

SANREM LTRA Review Questions and Recommendations
RESPONSE

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Practices and Strategies to Address Climate and Market Risks in Vulnerable Agro-Ecosystems

1. We are exploring ways to integrate the various activities that we are funding into a “program.” Would you consider providing intellectual leadership to the SANREM CRSP in the areas of soil quality assessment? Taking leadership in this area would probably involve working with the other activity teams to determine the extent to which common methodologies can be developed across projects (to facilitate comparative analysis) and periodic reviews of the other activities in this area (particularly prior to annual meetings).
Yes. We talked with Peter Motavalli and he is willing. He had many questions about how the other sites will approach soil quality assessment. Such assessments can be simple (focused on one discipline) or complex (including the perspectives of the stewards of the land). So in principle yes. Other questions remain, like how do we incorporate this in our plan of work, as well as travel funds. Our budget does not have travel to the annual meetings for Peter included. Because the meeting is in the US this year we can afford to fund his participation, In the future it may require discussions via email, conference calls or video conferencing.

2. Attached please find a proposal from Jeff Alwang at Virginia Tech. Both he and you will be working in the Bolivia and have similar objectives and approaches. Please review his proposal and see if you can identify areas of potential cooperation. We are sending him a copy of your proposal as well. Do you see any areas where you might work collaboratively (biodiversity assessments, participatory appraisals, soil quality work (you are particularly strong on this), etc.? Would it be possible to agree on some common methodologies so you could do comparisons across sites?
We have talked with Jeff about his plans for Bolivia. We share a common collaborator, PRONINPA. Dr. Alwang has been working with the Cochabamba office and we have been working with the La Paz one. Both offices use similar approaches to participatory research and maintenance of crop bio-diversity that should facilitate comparisons across sites. We are exploring the possibility of working in a common community and watershed – possible one in the Apolobamba area. Our level of inquiry is the ecosystem. Dr. Roberto Quiroz from CIP is a counterpart of Dr. Alwang in the area of watershed modeling. He is also a member of our team. We have worked with Dr. Quiroz on watersheds in Peru, and he contributed to the preparation of the current proposal. It should be quite feasible to use similar methodologies in many areas.

3. The SANREM CRSP Landscape System Approach requires a linkage with one or higher level landscape systems (watersheds, governance/policy, ecosystems). We assume that your higher level system was ecosystems, but this was not explicitly stated in your application. We would recommend that you include an explicit watersheds linkage. The other SANREM activity in Bolivia will be developing methodologies to do this in partnership with CIP. Watershed-scale models can extrapolate the hydrologic and water quality impacts of the changes in land management practices that you are proposing at the watershed level. Would you be willing to incorporate this into your activity so that this is a feature of the four

SANREM activities involving evaluation of the impacts of changes in land management practices?

You are correct, our higher level was ecosystem, and therefore we are making comparisons within Altiplano Andean ecosystems, and other higher levels such as markets and policies. We have not included in our work plans and therefore budget, watersheds. We would be very happy to work with CIP on watersheds, but don't have the funding to do this. We have worked with CIP in the past in areas where they were also doing watershed management research, but not in the Altiplano of Bolivia. Watersheds are not as useful a level of analysis in the relatively flat parts of the Altiplano. We need to discuss this further with CIP if you agree, as they have been doing the modeling in this region.

We are considering an additional SANREM activity that would support hydrologic modeling activities for projects that did not include it. They would employ remote sensing to collect as much baseline data as possible and then model various land management scenarios that you specify. Your responsibility would be to provide them with site specific data from your study sites on changes in soil quality, land use, etc. I believe that this would be data that you already intend to collect. CIP could potentially be involved. Does this sound feasible? *See response 2 on CIP collaboration, and we would have to coordinate with soils and our field managers to determine how much more time will be required.*

