

CLIMATE CHANGE ADAPTATION: CASE OF THE KYRGYZ REPUBLIC

*Rahat Sabyrbekov,
Assistant Professor,
Department of Economics
American University of Central Asia
Abdymomunov st. 205
720040, Bishkek, Kyrgyz Republic
E-mail: rahat.sabyrbekov@gmail.com*

Abstract

The paper evaluates the current climate change adaptation policies. Kyrgyz Republic is signatory to all global climate agreements and is considered one of the leaders in the development of adaptation actions. However, the analysis shows that the adaptation programs suffer from lack of local context and local leadership. More worryingly, the national adaptation plans fail to meet sustainable adaptation criteria.

Keywords: sustainable adaptation, climate change, globalization.

Introduction

Climate change adaptation is ‘adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects’ (IPCC, 2007). The knowledge on adaptation and climate change is growing. Pasgaard and Strange (2013) found that the topic was researched in more than 15,000 scientific publications from 197 countries.

Adaptation is also the major focus of the latest IPCC report and our knowledge of the subject has advanced much since the first assessment report was published in 1990. One of the directions of discussion is the emphasis on the maintaining or increasing the standard of living while preserving the environment. The climate change is seen as a barrier for the economic growth and the development. So the approach calculates by how much the GHG should be reduced to keep the current levels of economic growth (Stern, 2007).

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Under this approach the corresponding policy options and the technological solutions are being developed. The proposed adaptation measures are derived in accord with homo economicus principle. Impact assessments are popular to estimate the damages and the adaptation costs. For example, Ackerman and Stanton (2008) estimate the cost of the global warming will reach \$1.9 trillion annually by 2100. This approach was picked up by many development organizations and the adaptation is enforced through the prism of the sustainable environment (e.g. UN Adaptation Fund). This approach has critics too. Stiglitz (2009) questions if the society “may also be confronted with false choices, seeing trade-offs between output and environmental protection that don’t exist.”

In recent years growing body of literature suggests that the adaptation has to be considered in a broader socioeconomic context (O’Brien 2011; O’Brien and Leichenko 2000; Adger et al. 2008; Moser and Ekstrom 2010). Plethora of empirical studies reveal that the adaptation decisions are influenced by social context and often may contradict to the rational expectations (Adger et al., 2008).

The other group of literature is represented by the behavioral scientists who see climate change adaptation as the result of non-market factors, and hence cannot be fitted into the standard economics models. They argue that the global warming adaptation is a complex process that involves various actors with diverse motivation (Gowdy, 2008). In their opinion, the standard approaches rarely provide the required solutions and the explanatory power of behavioral science should be used (Aaheim & Aasen, 2008).

In this paper I will attempt to review climate change adaptation in the Kyrgyz Republic. Section two tells what the impacts of climate change in the country are. Section three reviews the adaptation using main theoretical frameworks. Finally, section four concludes and section five draws on policy implications.

Climate change in the Kyrgyz Republic: adaptation to what?

Countries vary in cultural and economic values in addition to the geographical features. Therefore, global consensus is rarely achieved but climate change is one of these rare cases. It has been widely accepted that climate change is real and the immediate actions should be taken. The Vienna Convention and Montreal Protocols on Substances that Deplete the Ozone Layer and United Nations Framework Convention on Climate Change (UNFCCC) are UN conventions that

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have the highest number of ratified countries (UN, 2012). The Kyrgyz Republic is party to the UNFCCC and many regional agreements on climate change mitigation and adaptation.

The country is located in Central Asia and its population is more than 5 million. It is geographically diverse with the altitudes ranging from 400 meters to 7,500 meters above sea level and with its 85 % of the territory is above 1,500 meters. National rural poverty rate of 40 % and large dependence on natural resources make the country vulnerable to the climate change (NSCKR, 2011).

The Kyrgyz Republic faces significant and evident threats from climate change. Fay et al. (2010) rank the country as the third most vulnerable country to climate change in the Eastern Europe and Central Asia.

