

Contrasting Perspectives: Comparative Study of Climate Change
Perceptions in Rural and Urban Areas of Kyrgyzstan

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by

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ABSTRACT

This research investigates the differing perceptions of climate change between rural and urban communities in Kyrgyzstan, exploring how these perceptions correlate with varying degrees of exposure to climate change impacts and educational attainment levels. The study employs a comparative case-study approach, integrating qualitative interview data collection method. The findings reveal a pronounced disparity in climate change perceptions between urban and rural respondents. Rural communities, closely tied to their natural surroundings for sustenance, demonstrate a heightened awareness and concern for the impacts of climate change. This heightened concern is attributed to their direct exposure to environmental changes and reliance on agriculture, which is deeply affected by climatic variations. In contrast, urban populations, while generally possessing higher levels of educational attainment and acknowledging climate change, exhibit a lesser sense of urgency. The urban respondents view climate change as a more distant threat, both temporally and spatially, often overshadowed by immediate urban challenges. Rural residents displayed a greater capacity for resilience and adaptability, implementing diverse and innovative adaptation strategies, mainly focused around the water accessibility. Urban adaptation measures, though present, tended to be less varied. The research underscores the complexity of climate change perception and the influence of direct environmental experiences over theoretical understanding. The study contributes to the broader discourse on climate change perception, offering valuable insights into the dynamics of rural and urban responses to environmental challenges in the context of a developing country like Kyrgyzstan.

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Section 1. Introduction

The introduction consists of two parts, which paint the background of the research. Firstly, to fully comprehend the scope of the study, it's essential to recognize the current situation regarding environmental consequences for the country, with particular emphasis on rural environments, which is especially pertinent and simply can't be ignored given the substantial role rural areas play in the economy, geography, and demographics. Secondly, considering that an "education component" is part of the research question within the context of urban-rural disparities, it becomes vital to uncover the educational divide between these two areas. Consequently, the second section will elaborate on unfolding the "education" factor as a determinant affecting the extent of awareness of climate change; afterwards, the second section will emphasize and demonstrate the existing educational imbalance between urban and rural regions, shedding light on the disadvantaged state of education in rural areas compared to cities and towns.

1.1. Unraveling Climate Pressures in Kyrgyzstan

Climate change has become a global concern and debatable issue worldwide in the present era. Against this background, Kyrgyzstan's emission profile is notably low in terms of per capita and total emissions, taking into consideration that as of 2018, the nation contributed a mere 0.03 % to global releases.¹ However, being a small emitter of greenhouse gasses, Kyrgyzstan ranks third in terms of susceptibility to climate change within the nations of Eastern Europe and Central Asia.² This is due to the fact that land surfaces heat up and cool down faster than water surfaces, meaning that states

¹ Global Green Growth Institute, "Kyrgyzstan," accessed June 9, 2023, <https://gggi.org/country/kyrgyzstan/>.

² Olga Chepelianskaia and Madhurima Sarkar-Swaisgood, "Kyrgyz Republic Climate Change and Disaster Risk Profile," UN Economic and Social Commission for Asia and the Pacific, Working Paper Series, (2022): 11, accessed June 9, 2023, <https://www.unescap.org/kp/2022/kyrgyz-republic-climate-change-and-disaster-risk-profile>.

with continental climate, which Kyrgyzstan is, experience more vivid temperature fluctuations than regions closer to water; the state is landlocked (with no direct access to any coastlines or open seas) and is located in the northern hemisphere (which concentrates a larger landmass compared to the Southern, primarily made up of ocean), what makes it warm up more rapidly. Thus, the geography and topography of the republic makes it one of the most hazard prone countries, making the temperature in the region rise faster than the global average. The multi-model assemblage by World Bank predicts a substantial 6.1°C increase in temperature in the Kyrgyz Republic by 2100, considering the biggest release scenario (SSP5-8.5),³ in contrast to a typical escalation of 5.3°C for the Caucasus & Central Asia region and a worldwide average surge of 4.4°C.⁴

As for a more detailed consideration of the case, the following facts can be brought. The state mainly occupies areas with altitudes ranging from 1,000 meters to 7,400 meters; mountains predominantly encompass 93 % of its territory,⁵ making it one of the significant territories in Central Asia, distinguished by well-established contemporary glaciation. Nevertheless, while initially, the territory was home to 8164 glaciers, covering a total area of 7944.2 km², which accounted for nearly 4% of the country's total area on the basis of 1940-1970s estimations,⁶ by the 2013 – 2016 assessments the number of glaciers increased to 9959, with their total area reducing to 6683.9 km². This represents approximately 3.35% of the Kyrgyz Republic's total area, which indicates an overall reduction of 0.65% in the total area of the country covered by glaciers.⁷

³ World Bank, “92 - Mean Projections,” Climate Change Knowledge Portal, accessed June 9, 2023, <https://climateknowledgeportal.worldbank.org/>.

⁴ “Climate Change Adaptation and Mitigation in the Kyrgyz Republic,” IMF Staff Country Reports, no. 092 (2023): A002, accessed June 14, 2023, <https://doi.org/10.5089/9798400232725.002.A002>.

⁵ “Land, Geography and Weather of Kyrgyzstan,” Facts and Details, accessed August 9, 2023, https://factsanddetails.com/central-asia/Kyrgyzstan/sub8_5e/entry-4798.html.

⁶ Ibid

⁷ United Nations Development Programme, “Ледники Кыргызстана: как исчезает ледяной покров” [“Glaciers of Kyrgyzstan: How the Ice Cover Is Disappearing”], accessed June 9, 2023, <https://www.undp.org/ru/kyrgyzstan/blog/%D0%BB%D0%B5%D0%B4%D0%BD%D0%B8%D0%BA%D0%B8->

Considering only the glaciation area itself, over the past 70 years the overall glaciated locale has reduced by 16%, primarily impacting large glaciers that have diminished by 17%. Thus, the small glaciers' area has shown an increase of two and a half times, expanding by 245%, which indicates overall degradation of glaciation, wherein the decline of large glaciers not only reduces their area but also brings about fragmentation into smaller ones.⁸

The glacial melt issue is directly connected with the detrimental effects on energy supplies, which are already strained. Approximately 90% of the total electricity generation in the region relies on hydro-based sources.⁹ However, with the accelerated glacial melt, the nation's previously abundant reserves of electricity and fresh water are being eroded away. The concomitant shifts in rainfall patterns, rising temperatures and escalating droughts are projected to diminish the reliability and availability of water, crucial for hydropower generation. Thus, over the next few decades, increased glacial and snowmelt could have dual impacts on hydropower: a potential surge in the next several years, followed by substantial declines after.¹⁰

Ensuing aspect to ponder is that the nation boasts more than 1,000 alpine lakes, with 200 deemed hazardous because of their closeness to populated areas and the associated threat of glacial lake overflow.¹¹ Therefore, as glacial thaw persists in response to increasing temperatures, more severe flooding incidents during certain periods (which are highly likely to be the colder months) and diminished water discharge in other

<https://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gcp/kyrgyzstan/Index.asp>

⁸ Ibid

⁹ IEA, "Kyrgyzstan Energy Profile," (2020), accessed July 1, 2023, <https://www.iea.org/reports/kyrgyzstan-energy-profile>.

¹⁰ UN Economic and Social Commission for Asia and the Pacific, "Kyrgyz Republic Climate Change and Disaster Risk Profile," 13, accessed June 10, 2023, <https://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gcp/kyrgyzstan/Index.asp>

¹¹ Ibid

parts of the year (potentially the hot periods) can be anticipated,¹² not to mention more than three thousand rivers that can experience mudflows. Floods and mudflows, typically manifesting in the spring, might also be catalyzed by heavy rainfalls accounting for 80% of such incidents.¹³ Consequently, a rise in rainfall and bolstered water ingresses will directly influence the severity of such incidents. Statistical and numerical official data indicates the following: between 1990 and 2008, there were over 850 occurrences of floods and mudslides,¹⁴ with economic damage per event reaching up to significant 113.8 million KGS for mudslide events and 18.1 million KGS for flood incidents¹⁵. What is more, over 3,500 environmental emergencies were documented in the period of 2000-2014,¹⁶ and more than 24,000 individuals were impacted by such disasters from 2010 to 2017.¹⁷ Thus, the anticipated increase in temperature will speed up the water cycle, hasten the pace of glacier melt and, as a result, heighten the potential for severe flooding incidents.

Another issue to note in the context of Kyrgyzstan is the effect on agricultural sector, since glacier contraction not only disrupts river and lake dynamics, but also escalates dryness, impacting agriculture, which plays a significant part in the economy of the

¹² USAID, “2021 USAID CDCS Annex Kyrgyz Republic,” (2021): 4, accessed August 9, 2023, https://www.climatelinks.org/resources/2021_usaid_cdcs-annex-kyrgyz-republic.pdf.

¹³ United Nations Framework Convention on Climate Change, “NC3 Kyrgyzstan,” (2017): 126, accessed June 11, 2023, <https://www.unfccc.int/sites/default/files/resource/docs/natc/kgznc3.pdf>.

¹⁴ CAREC, “Concept on Nexus Project Ideas,” (2019): 27, accessed June 9, 2023, https://www.carececo.org/main/publications/for-publication_-concept-on-nexus-project-ideas_ru_28082019.pdf.

¹⁵ United Nations Development Programme, “Kyrgyzstan Climate Profile,” (2022): 43, accessed July 11, 2023, https://www.undp.org/kyrgyzstan/publications/kgz_kyrgyzstan-climate-profile_eng_for-web-opt.

¹⁶ Ministry of Emergency Situation of the Kyrgyz Republic, Monitoring, Prognozirovanie Opasnykh Protseessov i Yavlenii na Territorii Kyrgyzskoi Respubliki, (Bishkek, 2015).

¹⁷ OSCE Academy, “Monitoring Report,” (2020): 1, accessed August 11, 2023, https://www.osce-academy.net/en/research/policy-briefs/details.html?tx_ttnews%5Btt_news%5D=429&cHash=2be8f08bfb8ee9f4d7d1a00c1b562b20.

state and, again, is of a large significance for rural livelihoods. Agriculture, continues to hold significance for the sustenance of rural communities, with only 34% of population living in urban areas, while twice as many lives in the villages – 66% as of 2021,¹⁸ many of whom count on agriculture and livestock rearing.¹⁹ This emphasizes their ecosystem-based type of livelihoods (well-being closely tied to the state of local biomes), that are inherently more sensitive to climate change,²⁰ in contrast to economic livelihoods widely established in urban settings. Approximately 53 % of the entire territory in the republic is comprised of agricultural lands,²¹ with agriculture accounting for 14% of total GDP and concentrating about 35%²² – 48%²³ of the total workforce. Thus, continuing glacial melt, pressure on water resources and the projected temperature increases influence food and livestock production, and impact agriculture.²⁴ Furthermore, the shortage of irrigation water in 2023 turned out to be 50%

¹⁸ National Statistical Committee of the Kyrgyz Republic, “Demographic Yearbook of the Kyrgyz Republic,” (2023): 6, accessed August 9, 2023, <http://www.stat.kg/ru/publications/demograficheskij-ezhgodnik-kyrgyzskoj-respubliki/>.

¹⁹ OSCE Academy, “Monitoring Report,” (2020): 1, accessed August 11, 2023, https://www.osce-academy.net/en/research/policy-briefs/details.html?tx_ttnews%5Btt_news%5D=429&cHash=2be8f08bfb8ee9f4d7d1a00c1b562b20.

²⁰ Lira Sagynbekova, “Environment, Rural Livelihoods, and Labour Migration: A Case Study in Central Kyrgyzstan,” *Mountain Research and Development* 37, no. 4 (2017): 456-463, accessed June 5, 2023, <https://doi.org/10.1659/MRD-JOURNAL-D-17-00029.1>

²¹ United Nations Framework Convention on Climate Change, “NC3 Kyrgyzstan,” (2017): 10, accessed June 11, 2023, <https://unfccc.int/resource/docs/natc/kgznc3eng.pdf>.

²² Global Green Growth Institute, “Kyrgyzstan,” accessed June 12, 2023, <https://ggi.org/country/kyrgyzstan/>.

²³ Central Intelligence Agency, “Kyrgyzstan,” *The World Factbook*, accessed June 9, 2023, <https://www.cia.gov/the-world-factbook/countries/kyrgyzstan/#economy>.

²⁴ “Climate Change Adaptation and Mitigation in the Kyrgyz Republic,” *IMF Staff Country Reports*, no. 092 (2023): A002, accessed June 14, 2023, <https://doi.org/10.5089/9798400232725.002>.

in the Chui oblast only, compared to the last year.²⁵ Against this backdrop, it's obvious that the impacts of climate change are affecting both rural and urban areas; however, the magnitude of these effects varies across these domains.

On top of that, a rise in temperature coupled with potential heightened precipitation is likely to extend the mosquito habitat, leaving a chance for a sharp surge in malaria cases. Similarly, the prevalence of soil-transmitted worm infections, requiring warm soil conditions, might increase, with chances of other widespread infections growing due to prolonged warm periods, which in the first-place will hit the more susceptible layers. Water scarcity forcing families to prioritize drinking and cooking over hygiene potentially leads to declining sanitation conditions, leaving more room for disease spread through water due to its high potential for causing outbreaks.²⁶ Additionally, by the middle of these hundred years, harvest output in CA may decrease up to 30%, which may constitute a risk to adequate food supply on a regional level,²⁷ potentially leading to caloric deficiency, amplified spread of diseases, retarded growth and other sequelae. This again exposes, first of all, vulnerable demographic clusters, including rural areas, to an even more increased danger.

In the context brought above, it is crucial to bear in mind that one of the most susceptible groups to the impacts of global warming are the poorest.²⁸ The impoverished face the

²⁵ 24.KG, “Нехватка поливной воды. Дефицит влаги в этом году достиг 50 процентов” [“Lack of Irrigation Water. Moisture Deficit Reached 50 Percent This Year”], accessed July 16, 2023, https://24.kg/vlast/270294_nehvatka_polivnoy_vodyi_defitsit_vlagi_vetom_godu_dostig_50protsentov/

²⁶ United Nations Development Programme, “Kyrgyzstan Climate Profile,” (2022): 76, accessed June 9, 2023, https://www.undp.org/kyrgyzstan/publications/kgz_kyrgyzstan-climate-profile_eng_for-web-opt.

²⁷ World Bank, “Climate Change in Europe and Central Asia,” accessed August 14, 2023, <https://www.worldbank.org/en/region/eca/brief/climate-change-in-europe-and-central-asia>.

²⁸ “Climate Change, Human Rights, and Social Justice,” (2020): 310, accessed June 18, 2023, <https://storage.googleapis.com/planet4-international-stateless/2020/06/5ebe8ce9-climate-change-human-rights-and-social-justice.pdf>.

greatest exposure to climate-related risks.²⁹ As a result, climate change poses a greater threat to households with the least financial resources, as their inherent limitations restrict their ability to adapt to its impacts.³⁰ In case of droughts, the most impoverished are believed to face over double the likelihood of exposure to such incidents compared to other socio-economic groups.³¹ Against this backdrop, it is significant to take into account that the majority of the poorest people reside in rural areas. According to the National Statistical Committee those consuming below the poverty threshold reached a total of 2.24 million individuals in 2021, what constitutes 33.3% of the whole population.³² Thus, in the context of rural and urban settings comparison, poverty is not evenly spread throughout the nation. It is the rural spaces, where poverty is accumulated,³³ which is confirmed by consecutive data from 2017 to 2020, displaying that the poverty rates were disproportionately concentrated in rural areas.³⁴ Of those living below the national poverty threshold, 73.7% resided in rural regions.³⁵

²⁹ R.A. Heltberg and M. Bonch-Osmolovkiy, *Mapping Vulnerability to Climate Change* (Washington, DC: The World Bank, 2010), 5.

³⁰ University of Bonn, “Climate Volatility and Change in Central Asia: Economic Impacts and Adaptation,” (2023): 134, accessed June 18, 2023, <https://bonndoc.ulb.uni-bonn.de/xmlui/bitstream/handle/20.500.11811/5541/3238.pdf?sequence=1&isAllowed=y>

³¹ H.C. Winsemius et al., “Disaster Risk, Climate Change, and Poverty: Assessing the Global Exposure of Poor People to Floods and Droughts,” *Environment and Development Economics* 23, no. 3 (2018): 328–348.

³² 24.KG, “За чертой бедности в Кыргызстане живет треть населения страны” [“A Third of Kyrgyzstan's Population Lives Below the Poverty Line”], accessed June 9, 2023, https://24.kg/ekonomika/271655_zachertoy_bednosti_vkyrgyzstane_jivet_tret_nasel_eniya_stranyi/

³³ IMF Staff Country Reports Volume 2023 Issue 092: Kyrgyz Republic: Selected Issues,” (2023): 31, accessed July 5, 2023, <https://www.imf.org/external/pubs/ft/scr/2023/cr23092.pdf>.

³⁴ *Ibid.*, 33

³⁵ “EOM Visit Kyrgyzstan 23 May - 3 June 2022,” (2022): 3, accessed July 10, 2023, https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ohchr.org%2Fsites%2Fdefault%2Ffiles%2F2022-06%2FEOM_VisitKyrgyzstan_23May_3June2022.docx&wdOrigin=BROWSELINK

Furthermore, another multidimensional poverty assessment from 2020 determined that 50% of the populace were exposed to manifold deprivations, with this type of poverty being found to be 20% more prevalent in rural environments.³⁶ This was furthermore affected by the onset of the COVID-19 pandemic, which significantly elevated poverty levels, thrusting close to a million individuals into poverty during 2021, though with emphasis on the urban places.³⁷ Thus, the country is marked by high poverty rates with a greater concentration in rural regions, what highlights the uneasy status quo of rural segments.

Kyrgyzstan's climatic and geographical vulnerabilities, juxtaposed against its socio-economic fabric, exemplify the profound disparity in the global climate crisis. Despite its minuscule contribution to global emissions, Kyrgyzstan is at the frontline of climate-induced impacts, a distinction stemming from its landlocked geography, continental climate and dominant glaciated topography. The accelerated decline in glaciated areas, combined with predicted temperature spikes, exacerbates risks of flooding, mudflows and the dreaded aftermath of glacial lake overflow. These disruptions hold potential chain reactions with threats to agriculture that remains the economic backbone for a major part of Kyrgyzstan's population, particularly the rural communities that already grapple with elevated poverty levels and inadequate basic services. As the agrarian segment of the society faces these daunting challenges, there's a looming healthcare crisis given the rising threats of vector-borne diseases, malnutrition, and diminishing sanitation standards. Kyrgyzstan's plight underscores the urgency for comprehensive approaches to adapt to and mitigate climate change impacts. Addressing these challenges requires global solidarity and a recognition that while emissions might be unequal, the repercussions of climate change are indiscriminate, often hitting the most vulnerable hardest, which in this context are the rural communities.

³⁶ Ibid., 4

³⁷ “IMF Staff Country Reports Volume 2023 Issue 092: Kyrgyz Republic: Selected Issues,” (2023): 32, accessed July 5, 2023, <https://www.imf.org/external/pubs/ft/scr/2023/cr23092.pdf>.

1.2. Education

1.2.1. Education as a factor

Education has long been recognized as a cornerstone in shaping public opinion and awareness on various global issues, and climate change is no exception. As the world grapples with the multifaceted challenges posed by climate change, grasping how education influences awareness in the context of this critical issue becomes paramount. Several extensive surveys, encompassing a diverse range of countries and socio-economic backgrounds, have shed valuable light on this relationship.

In 2020, a sweeping survey of public opinion on climate change was launched, encompassing 1.2 million respondents across 50 countries that represent 56% of the world's population, including the Kyrgyz Republic representing the Central Asian region. This survey revealed insights into the relationship between education and climate change emergency belief, underscoring education as the most significant socio-demographic driver of public opinion on the issue.³⁸ Regardless of the economic status of the country, individuals with post-secondary education consistently recognized climate change as a global emergency. This was evident across high-income nations like Italy, France, and Germany, least developed countries such as Bhutan and the Democratic Republic of the Congo, and middle-income countries including Kyrgyzstan and Moldova. Against this backdrop, it is important to note that the survey also shed light on the gender influencing climate change beliefs, that basically categorized countries into three distinct groups:

- Countries where women and girls were more likely to view climate change as an emergency than men and boys (e.g., Canada, US, Australia).
- Countries where both genders were aligned in their views (e.g., France, Italy, Poland).
- Countries where men and boys were more likely to perceive climate change as a global emergency than women and girls (e.g., Nigeria, India, Kyrgyz Republic).

³⁸ UNDP and University of Oxford, "Peoples' Climate Vote Results," (2020): 53, accessed July 11, 2023, <https://www.undp.org/sites/g/files/zskgke326/files/publications/UNDP-Oxford-Peoples-Climate-Vote-Results.pdf>

Evidently, the third group, to which Kyrgyzstan belongs, raises questions on gender equality and empowerment within these states, considering that in Kyrgyzstan, the issue of girls dropping out of school due to certain socio-cultural factors is a recognized concern still in 2023, particularly in rural spaces, as highlighted by the Ministry of Labour, Social Security, and Migration.³⁹ This phenomenon, coupled with the fact that men and boys in Kyrgyzstan were more likely to see climate change as an emergency, underscores one more time, but from a gender viewpoint, the potential role of education in shaping climate change beliefs.⁴⁰

Another extensive survey, representing over 90% of the world's population on the predictors of climate change awareness and risk perceptions delivers some worthwhile insights as well.⁴¹ First of all, the findings of the survey underscore that an individual's level of education is the primary factor influencing their awareness of climate change, which resonates with earlier observations that education has a crucial role in understanding climate change. Secondly, according to the survey, developed countries exhibit higher levels of climate change awareness, whereas a significant portion of respondents in developing countries were unfamiliar with the concept, potentially correlating with the more extensive access to education in developed countries, which contributes to a greater awareness. It is noteworthy that, concurrently, people in developing countries who knew about climate change felt more threatened by it than those in developed countries. This could be because of the more direct and concrete

³⁹ Ministry of Labor and Social Development of the Kyrgyz Republic, “Общественные диалоги по вопросам защиты прав девочек на образование и от ранних браков стартуют во всех областях страны” [“Public Dialogues on Protecting Girls' Rights to Education and Against Early Marriages Start in All Regions of the Country”], accessed July 11, 2023, <http://mlsp.gov.kg/ru/2023/07/06/obshhestvennye-dialogi-po-voprosam-zashhity-prav-devochek-na-obrazovanie-i-ot-rannih-brakov-startuyut-vo-vseh-oblastyah-strany/>.

⁴⁰ UNDP and University of Oxford, “Peoples' Climate Vote Results,” (2020): 50, accessed July 11, 2023, <https://www.undp.org/sites/g/files/zskgke326/files/publications/UNDP-Oxford-Peoples-Climate-Vote-Results.pdf>

⁴¹ Lee, T., Markowitz, E., Howe, P. *et al.* Predictors of public climate change awareness and risk perception around the world. *Nature Clim Change* 5, 1014–1020 (2015). Accessed July 13, 2023, <https://doi.org/10.1038/nclimate2728>

impacts of climate change that they face or their higher vulnerability to its outcomes. These findings strongly align with the research framework, which will be revealed in the following paragraphs.