4. One of your proposed objectives was to develop market access that contributes to resilience. How do plan to address this for your small farmers? You might want to contact Robert (Bob) Rhodes at the University of Georgia (rrhoades@uga.edu, (706) 542-1042). He has had long-term involvement with SANREM and currently has one of our bridging awards. He has done a lot of potato genetic resource conservation work in the Andes with CIP.)
One of our main concerns is the reduction of varieties of potato within farms because there are no markets for the seeds of some of the varieties. Some of the resilient varieties, which can withstand frost and lower rainfall, are being lost, produced only for home consumption, or being no longer planted (i.e., the bitter varieties). We want to focus on these for high income markets. They are more resistant to frost and disease, and therefore they on the one hand can contribute to food security, yield in years of higher climate variability, and on the other, if markets are identified, can increase income. There have been some experiences in Bolivia and Peru on marketing some of the native varieties with CIP and PROINPA, and we plan to explore this line of research. Resilience in terms of withstanding shocks would be related to capacity to produce and market under variability. This has interesting gender dimensions. We will contact Robert Rhoades who has worked on potato genetic resources in Ecuador to get his inputs.
5. How do you plan to evaluate and minimize the risks associated with climate variability?
We have developed a diversity index that measures the income diversity (in-kind and cash) of the household portfolio. We are going to develop an instrument that will measure climate risks versus market risk perception. We will also measure the objective climate risks based on the climatology of the site in order to compare perceptions and actual changes. We will also look at transaction costs, access to markets, and price behavior to compare perceptions of risks with actual market integration constraints. This allows us to contrast perceptions with objective sources of risk. Based on these measures we will assess ways in which we can

change production systems to mitigate climate and market (or lack of market) risks, for example the introduction of frost resistance, and varieties of shorter growing seasons, as well as varieties that have more market appeal for consumers locally and in the larger markets where income elasticity is larger.

6. SANREM activities require testable research hypotheses or problem statements. What are your research hypotheses and how will you test them? (Just need to restate your development objectives in terms of researchable hypotheses or problem statements and then briefly indicate how you will test them.)
See attached list of hypotheses.
7. Based on your hypotheses or testable problem statement, what are the measurable outcomes of your research? *See attached list of measurable outcomes.*
8. The SANREM CRSP encouraged studies involving comparative analysis across sites. What is the nature of the comparative analysis you will be conducting? *All of our study sites have highly vulnerable populations of indigenous people and all are within the same high mountain/plateau eco-system there are differences among sites that permit comparative research. The sites vary in terms of elevation (frost risk), rainfall, market access and water resources (irrigation potential). This variation will allow us to assess the relative importance of these factors for successful management strategies. It will also increase the probability that our results are applicable throughout the region. We intend to use the same participatory methods in all communities to identify needs and to assess benefits. Likewise we will use common baseline instruments to measure impacts. Since possible interventions will be developed in concert with producers we do not expect them to be the same across communities.*
9. All SANREM supported research activities must contribute to the SANREM Knowledge Base. This was not mentioned in your application. Do you agree to participate in the development of the SANREM Knowledge and Information System and to enter all SANREM CRSP-generated information resources in the SANREM Knowledge Base?

Yes, we agree to participate in the SANREM knowledge base system.

10. SANREM encourages capacity building of NGOs in targeted host countries? How do you propose to incorporate NGOs in your research?
 - a. *PROINPA is a major research collaborator, responsible for research activities in UMALA and involved across sites in the topics of indigenous crops biodiversity and market access. PROINPA in turn works closely with an association of potato growers in Umala. In addition, the site coordinator in Apolobamba is CIPCA (Centro de Investigación y Promoción del Campesinado), a local NGO.*
 - b. *In the case of Perú we have two NGO collaborators for the work in Puno. The first is IER (Instituto de Educación Rural) that has a long term collaboration with UNALM. A second NGO established in Puno for many years is CIRNMA (Centro de Investigación en Recursos Naturales y Medio Ambiente), which has collaborated with MU and CIP in research and development for many years.*

Our logic for collaborating with NGOs is that they are trusted agents and institutions in rural communities. They know how to work with rural communities. The project, through participatory research will develop new knowledge that will become part of their knowledge base, as they implement the research with the universities. The collaboration should benefit their organizations, and project by initiating activities with less lag time because of the existing trust, and for the results to continue beyond the life of project because of the collaborative approach.

11. Your application seemed to propose significant collaboration with CIP (through KSU); however, no financial resources were allocated to CIP. Could you provide more details on the nature of this collaboration? Is CIP cost sharing their participation?