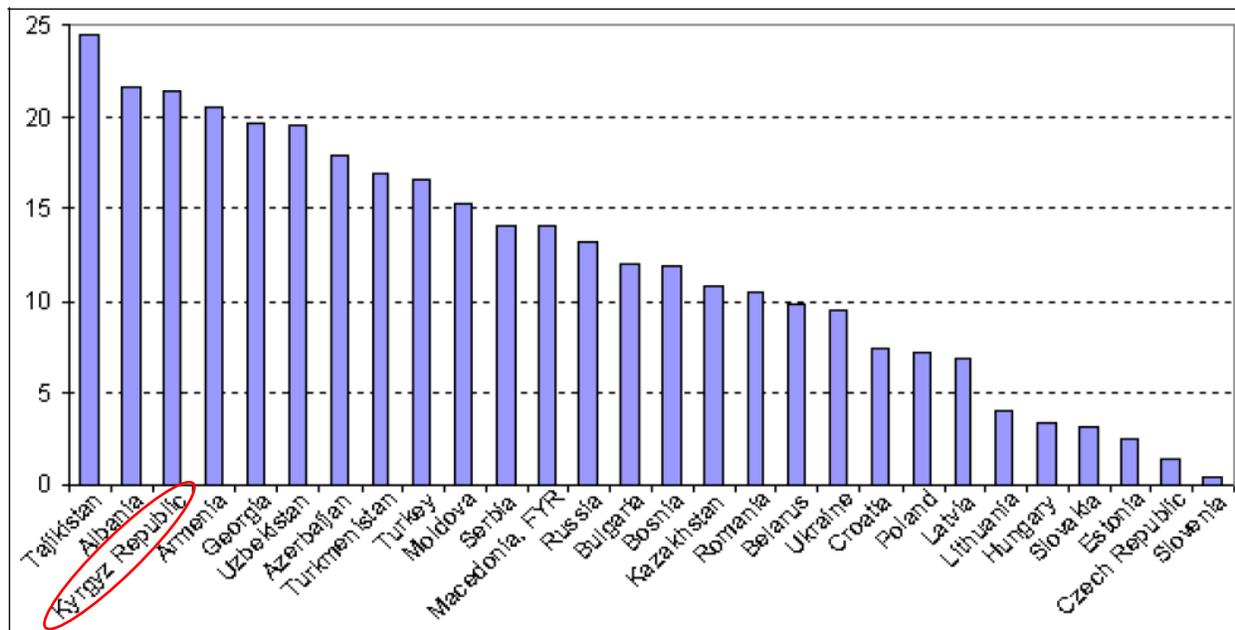


Figure 1. Vulnerability in Eastern Europe and Central Asia, (Fay, Block & Ebinger, 2010).

The meteorological observations show a clear pattern of increasing average annual temperatures and growing climatic abnormalities. However, the country level climate research is very limited and the available data is collected primarily by the government agencies and international NGOs.

Major climate change consequences identified by the government are: 1) higher temperatures, particularly in summer, 2) change in precipitation patterns, 3) stronger winds, 4) more frequent and larger areas affected by droughts, 5)

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increased incidents of mudflows, river runoffs and other natural disasters (Kyrgyzstan, 2009).