1.2.2. From City to Countryside: The Stark Contrast in Kyrgyzstan's Educational Landscape

In the context of this inquiry, it is essential to delve into the prevailing state of education within Kyrgyzstan, concentrating specifically on a comparative examination between rural and urban locales. This investigation aims to underline key distinctions in educational access and education's quality between these contrasting environments, casting light on pivotal discrepancies that exist. The study is structured to unfold in a systematic manner, addressing critical tiers of the educational hierarchy, such as **a) preschool education, b) primary and secondary education, and c) tertiary or higher education**. Collectively, these segments compose a comprehensive picture of the educational terrain.

a) The Preschool Divide

Preschool education serves as the foundational stage of the education system, spanning the age range from birth to seven years. During this vital phase, core personality attributes like thinking, attention, memory, imagination and speech are developed, with essential neural connections forming at this stage, which enables further growth and learning as the child matures. Therefore, success of a child's subsequent development to a significant extent often hinges on the knowledge and skills acquired during the preschool years. Recognizing the significance of this early education, many governments have taken steps to make preschool education nearly universal for children who are three years old and above, taking into account that children who do not have the benefit of preschool education often lag behind their peers who have,⁴² and those who have completed preschool education are more than twice as likely to achieve basic literacy and numeracy skills than children who have not received it.⁴³

⁴² UNICEF, "A World Ready to Learn: Advocacy Brief," (2019): 12, accessed July 13, 2023, <https://www.unicef.org/reports/world-ready-to-learn>.

⁴³ Ibid., 19.

Based on the report by UNICEF, out of 45 states Kyrgyzstan is positioned at 6th place with the lowest proportion of children who have gained literacy and numeracy abilities through engagement in early childhood education programs.⁴⁴ As per the 2019 data only 25.4 % of children in the republic were enrolled in preschool education, with a noticeable disparity existing between urban and rural areas in this regard. For instance, cities by 2019 had an enrollment rate of 34.5 % in kindergartens, compared to just 20.6 % in rural areas.⁴⁵ A more stark picture is seen in rural areas of Jalal-Abad oblast, a southern region and one of the most densely populated provinces of the Kyrgyz Republic, which has the lowest pre - school coverage in the country at only 9.5 %.⁴⁶ In contrast, neighboring Kazakhstan demonstrated a different rate of gross enrollment of 78.3 %, with the percentage of children attending preschool being higher in rural areas – 87 %, compared to 72.5 % in urban areas.⁴⁷ In Kyrgyzstan, the enrollment rate for children in preschool institutions has historically been low, considering that even during the Soviet Union at its peak, the gross enrollment rate was 33.9 %.⁴⁸ Additionally, research found that participation in early childhood development had little impact on children in rural schools, possibly indicating a deficiency in quality in these areas. Conversely, participation in early childhood development seemed to have a more

⁴⁴ Ibid., 14.

⁴⁵ National Statistical Committee of the Kyrgyz Republic, “Охват детей дошкольным образованием в городских поселениях и сельской местности” [“Coverage of Children by Preschool Education in Urban Settlements and Rural Areas”], accessed July 12, 2023, <http://stat.kg/ru/opendata/category/123/>.

⁴⁶ ECE Accelerator, “Annex II - Example of an ESA Report with Pointers,” (2020): 43, accessed July 10, 2023, https://ece-accelerator.org/resource/2-4-annex-ii-example-of-an-esa-report-with-pointers_2.pdf.

⁴⁷ National Statistical Committee of Kazakhstan, “Охват детей дошкольным воспитанием и обучением” [“Coverage of Children by Preschool Education and Training”], accessed July 15, 2023, <http://stat.gov.kz/>.

⁴⁸ UNESCO, “All Children in School by 2015: Global Initiative on Out-of-School Children, Kyrgyzstan Country Study,” (2015): 19, accessed July 16, 2023, <https://unesdoc.unesco.org/ark:/48223/pf0000221279>

pronounced effect on students in schools in Bishkek, the capital city, hinting at superior quality and resources available for ECD in urban locations.⁴⁹

Within this scenario, it's essential to recognize other determinants, like, for example, the deficit in educational infrastructure in Kyrgyzstan, since as of 2019, the country was in need of over 1,800 kindergartens, which only amplifies a significant gap in providing essential early childhood education.⁵⁰ A major factor influencing the current educational landscape in Kyrgyzstan is poverty. Social and economic disparities significantly impede pre-school attendance, creating a striking contrast between different economic groups. While half of the children from the wealthiest quintile are able to attend pre-school institutions, this opportunity extends to a mere 11.7% of children hailing from the poorest households. This discrepancy underscores the stark inequality in educational access and emphasizes the role of economic status in shaping educational opportunities for the nation's youth.⁵¹ Furthermore, in 2020 every fourth resident was considered living in poverty; notably, 74 % of such individuals resided in rural areas.⁵² Thus, poverty remains essentially a rural occurrence in Kyrgyzstan, which subsequently affects the state of preschool education as well.

b) The Primary, Middle and Secondary Schooling Years Divide

⁴⁹ ECE Accelerator, “Annex II - Example of an ESA Report with Pointers,” (2020): 50, accessed July 10, 2023, https://ece-accelerator.org/resource/2-4-annex-ii-example-of-an-esa-report-with-pointers_2.pdf.

⁵⁰ Azattyk, “‘Для детей места нет’. В Кыргызстане не хватает около 2 тысяч детсадов” [“No Place for Children.’ Kyrgyzstan Lacks About 2,000 Kindergartens”], accessed July 11, 2023, <https://www.azattyk.org/a/kyrgyzstan-kindergarten/30212847.html>.

⁵¹ ECE Accelerator, “Annex II - Example of an ESA Report with Pointers,” (2020): 42, accessed July 10, 2023, https://ece-accelerator.org/resource/2-4-annex-ii-example-of-an-esa-report-with-pointers_2.pdf.

⁵² National Statistical Committee of the Kyrgyz Republic, “В 2020 году каждый четвертый житель Кыргызстана проживал в условиях бедности” [“In 2020, Every Fourth Resident of Kyrgyzstan Lived in Poverty”], accessed July 12, 2023, <https://stat.kg/ru/statistics/blagoustrojstvo/>.

As of the current date, access to quality primary and secondary schooling in the regions of Kyrgyzstan is not as equal as the constitution envisions.⁵³ Today rural areas present greater challenges, with only slightly more than half (53.8 %) of children between the ages of 7 and 14 managing to successfully demonstrate basic reading skills there, while urban areas fare better with two-thirds (66.7 %) in the same age group achieving that level.⁵⁴ There are many related problems that affect the quality education like the material and technical base shortfall.⁵⁵ For example, a deficit of books is vivid in 54 % of Russian-language schools, falling in the "60% and below" range of textbook provision.⁵⁶ The lack of educational infrastructure is evident as well, taking into account that in 2018 the republic lacked about 600 secondary educational institutions,⁵⁷ not to mention the emergency condition of many, considering that almost every tenth school was in disrepair by 2020-2021 and that 68% of schools were not connected to hot water supply.⁵⁸ The ensuing problem of classroom overcrowding is present as well.⁵⁹ For

⁵³ Ministry of Justice of the Kyrgyz Republic, “Конституция Кыргызской Республики от 5 мая 2021 года” [“Constitution of the Kyrgyz Republic of May 5, 2021”], accessed July 12, 2023, <https://cbd.minjust.gov.kg/112213?cl=ru-ru>

⁵⁴ United Nations, “Visit to Kyrgyzstan,” (2023): 7, accessed July 11, 2023, <https://digitallibrary.un.org/record/4011267>

⁵⁵ National Institute for Strategic Studies of the Kyrgyz Republic, “Снижение качества образования: факторы, проблемы, тенденции” [“Decline in Education Quality: Factors, Problems, and Trends”], accessed July 10, 2023, <https://nisi.kg/blog/35-Snizhieniie-kachiestva-obrazovaniia-factory-probliemy-tiendientsii.html>

⁵⁶ Ministry of Education of the Kyrgyz Republic, “Исследование по распределению учебников” [“Research on the Distribution of Textbooks”], (2023): 11, accessed July 15, 2023, <https://edu.gov.kg/media/files/e86dcce3-64a7-4b13-a1b0-43984e8744fd.pdf>

⁵⁷ Azattyk, “Минобразования: В Кыргызстане не хватает около 600 школ” [“Ministry of Education: Kyrgyzstan Lacks About 600 Schools”], accessed July 17, 2023, <https://www.azattyk.org/a/kyrgyzstan-schools/30106638.html>.

⁵⁸ Национальный институт стратегических исследований при Президенте Кыргызской Республики, “Снижение качества образования: факторы, проблемы, тенденции” [“Decline in Education Quality: Factors, Problems, and Trends”], accessed July 14, 2023, <https://nisi.kg/blog/35-Snizhieniie-kachiestva-obrazovaniia-factory-probliemy-tiendientsii.html>

⁵⁹ Google Sheets, “Анализ (переполненность)” [“Analysis (Overcrowding)”], accessed July 17, 2023, https://docs.google.com/spreadsheets/d/1olYskzqAKI_tQ4CHqxJOgIFNdKjipIH1Oew-tbhpHGw/edit#gid=467592645

instance, during the 2022 - 2023 academic year in Batken oblast the actual number of students exceeded the standards by 1.7 times.⁶⁰ Shortfall of teaching personnel is another quandary, considering that by the 2022 Kyrgyzstan lacked hundreds of teachers,⁶¹ with remote areas experiencing insufficiency in such subjects as computer science, physics, chemistry in particular.⁶² All of this is closely interwoven with budgetary constraints expressed in billions of soms,⁶³ not to mention other issues, like the COVID-19 that compounded the overall situation. Notable in this context is that during the pandemic private schools managed to adapt to the forced remote learning format quicker and easier due to their better socio-technical preparedness.⁶⁴ Against this backdrop it is crucial to underscore that the overwhelming majority out of 191 private school institutions registered in the country are located in urban areas,⁶⁵ what exemplifies the gap in terms of accessible quality education between rural and urban students, not to mention the cost of private education. A parallel trend emerges within

⁶⁰ Region.kg, “Школьное образование в Кыргызстане: реформы и поддержка России” [“School Education in Kyrgyzstan: Reforms and Support from Russia”], accessed July 13, 2023, <https://region.kg/школьное-образование-в-кыргызстане-р/>.

⁶¹ 24.KG, “В Кыргызстане в школах не хватает более 800 учителей” [“More Than 800 Teachers Are Lacking in Kyrgyzstan's Schools”], accessed July 18, 2023, https://24.kg/obschestvo/246495_vkyrgyzstane_vshkolah_nehvataet_bole_800_uch_iteley/

⁶² Национальный институт стратегических исследований при Президенте Кыргызской Республики, “Снижение качества образования: факторы, проблемы, тенденции” [“Decline in Education Quality: Factors, Problems, and Trends”], accessed July 14, 2023, <https://nisi.kg/blog/35-Snizhieniie-kachiestva-obrazovaniia-factory-probliemy-tiendientsii.html>

⁶³ KLOOP.KG, “Три смены по трое за партой. Кыргызстану прямо сейчас (!) нужны сотни новых школ” [“Three Shifts, Three to a Desk. Kyrgyzstan Needs Hundreds of New Schools Right Now (!)”], accessed July 17, 2023, <https://kloop.kg/blog/2020/01/14/tri-smeny-po-troe-za-partoj-kyrgyzstanu-pryamo-sejchas-nuzhny-sotni-novyh-shkol/>.

⁶⁴ Решения на РБК+, “Частные школы легче адаптировались к удаленке” [“Private Schools More Easily Adapted to Remote Learning”], accessed July 18, 2023, <https://plus.rbc.ru/news/5f3d0a0f9a79472db4c8b45f>.

⁶⁵ Ministry of Education of the Kyrgyz Republic, “ИСУО,” accessed July 18, 2023, <https://open.edu.gov.kg/index.php>

the public schooling sector in Kyrgyzstan, highlighting disparities in educational opportunities between urban and rural areas. Of all the schools in the republic, 82% are general education schools, while gymnasiums and educational complexes form a smaller fraction at 12% and 2.5%, respectively. Bishkek, the capital, offers the most diverse selection of schools, housing 29.6% of the country's gymnasiums and 18.5% of educational complexes, which typically involve a more specialized study of certain disciplines. In contrast, general education schools comprise only 44.4% of all institutions in Bishkek, whereas in rural districts, they account for 89.6%.⁶⁶ This stark difference underscores the inequality in educational resources and opportunities, potentially limiting the educational prospects for students in rural regions.

In this context the results of the PISA (Programme for International Student Assessment) assessments of 2006 and 2009 deserve attention too, indicating that roughly 80% of the students in Kyrgyzstan did not have basic competency in the subjects being tested and had a level “below basic,”⁶⁷ while the worst results in education were shown by children from remote rural schools and poor families. The study conducted among CEE/CIS countries participating in PISA indicate a trend of decline with the disparities growing progressively from larger cities and center zones to smaller villages and rural areas, demonstrating city-to-countryside stratification. In the Kyrgyz Republic, this trend is especially pronounced, revealing substantial differences in student performance between rural and urban regions.⁶⁸ This gap is confirmed by the fact that children belonging to the lowest income quintile typically lag nearly a year behind those from the wealthiest quintile in educational achievement.

⁶⁶ Ministry of Education of the Kyrgyz Republic, “National assessment of educational achievements of 4th grade students,” (2023): 105, accessed July 17, 2023, <https://edu.gov.kg/fa89cc70-d2ac-4419-9e22-651bdff187f8.pdf>.

⁶⁷ Center for Policy and Public Administration, “ИССЛЕДОВАНИЕ. Качество школьного образования в КР: состояние, проблемы и пути их решения” [“RESEARCH. Quality of School Education in the Kyrgyz Republic: State, Problems, and Ways of Solving Them”], accessed July 12, 2023, <https://center.kg/article/455>

⁶⁸ UNICEF, “Out-of-School Children,” (2017): 44, accessed July 19, 2023, https://www.unicef.org/kyrgyzstan/media/3641/file/%D0%94%D0%B5%D1%82%D0%B8,%20%D0%BD%D0%B5%20%D0%BF%D0%BE%D1%81%D0%B5%D1%89%D0%B0%D1%8E%D1%89%D0%B8%D0%B5%20%D1%88%D0%BA%D0%BE%D0%BB%D1%83_%D0%B0%D0%BD%D0%B3%D0%BB.pdf%20.pdf

Similarly, children residing in rural areas tend to fall about two years behind their counterparts in urban areas.⁶⁹

The quality of school education in the Kyrgyz Republic can also be illustrated by the results of nationwide testing known as ORT (Obsherespublikanskoe testirovanie or General Republican Testing, GRT), the analysis of which provides indicative conclusions on the differences between the urban and rural sites. General Republican Testing by itself represents a mandatory examination for applicants seeking entry to higher educational institutions. Every year, thousands of graduates take the test, but quite a significant number of students are left not being able to enter universities because they fail the test. For example, in 2014, over 28,000 students, or more than half of those tested, failed to reach the mandatory threshold mark of 110 points on the General Republican Examination.⁷⁰ This result is particularly concerning when considering the geographical aspect: two-thirds of graduates from the southern part of the country did not achieve the required score in 2014.⁷¹ The significance of this is underscored by the fact that in 2014, the oblasts of Osh, Batken, and Jalal-Abad, which collectively make up the southern part of the republic, recorded the highest poverty levels, with destitution rates of 32%, 41%, and 46%, respectively,⁷² what demonstrates a correlation between poverty and educational underachievement. Thus, students hailing from the more prosperous regions of the country consistently outscore those from less developed areas. This pattern of educational disparity extends to the rural-urban divide, taking into account that roughly 75% of schools are located in rural

⁶⁹ UNICEF Kyrgyzstan, “Education Equity Now,” (2023): 4, accessed July 21, 2023, <https://www.unicef.org/kyrgyzstan/reports/education-equity-now>

⁷⁰ National Testing Center, “ORT Report 2014,” (2014): 17, accessed July 20, 2023, https://testing.kg/media/reportR2014_rus.pdf

⁷¹ KLOOP.KG, “Без вариантов. Почему школьники из бедных семей не могут сдать ОПТ и поступить в вуз” [“No Options. Why Students from Poor Families Cannot Pass the Unified National Testing and Enter University”], accessed July 17, 2023, <https://kloop.kg/blog/2020/01/14/bez-variantov-pochemu-shkolniki-iz-bednyh-semej-ne-mogut-sdat-ort-i-postupit-v-vuz/>.

⁷² National Statistical Committee of the Kyrgyz Republic, “Уровень бедности” [“Poverty Level”], accessed July 15, 2023, <http://stat.kg/ru/opendata/category/123/>.

areas,⁷³ thus potentially reflecting a concentration of educational challenges in specific geographical locations, namely, in rural locales. One more quite noteworthy observation is pertinent to the language in which the General Republican Testing is conducted. It implies that students tested in Russian achieve scores more than 20% higher than those tested in Kyrgyz;⁷⁴ and there is a significant correlation between the language of instruction and performance, with students educated in Russian outperforming those instructed in Kyrgyz language, which prevails in outlying zones of the state.⁷⁵ These findings demonstrate the multifaceted nature of educational disparities, tied to geographic locations interwoven with linguistic factors.

To indicate the stark differences further, average scores for rural and urban areas from two consecutive 2006⁷⁶ - 2007⁷⁷ years are brought below (only accessible years with average score data for rural and urban areas at the moment), which corroborate the trend identified in PISA studies, revealing a diminishing trend with the discrepancies in scores expanding gradually from urban centers and major cities to outlying villages and rural areas:

⁷³ Ministry of Education of the Kyrgyz Republic, “ИСУО,” accessed July 17, 2023, <https://open.edu.gov.kg/index.php>

⁷⁴ KLOOP.KG, “Родной язык или будущее: почему школы Кыргызстана плохо учат и на русском, и на кыргызском” [“Mother Tongue or Future: Why Kyrgyzstan's Schools Teach Poorly in Both Russian and Kyrgyz”], accessed July 18, 2023, <https://kloop.kg/blog/2020/01/14/rodnoj-yazyk-ili-budushhee-pochemu-shkoly-kyrgyzstana-plokho-uchat-i-na-russkom-i-na-kyrgyzskom/>.

⁷⁵ Asian Development Bank, “Assessment of Higher Education: Kyrgyz Republic,” (2023): 5, accessed July 18, 2023, <https://www.adb.org/kyrgyz-republic/education-assessment>.

⁷⁶ National Testing Center, “Main Report 2006,” (2006): 26, accessed July 17, 2023, https://testing.kg/media/mainreport2006_rus_xFRtLVf.pdf

⁷⁷ National Testing Center, “reportR2007,” (2007): 30, accessed July 18, 2023, https://testing.kg/media/reportR2007_rus_jJPbU9b.pdf

Figure 1. 2006 ORT Average score data

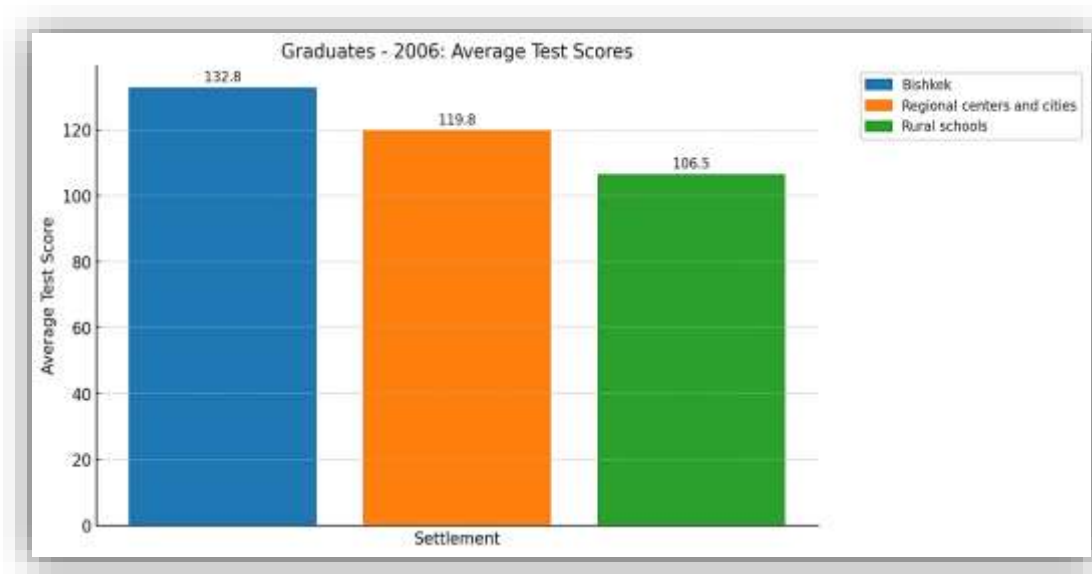


Table 1. 2006 ORT Average score data

Location	Participants	Average
Bishkek	6455	132.8
regional centers and cities	5956	119.8 (-13 points less than Bishkek)
rural schools	20989	106.5 (-26.3 points less than Bishkek) (-13.3 points less than cities)

Figure 2. 2007 ORT Average score data

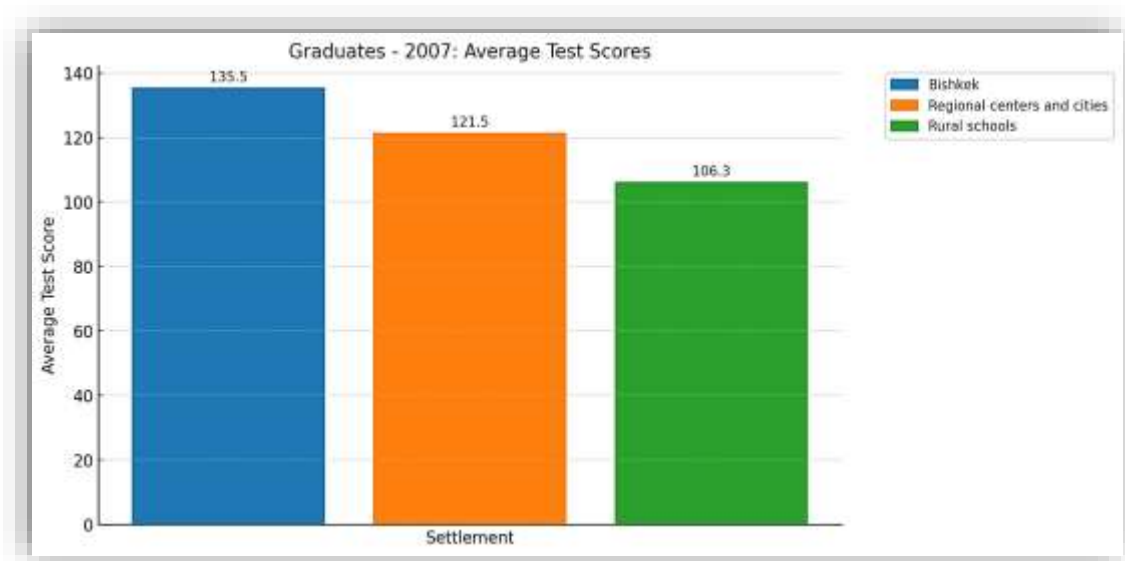


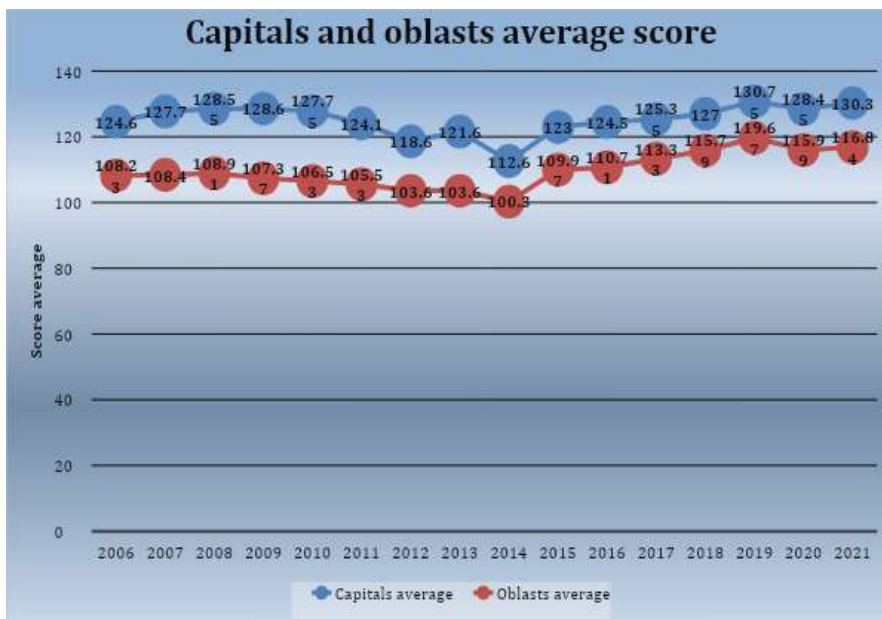
Table 2. 2007 ORT Average score data

Location	Participants	Average
Bishkek	6542	135.5
regional centers and cities	5362	121.5 <u>(14 points less than Bishkek)</u>
rural schools	17287	106.3 <u>(29.2 points less than Bishkek)</u> <u>(15.2 points less than cities)</u>

Resembling sequence is found in the framework of 15-year comparison of average scores of seven oblasts and two capital cities (Bishkek & Osh) from 2006 to 2021:⁷⁸

⁷⁸ Testing.kg, “ЦОМО,” accessed July 18, 2023, <https://testing.kg/>.

