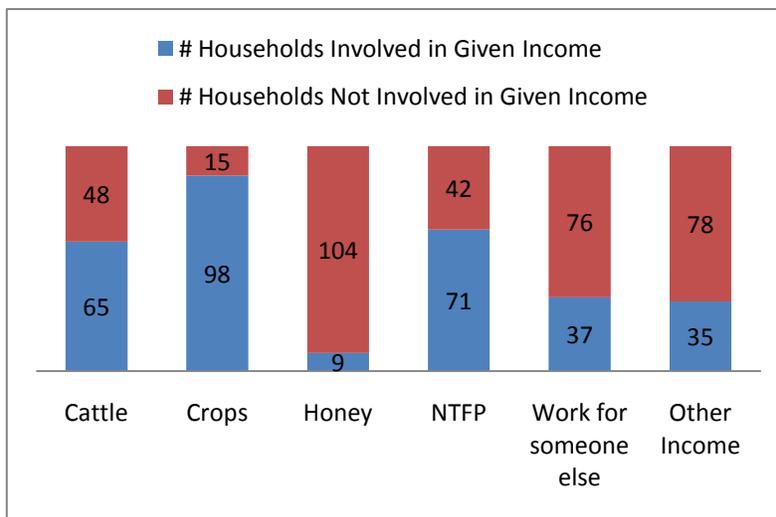


Figure 5. Stacked graph showing proportion of 113 households involved, and not involved, in main income-generating activities.

ii. Motivation for Livelihoods

In considering projects that require participants to change their lifestyle in some way, it is very important for WCS to understand why villagers pursue the livelihood they currently do. In some cases, it is even more illuminating to see why villagers have chosen *not* to pursue a specific livelihood.

In understanding villager motivation, WCS can design projects that align with a community’s values. This section also attempts to distinguish different groups, and see if they have differences in their willingness to participate in community projects.

1. Livestock Livelihood Motivations

Reasons for Raising Cattle

We asked villagers to pick their main choice of the options displayed, although some suggested they had more than one reason for keeping cattle.²¹ Aside from these reasons, some people used their cattle to help them plough land for crops, and others felt that they were useful for eating the leftover straw from the harvest. 67% cited a motivation having to do with income generation.

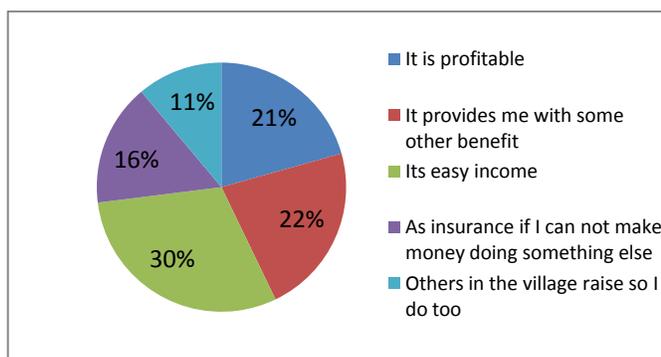


Figure 6. Reasons that villagers decide to keep cattle. n=63, categories are exclusive.

²⁰ (Quach, 2010)

²¹ The option labeled “As insurance if I cannot make money doing something else” was translated into Chinese to say “As insurance when I need the money.”

Reasons *not* to Raise Cattle

Aside from the reasons listed in Figure 7, respondents also pointed to deficiencies in available breeds of cattle, that cattle got sick too easily, and that earning income from cattle took too long.

We see that most respondents view cattle-raising as a risky venture. One very wealthy respondent noted that raising cattle was a low-return activity, and that he found growing crops to be the most stable income source.

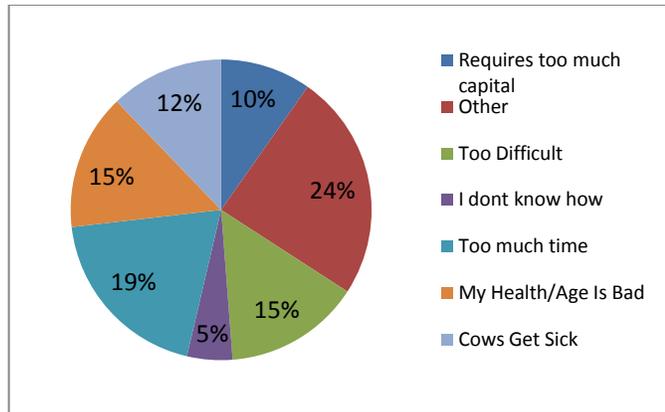


Figure 7. Reasons that villagers do not keep cattle. *n=41, categories are exclusive*

Reasons for Selling Cattle

The average villager who raised cattle had **6.6 cattle** at the time of the survey, with a range from 1 to 18. However, there was no single method that cattle-raisers used to decide when to sell their cattle. 80% of villagers sold to whatever middleman came to the village, while the remaining either hadn't sold their cattle (10%) or didn't know who they sold to (3%). Decision of whom to sell to was driven purely by whether or not they liked the price.

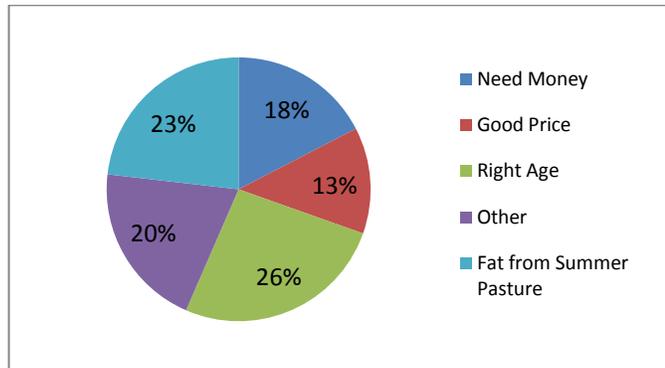


Figure 8. How villagers decide it is the right time to sell their cattle. *n=105, categories are exclusive.*

2. Willingness to Participate in a Conservation Project (Overall)

WCS China put funding towards helping the town of Xiaomaomao (下草帽) build a stall in which cows from the village could be fattened and then sold for more money. However, due to lack of trust that other families would feed each other's cattle²² the project did not achieve the scale necessary to make it successful or worth the investment.

RARE also partnered with WCS to provide boxes of honey bees to a number of residents in Xiaomaomao. In return, project participants were asked to work on a snare patrol in the winter, removing snares that hunters set for roe deer and boar (the main prey of the Amur Tiger).²³

Recipients were also asked if they would like to raise fewer cattle of a better breed. In another project, herders successfully reduced the number of goats they kept by obtaining goats of a better breed.²⁴ The better goats could be sold for a higher price in the market, thus maintaining herder profits while reducing impact on the environment.

Overall

²² (Quach, 2010) (Liu, 2011)

²³ (Quach, 2010)

²⁴ (Moore, 2008)

Of the 62 households we surveyed that kept cattle, we found their overall willingness to participate in projects was as follows:²⁵

- Willingness to participate in stall-feeding, mean: 0.0
- Willingness to participate in honey-bee raising program, mean: 0.0
- Willing to participate on a local village snare patrol, mean: 0.2
- Willingness to raise fewer cattle of a better breed if profit was equal, mean: 0.4

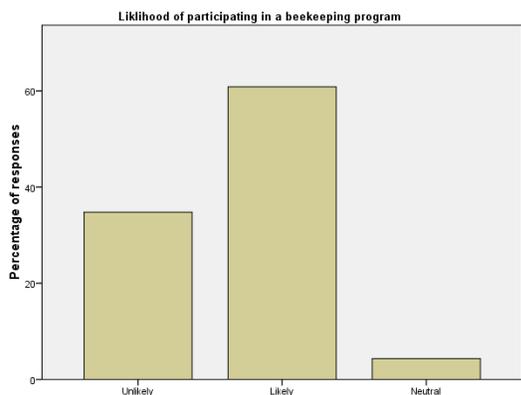


Figure 9. Overall likelihood of participation in bee keeping program. *n*=23.

3. Willingness to Participate in a Conservation Project (By Income Group)

Despite the fact that most families include cattle-raising in their economic activities, 73% of families make less than 10% of their income by selling cattle. Thus, it seemed appropriate to test whether or not there would be a difference in project interest between two “income groups.”

Group 1: Profit made from cattle raising constitutes less than 10% of average income

Group 2: Profit made from cattle raising constitutes more than 10% of average income

Between Group 1 and Group 2, we found no significant difference in their willingness to participate in a stall feeding program (*df* =1 *P*= 0.95) (Figure 9).

Specifically, we asked these 62 households involved in cattle-raising whether or not they would be willing to participate in a cattle-raising project. 45.2% were unwilling to participate, 48.4% were willing to participate, and 6.4% had a neutral opinion on participation.

We then specifically asked 23 households who did not raise cattle how willing they would be to participate in a honey-bee raising program. 34.8% were unwilling to participate, 60.9% were willing to participate, and 4.3% had a neutral opinion on participation.

(Figure 9)

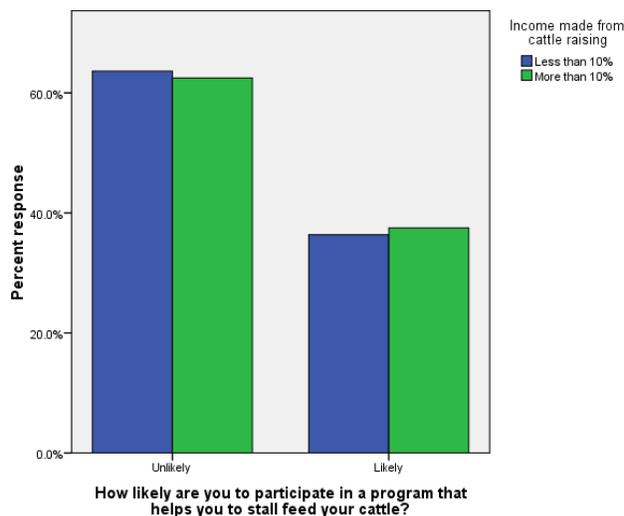


Figure 10. Responses of likelihood for participation in a stall feeding program, contrasting people who earned less than 10% of income from cattle with those who earned more than 10%.

²⁵ Mean scores were calculated from a scale of -1 to 1, with -1 indicating unwillingness, 0 indicating indifference and 1 indicating willingness.

4. Willingness to Participate in a Conservation Project (By Village)

Villages varied greatly in the way they managed their cattle populations, as well as in the types of community development projects. In one village, Lanjia (兰家), many of the residents had just begun participating in a village-supported program to grow Jew's Ear Mushroom (黑木耳). In Madida (马滴达), a cattle cooperative existed to help each other guard and raise one another's cattle. Because of these distinctions, some villages may be more willing to participate in a community project than others. Was there in fact a difference in willingness?

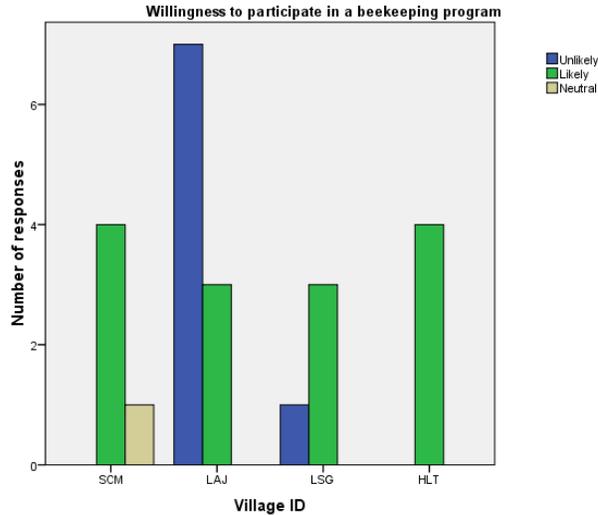


Figure 12. Likelihood of participating in a bee keeping program. SCM=Shangcaomao (上草帽), LAJ=Lanjia (兰家), LSG=Lishugou (梨树沟), HLT=Hulutougou (葫芦头沟). $n=23$

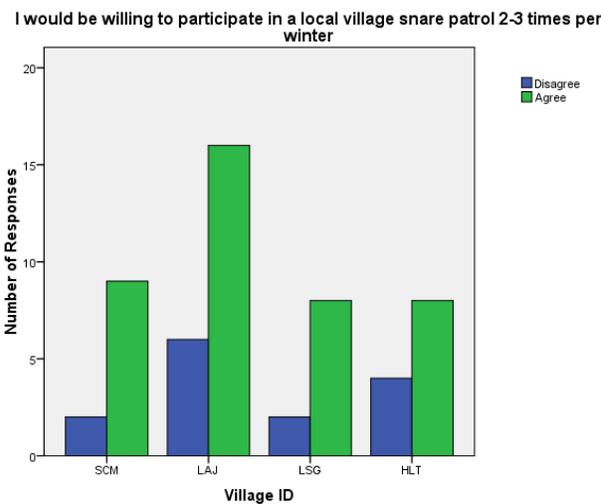


Figure 11. Willingness to participate in village snare patrol. SCM=Shangcaomao (上草帽), LAJ=Lanjia (兰家), LSG=Lishugou (梨树沟), HLT=Hulutougou (葫芦头沟). $n=55$

Because of these distinctions, some villages may be more willing to participate in a community project than others. Was there in fact a difference in willingness?

We analyzed only villages that had more than 10 replicate surveys and were conducted by experienced interviewers.²⁶ Therefore we compared differences between 41 respondents in 4 villages: Shangcaomao (上草帽), Lanjia (兰家), Lishugou (梨树沟) and Hulutougou (葫芦头沟). 57.5% were unwilling to participate, 37.7% were willing to participate, and 5% were neutral in their likelihood of participation.

We found a significant difference between villages in their willingness to participate in a stall-feeding program. ($df=6$, $p=0.01$, $n=40$). Based on our survey responses, respondents in Lanjia were the most resistant to participating in a stall feeding program (**Error! Reference source not found.**). We believe Lishugou has the greatest potential for participation in a stall-feeding program. However the sample number for our survey is relatively small and further investigation would be needed in this village before beginning a project there.

For level of willingness to participate in a bee-raising program, we found a significant difference between responses (Figure 12). Lanjia showed an opposite trend to the other villages indicating a potential greater resistance to participation in a bee keeping program ($df=6$; $p=0.04$). This trend is also seen for the response by cattle owners to an identical question that asks if they would participate in a stall feeding program.

²⁶ A number of volunteers from the Chinese Academy of Sciences in Beijing traveled to Hunchun to assist with surveys. However, due to language barriers and misunderstanding over how strictly they needed to hold to survey methods, there arose inconsistencies in how they conducted the surveys. Although one of the villages they surveyed, Dongxingzhen (东兴镇), had more than 12 surveys, we did not use it in this particular analysis.

The last project we asked about was willingness to participate in a village snare removal patrol 2-3 times per winter. 75% of people agreed that they would participate in a village snare patrol. We found no difference in willingness scores between the villages patrol ($df = 3; p = 0.83$) (Figure 11). All villages showed a greater number of people showing a willingness to participate in a snare removal patrol .

iii. Community Rapport

A key factor in successful community-based projects is the ability of communities to self-organize, and most specifically, the presence of shared views, skills and knowledge amongst key players within the community.²⁷ As Shukla writes, “Self-organization within communities is thus an indicator of how unified the system of governance or management is, particularly in times of changes or surprises.”²⁸ In other words, self-organization – the ability to initiate and continue a specific activity – is vital to the success of conservation projects.