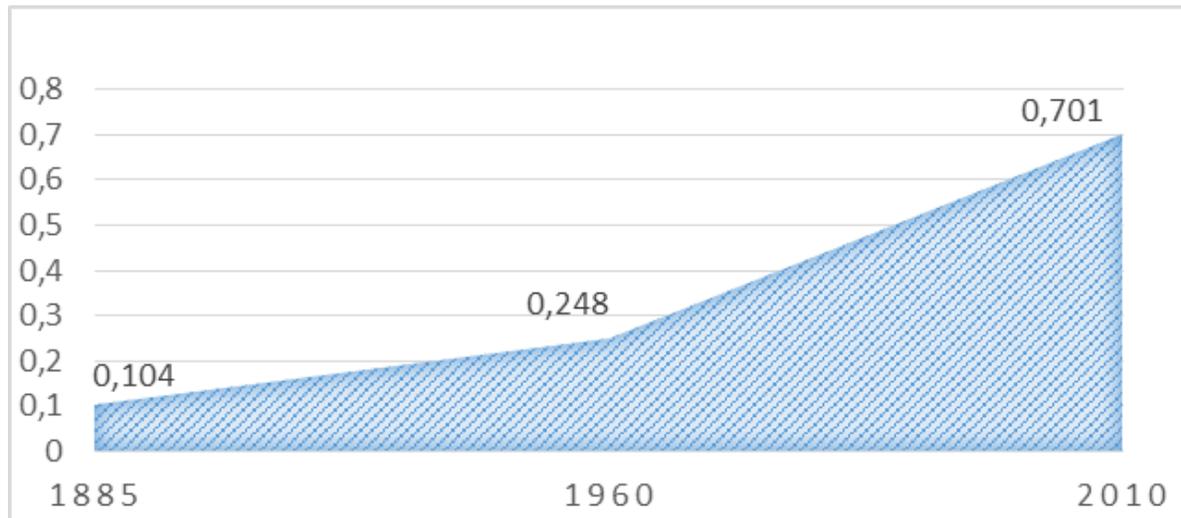


Figure 2. Growth of average annual temperature in Celsius (Kyrgyzstan, 2013).

To this date the Government of the Kyrgyz Republic produced the two climate reports for the UNFCCC and developed the Climate Change Adaptation Strategy till 2020. The strategy identified four sectors where the adaptation activities will be implemented: water resources, agriculture, natural disasters and healthcare (Kyrgyzstan, 2013).

Water resources

45 % of fresh water reserves of Central Asia are located in the glaciers of the Kyrgyz Republic and it is hard to overestimate its importance for the livelihoods. The melting rate of glaciers is alarming and under the various climate change scenarios the glaciers mass could decrease by 20 % to 70 % (Savoskul & Smakhtin, 2013). The melting of glaciers causes river runoffs, reduction of biodiversity, threats for rural livelihoods and infrastructure such as hydropower stations, communication and roads.

Government's adaptation measures include the irrigation improvement, the infrastructure modernization and the enhancement of the water use efficiency.

Agriculture

Agriculture counts for 18% of GDP of the Kyrgyz Republic and half of the population resides in rural areas. As in many countries Kyrgyz rural households are the main risk group in climate change. Primary reason is the direct dependence on

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natural capital and limited livelihood strategies. Climate volatility will cause major disruptions to the agriculture and worsen the rural poverty (Mirzabaev, 2012).

The adaptation measures are introduction of drought-resistant crops, pasture management and breeding enhancement.

Growing number of natural disasters

The Kyrgyz Republic experiences the growing number of natural disasters such as droughts, river runoffs, mudslides, avalanches and glacier lake outbreaks. For instance, changes precipitation patterns exacerbated the occurrence of mudflows and floods that increased more than 50 % in 2008-2010 (SAEFP, 2012).

The adaptation includes improvement of monitoring and forecasting system, early warning systems, infrastructure improvement, insurance system, institutional enhancement.

Healthcare

The official reports and strategies underscore the negative effects of climate change on human health. Increase of infectious diseases, cardiovascular illnesses and cancer are mentioned as climate induced or exacerbated health issues in the Second National Communication to the United Nation (Kyrgyzstan, 2009).

The adaptation activities are limited to monitoring and raising awareness among population (Kyrgyzstan, 2013).

Review of climate change adaptation activities

Leadership

Research on climate change adaptation in the Kyrgyz Republic is driven mainly by the state and NGOs. The research on autonomous adaptation is nascent (Ashley & Ershova, 2012). The climate change literature is focused on planned adaptation practices and macro scenario modeling. The review shows that climate change adaptation activities are developed by the government in the framework of the international climate treaties. Two climate change reports and the adaptation strategy was also written with the extensive support from the international development agencies using experts.

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It is evident that the national development plans and activities do not include climate-wise activities (Bizikova, Hove, & Jo-Ellen, 2011). This can be explained by two factors. First, the influence of the international NGOs in the country has been traditionally strong and this increases the willingness of Kyrgyz government to participate in the environmental treaties (Dolšak, 2012). Thus, the country ratified Kyoto protocol in 2003, while neighboring Tajikistan and Kazakhstan joined only in 2008 and 2009 respectively.