Figure 3. 2006 – 2021 Average scores of seven oblasts and two capital cities



This indicates that regions, which to a significant extent consist of rural areas, on average score 16 points less compared to capital centers on General Republican Testing.⁷⁹

One of the distinctive features of the ORT examination is the annual awarding of the "zolotoy sertifikat" (golden certificate) to the top 50 scoring students (this accolade provides the recipients with the opportunity to study at any university within the country

⁷⁹Google Docs, “Spreadsheet,” accessed July 20, 2023, <https://docs.google.com/spreadsheets/d/1Q3bPhD0riE7bZTLv8AQBAPLykkIucEJz/e/dit?usp=sharing&ouid=114090695568971227364&rtpof=true&sd=true>

completely free of charge). Examining the data from the 2017,⁸⁰ 2018,⁸¹ 2019,⁸² 2020,⁸³ 2021,⁸⁴ 2022⁸⁵ and 2023⁸⁶ with respect to the number of certificate awardees and their original locations provides significant insights. By categorizing the recipients into three

⁸⁰ Kaktus Media, “Лучшие из лучших. Список выпускников, получивших золотые сертификаты” [“The Best of the Best. List of Graduates Who Received Gold Certificates”], accessed July 17, 2023, https://kaktus.media/doc/401367_lychshie_iz_lychshih_spisok_vyposhnikov_polychi_vshih_zoloty_e_sertifikaty.html

⁸¹ Kaktus Media, “Известны результаты общереспубликанского тестирования. У кого максимальный балл? Список” [“Results of the Nationwide Testing Known. Who Scored the Maximum Points? List”], accessed July 21, 2023, https://kaktus.media/doc/375868_izvestny_rezyltaty_obsherespyblikanskogo_testirovaniia_u_kogo_maksimalnyu_ball_spisok.html

⁸² Kaktus Media, “Победители Общереспубликанского тестирования. Все обладатели золотых сертификатов” [“Winners of the Nationwide Testing. All Holders of Gold Certificates”], accessed July 22, 2023, https://kaktus.media/doc/393236_pobediteli_obsherespyblikanskogo_testirovaniia_vs_e_obladateli_zolotyh_sertifikatov.html

⁸³ Kaktus Media, “53 человека получили в этом году золотые сертификаты на ОРТ. Список” [“53 People Received Gold Certificates at the Unified National Testing This Year. List”], accessed July 24, 2023, https://kaktus.media/doc/417198_53_cheloveka_polychili_v_etom_gody_zoloty_e_sertifikaty_na_ort_spisok.html

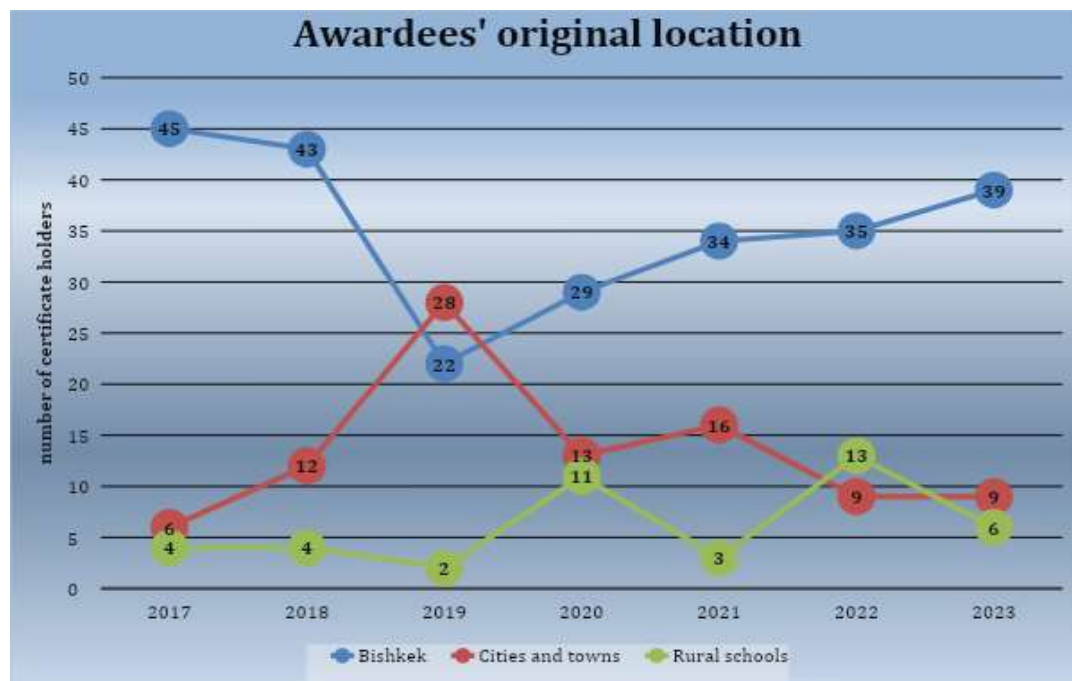
⁸⁴ Ring.Kg, “«Сапат» лицейлери алдыда. ЖРТнын жыйынтыгы чыкты (Тизме)” [“Sapat' Lyceums Ahead. Results of the Unified National Testing Released (List)”], accessed July 27, 2023, <http://ring.kg/sapat-liczejleri-aldyda-zhrtnyn-zhyjyntygy-chyky-tizme/>

⁸⁵ Kaktus Media, “Самые умные выпускники. Список обладателей золотых сертификатов” [“The Smartest Graduates. List of Gold Certificate Holders”], accessed July 28, 2023, https://kaktus.media/doc/462596_samye_ymnye_vypyskniki_spisok_obladateley_zolotyh_sertifikatov.html

⁸⁶ Kaktus Media, “Кто в этом году получит золотой сертификат ОРТ? (список)” [“Who Will Receive the Gold Certificate of the Unified National Testing This Year? (List)”], accessed July 22, 2023, https://kaktus.media/doc/482678_kto_v_etom_gody_polychit_zolotoy_sertifikat_ort_spisok.html

distinct groups – 1) those from the capital, Bishkek, 2) those from other cities and towns, including Osh, and 3) those from rural areas, a clear trend emerges:⁸⁷

Figure 4. 2017 – 2023 Awardees’ original location



The examination of data spanning six years illustrates that graduates from Bishkek receive a significant amount of 65% of all certificates, while cities and towns collectively obtain 24%, leaving rural students with just 11%. This underscores the disparity between urban and rural areas in educational achievement as reflected in the distribution of these prestigious awards.

c) The Higher Education Divide

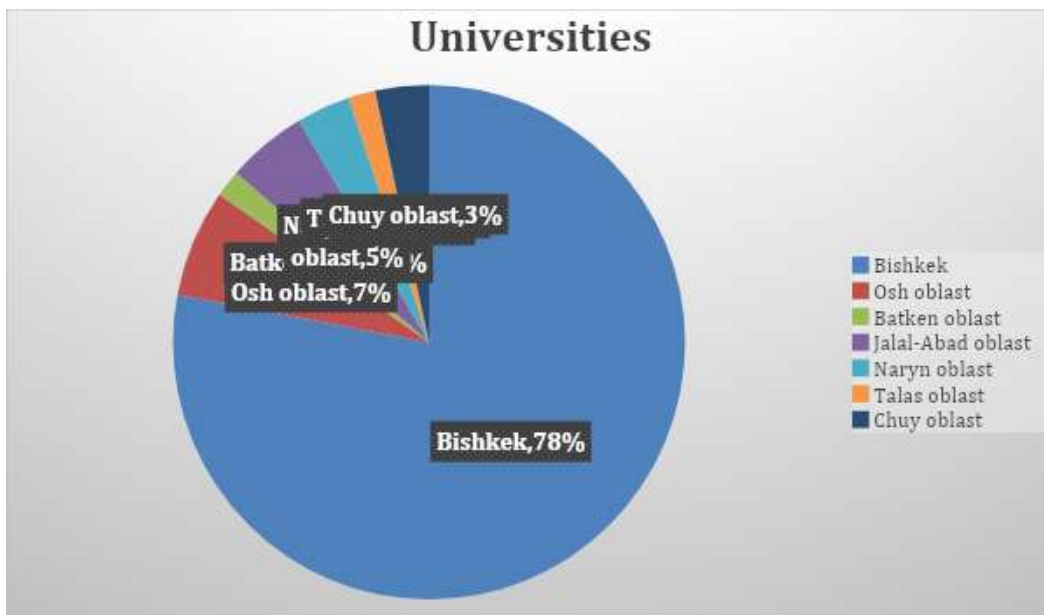
The landscape of higher education in the Kyrgyz Republic underwent a significant transformation since achieving independence. Initially, the country had only nine state-run universities, accommodating nearly 55,000 students during the entire Soviet Union.⁸⁸ Following 1991, the Kyrgyz Republic experienced a swift increase in

⁸⁷ Google Docs, “Spreadsheet,” accessed July 24, 2023, <https://docs.google.com/spreadsheets/d/1z3kdPAeCtJfFumzi1zkCMSyEljm-RJo5/edit?usp=sharing&oid=114090695568971227364&rtpof=true&sd=true>

⁸⁸ Asian Development Bank, “Assessment of Higher Education: Kyrgyz Republic,” (2023): 10, accessed July 23, 2023, adb.org/sites/default/files/institutional-document/175940/higher-education-kgz.pdf

universities, resulting in a current total of 63 institutions, including 28 that are privately operated. This expansion prima facie reflects a broader trend of increasing access to higher education in the nation, however disparities between rural and urban areas still linger, taking into account that the majority of universities in Kyrgyzstan are concentrated in the capital, Bishkek, creating an unequal distribution across different regions. Specifically, the breakdown is as follows: 46 universities are located in Bishkek, 4 in Osh city (Osh oblast), 1 in Batken (Batken oblast), 3 in Karakol (Issyk-Kul Oblast), 4 in Jalal-Abad (Jalal-Abad oblast), 2 in Naryn (Naryn oblast), 1 in Talas (Talas oblast), and 1 university each in Tokmok and Kant (making a total of 2 in Chuy oblast, excluding Bishkek)⁸⁹

Figure 5. Universities location



This geographic concentration might serve as an indicator of the observed disparities in education opportunities between urban and rural areas.

According to the 2020 estimates, there's a pronounced disparity in the likelihood of completing higher education between rural and urban residents. While 56% of urban

⁸⁹ Erasmusplus.kg, “Список высших учебных заведений Кыргызской Республики (по состоянию на 1.04.2023г.)” [“List of Higher Education Institutions of the Kyrgyz Republic (as of April 1, 2023)”], accessed July 27, 2023, <https://erasmusplus.kg/wp-content/uploads/%D0%A1%D0%BF%D0%B8%D1%81%D0%BE%D0%BA-%D0%92%D1%83%D0%B7%D0%BE%D0%B2.pdf>

residents are expected to complete higher education, the figure drops to just 27% for those living in rural areas. The gap becomes even more stark when comparing the economic extremes of the population; only 12% of the poorest (which predominantly reside in rural regions), are likely to complete higher education, compared to 69% of the richest segment of the population.⁹⁰ This underscores the profound distinction between outlying rural countryside and urban centers in terms of educational outcomes in this facet as well.

The distribution of qualified teaching staff across different regions in Kyrgyzstan also reflects a disparity that appears to widen as one moves from central to more remote areas, what again can be referred to as city- to - countryside stratification. Back in 2001, a notable imbalance in academic qualifications among university teachers across Kyrgyzstan was brought to light by experts.⁹¹ Of the 8,383 full-time university teachers nationwide, only 2,130 possessed a degree. A closer look at the distribution of highly qualified professionals revealed a concentration in the capital: Bishkek was home to 226 of the 311 doctors of sciences and 1,341 of the 1,819 candidates of sciences in the entire republic. This left a stark contrast in the regional distribution of academic talent. For instance, Jalal-Abad's three universities had a mere nine doctors and 54 candidates of science. Similarly, the five universities in Karakol had only two doctors of science and 50 candidates of science, indicating a significant regional disparity in academic expertise. This trend of concentrating higher-qualified teaching staff in the capital continued to be evident in the period from 2007 to 2010. According to the data from those years, there was a noticeable decline in the quality of teaching staff as one moved from the capital to regional universities. While approximately 72% of doctors and candidates of sciences resided in the universities within the capital, the remaining 28%

⁹⁰ UNESCO Digital Library, “Аналитическая записка: Высшее образование в Центральной Азии” [“Analytical Note: Higher Education in Central Asia”], (2023): 3, accessed July 22, 2023, https://unesdoc.unesco.org/ark:/48223/pf0000377911_rus

⁹¹ Р. Джапарова, “Высшая школа в Кыргызстане: проблемы модернизации” [“Higher Education in Kyrgyzstan: Modernization Challenges”], Высшее образование в России (2004): 136, accessed July 27, 2023, <https://cyberleninka.ru/article/n/vysshaya-shkola-v-kyrgyzstane-problemy-modernizatsii>.

were distributed across the regions of the republic.⁹² This historical perspective indicates a possible concentration of higher-qualified educators in urban centers, especially in the capital, leaving the remote regions with a relative scarcity of academically credentialed professionals.

The educational landscape of Kyrgyzstan paints a vivid picture of the stark disparities between urban and rural settings. From the early stages of education to higher learning, access and quality of education significantly vary across these contexts. Beginning with preschool, a critical developmental phase, urban areas show higher enrollment rates compared to rural regions, with discrepancies arising from factors like economic inequalities and limited educational infrastructure, preventing many children from benefiting from early childhood education programs. Moving into primary and secondary schooling, the divide becomes even more evident, with urban students consistently outperforming their rural counterparts in academic achievements. Furthermore, the distribution of universities in Kyrgyzstan is heavily skewed towards urban centers, particularly the capital city Bishkek, creating an uneven landscape for higher education. Completion rates for higher education are considerably lower in rural areas, reflecting disparities in educational outcomes between urban and rural residents. Thus, across these three main learning dimensions – primary, secondary, and tertiary education – a vivid and clear educational divide emerges between rural and urban communities.

Section 2. Research Puzzle

2.1. Research question

While urban populations generally have a higher level of educational attainment, it is unclear how this translates into their perceptions of climate change and their sense of

⁹² Р.Н. Джапарова, “Проблемы качества высшего профессионального образования в Кыргызстане” [“Problems of the Quality of Higher Professional Education in Kyrgyzstan”], КРСУ жарчысы 10, no. 7 (2010): 76, accessed July 15, 2023, <http://vestnik.krsu.edu.kg/ky/archive/146/6263>

urgency compared to rural communities, who are more directly exposed to its impacts, though having a lower level of educational attainment. This creates a question:

“How does the perception of climate change differ between rural and urban communities in Kyrgyzstan, and how does this difference correlate with the varying degrees of exposure to climate change impacts and the varying degrees of educational attainment?”

This question aims to unpack the puzzle by investigating the perceptions in rural and urban areas. It allows us to explore the influence of factors such as educational attainment and direct exposure to impacts of climate change.

2.2. Research significance

The significance of this study is manifold and can be dissected through the lens of academia, policy-making and the larger discourse on climate change, both locally and globally. Firstly, from an academic standpoint, this study addresses a notable gap in the current literature on climate change perception, particularly within the context of Central Asia, and more specifically, Kyrgyzstan. There's an array of studies focusing on climate change perceptions in various parts of the world, with a rich body of literature on developed countries, while less attention has been paid to developing nations, particularly, in Central Asia. The study's focus on contrasting rural and urban perceptions within a single country is unique and may provide a novel perspective that complements the existing body of knowledge. The potentially divergent experiences and perceptions of climate change in rural and urban areas, as well as the interplay between exposure to climate change impacts and educational attainment, is an under-explored area. Secondly, from a policy-making perspective, an understanding of climate change perceptions among rural and urban populations could help in the formulation of more effective and more tailored strategies for mitigation and adaptation. The lessons learned from the distinct experiences and responses of these communities could be used to develop more localized, context-specific policies and interventions. This could be particularly crucial in a country like Kyrgyzstan where a significant portion of the population relies on climate-sensitive sectors like agriculture. Lastly, on a broader scale, the study will contribute to the ongoing global discourse on

climate change, particularly in how diverse populations perceive this issue. By shedding light on the perspectives of communities in Kyrgyzstan, this study adds a necessary layer to the global understanding of climate change perception and highlights the importance of incorporating diverse, context-specific perspectives into international climate strategies and policies.

2.3. Hypothesis

"Despite their lower levels of educational attainment, rural residents in the Kyrgyz Republic perceive the impacts of climate change as a more urgent threat due to their direct exposure. In contrast, while urban residents with higher levels of educational attainment mostly do recognize climate change as an issue, this awareness does not necessarily translate into a perceived sense of urgency."

To grasp the essence of the hypothesis it is crucial to apprehend the following points, which twine the proposed hypothesis and are deeply intertwined with each other:

2.3.1. Conceptualization of Perception

In this research context, it is essential to articulate the meaning of "perception," a term that takes on various forms within scholarly discourse. In the realm of theoretical research, the term "perception" is laid out within a variety of representations. For example, there are studies that focus on a general definition of perception, offering a broad understanding of perception as a cognitive and sensory process, focusing on encompassing the general ways in which people interpret and understand sensory information from their surroundings. It might involve a process of selecting and interpreting information from the environment, influencing attitudes and outcomes, thereby framing perception as a crucial cognitive function in understanding and interacting with the world.⁹³ Besides this, perception is examined through the lens of risk assessment and response, where the interplay of thought and feeling in evaluating risks is scrutinized. Research in this area may investigate how cognitive and affective

⁹³ E.H. Kessler, "Perceiving and Understanding Accurately," in *Management Theory in Action* (New York: Palgrave Macmillan, 2010), accessed December 12, 2023, https://doi.org/10.1057/9780230106024_4.

dimensions—like concern and confidence—affect how disadvantaged groups perceive risks, revealing how these perceptions shape attitudes towards hazards.⁹⁴

In the field of climate research, studies often focus on how farmers perceive and understand climate change.⁹⁵ This research also explores the broader public's comprehension of climate change, examining the role of personal experiences and the mental distance between individuals and the impacts of climate change, thus acknowledging the intricate nature of environmental perception.⁹⁶

This particular study delves into the nuances of perception with a focus on how individuals mentally process and react to environmental challenges specifically linked to global warming. Taking into account the broad array of approaches to the concept of perception, this research hones in on the individual level, framing perception within the realm of climate-related issues. Central to this investigation are two main elements of perception: “Awareness” and “Concern.” It's crucial to understand that these terms are not fixed; their meanings can shift depending on their context and the domain in which they are applied. In this paper the term “**awareness**” is being delineated as *the state of knowledge or understanding of a certain information or question*, descending from such definitions as “the quality or state of being aware”⁹⁷ or “knowledge and understanding that something is happening or exists.”⁹⁸ The term “**concern**,” in this context, is being defined as a *troubled state of mind due to personal interest, relation,*

⁹⁴ V.S. Freimuth and S.R. Hovick, “Cognitive and Emotional Health Risk Perceptions Among People Living in Poverty,” *Journal of Health Communication* 17, no. 3 (2012): 303-318, accessed December 14, 2023, <https://doi.org/10.1080/10810730.2011.626505>.

⁹⁵ T.P.L. Nguyen et al., “Understanding Farmers' Perceptions and Adaptation to Climate Uncertainties,” *Agricultural Systems* 143 (2016): 205-216, accessed December 13, 2023, <https://ideas.repec.org/a/eee/agisys/v143y2016icp205-216.html>

⁹⁶ E.U. Weber, “What Shapes Perceptions of Climate Change? New Research Since 2010,” *Wiley Interdisciplinary Reviews: Climate Change* 7 (2016), accessed December 10, 2023, <https://wileyonlinelibrary.com/journal/wcc>.

⁹⁷ Merriam-Webster, “Awareness Definition & Meaning,” accessed December 12, 2023, <https://www.merriam-webster.com/dictionary/awareness>.

⁹⁸ Merriam-Webster, “Concern Definition & Meaning,” accessed December 12, 2023, <https://www.merriam-webster.com/dictionary/concern>.

or affection, based on such characterizations as “an uneasy state of blended interest, uncertainty, and apprehension”⁹⁹ or “a matter that causes feelings of unease.”¹⁰⁰ The terms of “**apprehension**,” “**anxiety**,” or “**unease**” **might be considered as well in case with the latter**, since these concepts also convey a sense of worry or unease about something uncertain, which aligns with the idea of being worried about the potential dangers of a certain issue, in our case of the climate change.

Furthermore, within this outlined framework, it is crucial to draw attention to the collocation of “**impacts of climate change**,” **without confusing it with “climate change”** as a concept itself. Especially, when it is stated that rural people may not be aware of climate change as of a theoretical notion by itself, but in spite of this may have a possibility to directly observe the environmental shifts, subsequently having concerns of the perilous “impacts” to which they are exposed, which are, in their turn, affected by ecological transformation.