As mentioned earlier, there is often a temptation for organizations to apply blanket conclusions to all members of a group. Let’s take the above example of the stall-feeding program. It would be easy to state that because the project failed, that all people in the villages don’t trust one another.²⁹ In fact, communities are nuanced. Some people trust each other, some people don’t. Some people see leadership in the village and others don’t. Likewise, some people are willing to be organized, and others are not. The following analyses are based on community’s willingness to trust and to learn from others.

1. Willingness to trust others (Overall)

We split our respondents, again, into two groups: 1) Villagers with cattle and 2) Villagers without cattle. All villagers with cattle were asked if they’d trust other cattle-owners in the village to take care of their livestock. Those without cattle were asked if they’d trust another farmer to take care of their bees.

We asked about two separate examples because non-cattle owners had a difficult time visualizing their feelings toward a situation they were not familiar with. Unfortunately, this makes it difficult to pin down the source of any difference between those who did and didn’t keep cattle. If their answers were different from each other, was the difference attributable to the fact that they did/didn’t keep cattle. Or, attributable to a distinction between cattle and bees?

In large part, cattle owners did not trust other cattle owners to look after their livestock.

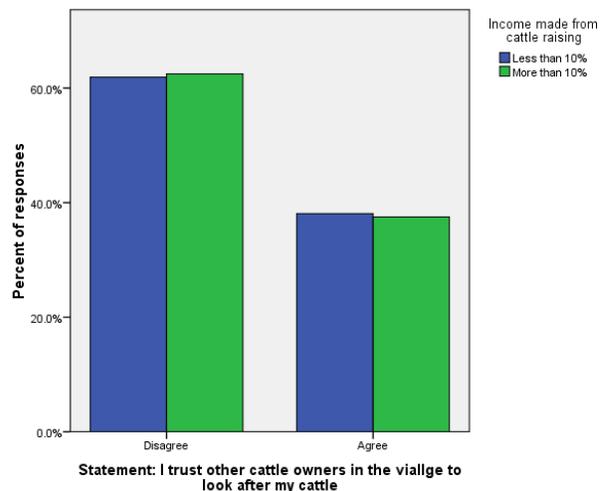


Figure 13. Respondents trust level comparing those making less than 10% of average income from cattle raising and those making more than 10% average income by profit from cattle raising.

²⁷ (Seixas, 2008)

²⁸ (Shukla, 2010)

²⁹ (Starobin, 2011)

Their mean score was mean: -0.3³⁰. Overall, 62.3% of cattle owners disagreed that they trusted others. 36.1% said they did trust others, while 1.6% felt neutral (neither trusted nor distrusted).

Those without cattle trusted others to take care of their bees, with a mean score of 0.1. Overall, villagers who did not keep cattle disagreed 38.5% of the time that they trusted others, agreed 57.7% of the time, and felt neutral 3.8% of the time.

2. Willingness to trust others (by Income)

Using the same 'income groups' as above, we explored whether the 'income group' influenced their response to the statement. We found no significant difference ($df = 1; P = 0.97$ (Figure 13)). This indicates that the overall 'distrust' that we recorded in response to the statement is likely not linked to how much income investment they have in cattle raising.

3. Willingness to Trust Others (by Village)

We found no significant difference between villages in cattle owners' answers to statements of trust ($df = 3; p = 0.97$). Nor was there any significant difference between villagers in answers by those who did not keep cattle ($df=6; p = 0.69$).

4. Willingness to Participate in Training by an Expert (Overall)

If someone is willing to participate in training, it often reflects a desire for new knowledge, and indicates that community members would be willing to change their behavior toward a certain livelihood. However, willingness to participate is different from willingness to change behavior – this is a key point. Although our English question included the “change the way I raise cattle,” the Chinese translation often ended up asking, “Would you participate in training,” without the “change” aspect.

Overall, of 61 respondents who raised cattle, 13.1% disagreed that they were willing to participate in training, 83.6% agreed that they were willing, and 3.3% said they were neutral on whether or not they would participate.

Of 46 respondents who did not raise cattle, 13% disagreed that they were willing to participate in training, and 87% agreed. No one felt neutral on this issue from the non-cattle raising villagers.

5. Willingness to Participate in Training by an Expert (By Cattle Ownership)

As above, we separated respondents into two groups, those who kept cattle and those who did not. We wanted to see if one group would be more open to training or behavioral change than the other group. The same complications apply with this question. Raising cattle and raising honeybees are two very different jobs.

Overall, 41 villagers with cattle had a willingness to participate in training with a mean value of 0.7³¹. 18% disagreed and 82% agreed that they would be willing to participate. Mean value for willingness of villagers without cattle was also 0.7. Of them, 20% disagreed and 80% agreed that they would participate.

We might conclude from this that that willingness to participate in training for both groups is high (Figure 15).

³⁰ Mean scores were calculated from a scale of -1 to 1, with -1 indicating unwillingness, 0 indicating indifference and 1 indicating willingness.

³¹ Mean scores were calculated from a scale of -1 to 1, with -1 indicating unwillingness, 0 indicating indifference and 1 indicating willingness.

6. Willingness to Participate in Training (By Village)

Cattle owners in all villages expressed a similar strong interest in training, with no significant difference found ($df=6; p=0.36$) (Figure 15). The results were much the same for villagers who did not own cattle. No difference in response was found, with all villages showing a greater 'agreed' response ($df=3; p=0.71$)(Figure 14).

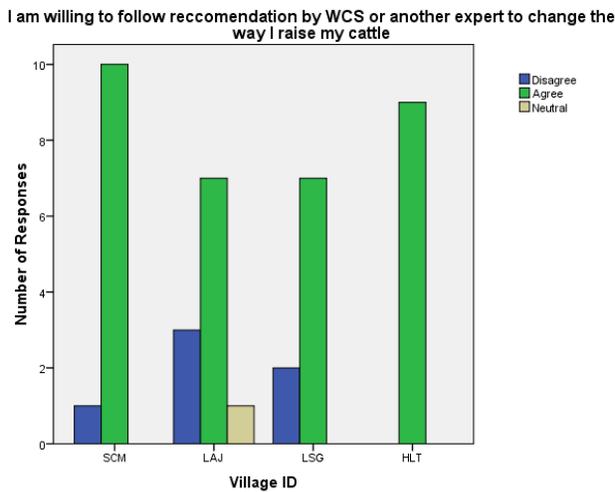


Figure 15. Willingness of cattle owners to follow recommendations from an expert. SCM=Shangcaomao (上草帽), LAJ=Lanjia (兰家), LSG=Lishugou (梨树沟), HLT=Hulutougou (葫芦头沟).

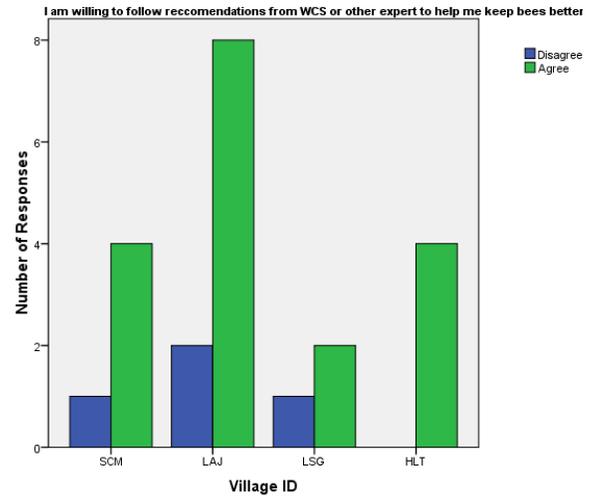


Figure 14. Willingness of those who do not keep cattle to follow recommendations from an expert. SCM=Shangcaomao (上草帽), LAJ=Lanjia (兰家), LSG=Lishugou (梨树沟), HLT=Hulutougou (葫芦头沟).

7. Willingness to Participate in Expert Training (by Gender)

We felt that due to cultural aspects, one gender might be more willing to participate in expert training than another group. This would allow WCS to target one group or another for training. Out of 62 participant from a household that raised cattle, 3.3% answered "Don't Know." All of these respondents were female. So even though the difference was significant between gender ($Chi-square = df=1; p=0.01$), the results are skewed. Out of 46 participants from households that did not raise cattle, there was no difference between response of genders ($df=1; p=0.49$).

8. Willingness to Cooperate to Protect Cattle from Tigers

Overall community rapport scores can be seen in Figure 16³². The only question not addressed in analyses above is that of cattle-owners' willingness to cooperate in order to protect their cattle from tiger attacks. We found the mean score of willingness to cooperate at 0.4.

³² Mean scores were calculated from a scale of -1 to 1, with -1 indicating unwillingness, 0 indicating indifference and 1 indicating willingness.

There is a clear distinction between the mean for our question on cooperation and the mean for our question on trust. It brings up several other questions. What is the difference between guarding cattle from tigers, and taking care of cattle? Is there a difference between willingness to cooperate and willingness to trust? These are excellent topics for further investigation.

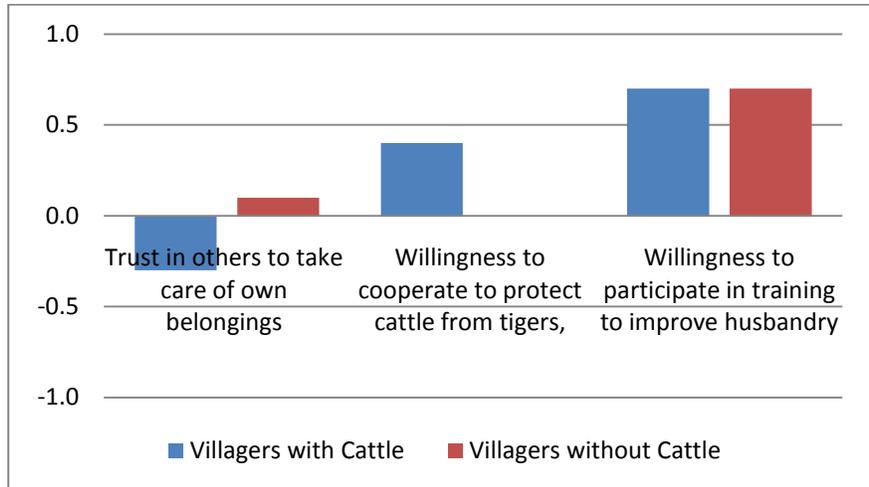


Figure 16. Overall community rapport measurements contrasting villagers whose household owned cattle, and those whose households did not. y =mean scores.

iv. Organizational capacity/Management Capabilities

The presence of stand-out leaders also plays a key role in the success of projects. Leaders can fill the role in many capabilities: 1) innovator – someone who is willing to try new things, 2) communicator – someone who helps others learn from each other 3) learner – someone who improves themselves and the project 4) bridge builder – someone who brings people together and 5) systems thinkers – someone who improves the project on a wide level and sees how different parts connect together 6) catalyst for initial project – someone who is excited about a new idea and will get others excited too.³³ Thus, we asked respondents if they could think of someone who would be a trusted project leader.

As many projects today rely on an understanding of market forces, and an ability to negotiate with others in the market, we asked respondents whether or not they knew of someone who would be good at negotiated prices on behalf of a larger group.

There is, of course, a distinction between reality and belief. It may be true that others do not believe their village has a leader, when in fact the person does exist.

The most important point here is that a village **must** have leadership and business acumen – if not in the same person, then at least spread across a group of people. The Wildlife Conservation Society China must ensure community ownership of the project. If not, then WCS China will be forced to support it indefinitely, and if funding or WCS human resources run out, the project will immediately fail.

1. Belief in Pricing Power

Did villagers believe that by cooperating they might have more power in the market to earn profit? We asked this

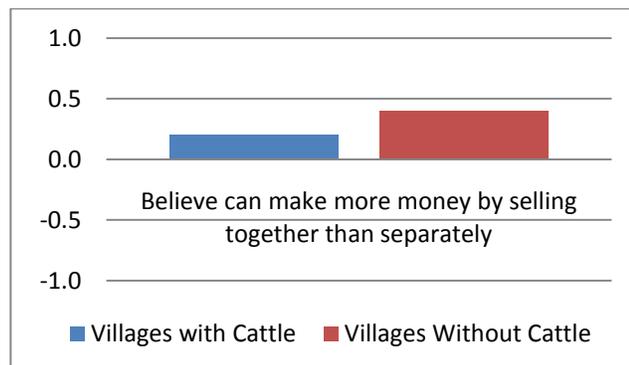


Figure 17. Contrasting opinions on whether you can earn more selling alone or selling with other people. y =mean scores.

³³ (Timmer, 2004)

question of villagers with cattle, and villagers without cattle.

Both groups believed they could make more money selling together than selling alone. However, those with cattle had a mean score of 0.2³⁴ whereas those without cattle doubled that score, with a mean of 0.4.

2. Belief in Leadership Potential (by Cattle Ownership, by Village)

Every village has a village head, who is elected into office by other residents in the village. However, these elections can be quite political, and do not ensure that the village head is actually the best person to lead a community-based conservation project.

We studied respondents' opinion on leadership potential per village, by those who did and did not own cattle, to see if there was a difference in responses.

Those who do not own cattle consistently state that there is no leader or negotiator in the village who could act on behalf of others' interests. We also found that no villages had majority groups of both cattle owners and non-cattle owners who believed there was leadership or negotiation potential.

Table 1. Per-village breakdown of whether a majority of respondents believed there was someone in the village they trusted to lead and keep the best interests of the village at heart. Percentages calculated by respondent type. Option "Don't know" also existed, but scores were less than 38% and thus not listed here.

Name	>=50% Yes, Exists		>=50% No, Doesn't Exist		Sample Size <i>n</i>	
	Cattle	No Cattle	Cattle	No Cattle	Cattle	No Cattle
CHH		X (50%)		X (50%)	3	2
DXZ				X (57%)	8	7
HLT					9	3
LAJ	X (55%)			X (55%)	11	11
LSG			X (67%)	X (75%)	9	4
MDD	X (83%)				6	0
SCM			X (73%)	X (88%)	11	8
SHG	X (100%)			X (67%)	1	3
XCM				X (100%)	4	1
YHD					0	8

We believe that based on this chat, the best groups to target for leadership development are cattle owners in Madida (马滴达), and perhaps Lanjia (兰家). The other promising percentages are based on sample sizes too small to analyze.

Villages where both types of respondents answered "no" should be carefully assessed. No knowledge of a leader either means that the village has no sense of community (villagers don't have no awareness of one another's skill sets), no sense of trust (villagers don't trust the effectiveness of other people's skills) or no capabilities (villagers simply have no skills).

Especially focus on "no" villages such as Lishugou (梨树沟) and Shangcaomao (上草帽).

³⁴ Mean scores were calculated from a scale of -1 to 1, with -1 and 1 indicating willingness.

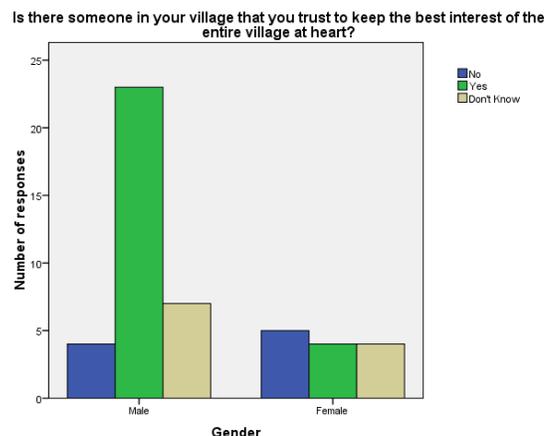


Figure 18. The different response by gender in villagers who did not own cattle.