The leading role of the development agencies in the adaptation discussion can also be attributed to the fact that the state has the industrial growth as its priority and the issues such as environment and rural livelihood are realm of the international donor projects.

The second factor is that the government does not recognize climate change as an immediate threat and sees no harm as long as its own agenda remains untouched. Moreover, the government with its severe budget deficit treats the international climate initiatives as another source of income. The adaptation strategy clearly states that the climate change adaptation will contribute to ‘systematization of external fundraising for development of national economy’ (Kyrgyzstan, 2013).

One of the main barriers in planned adaptation is lack of or ineffective leadership (Moser & Ekstrom, 2010). Despite existence of the official climate change adaptation strategy the government failed to take the lead. There is a clear willingness to follow the NGO guidance but no local ownership. The country participates in ten regional climate related projects funded by the international or bilateral partners but the government does not have single national initiative (Bizikova et al., 2011). Awareness assessment of civil servants concerning climate change performed by UNDP has revealed that less than 30 % have understanding of the issue. One would be surprised at such low level of awareness in a country so dependent on natural resources, 99% literacy rate and 50 universities.

Local context and knowledge

Interestingly, the 33 pages long the adaptation strategy mentions the words ‘international community’ and ‘international donors’ 23 times, while ‘citizen’ and ‘household’ only twice each. The adaptation plans fail to recognize individual households as main actors. The local knowledge is important for the successful adaptation and provides valuable information for the planned adaptation (Marin, 2010). Rural households already observe the consequences of climate change and

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their knowledge could make a large contribution to the national adaptation efforts (Ashley & Ershova, 2012). Due to lack of the information the rural population relate climate changes to short-term events such as assumed bomb tests in neighboring China or regard the changes as cyclical (Ashley, 2014, personal communication). In addition, the private adaptation could also provide public goods and save government resources (Tompkins & Eakin, 2012).