The costs incurred by CIP in their participation in activities regarding research with KSU are under the latter's budget. For example research site rental and maintenance of fields where both Forbes and Garrett will be collaborating in research. The costs of travel by Forbes and Quiroz will be assumed by KSU's and MU's budget to cover expert panel, as well as any costs we incur with our graduate students doing research under the guidance of CIP. This was possible because MU and CIP, as well as KSU and CIP have many years of collaboration and trust. It would have been optimal to have a budget flowing to CIP but with the many collaborators and institutions we opted for this arrangement, which is agreeable to CIP as the letters of support indicate. There has been mention of watershed research, which if more funds are identified, would be an area we would look forward to collaboration with CIP. CIP will provide access to labs but it is difficult to cost that as matching contribution.

12. Dr. Ostrom of Indiana University is also proposing SANREM activities in Bolivia. Her proposal addresses forest governance issues concerning access and sustainable use of resources. How would you envision her work relating to your climate variability activities?

We share a common interest in governance with Dr. Ostrom. Some examples are the following: because Bolivia has devolved many management issues from central government to the Municipio (municipality) level, there may be governance/policy issues related to this. We are also looking at producer group coalitions in order to negotiate or increase bargaining power in marketing products. We will be looking at this with UNALM and ISU in the region. We are not sure where in Bolivia where Dr. Ostrom intends to work, but for the most part the forested areas are not heavily impacted by climate change. It is the dryer and colder areas the ones experiencing more impact on livelihoods. However, Jere Gilles has collaborated with Dr. Ostrom in the past, as Valdivia has collaborated with Dr. Meinzen-Dick, so we will be very happy to collaborate with them in the future.

13. You mentioned in your application that you would be assessing biodiversity at your study sites. Administratively, as well as substantively, this would be valuable to the SANREM CRSP Program. USAID is expecting SANREM CRSP research to contribute to their biodiversity objectives. Would it be possible to include a more explicit focus on biodiversity, particularly with respect to monitoring wild fauna as well as flora? This is how the Biodiversity Team at USAID/EGAT sees it:

Valdivia proposal – Only a small portion of funds for this proposal could potentially be attributed to the earmark. As it currently stands, none. There is a brief discussion of wild crop relatives on page 19. As it is written, it is conservation for agricultural production rather

than for biodiversity conservation. However, there is a “reserve” mentioned which appears to have wild potato relatives. There is discussion of improving management of the reserve. This type of activity could count towards the earmark. There is also scattered discussion of conservation of cultivars and land races – none of that work can be counted towards the earmark.

Improving agricultural production can only count if there is a measurable (something that can be measured) reduction in threat to wild habitat as a result of the project’s activities. My read of the proposal is that there isn’t much wild biodiversity remaining in the area. But that could be clarified. (We need clarification on biologically significant areas near the research sites and whether the proposed activities might reduce threat to those areas.

Our project probably cannot be modified to meet USAID biodiversity conservation requirements. However, we would estimate that ten percent of our activities are related to preservation of wild biodiversity. It is true that in one of our areas (Ancoraimes) there is not wild biodiversity. In the other two sites there are substantial vicuña populations, and Apolobamba is within a critical biological habitat. With our limited budget our plan is to concentrate on conservation of native plants, and the impact on wildlife is indirect through the effect of the use of plants in competition with these animals.

14. At some point, your research application will be posted to the SANREM CRSP website. Your application was 21 pages long or one page over the page limit. Could you please shorten your application by one page so that when we post it will be the same length as the others. This might help us avoid unnecessary criticism from unsuccessful applicants.

Reduced to 20, attached.

15. The SANREM CRSP is developing a Research Briefs Series. A set of short, technical sheets (usually 2 pages back-to-back) highlighting research findings. Each LTR Activity will be expected to produce one or more per year. Only a rough draft (with photos and diagrams, etc.) of the technical issue need be submitted to our editors. They will prepare the brief and we will post, and circulate hard copies. Are you agreeable? *Yes.*

16. We need a revised budget with the following budget periods. The total budget cannot exceed \$1,199,283 over the 45 month period of funding. Based on your original budget request and the requests of the other activities, we are recommending that your annual budget allocations be revised so that they fall within the following ranges. You will be allowed to carry over up to 10% of budget funds from one year to the next. Please revise your budget accordingly.