3. Belief in Leadership Potential (by Cattle Ownership, by Gender)

We found no difference in belief in leadership potential for those who keep cattle ($df = 2; p = 0.61$), but did find a significant difference for those who did not ($df = 2; p = 0.05$). For 63 cattle owners asked if a leader existed, 39.7% said no, 39.7% said yes, and 20.6% said they didn't know. In 47 people who did not keep cattle, 19% said no, 58% said yes, and 23% said they didn't know. Males showed a greater trend to respond 'yes' than females who evenly responded no, yes and don't know (Figure 18).

5. Belief in Negotiation Potential (by Village)

Some villagers are located closer to large commercial areas (Chunhua or Hunchun), thus have more interaction with outside industry. We asked respondents if there was someone in their village that would be good at negotiating a price on behalf of others, believing that access to market might lead to a difference in the availability of people with strong negotiation skills.

Table 2. Per-village breakdown of whether a majority of respondents believed there was someone in the village who would be good at negotiating a price for other people. Percentages calculated by respondent type (ie. Cattle, no cattle). Option "Don't know" also existed, but all scores were less than 33%.

Name	≥50% Yes		≥50% No		Sample Size <i>n</i>	
	Cattle	No Cattle	Cattle	No Cattle	Cattle	No Cattle
CHH			X (67%)	X (100%)	3	2
DXZ			X (50%)	X (57%)	8	7
HLT	X (56%)			X (75%)	9	3
LAJ			X (55%)		11	11
LSG			X (78%)	X (50%)	9	4
MDD	X (50%)		X (50%)		6	0
SCM			X (73%)	X (75%)	11	8
SHG			X (100%)		1	3
XCM	X (50%)		X (50%)	X(100%)	4	1
YHD				X (63%)	0	8

Based on these responses, the best villages to target to find people with business skills are Hulutougou (葫芦头沟), Madida (马滴达) and Xiacaomao (下草帽).

Villages where both types of respondents answered "no" should be carefully assessed. No knowledge of a leader either means that the village has no sense of community (villagers don't have no awareness of one another's skill sets), no sense of trust (villagers don't trust the effectiveness of other people's skills) or no capabilities (villagers simply have no skills).

Especially focus on "no" villages such as Dongxingzhen (东兴镇), Lishugou (梨树沟) and Shangcaomao (上草帽).

6. Belief in Negotiation Potential (by Cattle Ownership, by Gender)

We found no difference between genders when we asked if there was someone in the village who would be good at negotiating a good price for a group. This was true for the 63 respondents who owned cattle ($df = 2; p = 0.69$) and the 47 respondents who did not ($df = 2; p = 0.24$).

Of those who owned cattle, 28.6% answered no, 58.7% answered yes, and 12.7% said they didn't know. Of those who did not own cattle, 23% said no, 60% said yes, and 17% said they didn't know ($df = 2; p = 0.69$).

Economic & Political Factor Analysis

V. Financial Environment Overview: Market Factors

“Incentives are the cornerstone of modern life.”

- Steven Levitt

Politics and the financial environment go hand-in-hand, especially in rural northeast China. From monetary subsidies to help farmers build new homes, to the laws which determine how much tax a farmer must pay (or not pay) on his annual harvest, the government can pull many strings to incentivize specific behaviors to the benefit or detriment of the environment.

This section focuses on how these two forces interact in the context of rural villages near the Hunchun Nature Reserve. Government agencies, the political structure and the political environment are key players in the success of any conservation project³⁵. The winter in Hunchun is long and cold, and heavy snows make it difficult to travel. As a result, most villagers are extremely active during the late spring through early autumn months – it is during this time that they need to make enough income to support themselves through the long winter. The daylight hours are also quite long during this time of the year. It isn’t unusual for villagers to rise at 3 or 4 in the morning to pick NTFPs, and return around 3 or 4 to dry them before dinnertime.

On the other hand, China’s infrastructure improvements, and the movement of freight from areas like Heilongjiang to Hunchun and beyond, mean that all villagers have access to mid-size market. As their purchasing power increases, they become more willing to try new profit-generating activities. As soon as we understand the success level of current activities, we also begin to understand what incentives the Wildlife Conservation Society China could offer within an alternative livelihood scheme. In addition to the social factors analyzed in the previous section, we find that the success of current livelihoods and the willingness of government to support key industries are two major factors in how communities make decisions for or against conservation goals.

i. Cattle Pricing

The cattle industry is targeted for significant growth over the next five years by the local and township level governments. In January 2011, Jilin and the Banshi municipal and city level government released a report detailing an extensive stall-feeding program that they will put into place. This document states government expectations for purchase and sale price per head of cattle³⁶.

Households described in the Banshi government plan help bear the cost of stall-building, government estimates that each household will receive 6,406 RMB per year of income from the project. Based on simple the numbers provided in the plan (Table 3), a loose point of comparison can be made between stall-feeding profits and current forest-grazing methods. Estimates, therefore, say that each head of cattle should bring in 3000 RMB of profit upon sale,

Table 3. Banshi Stall-Feeding Plan, cattle profit per head

Line Item	Amount (RMB)	Profit (RMB)
Sale price stall-fed cow	10000	10000
Purchase price cow (before stall-feeding)	3000	7000
Feed for 18 mo	4000	3000
	Total Profit	3000

³⁵ (Seixas, 2008)

³⁶ (Banshi Government, 2011)

keeping in mind that this does not include upkeep costs (electricity, water) for the stall and outbuildings.

Our survey found the majority (31%) of respondents estimated the sale cost of their best non stall-fed cow to be between 7100-8000 RMB (Figure 19). Most were unable to accurately estimate the amount they spent on food per year, in part because the cost

depended on fluctuating market prices of corn from year to year. The most common estimate was between 300-500 RMB per year. Most paid anywhere from 500 RMB per head to 7500, but the average was 2950 RMB.

We know that most farmers don't sell before their cattle is 4 years old, often waiting up to 8 years. At a sale price of 7000-8000 RMB for the best cow, and assuming farmers purchase 1 year old calves, the profits are equivalent or greater than those estimated by the government for a stall-fed cow (Table 4). And yet, when we asked most farmers how much they made per year in profit from cattle, most insisted in exasperation that "Cattle don't make any money!" Those who did make revenue reported on average that they had made 4,048 RMB in the last year.

The particulars of the number of cattle per household and the total profit are inconsistent between our survey and the Banshi Stall Feeding plan. Therefore, the best we can do is to compare average profits. Using the stall-feeding profit of 6,047 and comparing that to our average profit of 4,048 from grazing in the fields, we can say tentatively that from year to year, stall-feeding brings in 2000 more RMB of profit to each cattle-raising household every year. Farmers could reasonably be asked to put up additional capital of up to 2000 RMB per year to support upkeep and construction before stall-feeding is no longer profitable.

ii. Crop Pricing

Although cattle-raising is the main industry targeted for growth, it is still farming that is the main source of income for rural households in the Chunhua and Hunchun areas. Villagers were bringing in an average of 7,889 RMB of revenue per hectare. When asked to

Table 4. Average estimated profit per head of cattle sold

Age at Sale	Profit
4 years	2550-4150 RMB
5 years	2050-3850
6 years	1550-3550
7 years	1050-3250

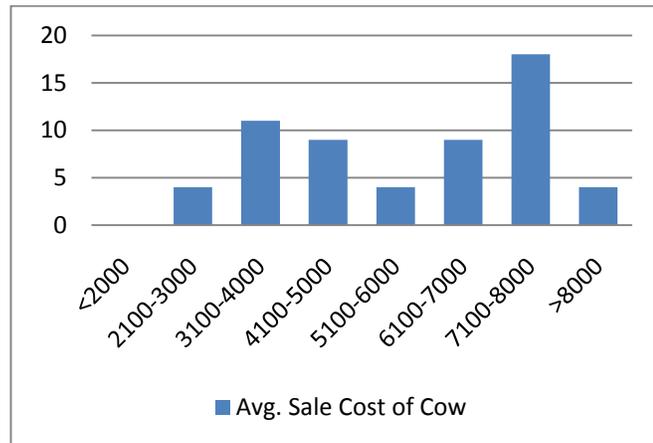


Figure 19. Average estimated sale cost of best cows in study area. Y=number of respondents in that category.

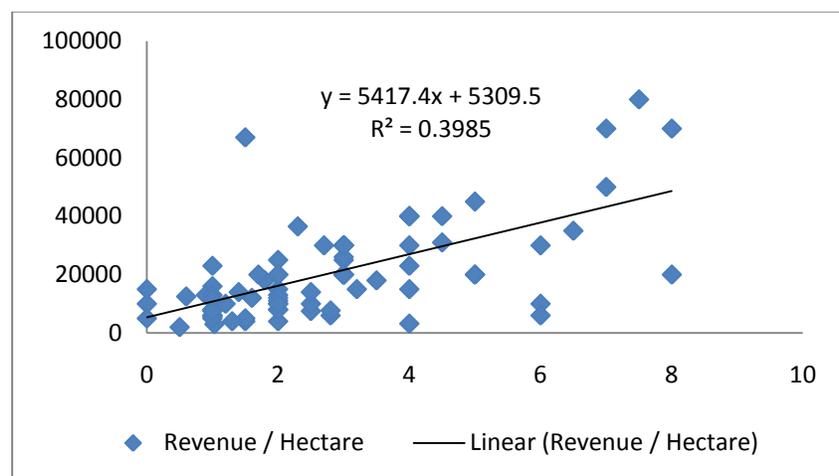


Figure 20. Income in revenue per hectare for crop. Data excludes farmers with more than 10 hectares as large farmers consistently underreported their total revenue. Y=annual income in RMB. X=hectares farmed.

estimate value for one hectare of mature corn, they gave prices from 800 to 18,000 RMB.

Crop revenue was reported to be 24,641, with each household owning rights to farm on average 2.5 hectares of land. If these numbers were accurate, a single household should be making 37,288 RMB per year from crop raising. As these numbers do not agree, there are two likely possibilities. 1) Respondents are underreporting revenue by 34%, and/or 2) Respondents are over-reporting land holdings. The effect may be a combination of both trends.

Every respondent we interviewed was planting some combination of soy, corn and rice. 92% of all farmers planted both soy and corn.

iii. Income (Revenue and Profit breakdowns)

Villagers reported annual revenues of 29,612 RMB, and annual profits of 20,187 (68%). However, if we increase this by a factor of 33%, we see that villagers are in fact making revenues of 39,650 RMB, which at 68% profit would give total annualized profits of 26,962 RMB.

Looking back at the government stall-feeding plan, we see that participation in this plan would lead to a profit increase of 22.5%. Taking the survey's profit as truth, villagers would see an even larger profit increase of 30.1% We also see that previous reports of villager profit, placed as low as 5,000 RMB³⁷, severely underestimated the true value.

iv. Markets

When businesses assess potential products, they first look at what competition already exists in the marketplace. They also look at the size and composition of their potential market to determine whether or not there is an opportunity for entry. In the context of conservation, a number of different definitions might apply instead (Table 5).

Table 5. General and Conservation definitions for marketing terminology.

Term	General Definition	WCS China Definition
Market	All the consumers who purchase a particular type of good or service. ³⁸	The beneficiary of project results
Product	Some item that has value, which you want your market to purchase	A conservation project, and its environmental benefits
Competition	Other products that target your consumer, and which use up the same resources that you wish to use (money, time, mental attention, etc) .	Other projects that use up resources that you need for your product. Likely to be projects run by other organizations, the village government, or even WCS itself.
Consumer	The person who buys your product	People whose approval you require in order for project to be successful.

In some markets, there is already significant competition in the form of other organizations or other projects. Sometimes the product they offer is the same (perhaps they are also increasing income and saving tigers), and they are doing it better than WCS China can. Other times, the consumer has already invested resources in someone else's product, and has none left to invest in WCS China's. In these cases, WCS China should figure out how it can address a different market, create a different product (project) or target a different consumer. In the normal business world, another option would be to out-compete the competitor. However, since all organizations should be working toward the same

³⁷ (Quach, 2010)

³⁸ (The Times 100, 2011)

goal of conserving the Amur Tiger, it would be in everyone's interest for WCS China to simply enter a different market.

Potential Markets

The first question to answer when identifying a potential market is: What is the market?

To answer, ask: Who is the main beneficiary of this conservation project? Who will want my project to succeed and therefore be willing to support it?

In the case of WCS China, there are likely to be multiple markets. The most apparent markets are as follows:

1. Amur Tiger
2. Local communities
3. Wildlife Conservation Society China

The Amur Tiger obviously does not make active decisions regarding conservation projects, and so we would normally discount it in our decision-making. However, it is the only beneficiary that truly matters, because WCS China should measure the success of its projects by looking at conservation impact. Thus, the measurement of "conservation impact" can stand in for the consumer action of "purchasing" a product. Estimates of Amur tiger populations in the area range from 16-22³⁹.

Local communities, the focus of this report, are a target market. In order for the Amur Tiger to benefit from a project, local communities must join the project and make it successful. The official population of the Chunhua township is 8,939 people⁴⁰ however some percentage of these people have only their houkou (residential registration) there, but actually live elsewhere. While there are a number of potential villages in the Chunhua area, some are located closer to the reserve's core zone than others. Rules for types of infrastructure and development vary from zone to zone. As a result, some project activities will be much easier to implement than others. Thus, WCS should decide which specific village will benefit from a WCS project, and declare that the target market.

The Wildlife Conservation Society China office will benefit from a successful project in multiple ways. The more successful the projects are, the more funding the office will receive. Not only that, but WCS China will be paid handsomely with the intangible benefit of having increased China's tiger population.

There are also secondary markets – they may not be the main focus during project design and implementation, but they also benefit from the project's successful implementation.

1. Local and mid-size governments
2. Wildlife Conservation Society
3. Other local NGOs
4. Other local wildlife

While WCS should not necessarily change its implementation strategy based on these markets, they may be able to use potential benefits to obtain resources (money, time, attention) from them in a useful way.

Once WCS China declares its market, it becomes much easier to make decisions – one would simply ask: Does this choice benefit or damage my market? If there is a benefit, does it outweigh potential damage to the other markets?

For example, WCS China might decide to focus solely on helping villagers to increase cattle populations for financial gain. The choice benefits one key market (local community) but significantly

³⁹ (Miquelle, 2010)

⁴⁰ (Quach, 2010)

damages another one (Amur Tiger). WCS China would then choose a different focus, because the benefit to local communities market does not outweigh potential damage to the Amur Tiger market.

Most decisions are more nuanced and complicated than the above example, but identifying the primary market can help bring clarity to otherwise difficult choices.

Potential Products

When deciding what product to offer, in the form of a conservation project, WCS China should think first of what its goals are. The project must be designed in such a way that it achieves, at least in some part, the conservation objectives. It must benefit the market as defined above. Section i. Idea One: Fenced Summer Pastures + Payment for Presence through Section iv. Idea Four: Women for Tigers provide several potential products that fulfill a variety of conservation and community objectives. These projects are just a few of many ideas that would fulfill, to various extents, the objectives.

It is important to note that any project requires resources. WCS China has some, but not all, of the resources required to successfully implement any project. Therefore, it should carefully consider the following questions: What resources will this project require to be successfully implemented? What resources are needed, what resources does WCS China already have, and where can we go to obtain the other resources? Again, resources can be time, money, attention or a wide range of other things. Project goals and objectives should be adjusted based on the ability of WCS China to procure necessary resources.

Potential Competition

Competitors come in many forms. To identify competitors, first ask: In order for this project to be successfully implemented, what resources does the target market need to provide? Once those resources are identified, ask: What other projects or activities are using up those resources?

There are two types of competing projects:

1. Conservation Projects:

These projects that benefit the Amur Tiger. These are likely to be other conservation organizations or government organizations who are also interested in habitat conservation or Amur Tiger conservation. They utilize common resources such as funding, government official attention, and local community attention.