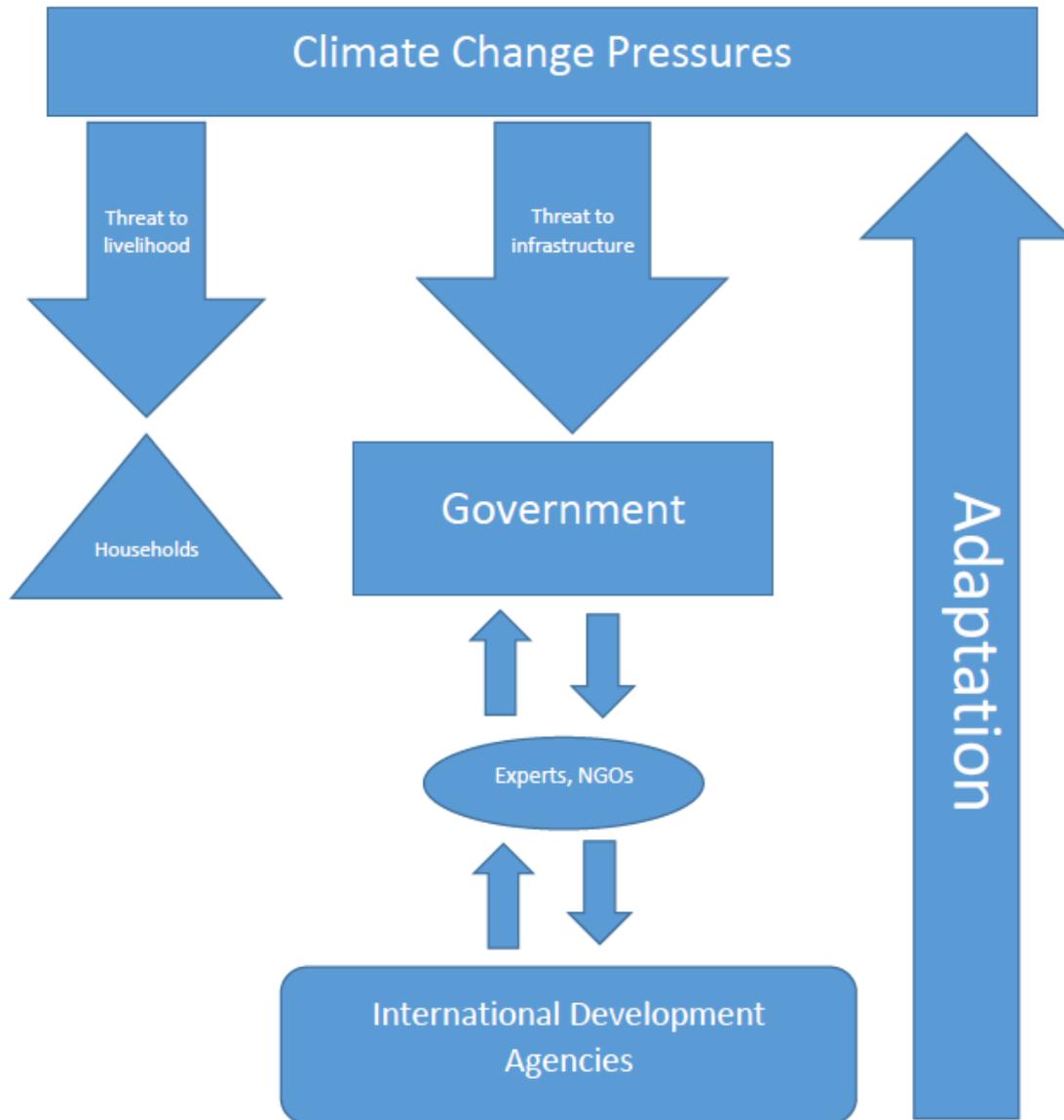


Figure 3. Scheme of development climate change adaptation measures in the Kyrgyz Republic.

From the Figure 3 it can be seen that the climate change pressures can be grouped into two streams based on the object: threats on household livelihoods and

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threats on public infrastructure. The process of development of the national adaptation measures is driven by the experts and NGOs with support of the international development agencies. The households are not involved into the process.

As the result of this top-down approach the adaptation activities are rather technical and focus on ‘outcome vulnerability’ and disregard the ‘contextual vulnerability’ (O’Brien, 2011). The proposed measures do not create new livelihood strategies for the rural communities. For instance, introduction of pasture management will not generate new opportunities for rural population and the further expansion of the traditional pastoral agriculture can only exacerbate risks and limit the available options.

Globalization and transformative change

Fall of the Soviet Union brought profound economic and social changes to the Kyrgyz Republic that gave the access to world markets. The country was first in the former Soviet Union to join the World Trade Organization in 1998 and today it is one of the most open economies in the region. O’Brien and Leichenko (2000) introduced the analytical framework of ‘double exposure’ that states that along with climate change many developing countries also are experiencing globalization.

Economic globalization had mixed effects on the country. On the one hand, it diversified the income sources and gave growth to the exports for greener sectors such as apparel, education and IT sectors. On the other hand, high prices in world markets directed mining companies to exploit country’s mineral resources. The resource extraction has become the most important sector for foreign investment, and it also diversified livelihood strategies of rural communities through creating new jobs and reduction of reliance on natural resources. However, increased rate of glacier melting and ecosystem degradation is often associated with bad mining practices (Hilson & Murck, 2001).

Another remarkable phenomena brought by globalization is growth of consumption by households. Globalization has altered consumption patterns and hence changed the structure of the economy. In 1990s 70% of energy was consumed by the industry and about 30% by households but today situation is opposite. To address this energy pressure the government plans to launch new coal power plant in 2016 and the energy sector accounts for 70% of GHG emissions in

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the country. The action is in major conflict with the announced climate change adaptation strategy.

