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Photo credit: Alma Karsymbek

Opinions matter! Subjective approaches to measuring resilience

Climate resilience in Kyrgyzstan

Resilience is an important concept for Central Asian disaster risk reduction and climate adaptation professionals. Climate predictions under a global 2 degrees warming scenario suggest that temperatures in Central Asia may increase by up to 6.5 degrees above pre-industrial temperatures by the end of this century (Reyer et al. 2017). Moreover Kyrgyzstan ranks as the third most vulnerable country to climate change impacts within Eastern Europe and Central Asia, predominantly due to the sensitivity of its agricultural systems to climatic change (ranked 3rd most sensitive out of 28 countries) and its low adaptive capacity (ranked 24th of 28 countries on adaptive capacity; Fay et al. 2010).
The impacts of climatic temperature changes will most likely be experienced through altered precipitation patterns and more frequent heat extremes, leading to increased incidence of aridity and drought, particularly in the mountain pastures. Moreover Kyrgyzstan's land area is 90% mountainous and therefore increasing temperatures may quicken snow and glacial melt, leading to an increased frequency and intensity of floods and mudflows (Ilyasov et al. 2013). In fact there is already an observable trend of increases in extreme weather events since 1990 *(ibid).* As such, Kyrgyzstan's rural exposure, sensitivity and relative lack of adaptive capacity to climate-related shocks and stressors make it increasingly important that building resilience to such events is at the core of development policy and programmes, in order to enable communities to continue thriving within their chosen geography and livelihood systems.

KEY MESSAGES

- It is increasingly important to identify which households are most at risk from negative impacts of extreme climate events and natural disasters
- A household's ability to maintain or improve its wellbeing in the face of such shocks and stressors is called its 'resilience'
- Resilience is often measured by trying to identify all of the capacities that make households in a certain place resilient. This can create very long surveys and a large amount of data that is difficult and expensive to analyse
- Another approach is to use subjective questions, asking local community members about their resilience directly, rather than trying to assess its component parts
- Our research finds that subjective resilience questions asked before the shock/stressor season are strong predictors of the future food security of households
- Using subjective resilience questions may help to accurately identify who is most at risk whilst significantly decreasing the length of the surveys

How can we measure resilience?

Increasing the resilience of a household or community means ensuring that adverse shocks and stressors do not have adverse development consequences on the people within that population. Therefore, a useful resilience measure should be able to predict which people will cope with and adapt to shocks and stressors best in the future. In other words, we want a measure that can predict future wellbeing.

Traditional approaches to measuring resilience

There have been many attempts to develop a measure of resilience, and they tend to follow a similar methodology:

- *Identify all important characteristics of the household that may make it more or less resilient to the types of shocks and stressors in their context*
- *Choose one or more questions to assess each of those characteristics*
- *Combine all of the data from these questions into a single value: their 'resilience level'*

However there are many problems with this approach. Firstly it is very difficult to decide which characteristics are the most important to local people in creating resilience in their particular scenario. Secondly it is challenging, if not impossible, to find meaningful measures of all these characteristics. For example, there is no universally accepted way to measure the social capital and/or social networks of a household, and these are reportedly very important to how households across the world cope with shocks/stressors. Finally, even if meaningful questions could be found, the question remains as to how to combine them into a summarized measure of resilience, accounting for all the interactions, thresholds and feedback loops that would exist between the characteristics. For example, if you were presented with the data in Table 1 and asked to conclude which of these communities is likely to be the 'most resilient', which would you choose?

Grouping	Indicator	Objective indicator	Household 1	Household 2
Economic	Market access	No. of markets within 20km	3	1
	Asset ownership	Value of consumer durables owned	$200	$450
Environmental	Communal grazing land	Presence: Yes/no	No	Yes
Infrastructure	Flood defences	Are there community-level flood defences?	Yes	No
	Access to basic services	How many health centres are within one day's travel?	2	2
Governance	Is there a pasture user group?	Yes\no	No	Yes

Table 1: Short examples of answers to a resilience questionnaire

Would your answer change if they were in the same community, or in different communities? Or in different countries? It may seem like you need more information to answer the question adequately, and in many ways that is true. However it is pertinent to ask how much more information you might need. In fact you would need to know almost every tiny detail about the household, its occupants, its location, the shocks and stressors it is typically exposed to, and how each of those things change and interact with each other, before coming close to knowing which household is more or less resilient. This creates a very high burden on questionnaire respondents and is likely to be both undesirable and unsustainable in the longer term.

Is there a better way to measure resilience?