Because they are driving toward the same goal as WCS China, it is probably best for WCS China to support these projects.

2. Livelihood Projects:

These are likely to be government-led initiatives targeted at raising the annual income of local groups, and like most development, are likely to have detrimental effects on the environment.

WCS China should partner with the organization leading these projects to change the way the project is run, and attempt to mitigate the negative environmental effects.

In fact, the best way to run a successful project is to start something that does not compete for the same resources as other projects. For example, a local village government has a Jew's Ear Mushroom-growing program. This requires significant time during mid-summer, and up-front capital investment on the part of the villager. If WCS China wants to start a project in the same town, they should attempt to do so in the early fall, or the winter time. The project should allow gradual investment over time.

Potential Consumers

The main purpose of the analysis in Section IV. Social Environment: Household Factors, is to stratify consumers. This is the best way to identify those members of the market that are *most* likely to benefit from (and therefore participate in) a WCS China conservation project.

WCS China must clearly understand who the project's most enthusiastic participants will be. These participants will champion the project to other potential participants. They will be excited and invested in making the project a success. These are the people who are most likely to stay with the project over the long term, and perhaps even provide the leadership or business acumen discussed in Section IV, iv. Organizational capacity/Management Capabilities.

Business marketers say that the more products a consumer is exposed to, the more savvy and differentiating they become. In other words, as a person is exposed to more and more project types, the more selective they become about which projects they will and won't participate in. This brings up two very important points:

- WCS China must know how "sell" projects to potential participants. By making sure villagers understand the benefit of a specific project, WCS China will increase the likelihood of involvement. Why should a person participate in the WCS China project over a different project? Some people are more attracted to one project benefit over another. WCS China should know how to adjust its message and communication to connect with as many consumers as possible.
- WCS China must know the motivations and incentives of this group very well so that WCS China makes sure to include those incentives in the project implementation. For example, if a farmer will join any project that makes him 10% more than his current income, WCS China knows that this farmer won't join a project that only makes a 5% increase.

To really make a successful project, WCS China must understand who the consumers are, what benefit they seek, and how WCS China can provide that benefit. Only then can the project be designed in such a way that it makes many people willing to participate.

VI. Political Environment Overview: Policy Factors



Figure 21. "Home of the Amur Tiger" sign near one of the villages in the Hunchun Nature Reserve.

Government entities play a primary role in the success of conservation in Hunchun. Although the interactions between the different organizations is quite complex, there are a number of government groups who should be known.

Additionally, we know that the pressure to increase cattle production in the Hunchun region is primarily driven by government-led initiatives to meet the rising demand for beef in China. The government is also in support of conservation, as Hunchun has been declared the "Home of the Amur Tiger." Therefore, WCS China, and its resources, are considered a welcome addition by the government to the overall plan for the region.

There are a few main priorities for the government in terms of economic growth for the region:

- *To increase the income of minority groups near the border of DPRK, thus also decreasing income disparity*
- *To expand the number of people engaged in livestock husbandry, and to make it more profitable (financially and socially) to be involved in the livestock industry*
- *To have large-scale enterprises interact continuously with individual villagers, teaching them how to harness market power*
- *To create a high quality brand of beef for the NE region*

- *To stabilize society*⁴¹

The following is a brief description of the local government organizations that WCS China has built relationships with.

Bureau	Brief Description
Hunchun Nature Reserve Administration Bureau	The nature reserve manages and protects the Hunchun Nature Reserve.
Hunchun Livestock Husbandry Bureau	Controls and encourages the development of husbandry within the borders of the Hunchun region.
Hunchun Forestry Police	Generally, border police are defined as having jurisdiction over the town to which they work for. They enforce laws near the border.
The Border Army (Patrol)	A patrol's main job, generally, is to monitor the security of the border and ensure peaceful activity.
The Forestry Bureau of Hunchun City	Has a long term lease on logging rights to land around Hunchun City. Established the Hunchun Nature Reserve Administration as a subset of itself.
Hunchun Environment Protection Bureau	In charge of environmental protection work of the city
State Forestry Administration	Country-level government office that provides some small amounts of funding to all the Nature Reserves in China

WCS China should determine which people need to work most closely with which government entity. Those people should then be asked to designate at least 4-5% of their effort solely to building good relationships with key people in those organizations.

The main danger here is connected to turnover. Let's say one employee holds a strong relationship with the Border Patrol. What happens if that employee leaves? WCS China must make sure that relationships are transitioned over to other employees so that the relationship does not damage WCS China's conservation work.

⁴¹ (Banshi Government, 2011)

Organizational Analysis

“No institution can possibly survive if it needs geniuses or supermen to manage it. It must be organized in such a way as to be able to get along under a leadership composed of average human beings.”

- Peter F. Drucker

The abilities, strengths and weaknesses of an organization determine what projects will and won't succeed. Organizations should always know what it can and can't do, what is it good at and what it should allow someone else to do. If an organization is failing or succeeding at its mission, this type of analysis helps to show “why.” Higher level managers can then know what it should *continue* doing, and what it should *change*. If an important project requires skills that no one has, perhaps WCS China can train an employee for those skills, or hire a new employee who has them.

Within organizations, employees should hold each other accountable. In a more hierarchical organization, employees may not understand what decisions they can or can't make on their own. They may feel that they need to check every decision with a manager. For fast-paced projects, this may cause problems. Is the necessary manager available when he or she needs to be? If not, how can the hierarchy change to allow decisions to move forward?

Lastly, organizations must be willing to outsource and partner with other groups. WCS China should clearly understand what it can offer to other organizations. This way, other groups will want to partner with WCS China, making its conservation projects stronger overall.

VII. WCS Management and Human Capital Capacity

In order to understand whether WCS China has the ability to meet its conservation goals, it is important to first look at the organization's Vision, Mission and Values:

WCS Vision: WCS envisions a world in which people value and embrace the diversity of life, live sustainably with wildlife, and ensure the integrity of the natural world.

WCS Mission: WCS saves wildlife and wild lands by understanding and resolving critical problems that threaten key species and large, wild ecosystem around the world.

WCS Values: We do so through science, global conservation, education and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together these activities change attitudes towards nature and help people imagine wildlife and humans living in harmony. WCS is committed to this mission because it is essential to the integrity of life on Earth.⁴²

An organization's people are of course its best asset. It's people who run organizations, and ultimately, who make it successful. Especially for offices with less than 10 people, every individual is a vital component of every project. This section focuses on WCS China, Hunchun's capabilities (Table 7), but touches on other offices where pertinent (Table 6, Table 8).

Why analyze the expertise and capabilities of a staff? Once WCS sets a goal, it should then ask, “How will I achieve this goal?” “Do my employees have the skills necessary to achieve this goal?” Only when the organization lays out its people and skills, does the answer become clear.

⁴² (Wildlife Conservation Society, 2011)

Most managers first ask, “Is this the right group of people to get the job done?” Assuming that manager hired the person to begin with, that answer is almost certainly, “Yes!” The next question is then, “Does this person have the skills necessary to do the job?” If yes, then great. The project is on its way to success. However, if the answer is “no,” you should ask “how long will I need this skill?”. For long-term needs, you should find a part-time employee to do the necessary work. Or maybe for the same cost, you can train the employee in the skills needed for the job. For short-term work, you can probably find an intern or a volunteer.

Table 6. WCS Beijing Office's human resources and expertise

WCS China, Beijing	
Name	Role/Background
Xie Yan, Ph.D., China Program Director Wildlife Conservation Society China	Dr. Xie is responsible for the overall vision of WCS in China. Due to the recent gaps in the office manager position for GuangDong (reptile) and Hunchun (tiger), Dr. Xie has also taken over management duties for the Amur Tiger and reptile conservation. She is well published as the author of numerous major publications on China’s wildlife, including the 2004, 2005 and 2009 China Species Red List, and the 2009 Biodiversity Atlas of China. Her experience spans government, information services, academia and nonprofit work.
Wang Jingjing, Liu Bin and Xiao Junfeng Communications Team Wildlife Conservation Society China	The communications team handles website content, marketing and PR campaigns. They translate a significant amount of content from English to Chinese. Grant applications go through this office, and there is common communication between the Beijing and New York offices.
Gan Minfang Administration and Finance Wildlife Conservation Society China	All the funding and accounts go through Ms. Gan as does all admin, human resources tasks, and other issues to help the office run smoothly.

Table 7. WCS Hunchun office's human resources and expertise.

Hunchun	
Name	Role
Tang Jirong, Ph.D., Senior Program Officer Wildlife Conservation Society China	Mammal specialist and major scientist for WCS. Manages WCS’ MIST patrols (snare removal) and population studies. Mr. Tang also maintains relationships with the nature reserve, as he normally sets camera traps.
Ren Yi, Senior Administrative Officer Wildlife Conservation Society China	A Hunchun local, Mr. Ren manages budgeting and resource distribution for the office. He is responsible for the maintenance of the office and WCS vehicles.
Liu Tong, Project Officer Wildlife Conservation Society China	Mr. Liu leads organization and involvement of WCS in Hunchun’s annual tiger festival. He facilitates the work of WCS’ interns, and assists in WCS’ involvement in tiger education for local schoolchildren. Other project work related to the social side of tiger conservation also falls within Mr. Tong’s responsibilities.

Table 8. Other resources and expertise working closely with WCS (excludes government entities).

Other Advisors	
Name	Role
Li Zhixing, President Tianhe Siberian Tiger Protection Society	Managing artificial insemination program, supported by WCS, designed to have farmers monitor their cattle while increasing local income through a controlled breeding program. Mr. Li has been working in the Hunchun area for a long time, and has excellent relationships with local community leaders in Xiacaomao.
Lang Jianmin, Campaign manager RARE Conservation	Mr. Lang worked with WCS-Russia on a community campaign that gave boxes of honeybees to local village members. In return, villagers agreed to conduct regular wintertime snare patrols. Mr. Lang is also the head of the education department of the Hunchun Nature Reserve.
Kang Aili, Ph.D. Tibet Office Manager Wildlife Conservation Society	Ms. Kang manages the Tibet conservation program, as well as the program on illegal trade. She has 3 full-time staff and some part-time staff under her, for a total of 5. Aili assists WCS Hunchun with expert knowledge of project implementation and surveys.

VIII. Organizational Management

Strategy consulting firms have created a number of useful frameworks for looking at an organization's place in the market. The SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) can help to distill an overwhelming amount of information about an organization into a more manageable format. This type of analysis helps organizations to understand how it can build on existing capabilities, and protect against weaknesses.

It is also important to remember the limitations of this framework, mainly that it by nature oversimplifies an organization:

“The classification of some factors as strengths or weaknesses, or as opportunities or threats is somewhat arbitrary. For example, a particular company culture can be either a strength or a weakness. A technological change can be either a threat or an opportunity. Perhaps what is more important than the superficial classification of these factors is the firm's awareness of them and its development of a strategic plan to use them to its advantage.”⁴³

This brings up a key point for the WCS Hunchun office. In this region, the biggest challenge is in negotiating conservation goals with the area's economic development. All projects require community cooperation in order to truly affect the conservation status of the Amur Tiger in China.

WCS China's projects in Hunchun require a deep understanding of social science research, and community-based conservation work. This is not an expertise that the Hunchun office currently possesses (Table 9). Thus, the office staff and manager should decide how to acquire the skills it needs.

⁴³ (Internet Center for Management and Business Administration, 2010)

Table 9. WCS Hunchun Capabilities Analysis (SWOT)

	Positive	Negative
Internal	<p>Strengths</p> <ul style="list-style-type: none"> ➤ Scientific skill ➤ Leading Brand with backing from strong international organization ➤ Respected Scientific Leadership ➤ Good relationship with Compensation Bureau, some Nature Reserve staff & wildlife law enforcement agencies ➤ Inter-organizational partnerships with local nonprofits ➤ Financially stability ➤ Inter-cultural fluency from regular exchanges with international academics and other WCS branches 	<p>Weaknesses</p> <ul style="list-style-type: none"> ➤ Office-level management ➤ Limited Community Relationships ➤ Lack of social science skills ➤ Relationships with Forest Bureau, Border Police, Border Patrol and some Nature Reserve staff are fragile ➤ No data with which can measure progress/program success
External	<p>Opportunities</p> <ul style="list-style-type: none"> ➤ Government resource availability ➤ Intern and volunteer availability ➤ Global focus on tiger conservation ➤ Population shift from rural to urban ➤ Increasing education level in target population 	<p>Threats</p> <ul style="list-style-type: none"> ➤ Local economic growth programs ➤ Consolidation of economic wealth ➤ Rise in power of private corporations ➤ Strong financial incentives against conservation ➤ Government restrictions on nonprofit activities

Our recommendation is for WCS China to partner with an organization that has clear expertise in social science. It isn't good enough to partner with someone who has good relationships with a village, or a lot of experience. Just as conservation science must be justified with quantitative data and peer-accepted science, so should community work be justified with quantitative data and peer-accepted science. Since one of WCS China's strongest abilities is its *science-based work*, it should not participate in projects that rely on conjecture and assumptions for justification.

Another recommendation would be to bring a social scientist to Hunchun to work on fellowship or extended internship, and make it part of the scientist's job to teach the other officers how to run social science research.

Lastly, WCS China could decide to be the hard-science partner for other organizations' projects. It should be a full partner in determining how to measure the success or failure of a project based solely on conservation gains (for example, the increase in tiger prey over the year that the project is implemented). Given current expertise and the focus of the larger global organization, this last option may be the best.

Implementation Analysis

“Those who plan do better than those who do not plan, even though they rarely stick to their plan.”
- Winston Churchill

All projects exist in a complex, interconnected system (Figure 22). As with any plan, situations change and plans must also change, too. Dwight D. Eisenhower once said, of preparing for battle, “Plans are useless, planning is everything.”

Goals and values, like planning, on the other hand, should always stay constant. A good project manager constantly changes her plans. However, she always remembers the environment of her project, and remembers the final goal. If she does this, even adjustments to different situations will not disrupt the momentum of the project. Thus, a good project plan should:

1. Inspire WCS China to consider creative ideas in conservation
2. Demonstrate how WCS China might structure project planning and implementation processes
3. Apply key findings from above sections to design appropriate projects

As mentioned in Section V, iv. Markets, these ideas can be thought of as potential “products” to offer to the target market.

IX. Project Plans

The following section comprises the main deliverable requested by WCS China – project ideas to resolve the issues of free-ranging cattle inside of Amur Tiger habitat. They are based off of the previous four sections, taking into account conclusions about the social and financial incentives of villagers in the Hunchun Nature Reserve, and the capabilities of market research, WCS China’s organization and the Hunchun office staff. However, it is important

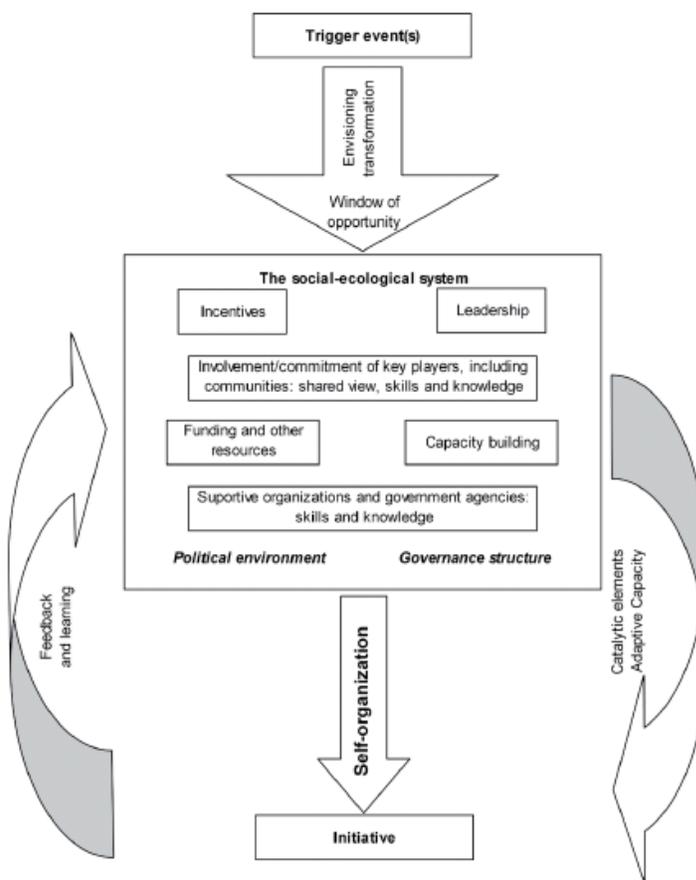


Figure 22. Model of Self-Organization (Seixas, 2008). This model is a useful guide for understanding how different community aspects come together to make projects successful. Seixas writes, “Community-based conservation...opportunistically evolve in a multi-level world, in which local communities establish linkages with people and organizations at different political levels, across different geographic scales, and for different purposes.”

to note that all recommendations are based on a set of assumptions.