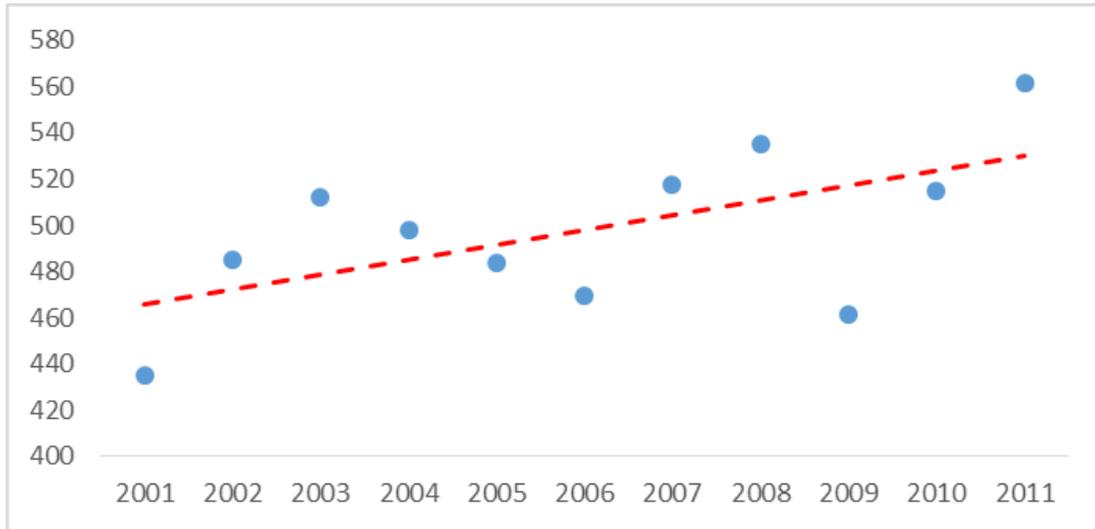


Figure 4. Energy use - kg of oil equivalent per capita in the Kyrgyz Republic (WB, 2014).

In this paper, I will avoid using term ‘consumerism’ due to its ‘slippery, morally charged’ nature (Trentmann, 2009). I will use term ‘cultural globalization’ to refer to the lifestyle that is pursuant to the increase the consumption as indicator of welfare, especially consumption of durable goods.

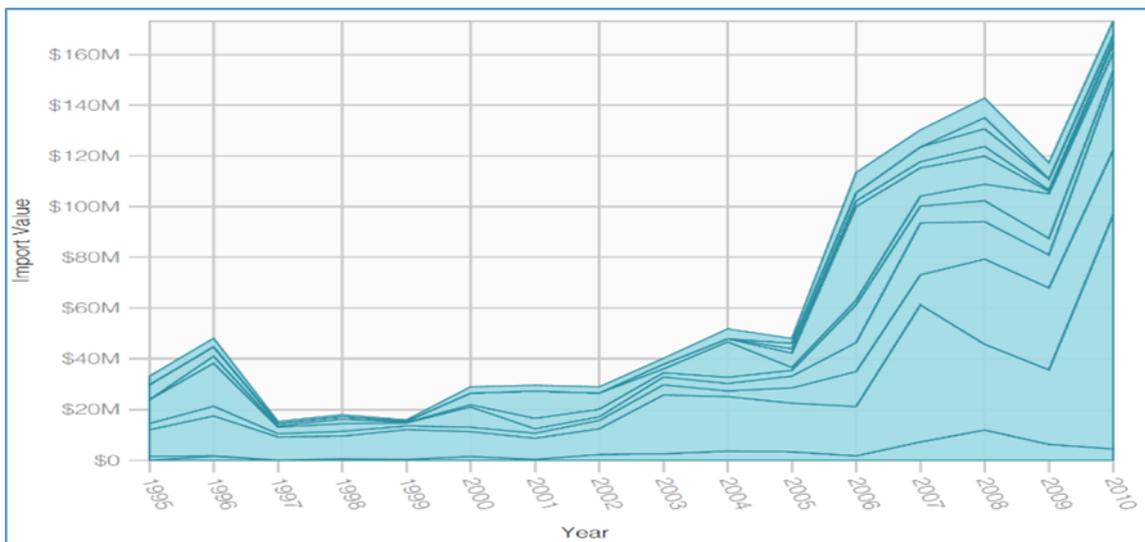


Figure 5. Import of cars to the Kyrgyz Republic, (Simoes & Hildalgo, 2011).

