ENVIRONMENT, CLIMATE CHANGE AND MIGRATION IN THE KYRGYZ REPUBLIC

IOM International Organization for Migration
МОМ Международная Организация по Миграции
МЭАУ Миграция боюнча Эл Аралык Уюму

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In its activities, IOM believes that humane and orderly migration responds to the interests of migrants and society as a whole. As a leading intergovernmental organization IOM is working with its partners in the international community, guided by the following objectives: to promote the solution of urgent migration problems, improve understanding of problems in the area of migration; encourage social and economic development through migration; assert the dignity and well-being of migrants.

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This research was realized in partnership with the Ministry of Emergency Situations of the Kyrgyz Republic

MINISTRY OF EMERGENCY SITUATIONS OF THE KYRGYZ REPUBLIC

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MESSAGE FROM THE MINISTRY OF EMERGENCY SITUATIONS OF THE KYRGYZ REPUBLIC

The Ministry of Emergency Situations of the Kyrgyz Republic, in collaboration with various institutions, including international organizations, is currently devoting significant efforts to study the impact of environmental and climate change on human security, on the availability of and access to natural resources, as well as on the ecological well-being of the country. For instance, the Ministry produces annually the *Monitoring and Forecasting of Hazardous Natural Processes on the Territory of the Kyrgyz Republic,* in which are published numerous thematic articles devoted to the study of natural hazards.

However, until now there have been no studies investigating the impact of these phenomena on human mobility, the adaptation of migrants to new environmental conditions and potential governmental actions to ensure an equitable distribution of resources between migrants and host communities.

The Mission of the International Organization for Migration in the Kyrgyz Republic, in cooperation with the Ministry, assessed the impact of environmental and climate change on migration dynamics in the short, medium and long term. I am convinced that the data and information produced by this project will improve our understanding of the complex interactions between migration, environmental factors and climate change in our country, and contribute to improve the actions of the Ministry and other governmental and non-governmental institutions in their efforts towards climate change adaptation.

Anarkul Aitaliev
Director of the Department of Monitoring and Prognosis of the Ministry of Emergency Situations of the Kyrgyz Republic

FOREWORD

The issue of environmental migration is gaining increased recognition and visibility, as was confirmed during the last conference on global climate change held in November 2015 in Paris. As the international community's commitment to tackle the negative impacts of climate change on forced migration is gaining momentum, the timing is propitious to initiate much needed actions in that field.

Well-designed actions, however, require a sound understanding of the complex interactions between the environment, climate change and migration dynamics. Indeed, context specific knowledge and data are needed to inform legislation, policies and other measures aiming at mitigating the negative effects of climate change and other environmental phenomena on migration. In Central Asia – and in Kyrgyzstan in particular – this issue remains understudied. The present research report, representing the result of a year of interdisciplinary research work, precisely aims to fill this informational gap.

Upon the study of the dynamics of environmental migration from the geographical, socio-economic and legal perspectives, this report proposes concrete measures aiming not only at reducing forced environmental migration in Kyrgyzstan, but also at furthering our understanding of the various paths through which well-managed and voluntary migration can be a positive adaptation strategy to a changing environment and climate.

This research reflects IOM's dedication to tackle the issue of environmental migration in Central Asia and in Kyrgyzstan by enhancing the knowledge base, thus allowing to design adapted and effective actions. We hope that the wide range of stakeholders involved in fields as diverse as climate change adaptation, environmental conservation, agricultural sustainability and migration policies, will find good use in the information and data contained in this report.

Dejan Keserovic
IOM Coordinator for Central Asia and Chief of Mission in Kazakhstan, Kyrgyzstan
Turkmenistan and Uzbekistan

ACKNOWLEDGMENTS

This report is the result of a year-long process that would not have been possible without the active involvement of many institutions and individuals, whose contribution is worth highlighting.

The IOM research team would first like to express its gratitude to its main governmental partner in the framework of this project, namely the Ministry of Emergency Situations of the Kyrgyz Republic, whose involvement spanned from very beginnings of the project's elaboration to the presentation of its final results. Special recognition must be granted to the Department of Monitoring, whose active collaboration allowed to design a research approach meeting the specific needs of government agencies. IOM would also like to thank the Ministry for the logistical support received during several field study trips. During these visits on the field, the IOM research team could witness the dedication of the Ministry's personnel to assist the country's population in coping with the sometimes dramatic consequences of natural disasters.