While these project recommendations try to work through many of those assumptions, it may be that some of them are far outside of the scope of what WCS China is capable of achieving. Allow these plans to guide, rather than dictate, the conservation projects ahead.

i. Idea One: Fenced Summer Pastures + Payment for Presence

Summary: WCS pays to fence sections of land near to the village. Villagers pay a small fee for use of the cattle pasture. Fee is used to hire someone to watch over cattle – monitor for illness, protect from tiger or dog attacks, and from snares. Payment is partially based on attendance (showing up to work) and partially based on presence of cattle (how many are there at beginning of the summer versus the end). Fees also go into a fund, used to pay for medicine for sick cattle.

If all cattle are healthy and present at the end of the summer, guard gets paid well and villagers have benefit of peace of mind about their cattle.

Background for Idea:

Some of the villages near the core zone of the reserve already have fenced areas for the summer pasturing of cattle. The fee they pay, of 20 RMB per head of cattle, currently goes to the village government⁴⁴. Thus, the village government has an incentive to maintain the fence, and to force villagers to keep cattle out of the forest.

Potential Upsides:

1. This is a project that villagers are likely to join, given that it is already being done successfully in other villages.
2. 65% of villagers raising cattle said they would be willing to cooperate with other cattle owners to keep cattle from being eaten by tigers.

Potential Challenges:

1. Some villages may not have any land available to use as pastureland. It will be expensive for the village to convert land from agricultural to pasture, and perhaps so expensive as to be prohibitive.
2. Cutting down forest in the Nature Reserve is illegal. Villagers travel great distances in order to collect firewood for the wintertime. If needed to cut down forest, would need to get multiple special permissions.
3. The pasture itself would be treated as a “commons” unless there were other restrictions on number of cattle allowed per family in the pasture.
4. Effective fences require regular upkeep, especially in a climate with harsh winters like Hunchun. A fee to use the pasture might not cover all the costs of having a guard, annual fence upkeep, and keeping the cattle healthy.
5. To make the pasture more productive than normal forestland, it may be useful to seed/plant the ground, which would be costly.
6. This project requires farmers to trust the guard who is hired. 36.1% of villagers say they are willing to trust the other cattle-owners in the village to take care of their cattle.

Stakeholders Required:

Local Village Government – to uphold rules of the pasture, to hire and oversee guard,

⁴⁴ (Villager, 2011)

Border Patrol and Border Police – permission to create pastureland, which will require influx of non-local Chinese workers

Nature Reserve and Forestry Bureau – permission to create pasture-land

Fencing Company – to provide materials, and put up the fence

Construction Company – to clear land

Veterinary Services – in case of illness or injury to cattle

Equipment/Resources Required:

Materials and equipment to clear land and construct a fence

Housing for guard and forms for him to fill regarding daily situation of cattle

Major tasks and Timeline:

TASK	DESCRIPTION	TIME
Determine Location	Determine the following: <ul style="list-style-type: none"> - Locations where there is land available for cattle. - Number of cattle in given location that would be removed from forest by fencing - How much fencing will be required, and of what height and construction (will need to consult with potential suppliers for the information) - Annual budgets based on: <ul style="list-style-type: none"> o Amount to pay a guard based on average income (from survey) o Amount would need to pay for medicine per year (from survey) o Amount would need to pay for fence upkeep o Number of heads of cattle in village, o How much each person would need to pay per year to cover all costs - Clarify benefit for village government of this program - Understand impact of construction equipment in the area for putting up the fence - Determine measurability scores for success (see section below) 	2 month
Determine Baseline	<ul style="list-style-type: none"> - Obtain a quantitative measurement of the factors you will measure in order to determine whether or not project is successful. 	
Obtain necessary buy-in and permission	<ul style="list-style-type: none"> - Present plan to village head. The most difficult part of this will be getting the land and the village head to buy into this, because this project is not possible without his support. - Need to get village head to agree that all cattle from his village will be placed inside of the pasture - Permission from nature reserve, border guard and village head for this project 	1-2 month
Market program	<ul style="list-style-type: none"> - Work with village head to educate villagers on benefits of putting cattle into the pasture 	summer

	<ul style="list-style-type: none"> - Once results are known, spread word to other villages about how much better it is to put cattle in a fence. 	
Build Fence	<ul style="list-style-type: none"> - Find reputable construction company, sign contract - Build fence 	3 weeks + 1 month
Train Guard	<ul style="list-style-type: none"> - Hire a highly trustworthy individual who cannot be bribed. - Must understand how to diagnose a sick cow, how to handle a cow who might be frightened because it is caught in a snare, and how to differentiate one cow from another - Train guard on what to tell village people if they ask about their cattle. Also, how to recognize snares and remove them. How to fill out forms. 	1-2 months
Monitor Progress against Baseline	<ul style="list-style-type: none"> - Keep track of lost cattle throughout the summer - Do field survey of surrounding forest vegetation 	summer
Evaluate	<ul style="list-style-type: none"> - See below for evaluation measure 	Summer + 1 week evaluation
Replication or Conclusion	<ul style="list-style-type: none"> - If cattle loss decreases and economic gain outweighs cost, then continue. - Otherwise, reassess fee and payment structure. 	9 months-1 year

Suggestions of how to measure success:

Measure	Method
Decrease in # cattle lost to illness or death, or killed by snares	<ol style="list-style-type: none"> 1. Survey villagers on how many cattle lost to illness, death, or snare injury before program 2. Survey villagers on how many cattle lots to illness, death or snare injury after program
Density of primary browse	<ol style="list-style-type: none"> 1. Measure density of understory browse primary production (forbs, shrubs and other ungulate food sources) in X radius of village before program. 2. Measure density of #1, but after 1 year of the program
Decrease in financial loss	<ol style="list-style-type: none"> 1. Calculate how much financial damage per year an average villager receives from cattle loss 2. Calculate decrease in damage based on decrease in cattle loss, against fee paid for pasture

Alignment with Government Cattle Objectives:

Cattle who are in a fence are safer, and more likely to survive to an age when they can be successfully sold for income by villagers. It may be that this pastureland can serve as a holding area for cattle who are destined for stall-feeding programs. Increases local government income, after initial capital investment, through annual pasture fees from villagers.

ii. Idea Two: The Cattle Fund

Summary: Current cattle owners sell all of the livestock they currently raise to the village government. Cattle are taken out of the forest and instead fattened in stalls built as part of government programs⁴⁵. As payment, villages do not receive money. Instead, they receive stock in the village's stall-feeding program. The value of their stock increases when the village increases profit from selling the stalled cattle. When a villager needs money, he can sell his stock back to the village and receive income. Or, if he has extra money, he can purchase more stock to hold.

Background for Idea:

Some villages such as Hulutougou are already planning to build their own cattle stalls. Unfortunately, this program is completely funded and run by the village local government. Therefore, it will not help increase the income of villagers who currently keep their cattle in the forest.

Survey results showed that approximately XXX% of cattle owners keep cattle because they find it profitable, and that they sell their cattle when they need the money. This project idea maintains the function of the cow (holding it as valuable property to be sold when need arises) but takes the actual work of raising the cow out of the villagers hands. It also removes the cattle from the forest as they would be purchased at the age of 3 years, fed for 18 months and then immediately sold.

On a much larger scale, Mongolia has given stock shares to herders whose grazing land was ruined by coal mining.⁴⁶

Potential Upsides:

1. The majority (67%) of locals have keep cattle because it is easy income, because it is profitable, or because it makes them money when they need it. 74% of farmers earn less than 10% of their income from cattle-raising. Some more financially savvy villagers (very wealthy from economic activities) cited cattle as a risky activity.
2. Financially, selling a cow looks like selling a stock. That is, a villager receives a single lump sum of cash that he/she can immediately use. The price of a stock should be more stable than the price of a cow (assuming nothing happens to the cattle in the stall-feeding plan). That is, the stock's value will track the market price of beef.
3. Socially, holding stock is easier than raising a cow. It is not reliant on whether or not an *individual* cow gets sick, or lost, or eats less than another cow. It relies on the price of the market, and not the whim of a middleman who comes by to bargain individually with each villager.

Potential Challenges:

1. This project is *very* difficult, operationally, to implement. In order for villagers to realize gains on their stock, the manager of the stall-feeding program must be a good business person. In order for villagers to cooperate with the program, a good social scientist must with adoption. In order for villagers and government to understand the program's benefits, and teach villagers how to treat stock, a good business educator must also be provided. Creating a supply chain – finding a buyer for the stall-fed cows, and purchasing feeder cows – is the easiest part of this project.
2. This project relies entirely on financial and social savvy, neither of which are WCS' strengths.
3. The concept of stock is difficult to understand. This project would require a significant amount of education to help villagers understand what exactly they are receiving, and how they should manage it. This is an extreme example, but when the USSR dissolved, many formerly-public

⁴⁵ (Banshi Government, 2011)

⁴⁶ (Kohn, 2011)

companies in Russia became privately held, and normal citizens were given stock shares. Not understanding what the slip of paper meant, ordinary citizens traded the paper away for next-to nothing, or threw the paper away. Sometimes the people who purchased the stock were savvy entrepreneurs, who are now incredibly wealthy, while their less-educated compatriots stayed poor. We can avoid this situation through proper education.

4. This project’s greatest barrier is social momentum. Many of these families are accustomed to keeping cattle, and it may be difficult for them to give it up, even if they are receiving something equally valuable. The leap to equating a piece of paper (stock) with a living animal is not an easy one to make.
5. Some breeds of cattle that local people keep are good for surviving Hunchun’s cold winters, but are not the best for stall-feeding. The village may not want to purchase these cattle, especially if they are too old. It may be best for the village to first arrange the sale of all the village’s cattle, then use those funds to purchase new cattle to be stall-fed.

Stakeholders Required:

- Village government – to run stall-feeding project, supplemented by business people
- Financial institution - issue and manage stock transactions
- One of the large beef companies, likely TianYi – to purchase stall-fed cows
- Construction company - to build stall large enough to accommodate growth
- Financial education experts – to teach villagers and government officials about stocks
- Nature Reserve/Forest Bureau – to get permission to bring in outsiders to educate and build

Equipment/Resources Required: Tangibles

Major tasks and Timeline:

TASK	DESCRIPTION	TIME
Determine Scale	Determine the following: <ul style="list-style-type: none"> - Which villages are best to target (based on relationships with village government, availability of stall-feeding buildings, number of people willing to give up cattle) - Level of financial education needed for villagers - What partner is available to provide the appropriate education for villagers to understand “stock.” - Level of financial/business education needed for village government to run stall feeding enterprise OR find a private firm to run the enterprise - How much funding is available and what aspects of the project is WCS willing to support. - What kind of safety net will be in place in case of catastrophic loss - Identify who cattle supplier and purchaser will be (likely TianYi) - How many cattle you will be removing from the forest - How to ensure villagers don’t just buy more cattle, or use income to degrade environment in a different way - Determine if policy/law changes need to go into effect in order to make this project successful (for example: no villagers are allowed to keep cattle older than 4 years old). - Figure out what partners you will need to bring together to make this idea work. 	3-4 months, possibly longer depending on government cooperation

	<ul style="list-style-type: none"> - Figure out what scientific measurements you will use to track success of the project. - How you will compensate people if project fails. 	
Determine Baseline	<ul style="list-style-type: none"> - Obtain a quantitative measurement of the factors you will measure in order to determine whether or not project is successful. 	1 month
Obtain permission for program	<ul style="list-style-type: none"> - Work with key stakeholders and people in power to understand how they will help support and enforce the guidelines of this project. 	1-2 months, then ongoing
Market program	<ul style="list-style-type: none"> - Market within the village all the positive benefits of the project – through posters, in-person training/information sessions 	Every 2 months
Training	<ul style="list-style-type: none"> - Run multiple training sessions for government and for villagers, including testing to check understanding, on how to hold and manage their stock. 	2 weeks, then ongoing
Monitor Progress against Baseline	<p>Monitor:</p> <ul style="list-style-type: none"> - Financial progress of the enterprise - Whether people are following rules by not holding cattle in the forest - How many people are holding onto their stock versus already selling it 	Ongoing
Evaluate	<ul style="list-style-type: none"> - Is this project achieving the goals you set out in the beginning? 	1 month
Replication or Conclusion	<ul style="list-style-type: none"> - If meeting your goals, continue - Otherwise, end program based on “exit strategy” 	

Suggestions of how to measure success:

Measure	Method
Amount of primary production available for tiger prey species	Scientific survey to measure density of primary production before and after cattle are removed from forest
Additional annual income received from shares in the village enterprise	Compare annual income against current survey data
Number of cattle held by village versus by private owners	Compare cattle intrusion into forest based on density before and after project.
Satisfaction of farmers with current cattle raising situation	Survey farmers before and after to determine how satisfied they are with cattle-raising, with the local government and how much time they spend on cattle-raising permonth.
Alternate livelihood ideas	Measure the types of activities that increase once farmers no longer keep cattle.

Alignment with Government Cattle Objectives:

This plan has all of the aspects of government's goals. It creates local farmer partnerships with large-scale industry. It increases farmer income, while conserving the environment. It teaches farmers about business, and helps local government to improve its position. It provides income for other industries (construction, investment, etc).

iii. Idea Three: Tiger Protection Team

Summary: WCS' "Eyes on the ground." The Tiger Protection Team would help WCS gather information about tiger track marks and sightings from villagers on a regular basis. They would also help identify which people would be willing to help on snare patrol. Their work will help WCS' tiger tracking efforts and increase awareness about conservation within the villages. Eventually, the Tiger Protection Team could help reduce the number of snares on the ground by offering trappers alternative sources of income – or perhaps employment on the Tiger Protection Team.

Background for Idea:

The idea of "Lion Guardians" amongst Tanzania's Masai people⁴⁷ has captured the hearts and spirits of a lot of international donors, bringing a lot of attention and donor money to the conservation program there. A particularly charismatic guardian got enough money to be sent to Oxford for his education. Lion retribution killings have been prevented, at times, by a guardian's quick action and ability to defuse a tense situation. These young people also then stay involved in the community, because they have a sense of purpose, and are employed by a legitimate organization, rather than just leaving for the big city to find a non-farming job.