This point leads us to assume **that it's not merely the educational attainment or understanding of a specific risk** (such as climate change within this framework) **that heightens people's level of concern. Rather, it's the repercussions** (specifically those resulting from climatic fluctuations in our context) **that truly drive their worry.**

2.3.2. Degree of vulnerability

Scholarly texts routinely reference three core components of vulnerability: (1) exposure to extreme weather events, (2) susceptibility to these events, and (3) the ability to adapt to such events.¹⁰¹ Considering vulnerability dimensions, exposure reflects the degree to which a community faces significant weather variations. Susceptibility indicates how a community is impacted, for better or worse, by these weather changes. Adaptability encompasses a community's resilience in terms of behavior, resource allocation, and technology use in response to weather fluctuations.¹⁰² Thus in theory,

⁹⁹ Ibid

¹⁰⁰ Ibid

¹⁰¹ M.B. Hahn, A.M. Riederer, and S.O. Foster, “The Livelihood Vulnerability Index: A pragmatic approach to assessing risks from climate variability and change - A case study in Mozambique,” *Global Environmental Change* 19 (2009): 74–88, accessed December 9, 2023, <https://doi.org/10.1016/j.gloenvcha.2008.11.002>.

¹⁰² N. Omerkhil, T. Chand, D. Valente, J.M. Alatalo, and R. Pandey, “Climate change vulnerability and adaptation strategies for smallholder farmers in Yangi Qala District,

rural settlements must fall behind the urban populations in each of these three dimensions, which might be explained through the fact that the essence of vulnerability in this context touches upon two intertwined elements:

- a. already existing societal vulnerabilities that are to a relatively greater extent more pronounced within the rural contexts (pre-existing starting point), emphasizing the multifaceted origins of vulnerability, which are not solely derived from climate change but, to a great degree proceed from social, economic and other types of factors;
- b. and the specific environmental hardships brought on by climate change, which rural communities feel more keenly due to their dependence on agriculture

Thus, from a theoretical standpoint, the rural zones must be more vulnerable in a different light from the urban habitat.

2.3.3. The complexity of climate change perception and the role of effect

The importance and complexity of understanding how perception influences reactions to climate change has been a key aspect of environmental risk research for a long time.¹⁰³ The basic premise in this domain suggests that a person's viewpoint of climate change directly molds their adaptation methods.¹⁰⁴ Moreover, there's an additional aspect acknowledging that mere awareness, even about the reasons for climate change, is not enough. Understanding the anthropogenic origins of climate change can provide a basis for directing people towards appropriate policies. However, this understanding alone may not possess the depth required to inspire substantial

Takhar, Afghanistan,” *Ecological Indicators* 110 (2020): 105863, accessed December 13, 2023, <https://doi.org/10.1016/j.ecolind.2019.105863>.

¹⁰³ R.E. O'Connor, R.J. Bord, and A. Fisher, “Risk Perceptions, General Environmental Beliefs, and Willingness to Address Climate Change,” *Risk Analysis* 19 (1999): 461–471, accessed December 14, 2023, <https://doi.org/10.1023/A:1007004813446>.

¹⁰⁴ University of Bonn, “Climate Volatility and Change in Central Asia: Economic Impacts and Adaptation,” (2023): 133, accessed December 14, 2023, <https://bonndoc.ulb.uni-bonn.de/xmlui/bitstream/handle/20.500.11811/5541/3238.pdf?sequence=1&isAllowed=y>

change.¹⁰⁵ On the opposite end of this range, a distinct element is set as a counterweight, complementing the overall landscape that in the context of this framework can be defined as the “level of exposure to risks,” the aspect which is to a broader extent uncovered further.

2.3.4. The Rural life and the Urban disconnect

In the Kyrgyz Republic, agriculture is not just a type of economic activity, but a way of life for a significant part of the population.¹⁰⁶ Agriculture in current conditions is the most accessible type of economic activity for the rural population and is based on the intensive use of natural resources. The share of land used for agricultural production is 55.4% of the total land area of the Kyrgyz Republic. About 48% of the total area of agricultural land is meadows and pastures of long-term use, 7% is represented by arable land and 3% by forest zones¹⁰⁷. All these numbers in combination reflect a range of socio-economic conditions that determine the nature of livelihood taking place in rural contexts. Due to the high dependence on such natural aspects as water, temperature, light, soil, and others, what sets the bar of susceptibility high, the rural sector is one of the most sensitive sectors to climate change,¹⁰⁸ with a great number of subsistence farmers and rural residents, heavily relying on the agricultural sector. In developing countries the level of vulnerability of these people to global warming might be further

¹⁰⁵ I. Lorenzoni, S. Nicholson-Cole, and L. Whitmarsh, “Barriers perceived to engaging with climate change among the UK public and their policy implications,” *Global Environmental Change* 17 (2007): 445–459.

¹⁰⁶ Институт статистических исследований, “Особенности и перспективы развития сельского хозяйства Кыргызской Республики” [“Features and Prospects of Agricultural Development in the Kyrgyz Republic”], (2023): 3, accessed June 9, 2023, <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.stat.kg%2Fmedia%2Ffiles%2F67cd4b04-154b-473c-9556-534d36e630b5.doc&wdOrigin=BROWSELINK>

¹⁰⁷ World Bank, “World Bank Document,” (2023): 4, accessed December 15, 2023, <documents1.worldbank.org/curated/es/689291553746281817/pdf/Climate-Smart-Agriculture-for-the-Kyrgyz-Republic.pdf>

¹⁰⁸ O. Jamshidi, A. Asadi, K. Kalantari, H. Azadi, and J. Scheffran, “Vulnerability to climate change of smallholder farmers in the Hamadan province, Iran,” *Climate Risk Management* 23 (2019): 146–159, accessed December 16, 2023 <https://doi.org/10.1016/j.crm.2018.06.002>.

intensified because of poor institutional support.¹⁰⁹ Summarily, when such mode of life is interrupted by phenomena like impacts of the global warming, this represents an obstacle for means of livelihood to people in rural locales. Urban people, on the other hand, engage with significantly more diversified ways of building their welfare, where climatic effects are not as impactful in the context of burdening their means for obtaining resources to make a living, at least in the short term. Urban settlements on a day-to-day basis deal with issues of different kinds, which in turn are shaped by a significantly lesser level of penetration of agriculture-based practices. Inhabitants of urban areas, often engaging with the unique demands and lifestyles of city life, may find themselves somewhat detached from the immediate repercussions of climate change, which is corroborated by survey data, revealing that even in states where climate change is acknowledged as a critical issue, it often takes a backseat to other immediate social concerns.¹¹⁰ In other words, being aware of the conceptual nature of the issue per se, and comprehending the reality of threat even with a possibility to observe the processes of repercussions already taking effect in the world, might not be a solid guarantee that the urban populations **are more or at least at the same level of concern** with regards to the climate problem without other complementing factors that could put them to a greater degree of exposure. This topic of perceiving climate change as a distant or abstract threat, rather than an urgent problem requiring immediate intervention, is a recurring theme in research.¹¹¹ Studies drawing from broad

¹⁰⁹ D.P. Lindoso et al., “Indicators for assessing the vulnerability of smallholder farming to climate change: The case of Brazil’s semi-arid northeastern region,” International Policy Centre for Inclusive Growth (2012), accessed December 15, 2023, <https://research.rug.nl/en/publications/indicators-for-assessing-the-vulnerability-of-smallholder-farming>.

¹¹⁰ I. Lorenzoni and N.F. Pidgeon, “Public Views on Climate Change: European and USA Perspectives,” *Climatic Change* 77, no. 1-2 (2006): 73–95, accessed December 13, 2023, [Public perception of climate risk and adaptation in the UK: A review of the literature - ScienceDirect](#)

¹¹¹ J. Wolf and S.C. Moser, “Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world,” *Wiley Interdisciplinary Reviews: Climate Change* 2, no. 4 (2011): 547–569, accessed September 19, 2023, https://www.researchgate.net/publication/230191284_Individual_understandings_perceptions_and_engagement_with_climate_change_Insights_from_in-depth_studies_across_the_world

quantitative data have uncovered a tendency among people¹¹² to view climate change as a problem for the distant future or remote locations, affecting other species or future generations more than themselves, making local risks look more important than global ones,¹¹³ what in turn dilutes the sense of urgency.

In essence, both urban and rural populations rely on resources to sustain their livelihoods. These resources are procured through methods unique to their respective environments. When an obstacle disrupts or complicates this process of resource acquisition, it interrupts the continuity of the resource chain, thereby elevating concern levels. The crux of the matter is that the ecosystem structures within these settlements are inherently different. This can be reflected through following example:

Consider the difference between a gardener and a supermarket shopper. The gardener, who depends directly on his homegrown produce, is acutely aware of the weather's impact. A drought, an unexpected frost, or a pest invasion can mean the difference between a bountiful harvest and a failed crop. Their day-to-day well-being is intimately tied to the rhythms of nature, much like rural inhabitants whose livelihoods are connected to the land.

In contrast, the supermarket shopper, akin to an urban dweller, is insulated from these immediate effects. While adverse weather may affect the price or availability of produce in the long term, the shopper's daily sustenance isn't directly jeopardized. They may be aware of environmental issues and even concerned about long-term food security, but the immediacy of the threat doesn't resonate in the same way as it does for the gardener.

This analogy reflects the contrast in the immediacy of environmental impacts on rural versus urban populations. It illustrates how direct dependence on natural resources

¹¹² A. Leiserowitz, E. Maibach, and C. Roser-Renouf, "Global Warming's 'Six Americas'," (New Haven, CT and Fairfax, VA: Yale University and Center for Climate Change Communication, George Mason University, 2008), accessed December 13, 2023, https://www.researchgate.net/publication/253113477_Global_Warming%27s_Six_Americas_An_Audience_Segmentation_Analysis_Invited

¹¹³ S. Hinchliffe, "Helping the earth begins at home: The social construction of socio-environmental responsibilities," *Global Environmental Change* 6, no. 1 (1996): 53–62, accessed December 17, 2023, <https://www.sciencedirect.com/science/article/abs/pii/0959378095001131>

fosters a more immediate and personal connection to the effects of climate change compared to the more buffered experience of those in urban environments. Furthermore, urban inhabitants, residing in a man-made environment, maybe protected from some of the impacts by built infrastructure,¹¹⁴ and thus perceive a lower level of threat. This point clearly indicates one of the core aspects, on which this study relies, which is the **type of socio-economic conditions that exist in both realms, but in distinct forms.**

Such configuration of perception can be deconstructed further from a psychological point. Studies demonstrate that firsthand experiences tend to forge more robust and enduring attitudes and behaviors compared to secondhand experiences.¹¹⁵ These firsthand experiences often elicit instinctual emotional responses, such as fear or worry, which act as signals alerting us to potential dangers. While the affective system is only one of the two processing systems together with the analytical one. It has greater influence over decisions under risk and uncertainty (including the context of global warming). Thus, emotions might be termed as a representation of the effect, usually being catalyzed by direct experience or immediate threat, which motivate persons to remove themselves from a dangerous situation or to change the environment in ways that reduce their feeling of being at risk.¹¹⁶ Conversely, analytical system relies on methodical reasoning. It functions more slowly and demands conscious effort. Although both systems function in parallel, the emotive system typically takes precedence when outputs clash. The dichotomy between rural and urban reactions to

¹¹⁴ S.L. Cutter, K.D. Ash, and C.T. Emrich, “Urban–Rural Differences in Disaster Resilience,” *Annals of the American Association of Geographers* 106, no. 6 (2016): 1236-1252, accessed December 18, 2023, <https://doi.org/10.1080/24694452.2016.1194740>.

¹¹⁵ R.H. Fazio and M.P. Zanna, “Direct experience and attitude-behavior consistency,” in *Advances in experimental social psychology* 14, edited by L. Berkowitz (New York: Academic Press, 1981), 161–202, accessed December 17, 2023, <https://www.sciencedirect.com/science/article/abs/pii/S006526010860372X>

¹¹⁶ E. Peters and P. Slovic, “The springs of action: Affective and analytical information processing in choice,” *Personality and Social Psychology Bulletin* 26 (2000): 1465–1475, accessed December 17, 2023, <https://psycnet.apa.org/record/2000-16738-002>

climate change exemplifies this dynamic. Analytical thought acknowledges the seriousness, but without a sufficient emotive response, the motivation to act may wither.

Section 3. Literature Review

The examination of literature on climate change perception reveals the following significant thematic strands that inform the understanding of the subject: firstly, the perception itself, as one of the driving forces for mitigating measures; secondly, the impacts of climate change on indigenous and rural communities; thirdly, the role of local knowledge and experiences in molding climate change perceptions. However, at the same time the analysis of the existing literature demonstrated certain limitations and gaps in the research.

3.1. Overview

The subject of public perceptions, awareness, and attitudes towards climate change is multifaceted and plays a crucial role in shaping responses to this global challenge. These elements directly influence public endorsement of climate change-related policies,¹¹⁷ and guide individual behaviors linked to environmental conservation.¹¹⁸ Therefore, the past three decades have seen a significant focus on studying public perceptions of climate change.¹¹⁹ Research conducted predominantly in

¹¹⁷ I. Lorenzoni and N.F. Pidgeon, “Public Views on Climate Change: European and USA Perspectives,” *Climatic Change* 77, no. 1-2 (2006): 73–95, accessed September 18, 2023, <https://www.atmosph.physics.utoronto.ca/people/lev/ESSgc/lorenzoniPclimchng06.pdf>

¹¹⁸ A. Leiserowitz, “International Public Opinion, Perception, and Understanding of Global Climate Change: Human Development Report 2007/2008,” (2007), accessed September 16, 2023, <https://doi.org/10.1002/wcc.146>

¹¹⁹ T.M. Lee et al., “Predictors of public climate change awareness and risk perception around the world,” *Nature Climate Change* 5, no. 11 (2015): 1014–1020, accessed September 17, 2023, https://www.researchgate.net/publication/282535453_Predictors_of_public_climate_change_awareness_and_risk_perception_around_the_world

the West,¹²⁰ has illuminated the presence of climate change in public discourse and awareness.¹²¹ A substantial collection of research, primarily originating from highly developed nations such as the United States, the United Kingdom, Canada, Australia, and various European countries, has been dedicated to large-scale public opinion surveys on climate change. This body of literature serves a crucial role in identifying common trends and variations in public opinions, attitudes, comprehension, and concern regarding climate change. By focusing on diverse populations within these developed regions, the research provides valuable insights into how western communities perceive¹²² and understand¹²³ the multifaceted challenges of climate change. Furthermore, a considerable amount of scholarly work has delved into the public's comprehension and attitudes toward climate change,¹²⁴ examining how these factors influence individual reactions.¹²⁵ This research underscores the idea that

¹²⁰ M.S. Schäfer and I. Schlichting, “Media Representations of Climate Change: A Meta-Analysis of the Research Field,” *Environmental Communication* 8, no. 2 (2014): 142–160, accessed September 18, 2023, <https://research.fit.edu/media/site-specific/researchfitedu/coast-climate-adaptation-library/climate-communications/youth-climate-amp-social-media/Shافر--Schlichting.-2014.-Media-Representations-of-CC.pdf>

¹²¹ I. Lorenzoni and N.F. Pidgeon, “Public Views on Climate Change: European and USA Perspectives,” *Climatic Change* 77, no. 1-2 (2006): 73–95, accessed September 19, 2023, <https://www.atmosph.physics.utoronto.ca/people/lev/ESSgc/lorenzoniPclimchng06.pdf>

¹²² S.C. Moser, “Toward a deeper engagement of the US public on climate change: an open letter to the 44th President of the United States of America,” *International Journal of Sustainable Communication* 3 (2008): 119–132, accessed September 20, 2023, https://www.researchgate.net/publication/281609763_Toward_a_deeper_engagement_of_the_US_public_on_climate_change_An_open_letter_to_the_44th_president_of_the_United_States_of_America

¹²³ M.C. Nisbet and T. Myers, “Twenty years of public opinion about global warming,” *Public Opinion Quarterly* 71 (2007): 444–470, accessed September 15, 2023, <https://doi.org/10.1093/poq/nfm031>

¹²⁴ R.E. Dunlap, “Lay perceptions of global risk: public views of global warming in cross-national context,” *International Sociology* 13 (1998): 473–498

¹²⁵ S. Ungar, “Knowledge, ignorance and the popular culture: climate change versus the ozone hole,” *Public Understanding of Science* 9 (2000): 297–312, accessed September 16, 2023,

personal insights into climate change are instrumental in determining support for remedial policies and a readiness to alter personal habits.¹²⁶ Some strategies to combat climate change indeed hinge on the direct involvement of people. For example, the UK's aggressive goal to cut emissions to 34% below 1990 levels by the year 2020, with an emphasis on efficiency in 'homes and communities,' mandated the necessary engagement of its citizens.¹²⁷ In a parallel vein, studies have shown that a meaningful reduction in US emissions could be realized through actions taken at the personal and familial levels, assuming that programs to change behavior are thoughtfully constructed and executed.¹²⁸ As Wolf et al.¹²⁹ note a multifaceted approach may be necessary for effective mitigation. This could encompass new regulations, incentives, tax structures, and other policy measures, potentially requiring individuals to reconsider various aspects of daily life, from energy use and travel to recreation, diet, lifestyle, and even family planning decisions. However, it has also been uncovered that climate change is perceived as a convoluted and abstract issue for many, often disconnected from daily lives.¹³⁰ This complex perception contributes to a lack of urgency among individuals

https://www.researchgate.net/publication/228596613_Knowledge_Ignorance_and_the_Popular_Culture_Climate_Change_Versus_the_Ozone_Hole

¹²⁶ Department of Energy and Climate Change, *The UK Low Carbon Transition Plan: National Strategy for Climate and Energy* (London: Department of Energy and Climate Change, 2009), accessed September 19, 2023, <https://assets.publishing.service.gov.uk/media/5a74b4b1e5274a3cb2866852/9780108508394.pdf>

¹²⁷ T. Dietz et al., "Household actions can provide a behavioral wedge to rapidly reduce U.S. carbon emissions," *Proceedings of the National Academy of Sciences* 106 (2009): 18452, accessed September 19, 2023, <https://doi.org/10.1073/pnas.090873810>

¹²⁸ Ibid

¹²⁹ J. Wolf and S.C. Moser, "Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world," *Wiley Interdisciplinary Reviews: Climate Change* 2, no. 4 (2011): 547–569, accessed September 19, 2023, <https://doi.org/10.1002/wcc.120>

¹³⁰ S.C. Moser, "Communicating climate change: history, challenges, process and future directions," *Wiley Interdisciplinary Reviews: Climate Change* 1, no. 1 (2010): 31–53, accessed September 20, 2023, <https://doi.org/10.1002/wcc.11>

despite the overwhelming scientific consensus.¹³¹ Individual perceptions of climate change are not formed in isolation but are a product of intricate interactions between social, moral, psychological, institutional, and cultural processes, collectively shaping the way people understand climate change, envision potential solutions, and establish their attitudes and behaviors in relation to the issue.¹³² Thus, it is worth noting that climate change, being a complicated and multifaceted issue, may not be directly perceptible or easily understood by certain segments of the population.¹³³ This lack of direct connection may further contribute to the disconnect between the recognized importance of the problem and the perceived immediacy of its impact. In summary, while there is broad awareness of climate change as a critical global issue, the complexity of the subject and the interplay of various influencing factors may hinder people's ability to relate it to their daily lives or to perceive it as an immediate threat. This part of literature emphasizes the importance of tailored communication and education strategies that make the subject more relatable and actionable for different segments of the population. Another significant part of the literature is devoted to the rural communities' dependence on natural resources and ecosystem services, which amplifies their vulnerability to climate change. This vulnerability is evident across diverse geographical locations, from the United States to Africa and Asia. For example, in rural areas of the United States, socio-economic impacts of climate change have been observed, affecting livelihoods and indigenous peoples.¹³⁴ In Zimbabwe, rural

¹³¹ IPCC, *Global Warming of 1.5°C: An IPCC Special Report* (2018), accessed September 16, 2023, <https://unfccc.int/news/unfccc-secretariat-welcomes-ipcc-s-global-warming-of-15degc-report>

¹³² A. Leiserowitz, "American risk perceptions: Is climate change dangerous?" *Risk Analysis: An Official Publication of the Society for Risk Analysis* 25, no. 6 (2005): 1433–1442, accessed September 18, 2023, <https://doi.org/10.1111/j.1540-6261.2005.00690.x>

¹³³ M.S. Schäfer, "Climate Change and the Media," in *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed.), edited by J.D. Wright (Amsterdam: Elsevier, 2015), 853–859, accessed September 20, 2023, <https://doi.org/10.1016/B978-0-08-097086-8.91079-1>

¹³⁴ P. Lal, J.R.R. Alavalapati, and E.D. Mercer, "Socio-economic impacts of climate change on rural United States," *Mitigation and Adaptation Strategies for Global Change* (2011), Springer, accessed September 20, 2023, <https://doi.org/10.1007/s11027-011-9295-9>

communities have been found to suffer the most from the effects of climate change, with governance structures not directly involving those most affected.¹³⁵ In other locales, from Nigeria¹³⁶ to India,¹³⁷ communities exhibit an acute awareness of climate change impacts, often informed by their direct experiences with altered weather patterns and the subsequent effects on their livelihoods. This acute awareness has spurred adaptive behaviors, despite the significant challenges. Such experiences underscore the validity and value of local knowledge in responding to climate change.¹³⁸ Indigenous knowledge has been recognized for combating climate change impacts in places like Ethiopia,¹³⁹ and adaptation measures using local knowledge systems have been studied in Zimbabwe.¹⁴⁰ The role of local knowledge in shaping

¹³⁵ S.S. Mugambiwa and J.R. Rukema, "Rethinking indigenous climate governance through climate change and variability discourse by a Zimbabwean rural community," *International Journal of Climate Change Strategies and Management* (2019), accessed September 16, 2023, <https://www.emerald.com/insight/content/doi/10.1108/IJCCSM-07-2018-0054/full/html>.

¹³⁶ S. Ishaya and Abaje, "Indigenous People's Perception on Climate Change and Adaptation Strategies in Jema'a Local Government Area of Kaduna State, Nigeria," *Journal of Geography and Regional Planning* 1, no. 8 (2018): 138–143, accessed September 19, 2023, https://www.researchgate.net/publication/236248674_Indigenous_People%27s_Perception_on_Climate_Change_and_Adaptation_Strategies_in_Jema%27a_Local_Government_Area_of_Kaduna_State_Nigeria

¹³⁷ N. Vedwan and R.E. Rhoades, "Climate Change in the Western Himalayas of India: A Study of Local Perception and Response," *Climate Research* 19 (December 2001): 109–117, accessed September 16, 2023, <https://www.int-res.com/abstracts/cr/v19/n2/p109-117/>

¹³⁸ F. Bossuyt, "The Importance of Boosting Societal Resilience in the Fight Against Climate Change in Central Asia," in R. Sabyrbekov, I. Overland, and R. Vakulchuk (eds), *Climate Change in Central Asia* (SpringerBriefs in Climate Studies, Cham: Springer, 2023), accessed September 18, 2023, https://doi.org/10.1007/978-3-031-29831-8_12.