Due to the cultural globalization the purchase of cars, mobile phones, house appliances and clothing grew at tremendous rates since 1990s in the Kyrgyz Republic (NSCKR, 2012). Thus, cultural globalization exacerbated GHG emission

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and failed 'to transform' the society to meet the new environmental challenges. The adaptation efforts are designed to accommodate the change and do not make the structural adjustments that are needed for the transformation (O'Brien, 2011). As in many developing countries 'GDP fetishism' prevails in the Kyrgyz Republic.

Conclusion

In this paper I reviewed the climate change adaptation in the Kyrgyz Republic. Currently the research is concentrated on the study of climate change impacts such as temperature, disasters and ecosystem changes. Another gap is lack of research on private adaptation.

The adaptation measures are designed to address the climate change impacts and as a result are dealing with outcome vulnerabilities. The proposed solutions are mere technological adjustments to production practices and infrastructure improvement.

Lack of leadership is evident. This is expressed through absence of local climate initiatives and absence of households and individuals in the adaptation activities. This also caused the negligence of local context and knowledge that could be valuable asset to the adaptation strategy.

The results of the globalization are mixed. The positive outcomes include switching to less polluting production and technology. However, the integration into global market attracted mineral resource mining companies that create the additional environmental risks.

The national adaptation plans do not meet 'sustainable adaptation' criteria developed by Eriksen et al (2011). In fact the proposed adaptation does not meet all four principles for the successful climate adaptation. Overall, the climate change adaptation in the Kyrgyz Republic is externally imposed and is mainly about adjusting current practices through technological solutions while neglecting community level participation. The adaptation efforts fail to recognize the unsustainability of business as usual and see climate change as a barrier on the way of economic development.

Policy implications

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The government should analyze climate change vulnerability on community level to understand and reveal the interconnectedness of the household livelihoods and climate variability.

The climate change adaptation should be integrated into the national development policies. Particularly, the major changes should be made in social and economic policies including transformation of the societal values related to the environment and economic development.

The state should accept the responsibility and take the leadership for the adaptation efforts that will bring the transformative changes.

The climate change awareness should be increased in rural and urban areas. The knowledge diffusion should include climate change, green technologies, energy efficiency, waste management and conscious consumption.

The macroeconomic policies should be designed to welcome new economics of networking and technological innovation that is developed to pursue the sustainable development goals. The practice of dirty or grey economics must be recognized as a short-sighted and wasteful. The government cannot work towards the sustainable development and have resource extraction as economic priority.

The changes in the national policy should have transformative impact and based on the existing advanced expertise. The developing countries have unique opportunity ‘to stand on giant’s shoulders’ and leapfrog to green economies without sacrificing the environment.

References

- [1] Aaheim, A., & Aasen, M. (2008). What do we know about the economics of adaptation? Centre for European Policy Studies.
- [2] Ackerman, F., & Stanton, E. A. (2008). The Cost of Climate Change: What We’ll Pay if Global Warming Continues Unchecked. NRDC (Natural Resources Defense Council).
- [3] Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., ... Wreford, A. (2008). Are there social limits to adaptation to climate change? *Climatic Change*, 93(3-4), 335–354. doi:10.1007/s10584-008-9520-z
- [4] Ashley, L., & Ershova, N. (2012). Climate Change Trends, Impacts, and Adaptation.
- [5] Bizikova, L., Hove, H., & Jo-Ellen, P. (2011). Review of Current and Planned Adaptation Action : Central Asia.
- [6] Dolšak, N. (2012). Climate Change Policies in the Transitional Economies of Europe and Eurasia: The Role of NGOs. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 24(2), 382–402. doi:10.1007/s11266-012-9260-6
- [7] Eriksen, S., Aldunce, P., Bahinipati, C. S., Martins, R. D., Molefe, J. I., Nhemachena, C., ... Ulsrud, K. (2011). When not every response to climate change is a good one: Identifying principles for sustainable adaptation. *Climate and Development*, 3(1), 7–20. doi:10.3763/cdev.2010.0060
- [8] Fay, M., Block, R. I., & Ebinger, J. (2010). Climate change in Eastern Europe and Central Asia. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