Potential Upsides:

1. When asked, "What is the best way to stop people from setting snares?", the most people (39%) stated that "Keeping people busy with another job" would prevent people from setting snares in the wintertime, followed by "Make punishment harsher" (27%). If given another job, those who are setting snares may potentially cease this activity, and instead help to prevent or catch others who continue to set snares.
2. Project aligns with WCS China's current efforts to educate schoolchildren, by continuing their potential involvement in active conservation as they get older. These children may go on to work in local government or business, and may continue to carry those conservation values with them.
3. Many people, when they were given contact information for the WCS Hunchun office, said they often saw tiger prints but never knew how or where to report about them. Having a trustworthy (non-threatening) contact in the village who is highly motivated to collect reports, will ensure that WCS China receives a lot more information about the location of tigers.

Potential Challenges:

1. There are issues of trust between people in the villages. It may be difficult for TPT to get information from other villagers about tiger prints. WCS China will have to also be very careful how they build relationships with the village to make sure it doesn't seem like they are "spying."
2. Accountability: currently very few villagers actively keep track of specific types of data⁴⁸ so they will need to be trained carefully to learn how to record and report truthful information.

⁴⁷ (Hazzah, 2011)

⁴⁸ When asked how much they fed their cattle, or how many days they'd gone out to pick NTFP, most could only broadly estimate the number.

3. It may be difficult to find young people who want to fill these roles. Older people may enjoy setting snares, and won't want to join the program.
4. If the project fails (doesn't return conservation results), and WCS China cancels the program, the young people may go back to setting snares. In fact they may set more if they are angry with WCS China for "firing" them. This project should not become a project of dependency, like compensation is often said to be.

Stakeholders Required:

Local government – to permit the hiring of locals as a Tiger Protection Team member

Nature Reserve & Forestry Bureau, Border Patrol & Police – to make sure it is okay to track the movement of tigers

Equipment/Resources Required: Tangibles

Training materials and identifying equipment (badge or something)

GPS devices

Paperwork and administrative items to record data

Equipment to remove snares

Major tasks and Timeline:

TASK	DESCRIPTION	TIME
Determine Scale	Determine: <ul style="list-style-type: none"> - Which villages you will target first - What age will you target. How you will find willing team members. - How many guards you can reasonably hire - What type of information you want them to gather, how many reports they should make per month - How you will make sure to maintain trust between Tiger Team and the villagers - Decide how long the project will run, how you will decide whether or not to continue it - Understand how they will contact you, how you will hold them accountable, how you will make sure they are not lying to you. 	3 weeks
Determine Baseline	<ul style="list-style-type: none"> - Obtain a quantitative measurement of the factors you will measure in order to determine whether or not project is successful. 	3 days
Obtain permission	<ul style="list-style-type: none"> - Work with local government heads to make sure you can hire and pay the guards - Ensure local government will not interfere with what guards report (or don't report!) 	Variable
Market program	<ul style="list-style-type: none"> - Market Tiger Team in local newsletter or newspaper, talking about goals and impact. - Aim is to generate buzz and discussion about the Tiger Team and all the good things they can do to help conservation - It is important to use this opportunity to tie WCS' ability to gather scientific data 	1 month

Train Guardians	<ul style="list-style-type: none"> - Train all guardians together to build a feeling of camaraderie - Training should cover: how to find tiger tracks, how to answer common questions from villagers, how to defuse tense situations if confronted about their work, how to report back to WCS, how they will be paid 	2 weeks
Monitor Progress against Baseline	<ul style="list-style-type: none"> - Regularly assess your data against baseline, and against your definition of success. - Make adjustments to the project as necessary. 	Ongoing
Evaluate	<ul style="list-style-type: none"> - Have goals been met? - What are results of guard's evaluation - What is willingness and effectiveness of continuing the program? 	2 weeks
Replication or Conclusion	<ul style="list-style-type: none"> - If results are bad, conclude the program - If results are good, look for other ways to extend the program (additional villages or hiring additional Team members). 	Variable

Suggestions of how to measure success: Different quantitative factors in determining success

Measure	Method
# Tiger pugmarks reported	Track number of pugmarks or tiger signs currently reported/gathered by team every year. Understand spatial distribution/density of tiger marks and how it changes based on regular reporting.
Increase in snares found per km ² patrolled	How does the density of snares found per month change?
Change in villager ability to connect scientific study to tiger conservation	Before and after, survey how many people understand connection between snare and pugmark location and conservation.
# of people who sign up for snare patrol	How many people willingly sign up to be on a snare patrol after hearing about its usefulness for tiger conservation?
Increase in Tiger prey density	Measure before and after the density of tiger prey species in the forest surrounding the villages.

Alignment with Government Cattle Objectives:

Prevents youth from leaving local villages for opportunities in the city. Provides local incentive for economic growth. Encourages conservation values in all ages. Helps manage the illegal setting of snares.

iv. Idea Four: Women for Tigers

Summary: Pay village women to run marketing and education campaigns. Focus is on delivering messaging about status of tiger in wild, importance of conservation, and amount of damage that cattle and snares do to the environment. This is followed up with information about actions that people can do in villages to help protect the tiger.

Background for Idea: Observational data from our survey time indicated that women often spent more time in the house than men, and also tended to gather together and visit one another more than men. Anecdotally, many of these women were not sure how much they were making from the various livelihoods, stating, “my husband would know.”

Thus, we believe that women are an untapped resource inside of villages. Women may readily take up the opportunity to earn extra income (possibly more than they might make gathering NTFP) and to “own” this source of income.

Potential Upsides: based on what is known from prior sections

Women have a strong influence on the shape of a society’s values. Empowering women, especially through education, has been shown to promote health, labor-market participation and increase average income⁴⁹

Potential Challenges: based on what is known from prior sections

Women are less apt to name someone who they trust as a leader than men are. This shows that they may have less knowledge about village activities.

The hierarchy of rural villages in China may prevent women from stepping out to work in these roles; they may feel that they are still needed in the home and with child-raising tasks, and therefore that they have no time for another job.

Stakeholders Required:

- Village women’s group - to provide manpower to run the project
- Village women’s group head – to organize women who are interested
- Village head – to make sure it’s okay to hire people for this project

Equipment/Resources Required:

- Training materials
- Incentive items (perhaps something beyond monetary reward for a good job)
- Badge/identification of some kind

Major tasks and Timeline:

TASK	DESCRIPTION	TIME
Determine Scale	Determine: <ul style="list-style-type: none"> - Which villages to target first - How many women should be involved (likely to be based on funding available) - What measurable outcome should this have (for example: “Increase awareness and # people practicing tiger conservation measures by 50%”) - Develop plan of major topics to educate on, and list of actions villagers should start to do - Decide how long project will run, how you will decide whether or not to continue it 	2 weeks

⁴⁹ (World Bank, 2011)

Determine Baseline	<ul style="list-style-type: none"> - Obtain a quantitative measurement of the factors you will measure in order to determine whether or not the project is successful. 	
Obtain permission for program	<ul style="list-style-type: none"> - Approach government in a pilot village with all training materials and explain the goals of the project, how long it will last, how much money you will spend and how many people you intend to employ. - Obtain support, or at least permission, for this program 	Variable
Market program	<ul style="list-style-type: none"> - Market the women's program in local newsletters or news outlets, talk about its goals and impact. - Go into villages and distribute information to women about the program, ask them to come to an initial meeting. At this meeting, explain what the program is about, expectations, etc. Ask for signups. 	1 month
Train Educators	<p>Hold training sessions to cover:</p> <ul style="list-style-type: none"> - How exactly to talk about conservation - Who to approach and how to be assertive in education - How they will receive payment for their work, and how they will be evaluated/held accountable for their work. 	2 weeks
Monitor Progress against Baseline	<ul style="list-style-type: none"> - Check in on a regular basis - Ensure those people with questions can contact you 	3-6 months
Evaluate	<ul style="list-style-type: none"> - Have goals been met? - What are results of women's evaluation? - What is willingness and effectiveness of continuing the program? 	2 weeks
Replication or Conclusion	<ul style="list-style-type: none"> - If results are bad, conclude the program - If results are good, look for a second village to expand to, allowing women from first village to join you in training. 	variable

Suggestions of how to measure success:

Measure	Method
Increase in villager ability to identify conservation values related to the Amur Tiger	Before and after, test people on common knowledge about the Amur Tiger, also test pride level to live in an Amur Tiger habitat area, willingness to protect tigers
Increase in income to household	Women's work on project increases total household income by some X%
Decrease in villager willingness to participate in harmful activities	Ask villagers to estimate the number of snares set every year before and after the project. Ask villagers how many people in the village are participating in harmful activities to the tiger before and after the project.

Alignment with Government Cattle Objectives:

Increase in total income for each village household. Women are given more economic power, helping them to increase the overall well-being of the home. A decrease in illegal activities such as illegal hunting (snaring). Promotion of conservation values to protect China’s natural heritage.

X. Adaptation and Continuation

Once a project is launched successfully, often the question is: “what next?” There are a number of directions a project can grow – expansion to other villages, expansion within the same village, or transformation into a different type of project.

Community-based conservation projects that involved alternative livelihoods were extremely popular in the 1990s. Millions of dollars were put into the projects, and most of them failed. Why? One reason is that many conservation projects were initiated, supported and maintained by the conservation organization itself. The organizations did not build management capacity or skills in the communities. Conservation organizations *must* understand that creating a project based on an alternative livelihood is like running a start-up. It requires either extreme cooperation and coordination between the community involved, or else a few very motivated, determined leaders to make it successful⁵⁰.

When many of these organizations tried to pass alternative livelihood projects on to the communities to manage, the communities did not have the motivation or the skills necessary to continue it. They then failed, and the money put into them was lost.

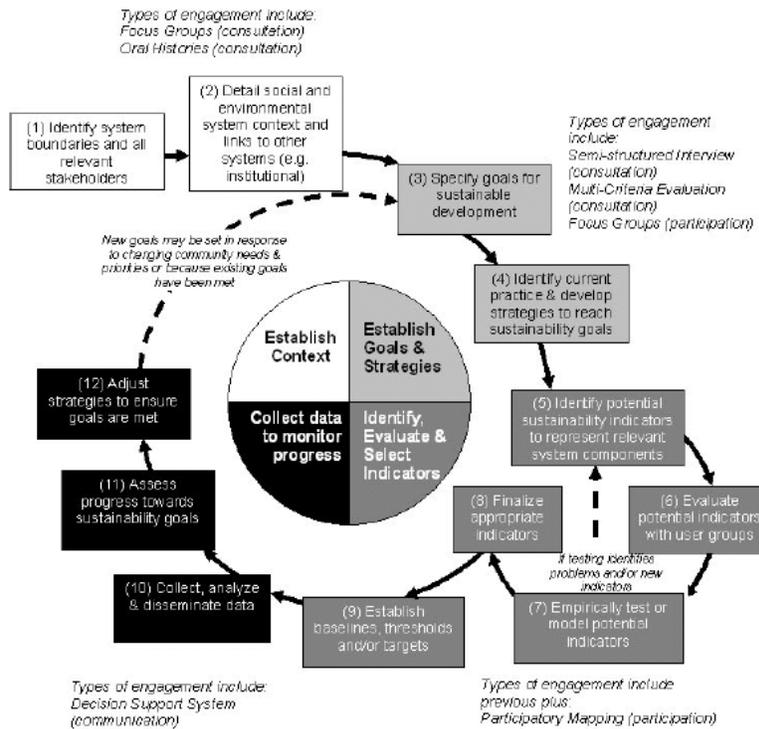


Figure 23. A model used to describe an environmental sustainability assessment using indicators based on local and scientific knowledge (Stringer, 2006).

Conservation organizations have a responsibility to think long-term when they enter a community-based conservation project. The backlash from a failed project, or the withdrawal of funding or support, may be more damaging to conservation than pre-project activities.

Stringers “Diagram of Environmental Sustainability” illustrates a good model for how to continually assess and improve on a conservation project. Within this model are also recommended tools for completed each segment of the project.

The key points are after point (10) “Collect, analyze and disseminate data. The next two points are: “Assess progress toward sustainability goals” and “Adjust strategies to ensure goals are met.” At this point, it’s likely

⁵⁰ (Bynum, 2011)

that new goals “may need to be set in respond to changing community needs & priorities, or because existing goals have been met.” This falls under “establish context” because, as mentioned in IX. Project Plans, success relies on flexibility, adaptation and continual evaluation of the local environment.

In addition to the evaluation cycle, organizations should also understand how they will end the project. Businesses refer to this step as an “exit strategy.” How will WCS China, having implemented a successful project, help that project to continue? And, while the project continues, how can it withdraw support and funding from the project? Making sure you plan for an exit strategy will give you an “out” regardless of whether things have gone well or poorly. Exit plans also determine how you operate the project as a whole. For example, if WCS China plans to pass the project management to the community, they should focus on starting to train the community members early in the process. Table 10 contains simplified descriptions of the main exit strategies for entrepreneurs and start-ups.

Ultimately, the exit strategy chosen depends on the individual organization’s preferences and operating style, and on the distinctive feature of each project (Table 10). It may seem strange to plan an exit before the project has even begun, but it is important to understand when conservation goals have been met, and how the organization will behave at that time.

Table 10. Exit Strategies and their Conservation Equivalents. Exit Strategies based on Entrepreneur's Guide by Mitchell York.⁵¹

Exit Strategy	Business Description	Conservation Description
Let it run dry	Settle remaining debt, close doors and liquidate remaining assets.	Declare conservation goals have been met, announce end of project, and reclaim your resources (staffing, funding, equipment)
Sell your shares	Sell equity to existing partners, leave firm cleanly	Pass project off to another group as is – either a conservation partner, the government, or the local community.
Liquidate	Sell everything at market value, use revenue to pay off debt	Similar to “Let it run dry” except rather than close doors, blend project with another organization’s and use the reclaimed resources for another project.

Given that WCS China intends to continue working in the Hunchun area for many years to come, we recommend that WCS China “sell its shares,” so to speak. It has some experience with this, having handed off their compensation program to the local government about 5 years ago. This method also ensures that WCS China maintains good relationships with local communities and government, and outwardly displays its long-term investment there.

⁵¹ (Richards, 2011)

Conclusion

XI. Closing Remarks

The Wildlife Conservation Society, China, has a long and difficult road ahead in tiger conservation. The status of the endangered Amur Tiger is less dire than some of its cousins in the south. However, the entire population of 331-393 adult—sub-adult individuals in the Russian Far East and just 18-22 solitary males in China, faces significant hurdles to recovery. The genetic diversity is quite low, and despite intensive conservation efforts, numbers are declining.⁵²

The focus on the Hunchun region both as key Amur Tiger habitat, and as a region for the cattle industry's development, make community-based conservation projects vital to successful habitat and wildlife protection in the region. WCS China's ability to adapt and grow successfully in this type of conservation may determine the viability of the Amur Tiger in the Hunchun Nature Reserve area.

Via a community household survey, and the analysis of this data, this report models the type of research that WCS China might pursue in order to better understand their target communities. It has stressed that in order to successfully implement community-based conservation projects, WCS China must first test its assumptions about human behavior. When governments fail to, or choose not to, dictate certain types of behavior, social surveys can determine the best way to change human behavior for the good of conservation. Though the bulk of this report covers relevant statistics to answer questions of social and financial incentives for the economic activity of cattle-raising, it has also stressed the importance of holistic planning – not just in projects, but also in overall management strategy.

If WCS China can build a coalition for tiger conservation in Hunchun through smart partnerships and effective use of its own staff, it has enough political capital and leadership passion to implement very successful tiger programs in this region. WCS China should also look seriously at its own responsibilities and roles. As a world-renowned scientific organization, what information could WCS China be gathering about the ecology of the tiger and its prey that might seriously influence policy? This is a self-stated strength of WCS China⁵³ and may be data point needed other entities to justify work in the area.