¹³⁹ Z.Y. Amare, "Indigenous knowledge of rural communities for combating climate change impacts in west central Ethiopia," *Journal of Agricultural Extension* (2018), accessed September 19, 2023, <https://www.ajol.info/index.php/jae/article/view/179572>.

¹⁴⁰ "Adaptation measures to sustain indigenous farming practices and the use of indigenous knowledge systems to adapt to climate change in Mutoko district of Zimbabwe," *Jàmá: Journal of Disaster Risk Studies* (2018), accessed September 20, 2023, <https://jamba.org.za/index.php/jamba/article/view/602>.

perception extends beyond rural communities.¹⁴¹ For instance, within urban environments, sustainable practices and innovations driven by local entrepreneurs and activists highlight a growing awareness of environmental issues and a willingness to take action.¹⁴² These initiatives, like zero-waste grocery stores, recycling programs and events promoting reduced consumption, represent not only a response to the perceived risk of climate change but also a potential model for broader community-based climate action.

3.2. Limitations & Gaps

Although these studies have significantly enriched our comprehension of the multifaceted nature of climate change perception, offering invaluable perspectives, they are not devoid of certain constraints and limitations. One prominent shortcoming is the geographical bias in scholarship. Much of the existing literature is centered on “Western” industrialized nations.¹⁴³ Therefore, it's worth noting that such concentration on developed nations may overlook or underrepresent perspectives from other parts of the world, potentially limiting the global applicability of these findings. This focus often overshadows the experiences and perceptions in other regions, where climate change impacts might be more uniquely manifested.¹⁴⁴ This Western-centric approach

¹⁴¹ G. Hughes (ed), *Sustainable Mountain Development: From Rio 1992 to 2012 and beyond*. Central Asia Mountains (University of Central Asia, Zoï Environment Network, Mountain Partnership, GRID-Arendal, 2012), accessed September 17, 2023, <https://ucentralasia.org/media/bllawjt1/web-caf-central-asia-mountains.pdf>.

¹⁴² A. Tskhay, “The Culture of Recycling, Re-use and Reduction: Eco-Activism and Entrepreneurship in Central Asia,” in R. Sabyrbekov, I. Overland, and R. Vakulchuk (eds), *Climate Change in Central Asia* (SpringerBriefs in Climate Studies, Cham: Springer, 2023), accessed September 21, 2023, https://doi.org/10.1007/978-3-031-29831-8_13.

¹⁴³ A. Leiserowitz, E. Maibach, and C. Roser-Renouf, “Global Warming’s ‘Six Americas’,” (New Haven, CT and Fairfax, VA: Yale University and Center for Climate Change Communication, George Mason University, 2008), accessed September 19, 2023, https://www.researchgate.net/publication/253113477_Global_Warming%27s_Six_Americas_An_Audience_Segmentation_Analysis_Invited

¹⁴⁴ IPCC, *Global Warming of 1.5°C: An IPCC Special Report* (2018), accessed September 20, 2023 <https://unfccc.int/news/unfccc-secretariat-welcomes-ipcc-s-global-warming-of-15degc-report>

has led to a significant gap in understanding climate change perceptions in other countries, including the Kyrgyz Republic. The literature review reveals a significant gap in understanding how climate change is perceived in countries like Kyrgyzstan.¹⁴⁵ Specifically, there is a dearth of research exploring the contrasts and commonalities between rural and urban communities within these less-studied regions. The current body of work often lacks a nuanced perspective that could shed light on potential disparities in climate change perception between rural and urban populations in such a context. Furthermore, the methodological approaches employed in existing studies present another limitation. Much of the scholarship relies on representative quantitative surveys,¹⁴⁶ which, while valuable for identifying general patterns and trends in climate change perceptions, may fall short in capturing the intricate, individualized perceptions of climate change. These methods often lack the depth required for detailed, close descriptions of personal experiences and attitudes towards climate change.

Thus, the review presents a niche that this thesis aims to fill, by delving into the intricacies of climate change perception within communities of the Kyrgyz Republic, mainly using the qualitative methods. The forthcoming research will contribute to the broader discourse by bridging this gap, further enriching our understanding of climate change perception and its varied determinants in the context of juxtaposition of urban areas against rural ones.

Section 4. Theoretical Framing

This research study will draw from two theoretical frameworks, namely the Social Construction of Reality Theory and the Theory of Planned Behavior, to establish

¹⁴⁵ R. Vakulchuk, A.S. Daloz, I. Overland, H.F. Sagbakken, and K. Standal, "A void in Central Asia research: climate change," *Central Asian Survey* 42, no. 1 (2023): 1-20, accessed September 18, 2023, <https://doi.org/10.1080/02634937.2022.2059447>.

¹⁴⁶ I. Lorenzoni and N.F. Pidgeon, "Public Views on Climate Change: European and USA Perspectives," *Climatic Change* 77, nos. 1-2 (2006): 73–95, accessed September 21, 2023, <https://www.atmos.physics.utoronto.ca/people/lev/ESSgc/lorenzoniPclimchng06.pdf>

a comprehensive basis for exploring the variations in climate change perception between rural and urban communities in Kyrgyzstan.

4.1. The Social Construction of Reality theory

The Social Construction of Reality theory provides a useful lens to comprehend how individual experiences, societal contexts and cultural norms shape what people perceive as their reality. This theoretical framework proves particularly pertinent in the context of climate change. In Kyrgyzstan, a country where agriculture represents around 14% of the GDP and employs a significant proportion of the rural population, climate change's impacts are acutely felt. Almost two-thirds of the population reside in rural areas, largely engaged in agricultural activities. The experiences of these rural communities with climate change are immediate and tangible. Changing weather patterns, decreased water availability, and the degradation of around 60% of the country's pasturelands, impact their livelihoods and consequently form their understanding and perception of climate change as a pressing and existential issue. This experience-based understanding, in essence, becomes their social reality, which informs their attitudes and responses towards climate change. Contrarily, urban communities in Kyrgyzstan, which constitute around 33.8% of the total population, experience a different social reality. They are generally more educated with a higher literacy rate. Their access to a wider range of information sources, including scientific data, global news and institutional narratives, is typically greater as well, though the information access gap in Kyrgyzstan has been narrowing between the two zones in the recent years.¹⁴⁷ Despite this, their relative insulation from the immediate impacts might lead to the perception that climate change, while indeed is a real, but not necessarily urgent or pressing concern in their daily lives. The impacts can appear abstract, removed and less immediate, thereby constructing a different social reality where climate change is acknowledged but not necessarily urgently addressed.

¹⁴⁷ Российская газета, “В Кыргызстане обеспечат доступом к интернету отдаленные села” [“Remote Villages in Kyrgyzstan to be Provided with Internet Access”], accessed September 11, 2023, <https://rg.ru/2023/04/05/opletut-voloknom.html?ysclid=lr13umaljd978343884>

4.2. Theory of Planned Behavior

The theory of Planned Behavior further adds depth to our theoretical understanding. According to this theory, an individual's behavior is influenced by three factors: their attitude towards the behavior, subjective norms surrounding it and perceived behavioral control. In the context of climate change, these three aspects can provide useful insights into different responses to climate change in urban and rural communities. In rural Kyrgyzstan, the direct experiences with climate change can cultivate a strong subjective norm in the community to combat these effects due to the impact on livelihoods and a sense of urgency that can increase the perceived behavioral control. In contrast, urban communities might have a more neutral or ambivalent attitude towards climate change due to its less immediate impact on their daily lives, weaker subjective norms due to less societal pressure and potentially a lower sense of perceived behavioral control due to the perception of climate change as a global issue beyond the control of individuals or communities.

Together, the Social Construction of Reality Theory and the Theory of Planned Behavior form a robust theoretical framework that allows us to delve into how social realities, informed by differential exposure to climate change impacts and access to climate change information, shape climate change perceptions and responses in rural and urban communities of Kyrgyzstan. Understanding these dynamics is instrumental in creating effective communication and education strategies tailored to the specific realities, perceptions, and behaviors of these communities.

Section 5. Research design / Methodology

A **comparative case study** design is being utilized, comparing the urban and rural populations. Employing a qualitative approach, this research incorporates primary research technique. The study is based on in-depth semi-structured interviews conducted with representatives from both rural and urban communities in the Kyrgyz Republic. This method allows for the inquisition into the question of how perceptions of climate change are being formed and influenced, whether by experience or educational attainment. This type of research design allows us to deeply investigate the different perceptions of climate change in these contexts.

Semi-structured interviews with residents in both rural and urban areas consist of a set of pre - determined questions, while providing room for participants to share their thoughts and experiences, and allowing to ask respondents follow-up questions, depending on the responses. The questions are open-ended, allowing participants to express their opinions freely, with an aim to obtain detailed information from the interviewees. Interview questions are designed to probe more deeply into individuals' perceptions and attitudes towards climate change and its impacts on their daily lives and futures. The study employs an interpretative research approach, rooted in qualitative methodologies. It adopts a non-probability sampling strategy, specifically, leveraging convenience sampling for participant selection. This methodological choice reflects a balance between practical constraints and the need for in-depth, contextual data. By using this approach, the research seeks to uncover insights into how the issue of climate change is perceived and experienced differently across segments of population, highlighting the contrasts and commonalities in environmental cognition between rural and urban communities. The findings from this research are expected to contribute to a more comprehensive understanding of the societal dimensions of climate change in the Kyrgyz context, offering valuable perspectives that can inform policy and community-level interventions.

5.1. Questionnaire and Data collection

The degree of perception was assessed based on the content of respondents' answers to certain questions from the list in a predetermined sequence. Moreover, each of the specific questions on the list had its own relative weight, which to a greater or less extent compared to other questions, influenced the final conclusions regarding how the perception of a particular person could ultimately be determined. Besides this, each question had its own specific goal in determining what exactly the perception of a particular respondent is, through touching on different aspects of perception of climate change from different angles, which made it possible to form a complete picture of the perception of each of the participant, connecting different pieces of information into a single whole picture of a respondent.

The content of respondents' answers to some questions from the list in a fixed order measured the degree of perception. Also, each question on the list had a relative weight that affected the final conclusions about how to determine the perception of a specific

person more or less than other questions. In addition, each question had a specific purpose in finding out the perception of a certain respondent, by covering different aspects of perception from various perspectives, which allowed to create a comprehensive picture of the perception of each participant, linking different pieces of information into a single image of a respondent.

The following is the list of the questions used for collection of primary data with a clear division into sections and a rationale behind each of them:

1. To grasp the prioritization of existing issues in the life of the respondent

- *What are the main problems in the Kyrgyz Republic in your opinion?*
- *What are the main problems in your **community** (name of the city – if respondent is from urban areas / name of the village – if respondent is from rural settlements) in your opinion?*

2. For analysis of the respondent's experience with effects of climate change, the degree of severity of those effects and whether he relates these effects to climate change

What kind of other problems can you name?

What kind of untypical ecological fluctuations or climate repercussions can you name?

3. For assessment of the general degree of comprehension of the concept of climate change

What do you understand by climate change?

- Respondent's belief in climate change (Whether or not it exists)
- Respondent's understanding of causes of climate change (Whether climate change is caused by a natural or an anthropogenic factors)
- Respondent's understanding of mechanism and process through which climate change takes place (anthropogenically and naturally)

4. To expand the researcher's understanding of the possible perception of climate change issue by the larger public of the respective locale from the respondent's subjective point of view

What is the general perception of the impacts of climate change in the society which you are a part of?

- Respondent's picture of local public's belief in climate change (believe or not)
- Respondent's picture of local public's awareness on the issue of climate change (aware or note)
- Respondent's picture of local public's concern with the issue of climate change (concerned or not)

5. To assess the respondent's level of comprehension of countermeasures

What types of adaptation measures can you name that are practiced in your community or ones that you are aware of?

- Respondent's experience of utilization of such methods
- Respondent's knowledge of such methods
- Respondent's ability to differentiate adaptation measures and mitigation measures

Data collection occurred from August to December 2023, primarily through face-to-face interviews and occasionally via an online platform. Interviews typically lasted between 30 to 40 minutes. Field studies were conducted in two languages: Kyrgyz, predominantly used in rural areas, and Russian, primarily used with urban participants. To ensure confidentiality, the actual names of 36 participants were changed.

5.2. Selected sites

The target population for the current investigation consisted of:

- 1) rural representatives, that include farmers, livestock herders and residents from five oblasts (Jalal-Abad, Batken, Issyk-Kul, Chuy and Naryn), encompassing such villages as Syrt, Apkan and Orozbekov (Batken oblast), Sakaldy and Aral (Jalal-Abad oblast), Ak-Bashat and Syn-Tash (Chuy oblast), Zherge-Tal (Naryn oblast) and Orgochor (Issyk-Kul oblast);
- 2) urban representatives from such administrative-territorial units as Chuy, Osh, Jalal-Abad and Batken, with such cities included as Bishkek and Tokmok (Chuy oblast), Osh (Osh oblast), Kochkor-Ata and Bazar-Korgon (Jalal-Abad oblast), Aidarken and Kyzyl-Kia (Batken oblast).

It is important to note that such configuration of rural and urban sites was mainly dictated by practical constraints, which appears one of the major limitations of this research, in spite of the fact that this study is qualitative research with an aim of extracting an in-depth data.

Section 6. Presentation of collected data

As elucidated in preceding chapters, it has become increasingly apparent that climate change is a global concern of paramount importance in the contemporary world. Armed with a spatial comparative study approach, this section shifts the focus to explore the rural and urban perspectives on this issue, delving into the local comprehension, experiences, and level of intelligence within the environmental discourse. In this part, an analytical exploration into the local perception of climate change from a two-dimensional geographic perspective, focusing on communities both in the central and rural areas of the Kyrgyz Republic is presented. It utilizes the interpretive research based on the qualitative approach, employing the convenience sampling of non-probability sampling design with in-depth interviews as the tool of data collection. This analysis aims to paint a picture of the state, nature and degree of awareness and concern for global environmental issues among the groups living in the Kyrgyz Republic.

The collected data with division into rural and urban sites comprises 37 interviews in total. 36 conventional interviewees, out of which 30 were male, 6 were female, and 1 expert interview. The following is a geographical configuration of 36 respondents, with indication of their type of locale (urban or rural), respondent's region (oblast) and his specific settlement (cities for urban and villages rural respondents):

Table 3. Geographical composition of respondents

Locale Type	Region	Settlement	Number of Interviews
Urban	Chüy	Bishkek city	7
Urban	Chüy	Tokmok city	2
Urban	Jalal-Abad	Bazar Korgon city	1
Urban	Jalal-Abad	Kochkor-Ata city	2
Urban	Osh	Osh city	3
Urban	Batken	Aidarken city	2
Urban	Batken	Kyzyl-Kiya city	1
Rural	Chüy	Ak-Bashat village	1
Rural	Chüy	Syn-Tash village	1
Rural	Jalal-Abad	Sakaldy village	5
Rural	Jalal-Abad	Aral village	2
Rural	Batken	Syrt village	3
Rural	Batken	Apkan village	3
Rural	Batken	Orozbekov village	1
Rural	Naryn	Jerge-Tal village	1
Rural	Issyk-Kul	Orgochor village	1

Figure 6. Geographical composition of respondents (Urban)

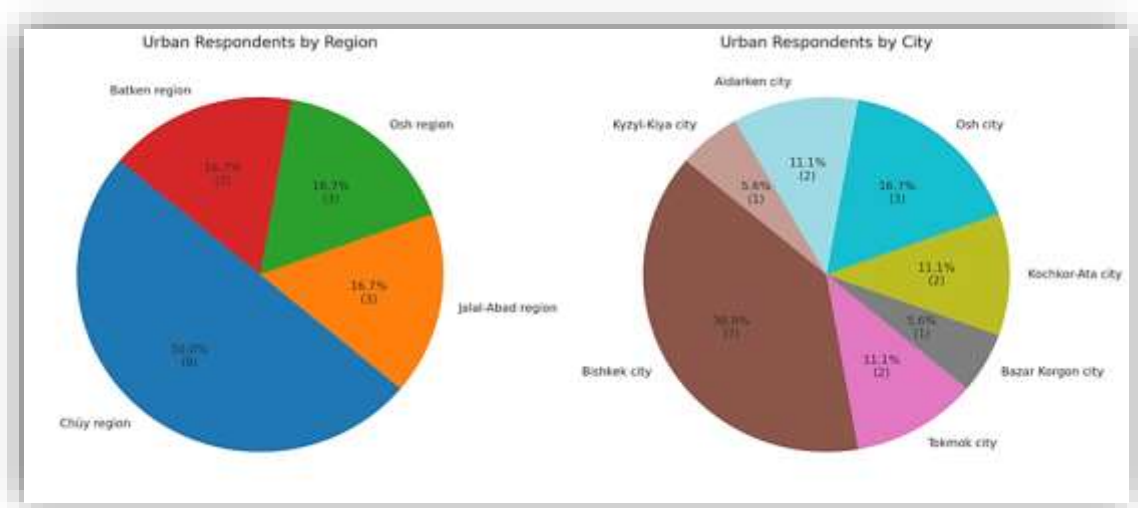
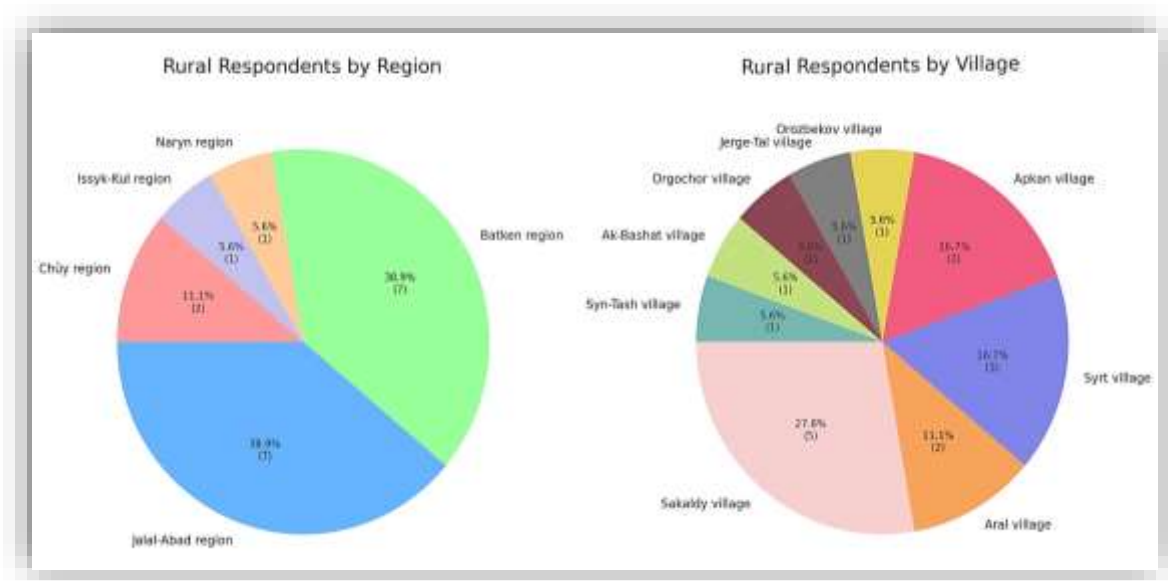


Figure 7. Geographical composition of respondents (Rural)



78% (14 out of 18) of urban respondents had higher education, while only 44% (8 out of 18) of rural respondents had higher education

6.1. Data analysis

In this section, a comprehensive analysis is presented, examining the responses to five key questions from the questionnaire, posed to each participant. This analysis delves into determining:

Central Issues: Identifying the primary concerns that dominate the respondent's perspectives and discussions.

Environmental Considerations: Assessing the role and place of environmental issues within the respondent's cognitive framework.

Conceptual Understanding: Evaluating the respondent's grasp of climate change as a concept.

Community Perception: Exploring the respondent's insights into how climate change is perceived within his community.

Adaptive Actions: Investigating the measures for climate change adaptation or mitigation that the respondents are practicing or are cognizant of.

By coupling this analysis with tailored visualizations, the aim is to elucidate a clear picture of climate change perceptions among both urban and rural populations.

6.1.1. First set of questions

What are the main problems in the Kyrgyz Republic in your opinion?

What are the main problems in your community in your opinion?

During the interviews with urban respondents, when asked first two questions, on the main problems in Kyrgyzstan/in their community, 9 respondents noted 4 climate-ecology related issues in total, which included: air pollution (9 mentions), garbage and landfills (4 mentions), lack of green spaces (2 mentions) and the issue of water shortage (1 mention). During the interviews with rural respondents, when asked the same two questions, climate/ecology related problems were noted by 14 respondents, which included: mainly the problem of water shortage (13 mentions) and the problem of pasture degradation (2 mentions). Urban respondents predominantly covered a broader range of issues, mostly linked to urban living and industrial activity, noting the issue of water shortage only once, and putting the greater emphasis on the problem of smog. In contrast, rural respondents overwhelmingly highlighted water deficit with two more mentions of pasture degradation, reflecting their direct dependence on natural resources.

This is the starting point of the differences between these two environments that is reflected in the water reliance. Furthermore, these effects can be classified as direct and indirect, depending on how immediately and visibly these impacts are felt. In the context of rural respondents, water shortage and pasture degradation can be considered direct impacts.¹⁴⁸ These issues directly affect rural livelihoods, since water shortage directly influences crop irrigation and drinking water supply, while pasture degradation directly affects livestock health and productivity, having a straightforward cause-and-effect relationship with daily activities and survival. On the other hand, indirect impacts, which are the case with urban areas, might not immediately disrupt daily life

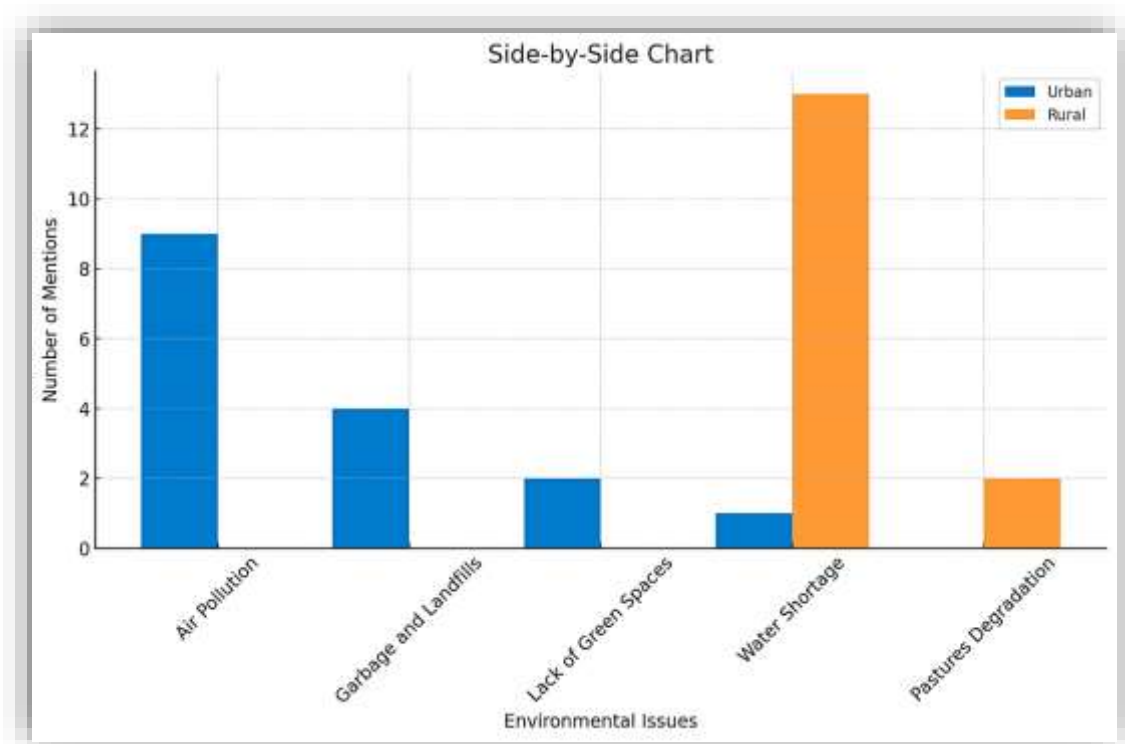
¹⁴⁸ Z.J.U. Malley, M. Taeb, T. Matsumoto, and H. Takeya, "Linking perceived land and water resources degradation, scarcity and livelihood conflicts in southwestern Tanzania," *Environment, Development and Sustainability* 10 (2008): 349-372, accessed December 18, 2023, <https://doi.org/10.1007/S10668-006-9069-9>.

but have long-term effects on health, wellbeing, and the environment, with air pollution in urban areas falling into this category.¹⁴⁹ The timely features of water issue in rural locales and air pollution in urban area like Bishkek might be important to consider too, since the problem of smog in the capital city, as a periodic issue, may be a less permanent reminder of the environmental problems compared to the issue of water deficit in villages.