NATURAL SCIENCES

- [9] Gowdy, J. M. (2008). Behavioral economics and climate change policy. *Journal of Economic Behavior & Organization*, 68(3-4), 632–644. doi:10.1016/j.jebo.2008.06.011
- [10] Hilson, G., & Murck, B. (2001). Sustainable development in the mining industry: clarifying the corporate perspective, 26(2000), 227–238.
- [11] IPCC. (2007). *Climate change 2007: Working Group II: Impacts, Adaptation and Vulnerability*.
- [12] Kyrgyzstan. (2009). *Second National Report on Climate Change in the Kyrgyz Republic*.
- [13] Kyrgyzstan. *Climate Change Adaptation Strategy of the Kyrgyz Republic till 2020* (2013). State Agency for Environment and Forest Protection of the Kyrgyz Republic.
- [14] Marin, A. (2010). Riders under storms: Contributions of nomadic herders' observations to analysing climate change in Mongolia. *Global Environmental Change*, 20(1), 162–176. doi:10.1016/j.gloenvcha.2009.10.004
- [15] Mirzabaev, A. (2012). *Climate Volatility and Change in Central Asia: Economic Impacts and Adaptation*. Rheinischen Friedrich-Wilhelms-Universität zu Bonn.
- [16] Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. *Sustainable science*, 107(51). doi:10.1073/pnas.1007887107/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1007887107
- [17] NSCKR. (2011). *National Poverty Level, Kyrgyz Republic (Vol. 1)*.
- [18] NSCKR. (2012). *Уровень жизни населения Кыргызской Республики*.
- [19] O'Brien, K. (2011). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography*, 36(5), 667–676. doi:10.1177/0309132511425767
- [20] O'Brien, K. L., & Leichenko, R. M. (2000). Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, 10(3), 221–232. doi:10.1016/S0959-3780(00)00021-2
- [21] Pasgaard, M., & Strange, N. (2013). A quantitative analysis of the causes of the global climate change research distribution. *Global Environmental Change*, 23(6), 1684–1693. doi:10.1016/j.gloenvcha.2013.08.013
- [22] SAEFP. (2012). *National Report on Environmental Situation in the Kyrgyz Republic 2006 - 2011*. Bishkek.
- [23] Savoskul, O., & Smakhtin, V. (2013). Glacier Systems and Seasonal Snow Cover in Six Major Asian River Basins: Water Storage Properties under Changing Climate (p. 69). Retrieved from www.iwmi.org/Publications/TWMI_Research_Reports/index.aspx
- [24] Simoes, A., & Hidalgo, C. (2011). The Economic Complexity Observatory: An Analytical Tool for Understanding the Dynamics of Economic Development. Workshops at the Twenty-Fifth AAAI Conference on Artificial Intelligence. Retrieved from http://atlas.media.mit.edu/explore/tree_map/hs/import/kgz/all/show/2010/
- [25] Stern, N. (2007). *The economics of climate change*. The Stern review. Cambridge University Press.
- [26] Stiglitz, J. E. (2009). *GDP Fetishism*. (T. E. Voice, Ed.). Retrieved from www.bepress.com/ev
- [27] Tompkins, E. L., & Eakin, H. (2012). Managing private and public adaptation to climate change. *Global Environmental Change*, 22(1), 3–11. doi:10.1016/j.gloenvcha.2011.09.010
- [28] Trentmann, F. (2009). Crossing Divides: Consumption and globalization in history. *Journal of Consumer Culture* (Vol. 9, pp. 187–220). doi:10.1177/1469540509104374
- [29] UN. (2012). *United Nations Blog. Most-ratified international treaties*. Retrieved April 18, 2014, from <http://blogs.un.org/blog/2012/09/24/most-ratified-international-treaties/#sthash.niCG0PjG.ZYhfUAEg.dpbs>
- [30] WB. (2014). *Energy use*. Retrieved April 19, 2014, from <http://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE?page=1>