In 2007, WCS China declared that their goal was to double the number of wild tigers by 2020. WCS China has set the stage for their work, and in order to achieve this goal should move decisively and purposefully. Perhaps it is Margaret Mead who said it best, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."

⁵² (Miquelle, 2010)

⁵³ (Xie, 2011)

Appendix

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XIV. Methodology

These survey methods were written jointly by Joshua Berger and Jennifer Chin.

i. Survey Development

Initial Survey Development

Following a literature review and a review of existing WCS Amur Tiger materials as authored by Haas Business School in Summer 2010, an initial survey was developed in Durham, N.C. This survey contained demographic questions, but also questions regarding willingness to collaborate, income data and factors in local decision-making.

Pre-Test Survey Development

After arriving in Hunchun, the three interns and WCS Hunchun's education officer co-developed a more complete draft of the survey. This draft included new questions on compensation. This survey was approved by the Internal Review Board (IRB) at Duke University.

The survey was pre-tested in two small towns close to Hunchun. Problems were identified with 1) mistranslation (more on this later) 2) question order and 3) missing questions to assist survey organization. Upon returning to the office, we went through the survey question-by-question and many changes were utilized.

We sent the survey to Kang Aili, head of the WCS Tibet office, who had significant social survey experience. She recommended other changes, which we then made. This next draft also included follow-up questions from WCS' 2010 Fall livelihood-and-wildlife-attitude survey.

Final Survey Development

After all feedback was received, the final survey was reformatted to include guideposts, and additional questions related to compensation. Some of these questions came out of literature review done by Joshua Berger.

ii. Methodology of Survey Teams

All surveys were administered in teams, with one person asking survey questions and the other person recording responses. Although we tried to keep all the same teams, issues with the border patrol forced us to change them. As a result, we ended up with effectively 5 different teams:

Jennifer and Liu Tong

Zhu Jiawei and Li Chunlin

Joshua and Ren Yi

Joshua and Xiao Wenhong

Xiao Wenhong and Liu Tong

Joshua Berger: Master's student from AgroParisTech, environmental economics, Paris, France

Jennifer Chin: Master's student from Duke University, business and environmental management, Durham NC, USA

Li Chunlin: PhD student from China Academy of Sciences, wildlife ecology, Beijing, China

Liu Tong: Education Officer, Wildlife Conservation Society, Hunchun, China

Ren Yi: Administrative Officer, Wildlife Conservation Society, Hunchun, China

Xiao Wenhong: Master's graduate from China Academy of Sciences, wildlife ecology, Beijing, China

Zhu Jiawei: Master's graduate from China Academy of Sciences, wildlife ecology, Beijing, China

Mr. Berger, Mr. Liu and Ms. Chin were all heavily involved in the development of the survey. Xiao Wenhong especially assisted with the translation into Chinese from her location in Beijing. These four understood very well the background behind each question. Li Chunlin had done a 300-household social survey in Qinghai, measuring attitudes around conservation in the region of Prezwalski's Gazelle. Zhu Jiawei had helped him with those surveys. Ren Yi works with WCS and helped administer the Fall 2010 survey. So, these people had survey experience.

Before we trained the volunteers, we sent the survey to Xie Yan (Wildlife Conservation Society country director), and she raised a lot of questions. While in training, all the volunteers raised a lot of suggestions on how the survey should be changed. We realized at this time that most of the objections arose from the Chinese translation of the questions.

Tony, who did the original translation, went through and fixed a lot of it – with input from myself, Xie Yan, and Joshua.

iii. Sampling Selection

Aili Kang of the WCS China, Tibet office, strongly recommended we do a random stratified sample in our survey villages. Our sampling method be designed so as to get :

- a representative sample for the zone of concern so that we can draw conclusions that can be applied for the whole zone.
- the difference between the areas inside the Nature Reserve and outside of it.

However, it wasn't clear how exactly we should develop our strata. In the end, we decided to just do a random sample. We ran into a couple of problems:

- Villages were sometimes chosen for convenience (close to the place we where staying) and were also limited in our choice by Nature Reserve's rules. Due to being foreigners, we could not go to Shangcaomao, Guandaogou, Xidaogou, Fenshuiling and Beidaogou, which are in the core zone of the reserve but also very close to China's border with Russia. So we were not able to purposefully sample villages in and out of the reserve (or in different zones).
- We obtained lists of names of village's households in order to randomly select people from that list. Unfortunately, these lists were outdated. We found that about 60% of households heads had died, moved to another village, or left to a different country to work. These lists were obtained through Chunhua's government for Chunhua *Zhen's* villages and through Machuanzi's government for Yilihada. It looks like they are based on *hukou* (户口). This also meant that people who had recently moved into the village, or had their *hukou* located elsewhere, would not have been selected off the list.
- In the future, WCS should try to get a list from the head of the village and specify clearly that it wants a list of people currently living in the village and not of village's *hukou* (or another random selection method must be found). It is very important to get a correct sample. We only found this out after we showed the list to another resident, and they were able to update us on the whereabouts of these residents.
- It was difficult to find people who were on the list, especially if they were working in the fields. We surveyed people only between 8:30am to around 12:00pm and from around 1:30pm to 6:00pm, inducing bias. Those who work all day and only come back after 6pm (when we had left the village) may have had very different opinions from those who were home when we were.
- It happened several times that we had a (good or at least not so bad) plan and were not able to or did not stick to it. More rigor is necessary if WCS wants scientific results.

iv. Methodology by Village

1. **In YiliHada (依力哈达)** we spent 2 hours driving back and forth between the village and Hunchun trying to find the village head. When we found him, he initially started to photocopy the village list for us (names, ages, people in household). However, as he photocopied, he changed his mind, saying "You have foreigners with you." The only way we were allowed to take names with us was to handwrite the first 50. We don't know how the list was ordered, so the sample was not truly random. Sample size pretty small compared to the total population. It was the first time we really surveyed people after the period test. Some questions may still have been unclear.

2. **In MaDiDa (马滴达)**, we were not able to find the village head, but only the treasurer. In MaDiDa, we used a convenience sample. This town has a form of a cooperative in which they take turns watching each other's cattle (but still sell separately). On the street we ran into a man who was part of the cooperative. We surveyed him, and then he took us around to some of the other houses. The first two

others that he took us to, he sat in on the surveys. There were also other people sitting in the houses, as it was lunch time. We also took a late, long lunch before doing more surveys. Sample size was small compared to the total population.

In MaDiDa, the border guard came by and saw Joshua giving an interview to someone. Because they were suspicious of his “foreign face” we had to leave the village before we hit our survey target for the day.

Our plan was to go next to Chunhua (春华) and spend four consecutive days surveying there. Liu Tong (aka. Tony) acquired lists of all the names of the “head of household” for every village around Chunhua. Joshua used Excel to randomize the names, and we took the top 50 from every list.

3. On one day, for surveys from June 8, Liu Tong went out and surveyed on his own. He chose the households based on convenience sampling: he interviewed a veterinarian who he was working with, and two other households that they visited together.

4. Two groups went to Chunhua. The first group (Tony + 3 volunteers from Beijing) went for 2.5 days. They used a convenience sample method. They did not go to the villages that they had lists for, and so they simply went around to different houses and surveyed people who were home.

On the third day, they interviewed inside of Chunhua proper (a larger town with a few thousand households). So, this sample size is very small. Also when they came back, we saw that they had not understood how to fill out the Respondent ID section. Although we put them through a 5 hour training on how to administer the survey, they missed this very simple English-language step.

Thus, they may have missed other key aspects. On the other hand, two of the volunteers (Li Chunlin and Xiao Wenhong) were very experienced in social survey methodology, and later showed in conversation that they understood the process well. So, I think we can be confident that the parts of the survey that were written in Chinese were properly administered.

5. The second group that went was 1 Volunteer from Beijing, Tony, Jennifer and Joshua (two teams). This was an experienced team that understood the survey process well. **We went with our lists of names to specific towns and used the lists as best we could.** This happened on our first day of surveying because rain kept everyone indoors in **Shangcaomao(上草帽)** and our third day of surveying when hot weather kept everyone indoors in **Hulu tougou (葫芦头沟)**.

Our sample size in Shangcaomao was about 33%. We chose, on the second day, **Lanjia (兰家)** partly because it is one of the furthest North and may be more impacted by the tiger (now and in the future). This village has many households growing Jew's ears (木耳) so most of them were at home harvesting the Jew's ears. As in Shangcaomao, we were able to use our list of names but we have pointed the limitations of that list above. Good sample size (about 33%).

We chose Hulutougou because of its proximity to Chunhua. Our driver had to go back to Hunchun that day, so we were also able to make his drive shorter by going to this town. The village head had taken a group of residents to Chunhua to sing for the 90th Anniversary Celebration of the Communist party, and the weather was good for farm work. On this day, it was impossible to find many people on our list, and we reverted to knocking on doors throughout the village and asking anyone who was home to answer our survey. We ended up surveying everyone who was at home, as well as 3 households who were working in their fields nearest the villages, but this was still only between 15-20% of the total number of households. Others were some kilometers away from the village to take care of their crops. So only very few villagers were left in the village and therefore : we have a small sample size

(about 10%) and the people we interviewed are probably not representative of the total population. We surveyed people the morning and until around 2pm and ended our day then.

On our last day we went to Lishugou. We chose this village because it was not far from Chunhua and we had to drive back to Hunchun that evening. As in Hulutougou, some villagers were out in Chunhua for Red Songs. But we were still able to find most of the people on the list (and belonging to the 40% not dead or moved or out of the country). We left the village for some hours after lunch to check camera traps, so we may have missed people present at the beginning of the afternoon.

v. Reliability of Questions

Although the survey was intended to be a closed-ended survey, we found it impossible to actually administer the survey with this method. This methodology holds true for the Tony/Jennifer and Tony/Xiao Wenhong teams. We made the following alterations:

1. All Likert Scale questions were asked as open ended questions. This meant that questions were asked and written in very different way. For instance, question 48 « 我认为补偿金都发到了相应的人手中 » was almost always asked with additional explanations that could differ from respondent to respondent and surely differed between 2 interviewer teams. When respondent answered in the affirmative or negative, we would then ask them to clarify (do you only agree a little bit, or do you agree a lot? Do you disagree a little bit, or do you disagree a lot?). We later changed these to “agree” “neutral” and “disagree” in our analysis. These differences between the way the questions were written and actually asked mean there could be a lot of differences in the way they were asked between teams.
2. Multiple choice questions with qualitative options were read to the respondent. Sometimes respondents chose more than one response, or simply stated the one that they could remember. In this case we re-read the options that most closely matched what they said.
3. Multiple choice questions with quantitative options were asked as open-ended questions. The survey recorder then checked the box that fit the respondent’s answer.
4. For the large chart on page 2, all questions were asked open-ended. Ie. How many cattle do you have? What breed? What is your revenue for one year? Profit? Where do you keep them? Is it land owned by the village, government, or by you? Do you grow crops? How much land? ...and so on.
5. If the respondent didn’t understand the question, we repeated it in a slightly different way. If he/she still didn’t understand, we asked a third time. Then if we couldn’t obtain a response, we put “Don’t know” and moved on.

vi. Omissions

Following each survey, the survey administrator and recorder agreed on a “trust score” (from 1-100) for each respondent. This was based on

- Whether the respondent seemed to correctly report their income (ie. Did reported wealth match visually observable wealth of the family?)
- Whether the respondent seemed able to mentally process and understand the survey questions
- Whether the respondent was honestly answering the questions or merely on autopilot/trying to “get through it.”
- Whether the respondent was heavily influenced in honesty by other members of the household
- Whether the respondent had sufficient knowledge of the household to answer questions accurately (ie. Did they know how much they made from one year’s sales of crops?)

Omissions were made as follows:

- Any respondent with a score 60% or below was omitted.

We hope these methodology descriptions help to understand weaknesses and strengths in the data, as well as discuss the assumptions that must be made in looking at this data.

XV. WCS Survey, Summer 2011

I. 人口

1. 您是户主吗? (家里做主的人) Are you the head of Household? (makes purchasing decisions)

是/Y 不是/N

2. 性别 Gender: 男/M 女/F

3. 年龄? Age?: [] 25-35 [] 35-45 [] 45-55 [] 55-65 [] 65+

4. 其他家庭成员: Please list information about the other members of your house hold

关系 Relation to Respondent	能干农活吗? (能/不能) Ability to work on Farm? (Y/N)

5. 您在这生活多少年了? How many years have you personally farmed, managed land, or grazed cattle in this area?

6. 您的孩子将来会继续在这生活吗? Does your son/daughter plan to take over?

会/Y 不会/N 不知道/Don't Know

II. 养牛

8. 你养牛吗? Do you raise cattle?

养 (》跳到 10) /Y (skip to 10.)

不养 (》继续下一个问题) / N (continue)

9. 不养, 为什么? If no, why not?

太难 It is too difficult

不会 I don't know how

太花时间 It takes too much time

其它原因 Other _____

需要太多资金 Requires too much capital

》跳到 V. 补偿 /Skip to V. COMPENSATION

10. 你为什么养牛? Why do you raise cattle?

挣钱 It is profitable

是比较容易的一个收入 It is easy income

其它村民都养, 所以我也养 Others in the village raise cattle so I do too

急用钱的时候可以卖 As insurance if I can't make money doing something else

别的好处 They provide me with some other benefit. _____

11. 您夏天把牛放在哪? Where do you feed your cattle in the summer? (Check all that apply)

山里 (没围栏) Graze cattle in forest (non-fenced)

山里 (有围栏) Graze cattle in forest (fenced)

在圈里育肥 Stall feed them

12. 从谁那买的牛? How do you obtain your cattle?

邻居 From neighbors

自己繁殖 I breed my own cattle

牛贩子 From middleman

从养牛专业户, 名字叫 _____ From cattle breeder named

别的途径 Some other method _____

13. 多少钱? How much do you pay for them?

14. 牛一般卖给什么人? To whom do you sell your cattle?

大企业 Someone from a big company

政府 The government

邻居或亲戚 Neighbor or relative.

我也不知道 I don't know who

牛贩子 Middleman

15. 您一般都是每年卖给同样的人吗? Do you always sell to the same entity?

是/Y

不/N

不知道/Don't Know

16. 为什么? Why?

17. 您一般在什么情况下卖牛? How do you decide when to sell your cattle?

18. 你的最好的牛能卖多少钱? How much would your best cow sell for?

- | | |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> <2000 | <input type="checkbox"/> 5100-6000 |
| <input type="checkbox"/> 2100-3000 | <input type="checkbox"/> 6100-7000 |
| <input type="checkbox"/> 3100-4000 | <input type="checkbox"/> 7100-8000 |
| <input type="checkbox"/> 4100-5000 | <input type="checkbox"/> 8100< |

19. 一般来说, 一头 12 个月大的小牛能值多少钱? Price of average one year old calf?

- | | |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> <2000 | <input type="checkbox"/> 4100-5000 |
| <input type="checkbox"/> 2100-3000 | <input type="checkbox"/> 5100-6000 |
| <input type="checkbox"/> 3100-4000 | <input type="checkbox"/> 6100-7000 |

20. 你每年每头牛花多少钱喂饲料和盐? How much do you spend on food and salt for your cattle every year?

- | | |
|----------------------------------|----------------------------------|
| <input type="checkbox"/> 100-300 | <input type="checkbox"/> 710-900 |
| <input type="checkbox"/> 310-500 | <input type="checkbox"/> 900< |
| <input type="checkbox"/> 510-700 | |

21. 你每年每头牛花多少钱买药? How much do you spend on medicine for your cattle?