- a. Jan 1, 2006 to Sept 30, 2006 (9 months): \$235,000 to \$250,000
- b. Oct. 1, 2006 to Sept 30, 2007: \$310,000 to \$335,000
- c. Oct. 1, 2007 to Sept 30, 2008: \$310,000 to \$335,000
- d. Oct. 1, 2008 to Sept 30, 2009 (12 months): \$310,000 to \$335,000

We have submitted new budgets.

17. We need a detailed work plan (scope of work) for the Jan 1, 2006 to Sept 30, 2006 period detailing critical tasks and anticipated accomplishments by objective and an indication of who is responsible for each task/accomplishment. *We are submitting these.*
 18. We need a request for international travel approval for each anticipated international trip indicating the following **for each trip per individual**: countries to be visited, traveler(s), and approximate dates of travel. Please use the attached International Travel Request Form. *Done. There may be some changes in the future.*
 19. Given the Bush administration concerns about the election in Bolivia we need to be prepared for restrictions on project activities vis-à-vis Bolivia. *Our original research proposal concentrated more activities in Bolivia because we had greater mission support than in Peru, our second site. If the political situation delayed implementation in Bolivia, we could accelerate our activities in Peru and accomplish most of our research objectives there. This would give time for conditions to improve in Bolivia, and we could then complete our research there. If the only issue is travel approval to Bolivia, because of uncertain political conditions, we could have our planning meeting in Puno Peru with participation of our collaborators from Bolivia. Puno is approximately a four hour drive from La Paz Bolivia.*
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Objectives, Hypotheses, Methods, Outcomes

Objective 1: Develop a shared (by decision makers and researchers) understanding of the ecosystem, and the social, economic and environmental drivers of change in vulnerable communities of highland agro-ecosystems: Disciplinary and holistic approaches used to address production systems perceived or actual problems will be integrated through participatory research methods and common indicators will be developed.

Hypotheses Objective 1:

H1a Changes in climate have a negative impact on on-going cropping systems. Traditional cropping systems are changing in the face of increased climate risks.

Methods: Community participatory assessments of hazards and risks; Focus groups, group interviews, interaction with panels of local experts.

H1b Changes in cropping systems and soil management practices from traditional agricultural management systems due to climate and markets will cause a reduction in the perceived importance of organic soil amendments and soil organic matter maintenance.

Methods: Baseline on organic use, land use patterns, production and market activities (baseline survey instrument); focus groups, interaction with panels of local experts.

H1c On-going land use cropping systems practices that deviate from traditional practices (changes in rotations and fallow uses in addition to manure use and plowing) have resulted in lower soil organic C and N.

Methods: Direct analysis of C and N levels in farms with different types of management regimes from current to most traditional. Farms will be identified from baseline surveys. The baseline survey includes questions on land use, soil fertility, and production activities

H1d Local perceptions of climatic conditions reflect the trends identified in climatology analysis of the locality (confirmed by empirical analysis).

Methods: Baseline surveys and focus groups with local experts will provide us with perceptions. Our meteorologists will use available data to document actual weather trends and then will work with panels of local experts to reconcile the two if necessary. Daily weather data will be gathered from sites in the Altiplano having data for 35 years or more to look at trends in rainfall, onset of rains, frosts, frequency and intensity of rains. These trends will be compared with farmer perceptions obtained from focus groups and group interviews. Data will be used to evaluate the Intergovernmental Panel on Climate Assessments AR4 coupled model to evaluate the utility of this tool. The participatory assessments will also include changes in production systems patterns, to tease out (separate) climate effects, from changing technologies/practices effects.

H1e Cropping system diversity has decreased in recent years -in response to market incentives and out migration.