IOM would also like to express its gratitude to:

- The numerous experts from government agencies, district and oblast administrations, research institutes and international organizations who took time to answer the questions of the research team, and whose knowledge, experience and opinion were highly valuable to deepen the understanding of environment-migration interactions in Kyrgyzstan.

- All the participants and respondents to the household survey, focus group discussions and interviews across Kyrgyzstan, who are currently experiencing environmental and climate changes in a very concrete manner, and whose perceptions, opinions and needs have been reflected as accurately as possible in this report.

- Students of the Department of Journalism and Mass Communications of the American University of Central Asia, who conducted semi-structured interviews in Bishkek and whose involvement has proven highly useful to investigate the environment-migration interactions in an urban context.

- The various stakeholders – government officials, representatives of international and local organizations, research institutes and independent experts – who actively participated to the round table held in Bishkek in May 2016, and whose input proved invaluable for the formulation of recommendations.

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EXECUTIVE SUMMARY

The issue of environmental migration is relatively new on the international community's agenda and gaining increased attention worldwide in the context of global climate change. In several parts of the world, recent research initiatives are currently deepening our understanding of the complex interactions between the environment, climate change and migration dynamics, which in turn allows to develop and implement effective policies aiming to mitigate the negative consequences of forced environmentally induced migration.

However, in Central Asia and in Kyrgyzstan in particular, the issue has received little attention from both researchers and policymakers. This dearth of awareness, knowledge, data and political will needs to be addressed, especially considering that due to its geographical and socio-economic characteristics, Kyrgyzstan is highly vulnerable to several migration-impacting environmental phenomena. Indeed, this research has demonstrated that sudden-onset natural disasters such as landslides and floods, as well as progressive phenomena such as land degradation and water stress, do affect migration decisions at the individual and household levels, whether by forcing people to move because of danger and destructions, or by slowly enticing them to do so due to negative impacts on livelihoods and subsistence strategies.

The main conclusion of this research can be summarized by the fact that even though migration in Kyrgyzstan remains mostly economically motivated, environment and climate related factors do play a significant role in migration dynamics. Indeed, economic push factors of migration often have strong but hidden environmental causes. This is partly due to the fact that Kyrgyzstan's rural population's livelihood strategies are highly sensitive to environmental and climate changes. Indeed, the high economic dependency on few economic activities such as agriculture and animal husbandry increases the population's vulnerability to environmental changes and shocks.

In order to cope with environmental problems negatively affecting livelihoods, individuals and households often use international and internal labour migration as an adaptation strategy to increase income. This phenomenon entails both negative and positive consequences for rural communities. On the one hand, it allows households to increase their income and provides the youth with new opportunities to gain skills and independence. On the other hand, international labour migration causes an array of social problems in rural communities, such as the "children left behind" phenomenon (see chapter 5). Overall, international labour migration does not seem to significantly contribute to the development of the country's rural areas. Indeed, remittances sent home by labour migrants are often spent for immediate consumption rather than for investment. In regions such as Naryn, remittances are often used for household relocation to more environmentally friendly places, a phenomenon causing slow but progressive depopulation of some areas.

Additionally, labour migration used as an adaptation strategy to environmental problems often entails negative "reverse effects" on the environment. The most illustrative example of such phenomena is the increased quantity of livestock purchased by households with resources from labour migration. This high number of livestock in turn contributes to migration impacting processes such as land degradation, overgrazing and landslides, which are particularly acute in the country's southern regions.

This research also uncovered a paradox concerning migration decision processes associated with dangerous environmental factors such as landslides, which claim lives almost every year in Kyrgyzstan. Indeed, even though most people living in dangerous locations are well aware of risks and dangers, only a minority decides to migrate to safer areas despite the availability of state assistance to do so. This is mostly due to the widespread perception that areas intended for relocation are less advantageous in terms of livelihood opportunities than their actual place of residence. The fear of losing social ties also plays an important role in the decision to continue living in dangerous places. Thus, there is a dire need for a more comprehensive approach in resettlement procedures, which would include an increased sensitivity to livelihoods and subsistence strategies, as well as to social and cultural factors.

