

## **Working Around the Challenges: Climate Risk Impact Assessment in Central Asia**

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### **I. Abstract**

Assessment of climate-related risks is necessary to develop strategies and actions to manage short and long term climate impacts on lives, the economy and society. This paper summarizes a climate risk assessment process developed for sub-national assessments in Central Asia. The paper identifies three significant challenges to the assessment effort, and corresponding solutions:

- Missing or insufficiently detailed data, where data harvesting, infilling and advocacy were used to address these challenges.
- A lack of statistics to use to assess the impact of climate risk on livelihoods, where the use of the sustainable livelihoods framework and a Delphi process brought a range of climate impacts into the assessment process.
- Poor understanding of personal responses to climate risks, where a perceptions survey, including willingness to pay were, used to understand personal preferences in dealing with climate risks.

The paper demonstrates practical ways to work around a number of challenges faced by climate risk assessments in locations where less than comprehensive data sets are available.

### **II. Introduction**

Assessing the impact of climate on lives, the economy and society is essential for developing effective strategies and implementing local actions to manage negative outcomes. While global and regional assessments of climate change impacts have been developed (see Intergovernmental Panel on Climate Change, 2007), these results are not generally sufficient to identify sub-national actions to address the impact of changes in climate conditions. This paper identifies and proposes solutions for some of the challenges encountered in conducting climate risk assessments at the sub-national level where data is sparse or unavailable.

This risk assessment process was developed under the Central Asia Climate Risk Assessment Project, an effort to develop and test a process for a data-driven assessment of climate risks at the sub national level in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.<sup>3</sup> The countries contain a range of climates (e.g., from +7,000 meter peaks to below sea level seas), economic conditions and political histories. These conditions challenge development of a common assessment process but provide a diverse test bed for the assessment process. The project is funded by the **Climate Development and Knowledge Network** through CAMP Alatoo (a Kyrgyz NGO), with support of the United Nations Development Program.

### **III. The Climate Risk Assessment Process**

The process for assessing climate risk impact in Central Asia is set out in the **Climate Risk Assessment Guide – Central Asia** report (CAMP Alatoo). Six tasks to frame and define climate impacts to identify options to address these impacts:

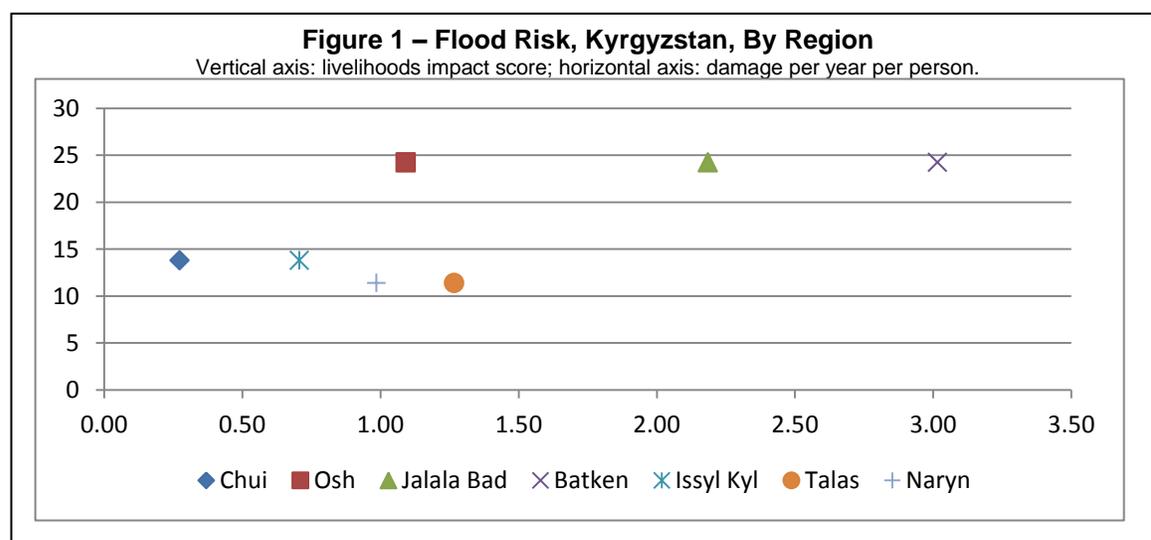
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<sup>3</sup> The project was on-going during the drafting of this paper, but ended in March 2013.