Methods: Existing data on local cropping systems will be compared with actual patterns detected in the baseline study. There has been previous research in some parts of our study areas. Conduct baseline survey of typical crop varieties, crop rotation, intercropping practices, changes in rotations and fallow of land, in addition to manure use and plowing for analysis, to assess soil quality impact, to predict risks of in situ conservation of traditional crop varieties and evaluate the economic benefits of conserving them. Where we do not have access to such data we will use focus groups and panels of elders and local experts to recall crops and other activities, and these will be included in the baseline survey to assess what activities and in which significance they were pursued in the past five, and ten years.

H1f Best disease and pest management practices are changing in the farm systems of our study region (potentially due to climate change)

Methods: Use focus groups and local expert panels to describe local practices, the strengths and drawbacks of them and whether they are becoming more or less effective. Use on farm trials to compare traditional practices with ones proposed by project scientists.

H1g Disease and insect herbivore loads of wild crop relatives in Apolobamba Integrated Management Area are changing (potentially due to climate change)

Methods: Survey disease and herbivore damage to wild crop relatives to provide baseline for long term study and to determine whether there are short term trends that can be explained by short-term weather patterns.

Outcome measures:

Since we are doing participatory research that includes scientists and producers, the rejection or validation of the above hypotheses is a measure of a common understanding. A simple check list listing results of research can document this.

Objective 2: Measure the role of market and climate risk (objective and perceived) on livelihood strategies, and the role of assets on risk perceptions and strategies. Understand how livelihood strategies are being developed in response to perceptions of the relative risks associated with these changes; and how these perceptions are linked to the assets they possess (livelihoods);

Hypotheses Objective 2:

H2a Perceived Climate Hazards are the most significant risk facing households in the communities of the High Altiplano Region.

Methods: Survey data, hazard risk mapping, and focus groups to understand risk rankings, will be use as the basis of risk assessment that looks at the relative level of risk posed by climate, markets, pests, and family health/well being. In household surveys we will elicit questions to measure impact of climate shocks, measure impact of prices and transactions costs in accessing markets. Contrast impact, and frequency of shocks with perceptions of risk, and determine which perceived risks influence strategies.

H2b Farm households having more biological diversity will have more stable levels of income and well-being than less diverse ones.

Methods: Assess farm productivity and net income as a function of crop system, crop species, and crop variety diversity using farm surveys and actual field measurements. A panel of farms will be followed for 3 cropping seasons. This will require annual assessment of selected crops.

H2c Perceptions of risks will differ between local experts and other producers.

Methods: Network analysis using baseline survey (see H2a) supplemented by group interviews and ethnographic data will identify local experts in the areas of climate prediction, marketing and production. Their perceptions of risk factors will be compared to other members of the communities.

H2d Less diversified economic portfolios in crops are more vulnerable to economic and climate shocks.

Methods: Survey data will be used to test this. Cross sectional regression analysis.

H2e Biodiversity/Growth in the natural capital (investments in soil fertility, water, landscape improvements, biodiversity) is negatively affected by degree of livelihood vulnerability.

Methods: Surveys will be the instrument to identify degree of vulnerability, and combined with direct measurement the bio-diversity. The natural capital indicators will be developed by the soil, crops biodiversity, and production systems researchers and producers (Objective 1).

Outcome Measures:

Again if we answer the questions in these hypotheses we will understand how livelihood strategies are being developed, and measure the impacts of climate and markets, as well as propose alternatives to reduce these risks. (Some of these are the technologies being assessed at the different research sites. See objective 3)

Objective 3 Explicitly link local and new knowledge to produce practices and information that provide alternatives for adapting to change;

Note: Here is where we begin taking the outcomes related to objectives one and two and have measurable outcomes. Here is where the pest and disease participatory research products, the soil management products, the forecast/climatology knowledge, and the potato (other native) and wild varieties findings come in. As the information is generated through participatory research groups the questions are: are the alternatives viable, and how are these communicated to others in the community, and to other communities.

Hypotheses Objective 3:

H3a Traditional forecast methods are unable to predict current climate behavior.

Methods: A baseline survey will provide perceptions of this phenomenon. Local forecasters/experts identified in surveys and focus groups will make forecasts using traditional methods, our meteorologists will make forecasts using their models, participatory (decision makers and researchers) groups will meet to synthesize results.

H3b Traditional soil classification systems and soil management systems emphasize organic content. Soil fertility will be defined in terms of organic content.