Instead of trying to measure every detail of what creates resilience in each context, it is possible to ask respondents to directly rate their ability to maintain their wellbeing in the face of the types of shocks and stressors that they expect. These questions will ask for an opinion and/or perspective from the respondent, and therefore they are called 'subjective' questions, as opposed to 'objective' questions, which ask respondents for factual information that can be verified. For example, the distance of a village from a market can be measured and observed, as can the presence or absence of flood defenses. However, opinions cannot be externally observed or verified by anyone but the person providing them, and they are therefore 'subjective'. Table 2 provides a comparison of objective and subjective questions.

Resilience characteristic	Objective indicator	Subjective indicator
Market access	Number of markets within 20km	Are you confidant in your ability to access markets to sell your produce when you need to?
Asset ownership	Value of consumer durables owned	In the event of a flood, do you have sufficient assets to protect your family from falling into poverty?
Flood defences	Are there community-level flood defences?	Is your family/home adequately protected by flood defences?
Access to basic services	Yes/no for presence of schools, health centre, piped water, electricity, telephone	Can you access health care when you need it?
Is there a pasture user group?	Yes/no	Are you able to access sufficient pasture resources for your herd?

Table 2: Comparing objective and subjective versions of questions

Subjective questions offer an interesting new approach to measuring resilience because they avoid the lengthy process of identifying which resilience capacities are relevant, measuring them, and interpreting that data. Instead the respondent is asked directly to rate how well they feel they are able to maintain their wellbeing within their known context, on the assumption that they are the best placed individual to know which resources they need, in what quantity, and how they interact with each other to help or hinder their ability to maintain their well-being under certain scenarios.

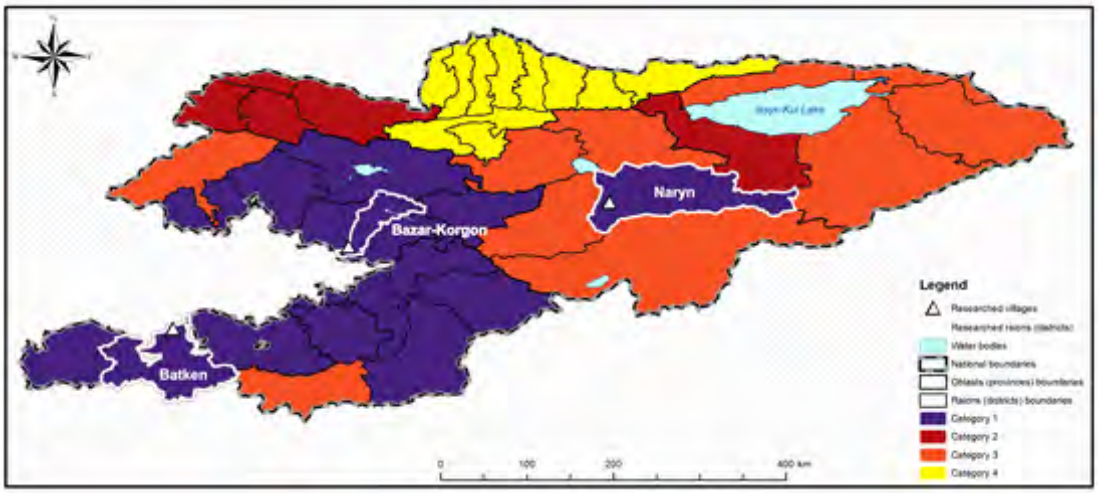

Figure 1:
Map of case study sites based on WFP assessment of high risk raions

Testing the value of subjective resilience (SR) measures?
This study is the first to test how well SR measures are able to predict future well-being, in this case represented by household food security (measured using the Household Food Insecurity Access Survey (HFIAS)). Three case study sites were selected across Kyrgyzstan, one village in each of Batken, Bazar-Korgon (Jalalabad province) and Naryn districts, each of which has been highlighted by the WFP as a Category 1 district, meaning they experience high recurrences of poverty and high or medium risk of natural shocks, relative to the rest of the country (Figure 1).
Gender-segregated focus groups were run in each location to assist in designing two types of SR measures. For the generalised measure, respondents were asked to identify shocks and stressors they would expect to experience in a 'typical' year from a locally-relevant list. They were then asked the question, "In a year where you experience the events that you just chose, i.e., a typical year, how is your family's well-being?" and could choose from six responses:

- We are always fine, regardless of these events
- We are mostly fine, and almost always have enough food and money
- Sometimes we struggle to have enough but we mostly get through
- It is difficult to find enough food and money for our needs
- It is really difficult to find enough food and money for our needs
- We are unable to meet even our basic needs for surviving