1. **Assess the correlation between climate-related impacts and historical climate conditions.** Understanding the link between impacts and climate conditions helps define whether climate alone, or other factors, particularly human actions, are influencing the impact of climate-related hazards.
2. **Define the impacts of climate events in terms of reported damage.** Damage, expressed in monetary terms, is the clearest way to define the impact of climate conditions and is an effective way to communicate climate issues to decision makers and those at risk.
3. **Define the impacts of climate events on livelihoods.** Most impact data focuses on physical damage and not the loss of income, access to natural resources, etc. The Central Asia process uses the Sustainable Livelihood Framework (IDS Knowledge Services), to capture a broader perspective on the impact of climate on lives and society.
4. **Define the risk of climate events.** Physical and livelihoods damage need to be considered together to indicate overall risk from climate conditions. Physical and livelihoods impacts are measured differently and cannot be directly combined. Instead, a scatter plot is used to define relative risk of locations by plotting damage/livelihood impact pairs for each location. This process allows for ranking locations by overall risk from single types of climate events (e.g., flood) or from a set of climate events. (See **Figure 1**.)



5. **Define possible future damage, livelihoods and risk outcomes.** The damage costs, livelihoods impacts and risk outcomes based on past events provide a starting point for building simple scenarios setting out future impacts and outcomes. The baseline scenario presumes a growth in climate impacts at the same rate as growth in population. Other scenarios present outcomes of a 1% per year reduction in impacts (a reduction in the impact of events due to climate factors or improved impact management), or a 1% increase in impacts, due to either changes in climate factors or increasingly risky living. This process is similar to, but much less sophisticated than, climate change modeling (see Intergovernmental Panel on Climate Change, 2007).
6. **Define the perceptions of those at risk of climate hazards and willingness to address these risks.** Many risk assessments focus on physical impacts and pay less attention to the

perceptions of those impacted. The Central Asia process incorporates two perception-focused assessments, considering direct perceptions of climate and the willingness to pay for actions to address climate impacts.

The assessment results, including specific analysis on climate event physical damage, impacts on livelihoods, event-specific and overall risk at the local level, future impacts and outcomes based on the scenarios, and perceptions and willingness to pay provide, provide the basis for recommendations on long and short term actions to reduce the impact of climate risks on individuals and society.

Further information on the assessment process can be found in the **Climate Risk Assessment Guide – Central Asia** (CAMP Alatau) available at <http://www.ca-crm.info>. Reports providing impact assessment results for specific sectors in Kyrgyzstan and Kazakhstan (currently being drafted) will be available on the same web site.

## **IV. Challenges and Responses**

### **A. Data Availability and Detail**

Climate data are relatively good in most of Central Asia, generally extending back several decades, but data on damage from climate events are not as good. In general, damage data is available only from 1992. In terms of disaster damage from climate events, available data is inconsistent in detail (e.g., the cost of impacts is not available for all years) and coverage (e.g., drought damage is not always included in a national disaster database). Disaster data may also be considered sensitive and not for public release.

The data challenges were addressed through a combination of data harvesting, infilling and advocacy. Data harvesting focused on reviewing published reports and unofficial documents to collect data on impacts. The process is time consuming, can generate inconsistent results and raises concerns that public disclosure of previously gray data could provoke negative reactions.

For gaps in data sets a process of infilling was used. This involved, for instance, averaging damage data for one type of event for several years and then using this average to fill in gaps in damage data for other years for which the number of events, but not the damage for each event, was known. This process lowers confidence in results, but creates a better-than-guesstimate baseline with which risk estimates and scenarios can be developed.