- | | |
|----------------------------------|----------------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 201-300 |
| <input type="checkbox"/> 1-100 | <input type="checkbox"/> 300< |
| <input type="checkbox"/> 101-200 | |

我现在给您念个句子, 请您用一个选项来表达意见。1 是强烈反对, 5 是非常同意

强烈反对 Strongly Disagree	有点反对 Somewhat Disagree	都行 Neutral, No Opinion	有点同意 Somewhat Agree	强烈同意 Strongly Agree	不知道 Don't Know
22. 如果可以赚同样的钱, 我愿意养少一点但是品种更好的牛。 I would be willing to raise fewer cattle of a better breed if I could still make the same amount of money.					
1	2	3	4	5	0

III. 育肥牛

23. 您有没有参加过圈养育肥牛的项目? Have you ever participated in a program that would help you stall feed your cattle?

有 (《继续走) / Yes (continue) 没有 (《跳到#25) / No (jump to 25)

24. 如果参加过, 您对项目满意吗? If Yes, how satisfied were you?

很不满足 Very Unsatisfied	有点不满足 Somewhat	没啥想法 Neutral, No	有点满足 Somewhat	很满足 Very Satisfied	不知道 Don't Know

	Unsatisfied	Opinion	Satisfied		
1	2	3	4	5	0

» 跳到#26 / JUMP TO #26

25. 您听说别人参加这样的项目了吗? Have you heard of anyone who participated in this program before?

听说过/Yes 没有/No

26. 一头育肥牛可以卖多少钱? How much can you sell a stall-fed cow for?

- less than 2000 5100-6000 不知道 Doesn't Know
 2100-3000 6100-7000
 3100-4000 7100-8000
 4100-5000 8100+

27. 关以育肥牛, 你最担心什么? Which of the following most worries you about stall feeding?

- 太难 It is too difficult 牛的健康问题 Cattle are less healthy
 需要很多资金 Requires too much capital 我没有专业知识 I don't know how
 太费时间 It takes too much time 其它 Other _____

28. 关以育肥牛, 你觉得最大的好处是什么? Which of these benefits do you most like about stall feeding?

- 牛的价格高 Cattle will sell for a better price
 牛不会被老虎吃 Cattle are safe from tigers
 不把牛放到山里, 对森林比较好 Stall-feeding benefits the forest environment
 其它 Other _____

29. 如果有类似育肥牛的项目, 您愿意参加吗? How likely are you to participate in a program that would help you stall feed your cattle?

强烈反对 Very Unlikely	有点反对 Probably not	都行 Neutral, No Opinion	有点同意 Probably Would	非常同意 Very Likely	不知道 Don't Know
1	2	3	4	5	0

IV. 合作社 (牛)

假设现在要在村里做一个项目。在这个项目中, 你得跟别的养牛户组成一个合作社。你们轮流饲养并看管牛群。大伙一块卖牛, 并用一个大家都同意的办法来分配所赚的钱。

我现在给你念几个句子, 请您用一个选项来表达意见。

强烈不同意 Strongly Disagree	有点不同意 Somewhat Disagree	都行 Neutral, No Opinion	有点同意 Somewhat Agree	强烈同意 Strongly Agree	不知道 Don't Know
30. 我放心让其他村民来喂养我的牛。 I trust the other cattle-owners in the village to take care of my cattle.					
1	2	3	4	5	0
31. 如果和其他村民一块讲价, 可以挣更多钱。 I can make more money if I coordinate with other villagers to bargain with the cattle purchaser.					
1	2	3	4	5	0
32. 我愿意和其他村民一块看管牛, 以防被老虎捕食。					

I am willing to cooperate with other cattle owners to keep our cattle from being eaten by tigers.					
1	2	3	4	5	0
33. 我愿意按照技术员的指导来养牛。 I am willing to follow recommendations from WCS or another expert to change the way I raise cattle.					
1	2	3	4	5	0
34. 因为要跟其他村民协调，我愿意晚一点拿到钱。 I am willing to accept delayed payment for my cattle because I am cooperating with other cattle owners.					
1	2	3	4	5	0
35. 如果分的公平，我愿意跟村民一块分赚来的钱。 I am willing to divide a share profit with a neighbor if it is divided fairly.					
1	2	3	4	5	0

36. 每头牛多赚多少钱，能让你愿意参加这个合作社？
How much additional money per cow would cause you to join the cooperative?

37. 如果需要一个领头人，村里有没有你认为特别公正、靠得住的人？
Is there someone in your village that you trust to keep the best interests of the entire village at heart?
有/Y 没有/N 不知道/Don't Know

38. 村里有没有特别会谈价钱的人？
Is there someone in the village who would be good at negotiating a good price for the cooperative?
有/Y 没有/N 不知道/Don't Know

39. 你对这样的项目有什么想法？ What thoughts do you have about this project idea?

V. 补偿

40. a. 您受到过野生动物造成的损失吗？ Have you ever had any economic loss caused by wildlife?
有/Y (continue) 没有/N (jump to 46)

40. b. 您是否曾申报过补偿？
Did you report your economic loss caused by wildlife for compensation ?
报了/Y 没有/N

41. 申报补偿以后，过了几天来查看现场？ How many days after reporting wildlife damage did the Compensation Bureau come ?

42. 您是否曾获得过补偿？ Did you receive compensation?
是的/Y (继续) 没有/ N (jump to 46) (《跳到#46)

43. 获得补偿需要等多长时间？ How many months did it take to get compensation for wildlife damage?

我现在给你念几个句子，请您用一个选项来表达意见。

强烈反对 Strongly Disagree	有点反对 Somewhat Disagree	都行 Neither agree nor Disagree	有点同意 Somewhat Agree	非常同意 Strongly Agree	不知道 Don't Know
44. 我认为之前的补偿金的数额是合理的。 I believe the compensation amt was reasonable.					
1	2	3	4	5	0
45. 我对于得到补偿金的速度很满意。 I am happy with how quickly I received compensation.					
1	2	3	4	5	0

我现在给你念几个句子，请您用一个选项来表达意见。

Please circle the numbers BELOW the statement.

》请圈出您的选择

强烈反对 Strongly Disagree	有点反对 Somewhat Disagree	有点同意 Somewhat Agree	非常同意 Strongly Agree	不知道 Don't Know
46. 我了解如何申报补偿。 I understand how to file for compensation.				
1	2	3	4	0
47. 我了解补偿金的数额是如何决定的。 I understand how the compensation amt is determined.				
1	2	3	4	0

》请圈出您的选择

强烈反对 Strongly Disagree	有点反对 Somewhat Disagree	都行 Neither agree nor Disagree	有点同意 Somewhat Agree	非常同意 Strongly Agree	不知道 Don't Know
48. 我认为补偿金都发到了相应的人手中。 I believe compensation goes to the right people.					
1	2	3	4	5	0
49. 假设 政府要求你遵守一些规则，才能得到补偿。比如： 有牛的话：晚上把牛赶回家或者白天查看牛。没有牛的话：在收获的季节看管农田，或者建造围栏来保护农田。 Suppose that the government give guidelines with a list of actions you must perform in order to receive compensation. IF HAS COW: This could mean guarding your cattle or bringing back home at night. IF DO NOT HAVE COW: This could mean guarding the fields or building a fence around them. 您同不同意 Agree or disagree: 我认为为了获得补偿要遵循这些规则是合理的。 I think it is normal to follow guidelines in order to receive compensations.					
1	2	3	4	5	0

50. 您能否阅读并填写一份四页的表格 In general, can you read and fill a 4 page form?

会（继续问）/Y (continue) 不会（跳道 52。）/N (skip to 52)

我现在给你念几个句子，请您用一个选项来表达意见

强烈反对 Strongly disagree	有点反对 Disagree Some	都行 Neutral	有点同意 Agree Some	非常同意 Strongly Agree	不知道 Don't Know
51. 我会定期填表来证明我做到了为获得补偿所必须遵守的规则。 I would fill the forms					

certifying I respect the guidelines in order to get the compensation.					
1	2	3	4	5	0
52. 如果政府对我额外的工作给予一定补助, 我愿意执行这些相应的措施来获得补偿。 I would respect the compensation guidelines if I received a subsidy that paid for my additional work.					
1	2	3	4	5	0

53. 应不应该允许打猎野生动物? Should people be allowed to hunt wild animals?

- 应该 Should
- 有害的应该 Only the harmful ones
- 不应该 Should not be allowed
- 没啥想法 No opinion

》要是他养牛, 继续走。要是不养, 跳到#57。 If they have cows, continue. If not, skip to #57

54. If your best cow was killed, how much should you get paid? 如果您最好的牛被老虎捕杀, 您认为应该补偿多少?

- 0-1000
- 1100-2000
- 2100-3000
- 3100-4000
- 4100-5000
- 5100-6000
- 6100-7000
- 7100-8000
- 8100-9000
- 9100-10,000

55. 如果您的一头十二个月的小牛被老虎捕杀, 您认为应该补偿多少? If a one year old calf was killed, how much should you get paid ?

- <2000
- 2100-3000
- 3100-4000
- 4100-5000
- 5100-6000
- 6100-7000

56. 最近三年, 你有多少头牛死亡(所有原因)? How many heads of your cattle have died for any reason in the last 3 years?

57. **有牛的话:** 如果牛损失, **没有牛的话:** 如果苞米 损失之后两个月您就能获得百分之百的补偿, 您愿不愿意每年付一定的保险费用? Would you be willing to pay a small annual/insurance fee per: **IF HAVE COW:** head of cattle **IF DO NOT HAVE COW:** ha of corn, if it guaranteed that you would be compensated for the full market price of a cattle within less than 2 months?
会/Y 不会/N 不知道/Don't Know

58. **有牛的话:** 为每头牛, **没有牛的话:** 为每垧苞米 您最高愿意付多少保险费用? What is the maximum fee you would be willing to pay per **IF HAVE COW:** head of cattle **IF DO NOT HAVE COW:** ha of corn, for a fee/insurance?

- [0 100 250 500 750 1000 1500 to 10 000]

59. 您去年的一垧成熟玉米的价值是多少? What was last year's value for 1 ha of mature corn?

60. 如果您的苞米地被野猪等野生动物破坏了, 您认为每亩应补偿多少? (确定: 10 亩为一垧) If your rice field was destroyed by wild boar, duck or geese, how much should you get paid per mu? (1/10 of a "shang" = hectare)?

VI. 蜂蜜

61. 您参加过养蜂的项目吗? Have you ever participated in a honeybee-raising program?
有 (》继续走) / Yes (CONTINUE) 没有 (》跳到#66) / No (JUMP TO 66)

62. 您对项目满意吗? How satisfied are you with the program?

强烈反对 Very Unsatisfied	有点反对 Somewhat Unsatisfied	都行 Neutral, No Opinion	有点满足 Somewhat Satisfied	非常满足 Very Satisfied	不知道 Don't Know
1	2	3	4	5	0

63. 你会继续参加这个项目吗? Will you continue to participate in this program?
是 / Yes 不是 / No 不知道/Don't Know

64. 一公斤蜂蜜可以卖多少钱? How much can you sell a box of honey for?

跳到#70. JUMP TO #70.

65. 你听说过这样的项目吗? Have you heard of anyone who participated in this program before?
知道/Yes 不知道/No

有的村参加养蜂的项目。这个项目给了每家几箱蜜蜂, 叫他们参加合作社一起养, 来增加收入。也让他们组成农民巡护队, 冬天上山巡护。 /Briefly introduce the program (In some villages the people joined a cooperative, were given boxes of bees and asked to join snare patrols).

66. 你愿意参加养蜂的项目吗? How likely are you to participate in a program that would help you raise honeybees?

不可能 Very Unlikely	大概不会 Probably Not	都行 Neutral, No Opinion	大概会 Probably Would	当然会 Very Likely	不知道 Don't Know
1	2	3	4	5	0

对下面的几句话, 请您用一个选项来表达意见? What is your opinion on the following statements?
》请圈出您的选择 Please circle the numbers BELOW the statement.

强烈反对 Strongly Disagree	有点反对 Disagree Some	都行 Neutral, No Opinion	有点同意 Agree Some	非常同意 Strongly Agree	不知道 Don't Know
67. Removed.					
68. 我愿意参加农民巡护队, 冬天每个月巡护 2-3 次。I would be willing to participate in a local village snare patrol 2-3 times per winter.					
1	2	3	4	5	0
69. 如果村民知道这是为保护老虎而组织的项目, 他们会更愿意参加。People in the village are more likely to participate in a project if they knew it was helping Amur Tigers.					

1	2	3	4	5	0
70. 村民知道如果被资助养蜂，大家有就应该参加农民巡护队。People in the village believe that if they accept help on a project, it's fair to work on a snare patrol.					
1	2	3	4	5	0

71. 关于养蜂，最让你担心的是什么？What worries you the most about keeping bees?

- 蜜蜂越冬 Bees can't live through the winter
- 销路 There's no one to buy the honey
- 养蜂太辛苦 It's too much work
- 我没有专业知识 I don't have the skills.
- 没有木头做蜂箱 There's not enough wood to build boxes.
- 其它 Other (*list below*)

72. 关于养蜂，你认为最大的好处是什么？Which of the following benefits do you like most about keeping bees?

- 养蜂很容易 It's easy
- 可以赚很多钱 I can make a lot of money
- 不费时间 It doesn't require much time
- 蜂蜜容易卖出去 Honey is easy to sell
- 其它 Other (*list below*)

VII. 合作社 (蜂蜜)

假如 WCS 要在你们村做项目。在这个项目中，你得跟别的养蜂户组成一个合作社，互相提供技术支持。全村的蜂蜜一块卖，公平合理的分配利润。

对下面这些陈述，你有什么意见？What is your opinion on the following statements?

》请圈出您的选择 Please circle the numbers BELOW the statement.

强烈反对 Strongly Disagree	有点反对 Somewhat Disagree	都行 Neutral, No Opinion	有点同意 Somewhat Agree	非常同意 Strongly Agree	不知道 Don't Know
73. 我相信其他村民养我自己的蜜蜂。I trust the others in the village to take care of my bees.					
1	2	3	4	5	0
74. 如果和其它养蜂户一起定价，可以卖更好的价钱。I can make more money by coordinating with other villagers to bargain with the honey purchaser.					
1	2	3	4	5	0
75. 我愿意按照技术员的方法来养蜂。I am willing to follow recommendations from WCS or another expert to help me keep bees better.					
1	2	3	4	5	0

如果他不养蜂，跳到 77。否则继续。If respondent doesn't keep bees, skip to 77.

76. 每箱蜂多赚多少钱会让你愿意参加这个合作社？How much additional money per box of honey would cause you to join the cooperative?

77. 如果需要一个领头人，村里有没有你认为特别公正、靠得住的人？Is there someone in your village that you trust to keep the best interests of the entire village at heart?

有/Y 没有/N 不知道/Don't Know

78. 村里有没有特别会谈价钱的人? Is there someone in the village who would be good at negotiating a good price for the cooperative?

有/Y 没有/N 不知道/Don't Know

79. 你对这样的项目有什么想法? What concerns do you have about this project idea?

80. 应不应该保护野生动物? Should we protect wild animals?

应该保护野生动物 Should

有害的不应该、其他的应该 Not the harmful ones, but should protect the others

有用的应该、其他的不应该 Only the useful ones, not the rest

没有必要保护 No need to protect

没啥想法 No opinion

81. 你觉得怎么样就没有人下套子了? What is the best way to stop people from setting snares?

丰富村民的娱乐活动 Keep them busy with entertainment

多干活, 多挣钱 Keep them busy with a different job

作出更严厉的处罚 Make punishment harsher

增加巡护 Patrol for snares more often

其它 Other (*list below*)_____