Methods: Focus groups and workshops with local experts will describe local soil classification system. Soils in different indigenous/local classifications will be chemically evaluated to ascertain the relationship between traditional classification teams and chemical composition. Changes in rotations and fallow uses in addition to manure use and plowing will be considered.

H3c The networks that producers use to access information to help in their decision making are not articulated to the networks through which experts, NGOs and government agencies try to disseminate information to producers.

Methods: Surveys and focus groups will use basic network analysis techniques to look at the flow of information used in production decisions by producers. Similarly focus groups with extension workers and scientists will identify the networks used in information dissemination strategies.

H3d Local experts who are the opinion leaders in their communities concerning agricultural decision making do not have contact with extensionists, NGOs and government agencies.

Methods: Approach described for H3c will identify experts and ascertain articulation with scientific based systems of production.

H3e The combination of local and scientific knowledge of climate can help farmers make production decisions that can increase resiliency.

Methods: Varieties and cropping systems that respond better to climate risks will be the object of on-farm trials and the results of these trials will be evaluated in terms of its economic and nutritional impacts.

H3f Local systems of soil classification and soil fertility will correspond to empirical measures of soil properties.

Methods: Same as for H3b.

Outcome Measures

1. Local opinion leaders will have linkages to scientific communities and other resources.
2. There will be an increased use of scientific based information in decision making.
3. Farmers will try out new varieties of crops that are less vulnerable to climate risks.
4. Farmers will include new, less vulnerable varieties in their production systems if economically viable.
5. Community members and scientists will agree on causes of changes in fertility.
6. Farmers will experiment with new soil management systems. If promising (cost effective?) ones are identified, they will adopt them.
7. Food security will be enhanced for families who adopt new technologies.
8. Families adopting new practices will handle shocks from extreme weather events (frost, drought, floods) better than those who do not.

Objective 4; To evaluate and identify market integration opportunities and institutions (mechanisms) that contribute to resilience. We define resilience as the ability of people and their environments to recover from shocks and stresses;

Hypotheses Objective 4:

H4a Vulnerable populations in rural communities lack reliable market access, as well as access to market information for their products.

Methods: Household survey information will compare market access by level of vulnerability measured in terms of access and control of labor and land, assets, and networks.

H4b Urban markets exist for traditional (native) varieties and cultivars of tubers and grains that are currently only used and valued for home consumption.

Methods: Focus groups will examine the uses and desirable traits of native cultivars. Marketers and urban consumers will be surveyed to identify potential demand. Data from MAPA will be analyzed for the regions of study to identify existing links.

H4c Best Management practices in the Altiplano will change under predicted climate change scenarios

Methods: GIS applications will be used to estimate management needs for the Altiplano under both simple and more complex climate change predictions. Baseline and monitoring surveys will be used to input as data to identify current land use patterns and climatic hazards.

Outcome Measures

1. Market linkages for selected traditional cultivars.
2. Market linkages for on-going production activities and linkages between producers by linking to associations lead to increased income from agricultural sales.
3. Increase in assets that could be used to cushion shocks.

Objective 5: Develop methods that integrate these knowledge systems. Our underlying approach is to share capacities across disciplines (bio-physical, social sciences), across countries (Bolivia, Peru, and the USA), rural communities, research and development communities (universities), and stakeholders (NGOs, UNDP, USAID, WFP, and CIP). This objective refers to the development of approaches and capacities that are interdisciplinary and collaborative. This is the pathway that enables the research to have impact, but it is a community building process and not one that is appropriate for research hypotheses.

Hypotheses Objective 5:

H5a The linking social capital of producers will be increased during the life of the project.

H5b Interaction between university researchers and stakeholders (NGOs, USAID, international organizations will increase as a result of this project.

H5c Producers from different communities will be linked to others- Networks of rural producers can be strengthened

Methods: As part of the baseline activities the linking social capital of community members, project researches and stakeholders will be assessed using informal interviews. =

Outcome measures

1. Community linkages with outside agencies will increase over the life of the project.
2. Families participating in the project will have increased linking social capital.
3. Capacity building: Researchers, farmers and students trained in participatory, interdisciplinary research for development.