Both these efforts have led to advocacy with data holders to make available existing data, and collect more usable data in the future. Such improvements will not have an impact on current impact assessments, but can improve assessment results as better data is collected.

### **B. Understanding Livelihood Impacts**

Given the weak data on impacts other than physical damage, a Delphi-based process was developed to assess impacts of climate events on lives (health and deaths), finances (income), social interactions, natural resources, and political systems. The assessment process considered the livelihood impacts for specific climate hazards in specific locations for the population as a whole, and specifically for females.

To guide the livelihoods impact rating, a table with standard descriptions for each livelihood capital for five levels of impact was developed. The table provided a common analytical framework for all groups conducting assessments and allowed for a degree of repeatability over time to assess changes in impacts. Although not as precise as other methods, using well

defined criteria provides sufficient rigueur to allow a comparison of results across hazards and locations.

<b>Scaling Capital Impacts for Climate Hazards</b>					
<b>Type of Capital</b>	<b>Level of Livelihoods Impacts in Relation to At Risk Populations</b>				
	<i>Insignificant</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Extreme</i>
Human	No negative outcome on health.	Temporary negative outcome on health; no deaths.	Limited, short term negative outcome on health; few deaths.	Extensive negative outcome on health; deaths above disaster threshold.	Significant negative health outcomes and deaths.
Financial	No loss income or financial assets	Temporary loss of work.	Loss of work extended for several months.	Significant loss of work.	Near total loss of income and financial assets
Social	No need for reliance on social network for support.	Occasional reliance on social network for support.	Heavy reliance on social network for support, but for only 1-3 months.	More than a year reliance on social network for support.	Total reliance on social network for basic needs.
Natural	No damage to natural resources.	Temporary reduced access to natural resources needed to meet basic needs.	Reduced access to natural resources for 3-4 months needed to meet normal needs.	Extended reduced access to natural resources needed to meet normal needs.	No access to natural resources due to damage or change in location or access.
Political	Full government engagement in response to event.	Minor gaps in government response.	Some government assistance but significant unmet needs.	Very limited response to event.	No government response to event.

### **C. Assessing Perceptions and Preferences**

The Central Asia Climate Risk Assessment went beyond an expert driven process and incorporated the perceptions of those affected by climate risks. This was done through a perception survey on short and long term climate risks. The short survey was designed for use with individuals or focus groups.

To define gaps in perceptions, the survey results were compared to expert-based results, for instance whether the winter was getting colder. A divergence in perception and expert results indicated where better education on climate impacts was needed, or that the experts needed to revisit their data.

The survey also provided participants with an opportunity to spend an imaginary amount of funds to address climate risks or other issues that they confront. The process helps identify how important participants believe addressing climate risk are: the greater allocation of funds indicates greater concern.

Interestingly, participants generally did not “spend” funds on climate risks, but on other needs. This result highlighted that climate risk, both short and long term, may not have a high salience among some of the residents of Central Asia and a need for further education to increase awareness about climate risks.

## V. Conclusions

This paper outlines a process for climate impact assessment developed for Central Asia. The process brings together impacts for short (climate variability) and long (climate change) term climate conditions by using historical data as the basis for future impact scenarios.

The assessment process faced the lack of, or appropriately detailed, data with which to clearly define impacts. Data harvesting, infilling and advocacy were used to address these challenges.

A livelihoods assessment using a Delphi process was used to bring climate impacts in addition to physical damage into the assessment. A perceptions survey was used to capture understandings of climate impacts, as well as the willingness to pay to address these impacts.

The Central Asia Climate Risk Assessment process demonstrates it is possible to work around challenges posed by limited “hard” data and data of limited utility to develop a comparative climate risk impact assessment. The techniques used broaden the scope of the assessment results and provide decision makers, and at risk populations, with simple measures of past and possible future climate impacts. The livelihoods impact assessment and survey tools (and particularly the willingness to pay assessment) can be useful for impact assessments under conditions similar to those in Central Asia.

## VI. References

- Camp Alatau (2013), **Climate Risk Assessment Guide – Central Asia** (draft), available at <http://www.ca-crm.info>.
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