The visualization further elucidates the contrasts:

Figure 8. Number of mentions for each environmental issue (Urban vs Rural)

¹⁴⁹ R. Hassan and M. Li, "Urban Air Pollution Forecasting Using Artificial Intelligence-Based Tools," (2010), December 20, 2023, <https://doi.org/10.5772/10049>.



To reflect this distinction existing in how urban see and prioritize main problems, the following extract from an interview with an urban respondent can be brought:

“Biggest problem today is geopolitical instability, we are in difficult situation between big players, have no access to the sea, and as the practice shows our politicians often try to abuse their powers... So, I would also mention the incompetence of our leaders and politicians... Of course, we have that air pollution here and climate is also a problem to consider, since there is accurate data that the temperature changes every year and 4 degrees will be added by 2050. Glaciers will melt and so on... But at the moment this should go by the wayside, since there is still time until 2050, and for it to go to the nuclear war, its escalation between the big states, is literally 2-3 years, and I think this is more important.” [Bolot, Bishkek city, male, student)

This excerpt illustrates the influence of urban living on perceptions of climate change. The interviewee, Bolot from Bishkek, is well-informed about global warming's key aspects. However, his focus on immediate geopolitical issues and internal political dynamics suggests a less personal impact from environmental issues. Consequently, he regards climate change as a remote concern, secondary to more pressing geopolitical matters. This perspective is contrasted with rural inhabitants who, as further analysis

will show, generally prioritize different concerns, reflecting the distinct influences of their living environments on their perception of climate issues.

6.1.2. Second set of questions

What kind of other problems can you name in addition to the ones you noted?

What kind of untypical ecological fluctuations or climate repercussions can you name?

A. Urban - Common list (for the first and second sets of questions) of noticed problems/effects/issues and repercussions, enumerated by the respondents and positioned according to their number of mentions in urban areas (ecology/climate related ones highlighted):

1. Corruption (7)
2. Infrastructure (7)
3. Snow reduction (6)
4. Air pollution (6)
5. Low level of public awareness (6)
6. Weak economy / inflation (6)
7. Weak education system (6)
8. High prices/low wages/unemployment (6)
9. Anomalous heat (5)
10. Reduced rainfall/shift of the rainfall season (5)
11. Water shortage (4)
12. Garbage and landfills (4)
13. Increased amount of chemicals in food (4) - **semi related**
14. High crime rate (4)
15. Drying and problematic growth of plants (3)
16. Degradation of pastures and grasslands (3)
17. Anomalously strong cold (3)
18. Anomalously warm winter (3)
19. Glacier melt (3)
20. Abnormally abrupt change of seasons/unpredictability of the weather (3)
21. Disorderly constructions (3)
22. Nepotism (3)

23. Increase in mudflows (2)
24. Lack of green spaces (2)
25. Increase in the number of sick people/cancer patients (2) - **semi related**
26. Birth of sick babies and deterioration of reproductive health (2) - **semi related**
27. Nationalism (2)
28. Traffic jams, public transport and parking (2)
29. Incompetence of the politicians (2)
30. Weak health care system (2)
31. Increase in the number of flying insects (1)
32. Shortened winter season (1)
33. Loss of biodiversity (1)
34. Repressive laws (1)
35. Insufficient level of religiosity of the population (1)
36. Border problem (1)
37. Lack of justice (1)
38. Sexual violence (1)
39. Domestic violence (1)
40. Lack of rule of law (1)
41. Imperfection of the political system (1)
42. Geopolitical instability (1)
43. Weak energy industry (1)
44. The lack of a unified ideology (1)

Out of 44 concerns in total, 17 were climate/ecology related and 3 concerns were semi-related, with the remaining 24 conventional ones. Out of 130 mentions in total, 55 mentions were climate/ecology related, 8 mentions were semi-related, with the remaining 67 conventional ones. The designation "semi-related" for issues like "Increased amount of chemicals in food," "Increase in the number of sick people/cancer patients," and "Birth of sick babies and deterioration of reproductive health" in the urban respondents' list is led by the fact that these issues might be influenced by environmental factors, though they are not direct results of ecological changes or climate events.

Remarkable to mention is a high frequency of mentions for the matter of "Low level of public awareness" (6). This concern was placed as one of the highest in the list, what

might be a crucial point or prism through which urban people discuss and portray their map of problems, what shapes the common discourses among them, including on the environmental issues. The following extracts demonstrate this point:

“In my specialty I often encounter this lack of justice - this is the problem, I associate it with an effective system of checks and balances that we don't have... and this I associate with the low level of awareness of the population, in general. And actually, all problems are connected with awareness, including ecology, which itself is a global problem in general. The root here is a sense of awareness of each person...It is a system of motives and ways of survival and existence, and this is our problem..., so, in general, we have problems with smog, traffic jams, transport and parking places. But this all comes from it, awareness I would call.” [Nuradil, Bishkek city, male, lawyer]

“Major problem with us is the low level of public awareness, which affects the environment, our future. Everyone thinks and lives as if: “oh, I'll throw this (refers to trash) here and nothing will change. We are raising children without proper understanding that this is our future generation, on which the country will hold. And we must not make it so that such a stunted sick population grows in such conditions. ...being in Bishkek, we live in our own bubble... but all our problems are very much visible if we get to other cities and villages of the country... you see a picture and think how many problems there are.” [Malik, Bishkek-city, male, media-activist and blogger]

“We must change how a person thinks, start from the beginning, from school, kindergarten. Then the culture will change. We have people who smoke cigarettes on the street and throw them right there, which was not the case when I was in Germany... here no one follows the rules, people shout, swear, drive as they want. It indicates that many people do not have self-awareness... so how such a person differs from an animal, he needs to be educated from scratch... roots grow here, with environment too...” [Mamatzhan, Kochkor-Ata, male, retired]

It is important to note that such view was noted by one of the rural representatives as well:

“This whole environmental problem is actually the first most important problem, but this all comes to how generations are raised. For example, there is not enough water in this village... and if we think about it, the problem is that we humans have become greedy. When human beings have education, they say: “It is difficult for him, he lives in the bottom, (meaning far from the water sources) and he also needs to drink water, he has small children, we need to help.” But when such an understanding is lost, such responsibility for society and for the environment is lost, this is where the environmental problems start.” [Noruzbek, Syrt village, male, farmer]

Nevertheless, such a way of discourse was not as widespread among villagers. Thus, for urban respondents a recurrent theme was the 'Low level of public awareness,' which they often noted as a foundational issue permeating various societal challenges, including ecological problems. This emphasis suggests that urban dwellers view many

environmental issues as symptoms of a broader systemic failure to educate and instill a sense of communal responsibility and foresight, revealing distinct narratives surrounding the perception and prioritization of environmental concerns. Overall, urban respondents expressed a balanced mix of conventional and environmental issues, compared to rural people, as shown further.

B. Rural - Common list (for the first and second sets of questions) of noticed problems/effects/issues and repercussions. Enumerated by the residents and positioned according to their number of mentions in rural areas were the following (ecology/climate related ones underlined):

1. Water shortage/water theft (15)
2. Drying and problematic growth of plants (11)
3. Snow reduction (11)
4. Anomalous heat (10)
5. Reduced rainfall (9)
6. Degradation of pastures and grasslands (8)
7. Anomalously strong cold (8)
8. Glaciers melt (6)
9. Unemployment/low wages (6)
10. Malnutrition and diseases of livestock (5)
11. Abnormally abrupt change of seasons/unpredictability of the weather (5)
12. Weak education system (5)
13. Corruption (5)
14. Anomalously warm winter (3)
15. Nepotism (3)
16. Shortened winter seasons (2)
17. Blood pressure deaths due to anomalous weather fluctuations (2)
18. Decreased volumes of extracted honey (2)
19. Lack of a unifying national ideology (2)
20. Infrastructure (2)
21. Nationalism (2)
22. Increase in the number of flying insects (1)
23. Spread of fakes (1)

24. Lack of rule of law (1)
25. Expensive coal (1)
26. Weak health care system (1)
27. Low level of physical security (1)
28. Low level of public awareness (1)

15 out of 28 are climate/ecology related, with remaining 13 conventional concerns. In total there were 31 mentions of conventional problems and 98 of climate/ecology related matters out of 129 overall. Rural respondents primarily highlighted climate and ecological issues, with seven matters such as water shortage, plant growth problems, snow reduction, anomalous heat, reduced rainfall, degradation of pastures and anomalous cold accounting for 72 mentions out of 98 environmental mentions altogether. This indicates the domination of environmental issues among concerns, and underscores the most sensitive ones. The following extracts are example of domination of environmental issues within rural locales:

“The main problem is that the water that the Earth has been giving to us is not so sufficient now, and now if we had not got boreholes, we would all have been broke and gone by now. You see, there is no water in the ditch, in Soviet times ditch would never dry, there was always water, right now I simply don’t know where it has disappeared.”
[Rahat, Sakaldy village, male, retired]

“When we were little, there was much snow and we played with snow or hockey, and now we no longer see that kind of snowing. Previously, it was solid, reaching up to one meter. Last year it got very cold in winter, it had not been so for many years... well, we see it because even Christmas trees that were brought here from Russia, and you know they got adapted to the climate of this area, and when it was too cold, the trees withered. It is also hot, 47 degrees. And already on the tenth of August it should have got chilly, but it's still hot. Now everything is thirsty for water. Also, there is no rain, in the past it would rain even in July. The aksakals (elderly) died from the heat... and also not enough water, we get the water supply at a hundred soms per hour and still it gets stolen. There is no grass on the hills, the cattle are thin and sick. Everyone feeds its livestock when or where he wants without any collective planning. For example, already in March people take out livestock and feed them where they should not, as a result no grass manages to recover.” [Talay, Sakaldy village, male, farmer]

These environmental challenges are not abstract concepts to rural residents; they are immediate and tangible, directly influencing their daily lives and economic stability. The narrative of the elderly suffering from extreme heat, and the disruption of traditional pastoral practices due to unregulated grazing, further highlights the deep-seated impacts of environmental change on rural communities. Such narratives convey

a community that is acutely reliant on environmental stability, with ecological disruptions translating into practical and often severe consequences.

The following charts highlight a rural-urban divide in concerns:

Figure 9. Distribution of concern types (Urban vs Rural)

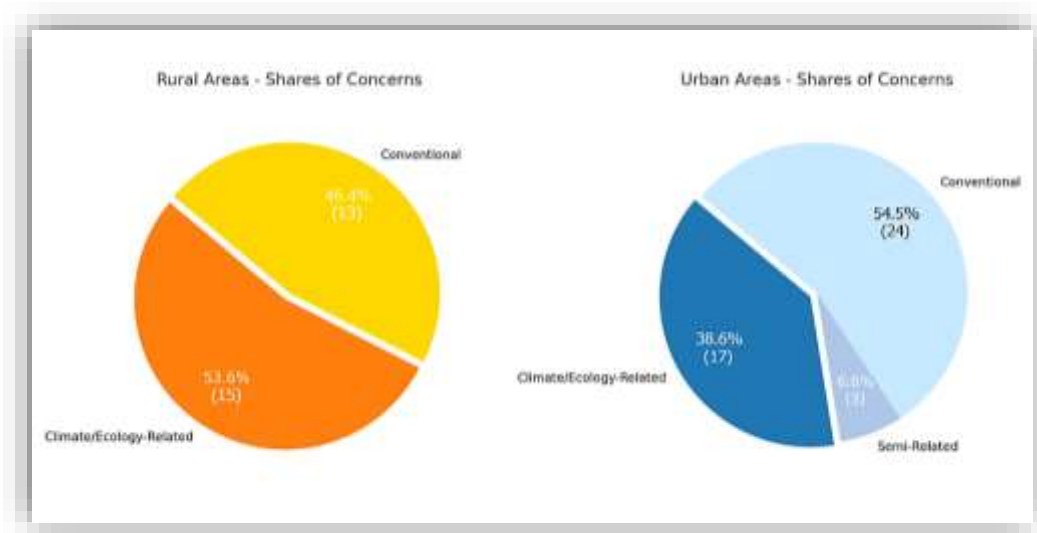
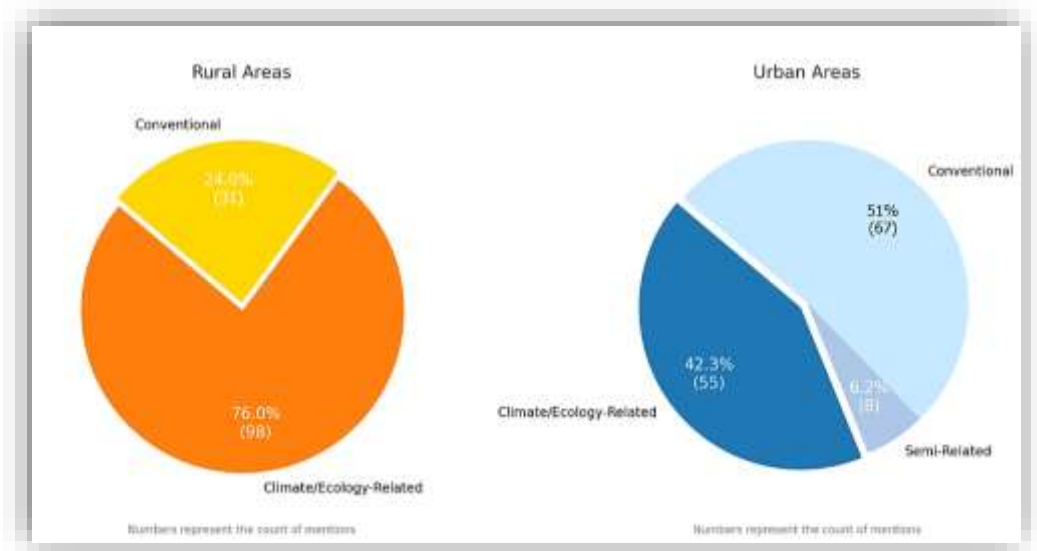


Figure 10. Distribution of mentions of concern types (Urban vs Rural)



For rural areas, 76% of the mentions were related to environmental matters, with 24% of the mentions being focused on conventional issues. For urban areas, about 42% of the mentions pertained to environmental concerns, with 6% of the mentions being semi-

related to environmental issues, and 51% of the mentions being about conventional urban issues.

While urban areas have a more balanced view, with climate issues being important but not overriding other socio-economic challenges, for rural residents it is not merely a matter of environmental concern but a crisis of a much larger scale.

6.1.3. Third set of questions (concept of climate change)

What do you understand by climate change?

This part of analysis comprises climate change understandings extracted from the respondents' answers and classified into several groups.

A. Urban understandings were classified into four groups:

1. **Comprehensive Understanding** (7 Respondents): Respondents could describe various aspects of climate change, including 1) the cause of the problem, 2) the nature of climate change, 3) barriers to solving the issue, 4) data and forecasts from authoritative sources and research, 5) mention certain climate terms, 6) the very mechanics of the global warming process, 7) as well as related topics of climatic and geographical conditions inherent in the CA

Here some benchmark extracts are brought further from an interview with one of the urban representatives that perfectly demonstrate multifaceted understanding of the issue by respondent:

“Climate changed happened before, but now with the introduction of fuel technology and factories, overconsumption in our daily lives, this has led to atmospheric emissions of greenhouse gasses, which creates the effect of a blanket that condenses and does not allow heat to escape and thus heat is trapped in the earth's atmosphere. This breaks the cycle. Thus, climate change became a problem, although it was not a problem, but was a common occurrence... You see, we accelerated the process 2-3 times, we of course set a goal to reduce the heat level by one and a half degrees by 2050, and we even have not achieved such results to this day. And what is more, we see how every time politicians struggle with the question of how to live on if we get rid of oil.

Central Asia is highly vulnerable, as it is subject to extreme heat, droughts, and a major crisis in terms of biodiversity. In mountainous areas, many mudslides occur and biodiversity is being lost... There was a discourse in internet that in Bishkek certain birds stopped singing and people understand that with the growth of cars and industry, birds fly away. The snow leopard rises higher, which is not typical either. We eat products with chemicals, there are a lot of allergies, people with lung problems are

getting more and more every year, because for 4-5 months we breathe smog, which is dangerous to breathe... well, the consequences were 10 years ago already, many say that smog appeared in our country 5 years ago, but it was already 10 years ago. There were studies when a Russian scientist put two hares in a cage where Belinka Bokonbayeva is, and watched them, and a year later they had cancerous growths...

...we see today rising ocean levels making countries with islands think what to do, last year one state on COP announced that it is going to move its country to the metaverse since it has already sunk into the ocean due to rising water, it may soon disappear completely. Thus, they gave residents the opportunity to immigrate to other places.” [Malik, Bishkek-city, male, media-activist and blogger]

2. **Natural and Anthropogenic Causes** (9 Respondents): A significant number recognized both natural and human-induced factors as causes of climate change.

“The reason is human activity, but it is also a natural process as far as I remember, but for the most part what affects today's consequences - it is human activity...” [Bek, Tokmok city, male, student]

3. **Natural Causes with Divine Association** (1 Respondent): Natural process while also associating it with divine motives.

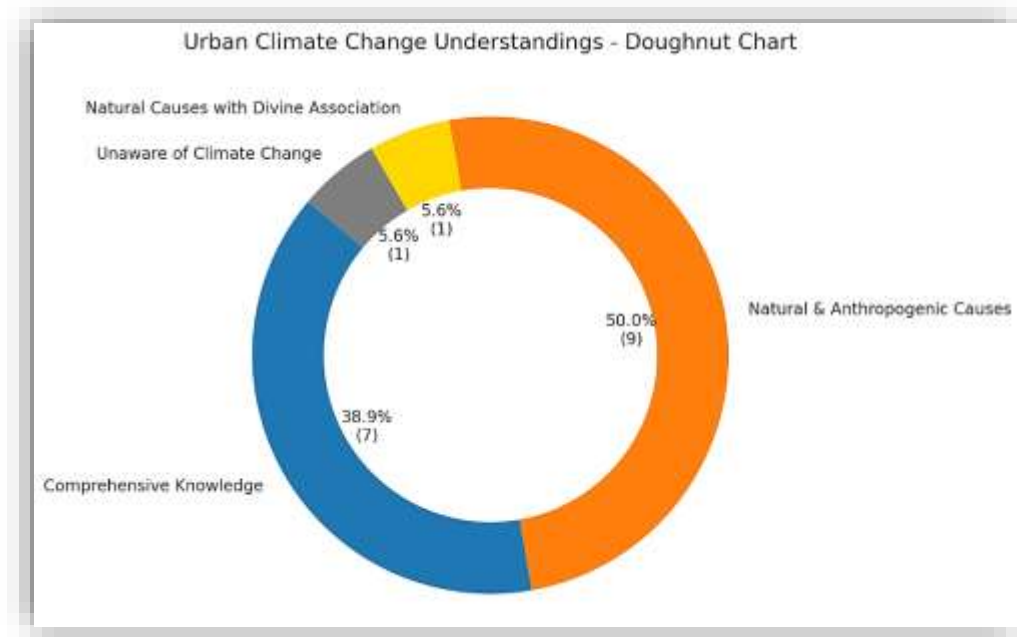
“This by itself is a natural thing, at the same time maybe it's a divine thing, you know people are getting different today, not afraid of Allah...” [Sultan, Kyzyl-Kia city, male, businessman]

4. **Lack of Awareness** (1 Respondent): A single respondent was unaware of the concept of climate change or global warming.

“Maybe I've heard about it, maybe not. You say climate so it must be something connected to weather...” [Erkayim, Aidarken city, female, accountant]

The following chart represents this variety of urban understandings:

Figure 11. Types of climate change understandings (Urban)



B. Rural understandings were classified into eight groups:

1. **Comprehensive Understanding** (4 Respondents): These respondents had a good understanding as well. They could describe 1) causes, 2) nature, 3) personal observations aligning with scientific predictions, 4) climate terms, and 5) complemented the topic with the relative issue of regional water management in the CA.

"...not only for Kyrgyzstan, but globally, global warming is a problem for the whole world, including Central Asia with its rising water deficit. Although Kyrgyz people believe that we live near water, it will definitely worsen the problem that is already bad. Our river is the Sokh River, and there is a lot of water now. But in early spring, much less water came, why? Because Uzbekistan received a lot of land, now there is not enough water in the Ak-Turpak district administration, this is already the beginning of the problem, in 10-15 years Kyrgyzstan will feel it and now global warming is hitting more and more, so there will be less from year to year. Here in Central Asia, the water issue will boil down to politics. There will be conflicts over water, other problems, quarrels." [Marat, Apkan village, male, retired]

This extract demonstrates the existence of the views among rural residents that include not just elements of the issue, but the adjacent matters as well.

2. **Natural and Anthropogenic Causes** (6 Respondents): Similar to urban respondents, recognizing natural and human-induced factors.

“...you see, it actually was a normal process, but a man intervenes in the life of nature in one way or another. Waste coming out of a person needs to be reduced. The glaciers are melting, maybe in 50-60 years will be melt completely, although now we still have water.” [Kunduzbek, Sakaldy village, male, businessman and a farmer]

3. **Anthropogenic Causes with Divine Link** (2 Respondents): These individuals linked human activity to climate change, while also associating it with divine motives.