For the shock-specific measure, respondents were asked to choose three options from a list of locally relevant shocks that they were most concerned about occurring in the coming 3-4 months (the approximate time gap between survey rounds). For each event chosen they were asked, "If [EVENT] happens in the next 3-4 months, how do you think it will affect your family's well-being?" and could choose from six responses:

- We will be totally fine
- We will mostly be fine, and almost always have enough food and money
- We might struggle a bit but we'll get through
- It will be difficult to find enough food and money for our needs
- It will be really difficult to find enough food and money for our needs
- We will be unable to meet our basic needs for surviving

So, do SR measures predict future food security?
YES! Regression models demonstrate that both the generalized and shock-specific SR measures are strong predictors of food security, controlling for a wide range of socio-demographic characteristics such as age, gender, and education of the respondent; household size; whether any member reported earning income from external migration, total value of household assets, what types of coping strategies and what types of help were received in response to past shocks and stressors.

And, can we use these SR measures to compare community resilience levels?
To some extent, yes, but they should be used with caution. The strength of an SR measure is its ability to predict future food security and so far the results show that within a given community those with a higher SR score will have better food security. But how about comparing across communities? For us to compare across community the SR measures would need to transfer across context, i.e., households reporting similar values of SR before shock/stressor season would then report similar values of food security after shock/stressor season.

From Figure 2 we can see that this is almost the case. The x-axis is general SR measured in either the first or second round of the survey, and the y-axis is the level of food security measured one time period later (in the second or third round).

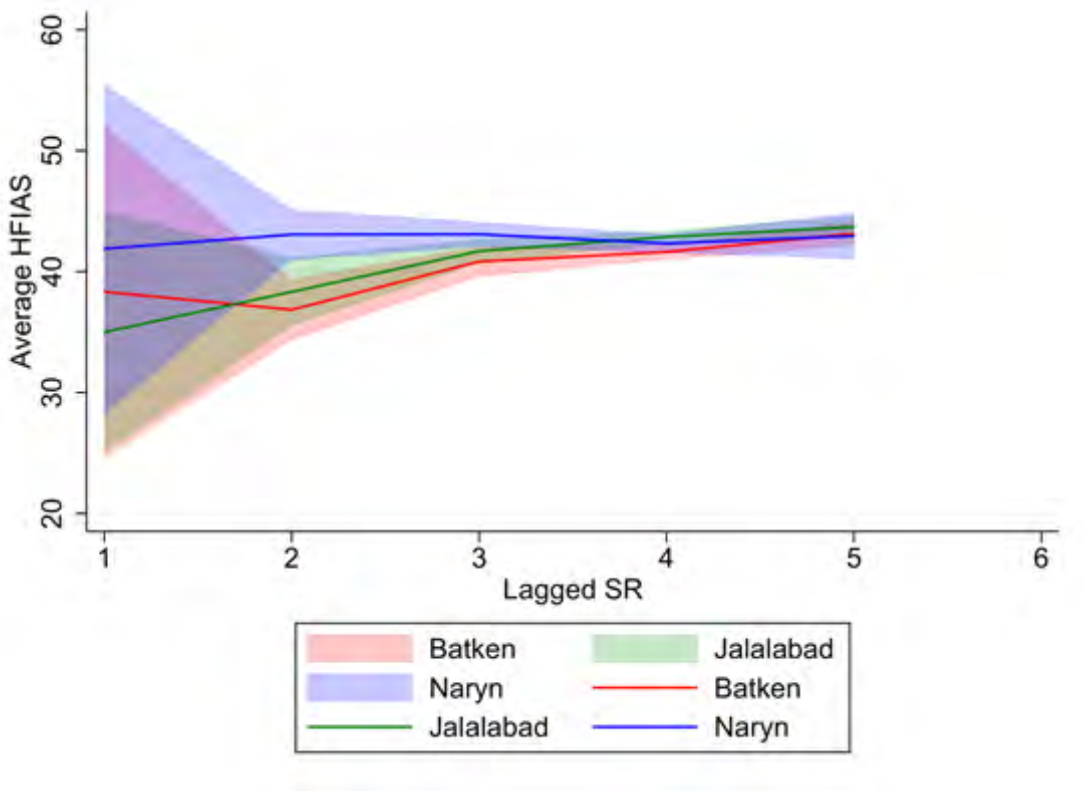

Figure 2:
Comparing subjective resilience scores across communities

Figure 2 shows that for scores of 3 and above the SR measure will predict equivalent levels of food security across different contexts, however at lower scores there is greater variation and less overlap between the community distributions. This means that comparisons of community-level SR when scores are very low may not be a good indicator of relative food security.

This is an exciting initial result for the field of subjective resilience indicators. Future work should focus on refining the questions to create a more robustly transferable indicator of resilience across contexts.

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Further Reading

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