“The climate gets worse from year to year. We believe in religion, we are Muslims, and it turns out that it is written in religious books, saying that during the last days, people will become so smart that they will be able to take something the size of a shoe and talk to others through it, and we have come to this time now. Now the earth is dying, the climate is changing, thus it is actually being cleaned up. Because people have already become different, not good. I regularly watch news, European sources mostly, and it eventually comes to one thing - that we are polluting this world.” [Noruzbek, Syrt village, male, farmer]

The response reflects a complex understanding of climate change, where anthropogenic factors are viewed through the lens of religious belief.

4. **Anthropogenic Cause combined with an alternative non-consensus theory** (1 Respondent): The respondent could state anthropogenic factors as the cause of current climate change, but also combined this point with an alternative cause that differs from the general consensus about human influence.

^{5.}
“From factories, from cars, from coal, the outgoing smoke affects the climate as I know. I've also heard that Kun (the Sun) is heating up increasingly and it is getting lower, getting closer to us, and for that the snow melts, and there's no more snow left in the mountains.” [Mahabat, Aral village, female, retired]

5. **Natural Causes** (1 Respondent): Attribution to natural processes.

^{6.}
“Actually, this is a natural thing that is happening with climate and weather, but I am not sure on human impact...” [Armat, Syrt village, male, retired]

6. **Natural Causes with Divine Link** (1 Respondent): Natural process while also associating it with divine motives.

“I think the climate is changing itself naturally, but you know, once our old grandparents used to say: ‘If a person's behavior and character change, then his life will follow this path,’ and now people's thinking has changed. For example, when we were little, people helped each other, we would always visit our neighbors anytime and it would be a regular thing. But now it is different, I think if a human character goes bad, the weather will change. You know, also there were scientists that explain that in Mecca, Medina cities (two holy cities of Islam) when there was a severe flood that

damaged everything, by that time actually very many bad people started to visit Mecca and Medina and the sacredness was violated. Therefore, in our current Kyrgyzstan, people are not compassionate and thankful to each other, relationships have deteriorated, number of bad people increased. But we cannot rely only on religion here, after all, we grew up in atheism and are not used to such reasoning, but still religious motives have their role. Well, the elderly would say: 'There is a prayer for rain, if you read it, it will rain and also the same is with snow.' So, I think that's right, there's a religious aspect to it. But at the same time the climate is changing somehow by itself, I think." [Ainura, Apkan village, female, school teacher]

The respondent seems to grapple with reconciling the natural progression of climate change with a religious understanding that human virtues or transgressions can influence the environment. While there's an implicit suggestion that human actions (potentially environmentally harmful activities) are connected to changes in climate, the respondent does not explicitly state this as an anthropogenic cause, preferring to frame the discussion within a religious context. This reflects a blend of acknowledging climate change as a natural phenomenon while also ascribing it a moral and spiritual dimension.

7. **Natural Causes Denying Anthropogenic Influence** (1 Respondent): Asserts natural causes, rejecting human impact and suggesting an international money laundering conspiracy theory.

"First of all, there is such a thing as climate change, but the climate has not changed now. Of course, the weather changes in spring, the weather changes in summer, it changes every month. But weather and climate are two different terms. Climate is a perennial condition of the atmosphere; weather is just one or two days. As a matter of fact, most people can't even distinguish what climate or weather is, if for example, there just rains less this year some people start to say, 'Oh, the climate has changed.'

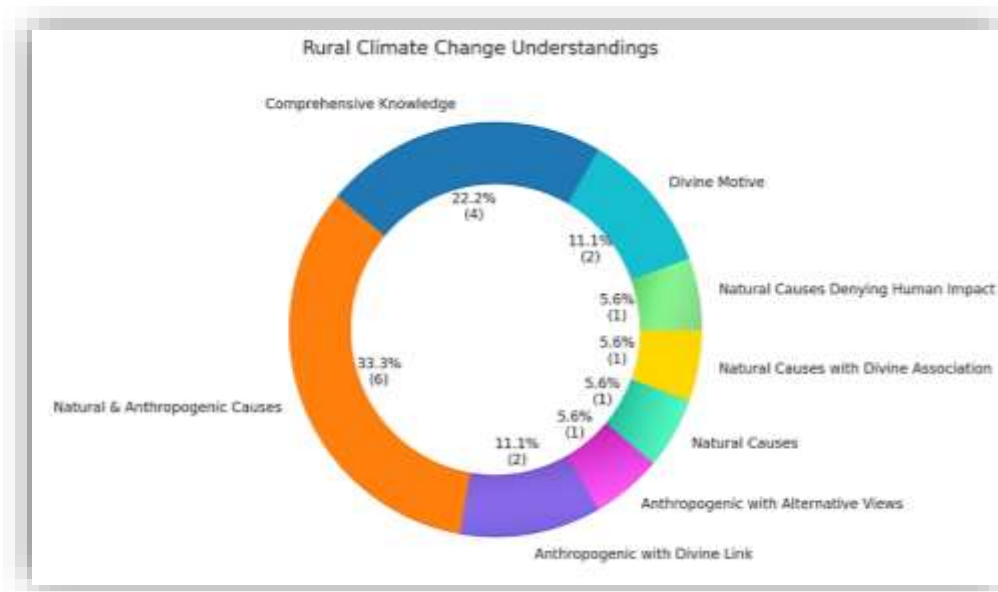
...The matter is that those who work in this industry, they get paid, they won't have a salary otherwise, so they add a little. For example, if we had a cold winter last year, they give it in a different way. But climate change exists as itself, I know that such climatic processes they happened before in the past. That's why I don't believe in such things. For example, it is also often stated that glaciers are melting due to climate change, but if a person goes and blows it up to mine, of course it disappears, but not due to climate change. So, eventually it all comes to politics, people just mix politics with this... And I understood it when social networks appeared, we started to watch not only TV, but find information through phones as well." [Said, Apkan village, male, school teacher]

8. **Divine Motive** (2 Respondents): Climate change attributed solely to divine will.

"Well, people are not capable of doing it, it all comes from Allah." [Zina, Syrt village, female, retired]

A noteworthy observation that four rural respondents did not directly state or acknowledge human activity as a contributing factor (groups 5, 6, and 8) and one respondent outright denied the anthropogenic impact (group 7) indicates that a certain portion of the rural sample holds views divergent from the scientific consensus. This divergence, visualized through the following figure, can be influenced by several factors, including educational background, media literacy, religious and cultural beliefs.

Figure 12. Types of climate change understandings (Rural)



The collected responses to the third set of questions on the concept of climate change reveal a contrast between urban and rural perceptions. Urban respondents demonstrated a more detailed understanding of climate change, discussing its causes, the nature of the problem, barriers to solving it, and citing authoritative sources and scientific data. Rural respondents, however, displayed a broader spectrum of understandings. While some aligned with scientific views, others were more influenced by personal beliefs, traditional wisdom, or alternative theories. This variety showcases the influence of local experiences and cultural contexts on the perception of climate change. Some rural individuals integrated broadly accepted factors with religious beliefs, viewing climate change as a mix of natural processes, human impact, and divine intervention. Others proposed alternative explanations or outright denied anthropogenic influence, sometimes attributing changes to divine motives or dismissing the notion of human-caused climate change altogether. This divergence in viewpoints underscores the

complexity of climate change perception, influenced by individual worldviews, educational background, and the interplay between local experiences and global understanding. The urban responses point to a more uniform scientific perspective, while rural responses reflect a range of alternative interpretations.

6.1.4. Fourth set of questions (communal perceptions)

What is the general perception of the impacts of climate change in the society which you are a part of?

The following is the configuration of how people see perceptions of their local communities. Types of perceptions are divided into groups, with motives behind each type of perception as painted by a respondent of his respective community.

A. Urban - Groups of perceptions types, identified in urban areas:

1. People are not concerned, despite being aware of the environmental problems - **Aware but Unconcerned** (13 respondents) due to:

- a. Other urgent issues taking precedence
- b. Reasoning that the issue will bypass them and that it is a faraway problem

“80-90% of people are not up to it, they are busy providing for families, on how to earn a living and find a job. For example, a taxi driver is thinking about how to find a car and work in order to earn and feed the children...” [Mamatzhan, Kochkor-Ata city, male, retired]

“...young people might have a better understanding than the older generations, but overall people are well informed I think, but these climate problems fade into the background due to other issues.” [Ulukmanap, Bishkek city, male, taxi driver]

“People don't care, most of them have a lot of other everyday problems and people don't think about it, that is it, they are just neutral. At most, they can express dissatisfaction a couple of times, but little is done on their actions...” [Beknur, Bishkek city, male, baker]

The respondents' reflections reveal a common theme: while there is a general awareness of climate change and its potential impacts, this awareness does not translate into active concern or engagement. This indicates that unless directly impacted, environmental issues remain a distant concern for many urban dwellers.

2. People in general are not concerned, though environmental effects started to be directly felt in recent years, raising much concern among small circles - **Concern confined to small circles** (1 respondent):

“Here in Kyrgyzstan, many years ago when people first time heard about global warming and that the climate is changing, people would say that it was somewhere far from us out there or something. But only now people are starting to think the other way. Just recently, in early December, there was no snow and it was plus 15-20 degrees, the whole internet was making noise about why this was happening. And then people realized that something was changing, and it is actually at such moments when I notice that people start to discuss such environmental topics...”

*... I remember when the community began to feel it noticeably 5 years ago, and began to feel it very strongly 2 years ago, when problems **with water shortage** began. People began to think where this shortage comes from, environmentalists and journalists began to explain the reasons, and people began to understand...the consequences became clear and felt to people 2 years ago. The same was with the smog that started like, 10 years ago, it was getting worse with every year. So now as we witness people begin to think only with the appearance of problems. Thus, the level of awareness has increased dramatically due to such problems..., but again, people whom I know, work with, spend time together - we understand that there is climate change, but society as a whole does not. Nevertheless, now people have at least some understanding compared to the past.” [Malik, Bishkek-city, male, media-activist and blogger]*

Initially perceived as a distant issue, the public's attitude began to shift notably in recent years due to tangible experiences like unseasonal weather and acute water shortages. However, despite this increased concern within certain groups, the overall societal concern remains limited. The respondent's observation that personal networks are more cognizant of climate issues contrasts with the broader societal response, which, while more aware still lacks concern.

3. People that are educated might be concerned - **Educated Segment Concern** (2 respondents):

“...there are no people in my environment who would be concerned about this, I at least did not notice. In general, in Bishkek, I think everyone realizes and understands that the climate has changed, but I do not know, purely my opinion. A few years ago, when the ecology related issue of uranium mining was raised there was a lot of buzz. People were really concerned then, but only that time. Well, in general, I think it is the educated segment of the population that might be worried with the problem nowadays.” [Bakyt, Osh-city, male, human rights activist]

This observation suggests that while the educated populace might have a consistent level of concern, the broader community's engagement with environmental issues is

more reactive and event-driven. The respondent acknowledges that during specific environmental crises, such as the uranium mining issue, there was a notable increase in public concern, highlighting that certain events can temporarily elevate environmental issues to the forefront of public consciousness.

4. People are much concerned - **General Concern About Environmental State** (2 respondents):

“I notice that the civic activity of the community is increasing, 10 years ago they thought that it would not affect anyone, now society reacts sharply to such environmental problems, moreover here as urban people we are more aware of it than others. Because Bishkek is experiencing the air pollution, so my friends and relatives perceive it all acutely, and the community as well.” [Damir, Bishkek-city, male, film director]

As the remaining two respondents observe, people in their city are much concerned with the environmental state, due to worsening air pollution/smog.

Thus, in urban areas air pollution takes precedence over water scarcity. Moreover, immediate socio-economic issues tend to eclipse climate change, thereby influencing the urgency assigned to environmental matters.

B. Rural - Perception types, identified in rural areas were classified in the following ways:

1. People are not concerned, since no water shortage is felt - **Not Concerned** (7 respondents), despite noticing environmental changes like pasture degradation and others, due to:

- a. absence of perceived water shortage
- b. short-term thinking and lack of long-term environmental foresight
- c. attribution of environmental changes to divine will (possibly affecting the perceived need for intervention)

“My 20-year-old grape withered after a severe cold, it was always growing very well, but it withered this year, though such things have never happened before. Due to such cold in the winter the persimmon also did not survive. Neighbors say the same things. This year, the water was good, so it is not because of a decrease in water. So, it is because of how cold it was. But the water is enough thank God, so for our community it’s not so big issue, but it seems like something was different this year with climate, we all felt.” [Kurman, male, Sakaldy village, farmer]

“Those who say that there is enough water - uneducated people who don’t want to think broadly, they think about today’s water, they just see water running in the ditch and think it is okay. And they will not be aware of the problem with water for maybe five more years, but it has already become known to the villages in the bottom. Our people just don’t think long-term... Firstly, there is little snow in the mountains. They say it enough, but already this year I noticed that the amount of water arriving was less than usual in Apkan. It was also too hot. Fruits don’t ripen as fast as they used to, or ripen earlier. There is no honey for beekeepers here, because there is no rain, let’s go to the Leylek, and there we will see the actual drought. If we look at people from the bottom they completely felt it, so this is a crucial problem already for people who live in the bottom farther from the sources than we.” [Marat, male, Apkan village, retired]

“People don’t think about that ‘climate change’ much. People say that this is the will of Allah, they do not know a lot. But sometimes I hear about the water deficit from people that are being concerned, those are generally from other villages experiencing deficit, this is a big problem right now, I personally think. It is enough for us now, and people in general are not so concerned since we have boreholes, but I get afraid for my grandchildren, when I listen to those people, what might happen in 5 or 10 years from now, everything may change.” [Mahabat, Aral village, female, retired]

According to the respondents, people notice shifts like unusual cold spells and crop damage but do not see these as immediate threats due to currently sufficient water resources. This leads to complacency about the broader environmental implications. Their short-term focus on immediate conditions, results in a lack of preparation for future environmental challenges. Additionally, some in this group attribute these changes to divine will, framing climate change as a natural or predestined phenomenon rather than an issue necessitating proactive response and mitigation.

2. People are not taking action, though water shortage is felt - **Aware and partially Concerned but Inactive** (6 respondents). This segment acknowledges environmental changes, specifically the decrease in water, but remains inactive due to:

- a. certain amount of water being still available, despite the observed decrease
- b. immediate agricultural priorities and the need to support families (people must manage to finish their work on fields in time, while the weather conditions allow, so they don’t have time on such issues)
- c. community fragmentation, hindering collective action.

“Firstly, all a person thinks about here is to live through the winter season without problems, and people here are simply just not interested in that ‘climate change’. This question here is not raised much, and certain other problems too. Because here we have that national division. We have the Tajik people here, the Kyrgyz, the Uzbeks and many others are mixed, and the problem is that there is no unity. But in general, of course everyone understands that there are environmental changes going on, the most

important thing is ecology nowadays... The water decrease is seen and the pastures are dying, but we have no unity” [Kadyrbek, Aral village, male, salesman]

“In recent years, the volume of water coming from mountains is getting less and less. So, the number of people that started pumping groundwaters has increased compared to previous years, and I am afraid we may start to experience the decrease of the groundwater as well. Now people understand that water is more expensive than gold. But again, for example, if the government comes and say not to pump so much water or something, they will not listen, saying, “There must be water near my house, I need to live somehow...” and the same is with the climate issue, we all feel it, the plants are withering, and we even can’t grow certain cultures normally, the same with pasture and livestock, but people are busy with their own issues [Noruzbek, Syrt village, male, farmer]

“We don't know much about that ‘climate change’, but we feel it ourselves, it is evident to us that the snow has decreased and the water deficit is present. But here people don't discuss often such matters, for example I don’t see people discussing that we should do something or manage water somehow, everyone just does what he thinks is good for himself.” [Zina, Syrt village, female, retired]

Despite awareness, a sense of inertia persists, largely due to combination of factors: the immediate availability of water, albeit decreasing, instills a temporary sense of security; pressing agricultural demands and familial obligations take precedence, leaving little room for collective environmental action; community fragmentation based on ethnic lines dilutes a response to the environmental crisis. This group is in a precarious balance between recognition of the problem and action, reflecting a state where urgency of daily survival outweighs the perceived importance of long-term sustainability.

3. People are concerned and they are taking actions - **Concerned and Active** (5 respondents). This group is actively engaged in addressing climate change impacts, driven by:

- a. direct experience of water scarcity and its consequences
- b. participation in workshops and engaging in projects supported by environmental organizations (IFAD, Rural Development Fund, Kyrgyz Jayit association)
- c. success of local initiatives, leading to broader community action (people have witnessed successful precedents of measures implemented by certain representatives of their community, what drives a bigger stimulus among society)

“Residents’ life here is connected with agriculture, for example, this year there were no rains, it was a dry year, there was a shortage of water. Because of the lack of water, we farmers had fewer crops... Our community feels all this on its own skin. At the same time the public is well aware and is involved in taking actions because we have different

projects within the ARIS (Community Development and Investment Agency of the Kyrgyz Republic) framework, these projects are funded by the World Bank and IFAD (International Fund for Agricultural Development), we have a lot of seminars and webinars on climate change, we have information about it. There are many topics and discussions, explanations, how to save water and climate, so our community is well versed in the theoretical aspect. Also, we are five villages in the vicinity, so five of our villages now are working together to recycle garbage and transport garbage from the villages. And there are other measures as well.” [Mirbek, Orgochor village, male, guide]

“Everyone may understand this issue differently, but what is felt by each of us is that the water has decreased, so in general this is perceived as a serious problem by the whole society, because all understand that water is less now, and people now start restoring their old boreholes. The public is experiencing other effects like pasture deterioration, livestock undernourishment, the humidity is being lost. So, eventually we decided to contact the Kyrgyz Jayit association, see if we can try setting up this artificial glacier together, to see if it can solve our issues at least partially.” [Ismat, Orozbekov village, male, farmer]

“100 percent all people know, they know, but whether they don't want to get any responsibility on their shoulder and their ego or what, cause when we would get together for a meeting in our village, and then when you mention certain environmental problems, they in response start teaching you on what is actually happening and how you should do what. But when it comes to work there are actually no attempts, they act as they know but do not do anything. But thanks God, we have people that are willing to act, and thanks to such people we managed to construct the first artificial glacier in Kyrgyzstan. ...and the interesting part is how people change their mind on such activities when they see it actually working. There are those who come to me and say, ‘This really has a future, this really has benefits,’ saying that the territory around the construction is green and has recovered, thanking for doing such a job. The project was partially supported by IFAD and Kyrgyz Jayit association and the rest we did ourselves, now when project was good the local administrative council is considering to find some free money to develop it further.” [Rustam, Zherge-Tal village, male, farmer]

“Understanding among people is good, the young generations and the elderly too have an understanding. Before that all people treated this indifferently. Now the buzz around water scarcity has been going on for three years, water has become more expensive than gold for people... It all started when I went to a workshop by Kyrgyz Jayit association on pastures, that is where I learnt about those artificial glaciers. To be honest when I first heard about it, I did not believe it, remember thinking, ‘How come it is possible to build such a thing? Are they crazy?’ But eventually when I returned home, I just decided to suggest it, saying ‘There was such an idea, what if we try?’ I am really proud and thankful to the community that we have here, they understood, did not call me too old or too young, or inexperienced or something. They supported with what they could, though there were some skeptics in the beginning. So, we did all the calculations and blueprints, and then we contacted Abdimalik Abdikaarovich (director of Kyrgyz Jayit association). In the beginning we were not sure, but after the initial actions and attempts ended up successful, there appeared an incentive among people. The people themselves started to suggest like, ‘What if we do it there, it turns out we

can create our own water reserves, let's do it together.' Now, that we have done the project, we are planning further, and by God's will if everything is okay, we want to set up another glacier this time from our own funds. But when we were starting it, again, even some of those who work in the local village administration would say like, 'Come on guys, don't tell us fairy tales.' But now the incentive from within the administration itself is very reassuring." (Zakir, Ak-Bashat village, male, farmer)

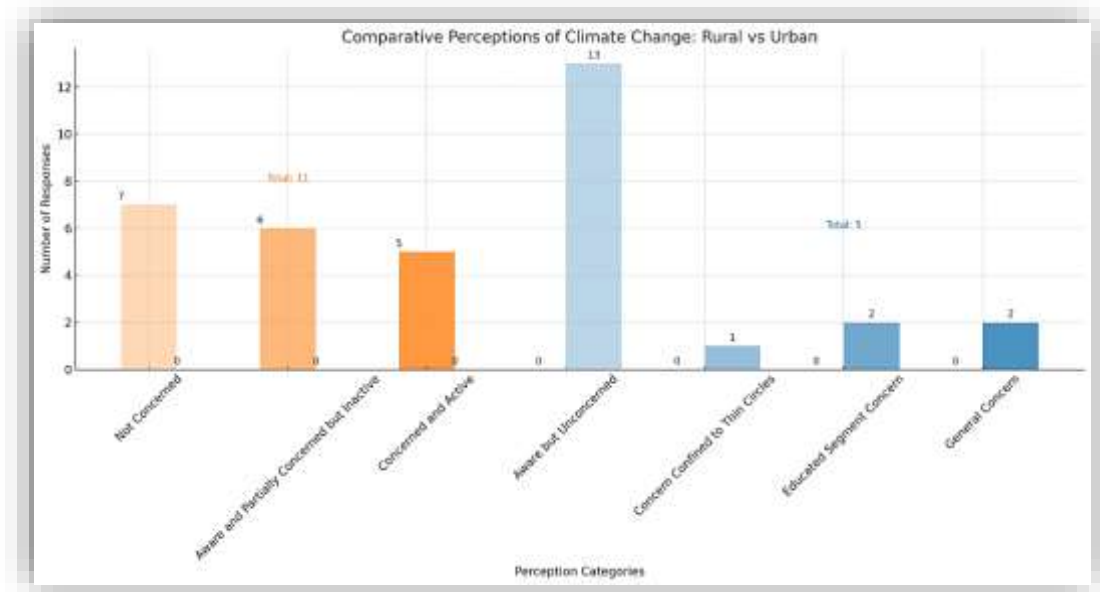
"Everyone in our community believes that something is changing with weather patterns, it has been so for the last 5 years, maybe even 10 years. So, from the start, when it was introduced here, the people accepted the idea with glaciers well, and every generation of people in the village gathering into their groups, whether 200 meters or 400 meters, would dig one by one. And this year with God's help we did it." [Adis, Syn-Tash village, male, farmer]

The success of these community-led initiatives underscores the potential of local action in driving broader environmental change and serves as a model for other communities facing similar challenges.

Water scarcity emerges as a key determinant in shaping local perceptions and actions regarding climate change. Its presence or absence significantly influences the level of concern and subsequent responses within the community. What is more, the lack of external training and involvement in the first two groups seemingly is the factor contributing to their inactivity. In contrast, communities that are "Concerned and Active" benefit from external educational resources and support, elevating the level of engagement and action in the groups. On the other hand, community fragmentation and immediate livelihood concerns also influence the degree of collective action.

From the narratives shared by urban respondents, 13 out of 18 were categorized as "Aware but Unconcerned." The remaining 5 accounts from urban areas conveyed varying levels of concern within their communities. On the other hand, rural respondents' descriptions painted a different picture, with 7 out of 18 narratives, being identified as "Not Concerned," while the other 11 depicted a spectrum of awareness and concern regarding climate change in their communities. The following chart illustrates the provided data:

Figure 13. Perception categories gained from respondents (Rural vs Urban)



In examining the perceptions of climate change in rural and urban areas, a clear contrast emerges. In rural regions, a spectrum of responses, from apathy and inaction to proactive measures, is seen. This is seemingly influenced by immediate agricultural needs, community fragmentation, external support and successful initiatives. It is important to note that fragmentation and disagreements at the communal level could result in low adaptive capacity.¹⁵⁰ Urban responses, predominantly falling under the 'Aware but Unconcerned' category, suggest a recognition of environmental issues without a corresponding sense of urgency, overshadowed by other immediate urban concerns. This results in a notable disparity: rural communities, despite some apathy, exhibit a higher overall level of concern and action compared to urban communities, where significant portions remain unconcerned despite awareness. The variation in responses across these settings highlights the complex interplay of environmental impacts, socio-economic factors, and cultural beliefs in shaping climate change perceptions.

¹⁵⁰ M. Abid, J. Schilling, J. Scheffran, and F. Zulfiqar, "Climate change vulnerability, adaptation and risk perceptions at farm level in Punjab, Pakistan," *Science of the Total Environment* 547 (2016): 447–460, December 20, 2023, <https://doi.org/10.1016/j.scitotenv.2015.11.125>

6.1.5. Fifth set of questions (adaptation/mitigation)

What types of adaptation measures can you name that are practiced in your community or ones that you are aware of?

A. List of counter-measures mentioned by urban residents:

1. Planting trees (2) **greening measure**
2. Conducting educational events (2) **educational measure**
3. Transition to drip irrigation (1) **water measure**
4. Insulation of calf barns (1) **livestock measure**
5. Transition to alternative fuel sources in the use of cars (gas and electric) (1) **alternative energy measure**
6. Use of vermicompost (1) **crop cultivation measure**
7. Construction of hydroelectric power stations (1) **alternative energy measure**
8. Installation of solar panels (1) **alternative energy measure**
9. Introduction of tax-free regime for electric vehicles (1) **legislational measure**

Urban respondents identified 9 strategies that could be grouped into 7 categories, garnering a total of 11 mentions. It's crucial to highlight that a substantial portion of the strategies suggested by urban participants was contributed by a single respondent who demonstrated a strong grasp of the subject matter.

B. List of counter-measures mentioned by rural residents with indications of number of mentions for each practice and the type of the measure:

1. Borehole and well construction (6) **water measure**
2. Construction of artificial glaciers (4) **water measure**
3. Replacing crops with more resistant alternatives (3) **crop cultivation measure**
4. Conducting educational events (4) **educational measure**
5. Cementing/concreting of waterways (3) **water measure**
6. Burying/mulching plants (2) **crop cultivation measure**
7. Optimization of pasture management (redistribution of territorial livestock grazing to reduce the load on pastures / transition to intensive cattle breeding) (2) **livestock measure**
8. Construction of a reservoirs (2) **water measure**

9. Planting trees (1) **greening measure**
10. Reading prayers (1) **religious measure**
11. Use of special substances in growing crops and plants (1) **crop cultivation measure**
12. Transition to drip irrigation (1) **water measure**
13. Changing the Land Code (1) **legislational measure**

Of the total 31 mentions, 16 instances correspond to 5 separate water-centric strategies, highlighting the strong focus on addressing water scarcity. Furthermore, diversity of strategies, including tree planting, pasture management optimization, educational measures, crop substitution, mulching plants, transition to drip irrigation, legislative measures and even religious ones demonstrate a multifaceted nature of methods utilized by rural communities. Collectively, rural respondents cited 13 strategies, which were sorted into 7 categories.

Rural communities, in general, exhibited a more holistic and multifaceted approach to climate change adaptation, prominently focusing on water scarcity. The prevalent measures, including borehole and well construction, artificial glacier construction, and cementing waterways, directly address this critical issue. Additionally, the implementation of diverse strategies such as crop substitution, educational events, pasture management optimization, legislative changes, and religious practices highlights a comprehensive approach. These varied measures, encompassing both practical interventions and cultural practices, reflect an integration of traditional knowledge and innovative solutions.

Overall, urban respondents unlike the rural participants were not able to delve as deeply into the topic of adaptation. The following charts present the differences:

Figure 14. Number of mentions for each measure (Rural vs Urban)

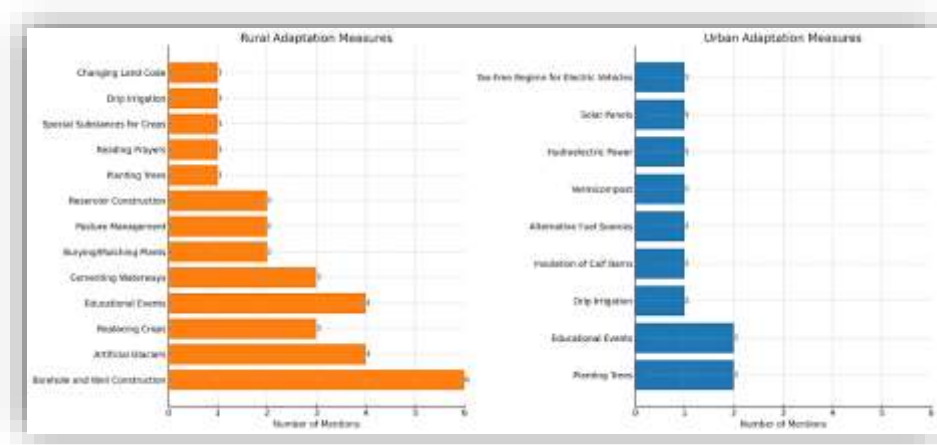
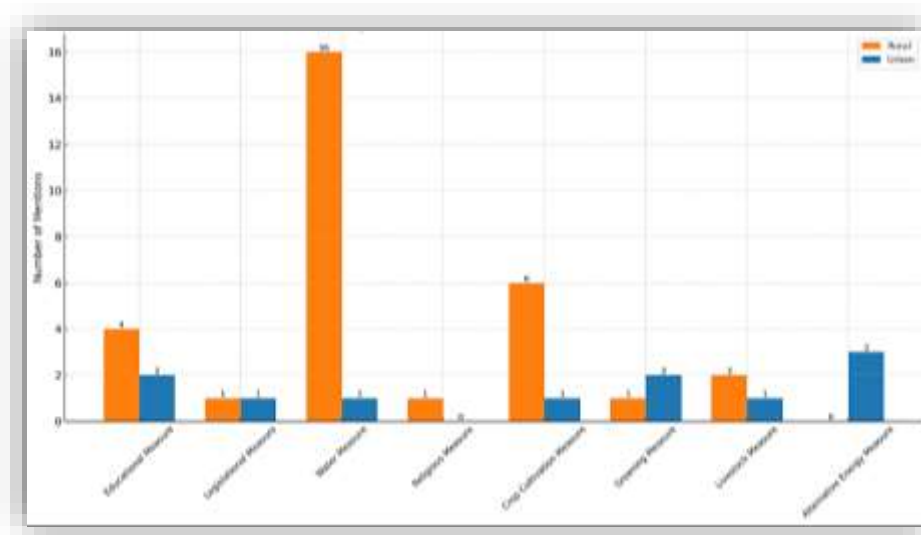


Figure 15. Number of mentions for each measure (categorized into common group based on the measure type) (Rural vs Urban)



Thus, rural communities primarily focus on water scarcity, as evidenced by both the frequency and diversity of water-related measures. Urban areas, while mentioning fewer measures overall, display strategies with a slight emphasis on sustainable technologies.

6.2. Important observations from the field studies to consider

6.2.1. Information accessibility as a potential factor

During the interviews, respondents would mention that they obtain information from various sources such as the internet, television, radio, and newspapers. These accounts, particularly from rural respondents, offer some insights into the current state of information accessibility in rural areas that were examined. The frequent references to these information sources indicate that rural inhabitants have access to a diverse range of information channels. This observation aligns with the initial findings from the preliminary research, which suggested that issues related to information availability have diminished in rural areas in recent years. Consequently, this factor was not initially considered as a potential variable that could influence the perceptions of rural groups, in contrast to other selected variables such as “exposure to risks” and “educational attainment.” Furthermore, the implications of this are twofold. Firstly, the enhanced access to information could be a significant factor in shaping rural residents' perceptions of climate change. With more information readily available, rural populations have the potential to be as informed as their urban counterparts about global and local environmental issues. This access allows them to incorporate a broader range of data into their understanding and discourse on climate change, making it a more salient issue in their consciousness. On the other hand, it is unclear to what extent it can expose rural residents to extensive disinformation on climate issues, particularly those with a low level of media literacy skills, what is reflected in the following excerpt:

“...The matter is that those who work in this industry, they get paid, they won't have a salary otherwise, so they add a little. For example, if we had a cold winter last year, they give it in a different way. But climate change exists as itself, I know that such climatic processes they happened before in the past. That's why I don't believe in such things. For example, it is also often stated that glaciers are melting due to climate change, but if a person goes and blows it up to mine, of course it disappears, but due to climate change. So, eventually it all comes to politics, people just mix politics with this. And I understood it when social networks appeared, we started to watch not only TV, but find information through phones as well.” [Said, male, Apkan village, school teacher]

Thus, the issue of media literacy within rural areas might deserve a separate attention.

6.2.2. Regional Climate Variations

During interviews, the northern respondents linked the drying of vegetation primarily to a discernible reduction in water availability, simultaneously

acknowledging a trend of warmer winters in recent years. Contrastingly, in the south, individuals associated similar botanical challenges with a notable decrease in winter temperatures rather than water scarcity, which was not as pronounced an issue for them as for their northern counterparts. Despite these regional discrepancies, a shared observation across both groups was a marked decline in snowfall. This points to the possibility of regional variations in climate patterns, influenced significantly by geographical location.

6.2.3. Artificial glaciers

Delving further into the topic of adaptation measures, a notable adaptive strategy of the construction of artificial glaciers can be noted. This innovative method has been proving instrumental for rural communities, facilitating the restoration of moisture to dried-up pastures, recovering green ecosystems, and crucially, augmenting water reserves for both irrigation and consumption purposes. This relatively new concept is swiftly gaining traction among Kyrgyz farmers. In this regard, Abdimalik Abdikaarovich, the initiator of the method and the director of the Kyrgyz Jayit association, elaborates on its impact, stating,

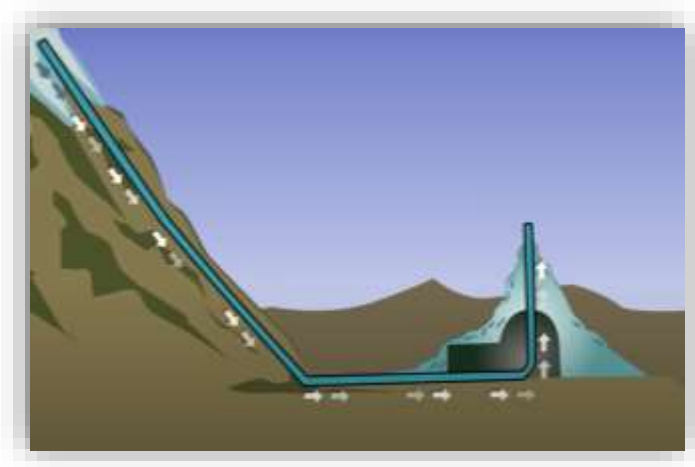
“...before that, we would create captages - from a water source in the mountains, but it was kind of a summer variant, and I decided why not transfer this technology to a winter format, because water anyway after 100-200 meters goes further into the soil in some random place and disappears. So why not direct and collect this in one specific place. We made it through putting a pipe down from the mountain sources and extending it to a specific place, where the pipe would be turned in a vertical position like a fountain 20 meters high up above the ground.

Unique feature is that it is this type of water does not freeze, always at the same temperature, and it goes down the pipe, and then the splashes from above for a long period of time, the layers of water on the surface of the ground freeze, and in the winter, gradually the large volume of ice forms - making up a glacier. Nowadays we already have in some places glaciers where the volume reaches up to 100 thousand cubic meters - a good supply of water. In the spring, when the warm season comes, it slowly begins to melt.

You can use this primarily for watering livestock and secondly as drinking water for the population who are nearby. It is also possible to irrigate areas in the nearest villages, the vegetable gardens and agricultural crops, or watering pasture areas, up to 20 hectares, and thus a favorable microclimate is created in such areas. And now we have been working with such projects in different regions for three years... Where such glaciers were created, the population says that the situation has changed, there are more herbage and insects, and it has become easier to plant trees, no negative aspects have yet been identified.

Recently, the Minister of Natural Resources even invited me and told me that it had reached our president and the president had commissioned the creation of such projects. We are only doing small ones so far, but they are already interested in making large glaciers.”

Figure 16. Artificial glacier illustration¹⁵¹



The positive transformation seen in communities with these glaciers highlights their significance in building climate resilience and offers a model for similar environmental initiatives in the future.

6.2.4. Revisiting Adaptability

According to outcome of this study, concerning the aspect of the adaptation strategies among rural and urban residents, rural communities showcased a deeper and more comprehensive approach to climate change adaptation. This challenges the conventional view among scholarly texts, mentioned before, that villagers are less adaptable. As it was noted, it is one of the three key aspects of vulnerability, which includes: (1) exposure to extreme weather, (2) sensitivity to these conditions, and (3) the capacity to adapt. Considering that adaptability means ‘how well a community can adjust its behavior, manage its resources and use technology to deal with changing weather,’ contrary to what might be expected, the rural participants in the study showed not just a deeper concern for the impacts of climate change, but a greater ability to adapt than their urban counterparts, in general. While it was initially pointed, according to scholars, that rural communities lag behind in adaptability, villagers actually

¹⁵¹ Azattyk youtube channel, “Жасалма мөңгү экологияны калыбына келтирүүгө жардам берет” [“Artificial Glaciers Help Restore Ecology”], accessed December 9, 2023, <https://www.youtube.com/watch?v=LPUCXb9FDMc>

demonstrated a stronger capacity for resilience, while other two constituents as exposure and sensitivity were confirmed. However, it's worth noting that this adaptability in certain rural areas correlated with the existence of additional factors in those settlements, like involvement of third parties, conductance of seminars and workshops, degree of communal unity and successfully implemented precedents of adaptation practices.

Nevertheless, while the study highlights the adaptability of rural residents, it needs to be noted that, overall, their urban counterparts, due to their generally higher socio-economic status, welfare, and resource availability, might have a potentially higher capacity for adaptability. This potential hasn't been fully realized or demonstrated in the same way as in rural communities, at least within the context of this study, possibly due to a different set of priorities and lesser direct impact of climate change in urban settings. In other words, while urban residents have the resources and socio-economic status that could facilitate adaptability, these advantages do not translate into a more effective response to climate change compared to rural areas. This might be elaborated further to deliver deeper insights on the influence on the adaptability of such factors as the level of welfare, or in contrast to, poverty and other potential factors. However, this topic might deserve a separate exploration itself.

6.2.5. Expert view

During the interview with Abdimalik Abdikaarovich, the following points were noted by the expert, that align with the research framework and offer valuable insights in general:

“In villages, they really feel natural problems more and evaluate them correctly. In places where we create glaciers, most of the population supports and people actively participate in the construction of the glacier themselves, everyone is ready to work, both men and even women, they all say themselves that they need it and are actively engaging. But in cities, too, this year many residents felt that there was not enough water and even a lack of drinking water began to be felt and the urban became worried, there was a lot of noise. But in the villages, of course, the absolute majority has been feeling it for years already. In our country, both in the Chui Valley and in the south, due to the lack of irrigation water, people lose a lot of crops, and the environmental situation worsens, not to mention that many of them still don't have access to clean drinking water. So, in general, rural residents have a more serious attitude, but in cities they are beginning to understand better, especially this year (referring to 2023).”

Thus, it can be inferred that peoples' perception in those rural areas is reflected in their active participation and support for projects like artificial glacier construction, where people collectively engage, recognizing the necessity of these projects for their well-being. The rural population, in general, has been experiencing the adverse effects of environmental degradation for years and this long-term exposure to environmental hardships has led to a more serious approach. At the same time, although urban residents have historically been less attuned to environmental issues compared to rural populations, there has been a change in urban perception, particularly regarding **water scarcity**, which became especially noticeable last year, as Bishkek started to experience a visible lack of drinking water. This point, once again highlights the role of the immediate effects and the lived experiences.

6.2.6. Voices from the field on “When Risk Becomes Real”

Throughout data collection, recurring themes emerged in respondents' dialogues, highlighting the significant role of "exposure to risks" in forming perceptions about climate change:

“The time when I started to realize for myself that there is actually a water issue exists - we have a land, 1 hectare, and I started looking after it 3-4 years ago. Before that I had never thought that there might be a water problem, my father took care of it. When eventually I replaced my father on that role and when it fell on my shoulders, that is when I started to see that there is actually a water problem” (Zakir, rural)

“When I studied at school, we had a teacher named Sabyrkul who used to teach us geography, he was a good man. He would sit and talk about it often, I sometimes disliked him, thinking ‘Is he crazy? Definitely out of his mind.’ He would say, ‘Years will pass, centuries will pass, the Earth will change, step by step Kyrgyzstan will come to the equator.’ I would say, ‘I am not so sure teacher, why are you saying such strange things?’ He would just say in response, ‘Just wait... just wait, and you will see.’ And now... from time to time I recall his words. I would not think about it during my school years, only would think, ‘He is going nuts, if he is saying that.’ And now I see that until a human being eventually does not feel it on his skin, he will not pay a little attention to it. And here we are, experiencing it and acknowledging it...” (Amir, rural)

*“We don't talk about such things. The other way around, I have my own businesses that I must take care of, and here with them the days pass, my family has businesses, and we think about them mostly... Well, but I am pretty sure if, for example, I owned a ski resort, probably I **would** be concerned by the fact that the snow is melting.” (Sultan, urban)*

“...well, if a hurricane hits them, then of course, I think, they will start thinking about something like climate change... But otherwise, people just live on autopilot, like vegetables.” [Nuradil, urban]

These and many other collected narratives directly from the respondents collectively once again indicate that the extent to which individuals face environmental risks, directly correlates with their perception and prioritization of climate change issues.

6.3. Chapter conclusion

The detailed examination of the survey responses casts light on the distinct perspectives on climate change held by urban and rural communities and the range of their adaptation strategies. Urban participants often discuss a wide array of socio-economic concerns, with environmental issues forming just one part of their complex urban narrative. Conversely, rural residents, whose existence is closely intertwined with their environment, demonstrate a pronounced awareness of ecological issues, notably water scarcity. This acute awareness is evident in both the types of challenges they identify and the variety of water-centric strategies they employ to cope with these challenges. Urban responses, while less varied, tend to focus on technological advances. In general, rural communities possess a higher level of concern. However, it is noteworthy as well that perceptions among urban communities have developed within the last several years towards a stronger sense of concern as well, namely due to the annual deterioration of air quality and, most importantly, noticeable water shortage in Bishkek - a problem that made itself felt acutely in 2023 in particular. Thus, it becomes vivid that concern within the both types of locales has been driven by one variable, namely, water scarcity. This underscores that these are individual experiences and the immediacy of challenges that play a decisive role in shaping perceptions above all else, what transcends a simple rural-urban division. This is substantiated by existence of a spectrum of concern levels, ranging from being unconcerned to the opposite within the both settlement types. Education also plays a pivotal role; rural regions that participate in environmental education initiatives showed heightened concern, whereas urban populations, with their wider access to education, display an overall deeper understanding of climate change, though this understanding does not necessarily translate into action. It was also also uncovered that collaboration with external organizations and the success of previous adaptation efforts greatly influence the level of awareness and the motivation to act. Overall, it appears that rural respondents exhibit a greater sense of urgency and a higher propensity for action in comparison to their urban counterparts.

Section 7. Conclusion

This research aimed to unravel the complexities surrounding the perceptions of climate change among rural and urban populations in Kyrgyzstan, investigating the interplay between educational attainment and direct exposure to environmental impacts. In both rural and urban settings, respondents demonstrated varying degrees of awareness and concern, reflecting the diversity within each group. Some rural respondents integrated scientific understanding with religious and cultural narratives, while others questioned or denied anthropogenic factors, attributing climate phenomena to natural or divine forces. Urban respondents, meanwhile, recognized climate change more uniformly but tended to relegate it to the background amidst other pressing urban matters. Villagers, whose livelihoods are intimately connected to the natural environment, exhibited a heightened sense of urgency towards climate change, rooted in their direct experiences with adverse environmental effects. Their concern is not merely an academic acknowledgment but a lived reality that threatens their daily sustenance. Despite lower levels of formal education, these individuals in general demonstrated a higher level of concern of the immediate repercussions, which shapes their perception of the impacts of climate change as an urgent threat. On the other hand, urban residents, despite typically higher educational attainment, do not necessarily translate their awareness into the same type of perception. While cognizant of climate change and its potential ramifications, they perceive it as a distant issue, to a greater extent accepting it as secondary. In urban respondents' framework environmental issues are more like one of many concerns competing for priority, while the priority for villagers is obvious and is expressed mostly in the need of water. The study indicates that direct exposure to climate change's impacts plays a more critical role in shaping perceptions than educational attainment. This research concludes that the perception of climate change in Kyrgyzstan is a mix woven from experiences, contexts, and the immediacy of challenges, dependent on the existing contrast between **rural immediacy and urban detachment.**

This finding implies that there is a potential for an organic progression from a state of 'concern' to one of 'awareness'. Those who are directly affected by climate change tend to proactively comprehend and mitigate their immediate concerns. In contrast, progression from a state of 'awareness' to a sense of 'concern' can prove more complex. Knowledge alone, without emotional resonance, might lead to an intellectual grasp of climate change not necessarily creating the urgency to act. This research thus culminates in an essential inquiry: *What other factors, except for the direct experience, can mold the perceptions of climate change before individuals personally confront its impacts?* Unraveling this question may require a separate exploration into understanding how individuals may come to respond to the pressing challenge of climate change before its effects become a personal reality. This question opens a new avenue for future research, inviting further investigation into the factors that shape our collective and individual responses to this global crisis.

Section 8. Limitations of the study

Certainly, this research has its constraints, primarily rooted in the resources available. Key limitations include:

8.1. Methodology

This research primarily utilizes qualitative methodologies, which, while offering detailed and context-specific insights, may not yield a comprehensive statistical representation of the broader population. Such methods are deeply informative but may not be widely generalizable. Participants for interviews are chosen based on their availability and willingness to engage, a decision driven by the practical and cost-effective nature of the approach. However, this may limit the extent to which findings can be generalized, as the results derived from this sample may not fully reflect those that could be obtained from a more diverse or larger population.

8.2. Resource and Time Constraints

The scope of the study was restricted by the availability of resources and time, possibly limiting the depth or breadth of the inquiry.

Despite these limitations, this research offers valuable insights and can serve as an essential preliminary step, sparking further studies and shaping more comprehensive agendas. By understanding these constraints, future researchers may design more robust studies that build on these initial findings, deepening our understanding of the challenges and opportunities within Kyrgyzstan's education system.

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APPENDIX

List of interviewed experts

- 1) Abdikaarovich, Abdimalik. Director of the Kyrgyz Jayit association. September 9, 2023.