Considering the challenges related to the impacts of both natural disasters and progressive environmental phenomena on migration dynamics in Kyrgyzstan, targeted interventions in a wide range of sectors are needed in order to 1) mitigate the negative impacts of environment and climate factors on migration; 2) increase the adaptive capacity of individuals, households and communities to these factors and 3) promote and facilitate well managed, voluntary and planned migration as an adaptation strategy to a changing environment and climate (chapter 7).

1. BACKGROUND AND RATIONALE

The 21st Conference of Parties on Climate Change (COP 21) held in Paris in November 2015 represented a major step in international coordination and efforts aimed at tackling the root causes and consequences of global warming. Among the many issues on the event's agenda, the impacts of climate change on human displacement were given more attention than even before. Indeed, the COP 21 confirmed a trend inaugurated at the COP 14, held in Poland in 2008, namely that the importance of human mobility in relation to environment and climate change is increasingly understood and supported. Thanks to the work of researchers, activists and decision makers in several countries, the issue of environmental migration is progressively getting higher on the international community's agenda.

To be sure, there is still a long way to go on the path of effectively addressing the negative impacts of environmental and climate change on forced migration. This nascent political will thus represents a significant and positive step, and should encourage initiatives aiming at the enhancement of populations' livelihoods, well-being, and adaptive capacity to environmental and climate changes.

However, the main factor hindering the development and effective implementation of such initiatives is the poor understanding of context specific environment-migration interactions. Symptoms of this problem include the lack of data, the absence and inappropriateness of legislation and policies, as well as the dearth of awareness and political attention devoted to the issue in many countries. This report, representing the result of a year-long research and advocacy project, precisely aims to address these challenges in Kyrgyzstan.

Specifically, it intends to fill the knowledge gap about environment-migration interactions in a country which is in many ways vulnerable to the negative consequences of environment and climate factors, be they sudden-onset natural disasters such as landslides and floods, or longer-term, progressive phenomena such as land degradation and water stress. As it will be demonstrated throughout this report, these various phenomena, either by increasing risks of destructions and fatalities or by impacting population's livelihoods, are currently affecting migration dynamics in Kyrgyzstan.

The data and knowledge produced in the framework of this project are designed in such a way as to serve as tools for evidence-based decision making, whose ultimate goals should be the reduction of risks and dangers associated with environmentally induced forced migration and the facilitation of planned, well managed and voluntary migration as an adaptation strategy to environmental and climate changes. Hence, the information and recommendations contained in this report are intended for a wide range of stakeholders, including government ministries and agencies, research institutes, the donors' community, and international, national and local organizations with mandates related to such various fields as environmental protection, disaster risk reduction, migration policy, agricultural sustainability and rural development.

Even though this research's ultimate objective is to further the understanding of environment-migration interactions in Kyrgyzstan, the year-long project in the framework of which it was conducted allowed to achieve parallel outcomes as well. Firstly, is contributed to increase the national research potential related to environmental migration in Kyrgyzstan. The involvement of local researchers, of students from the American University of Central Asia and the exchange of information with several national research institutions contributed to foster the interest of Kyrgyzstan's research community for environmental migration, as well as to develop conceptual and methodological tools to further investigate this topic. Indeed, it is hoped that in addition to presenting context-specific findings, this analysis will constitute a baseline upon which future research can be initiated in order to deepen our understanding of environmental migration dynamics in Kyrgyzstan.

Secondly, close collaboration with government agencies – mainly the Ministry of Emergency Situations – throughout the project's various phases, allowed to raise the awareness of key government officials to the issue of environmental migration. Even though several governmental institutions already deal, directly or indirectly, with related issues, this project contributed to precise and substantiate their approach in doing so. It can be said that it facilitated the introduction of the issue of environmental migration into government's and other stakeholders' terminology and agenda.

Finally, advocacy activities contributed to initiate institutional and legislative changes related to environmental migration. In collaboration with the State Migration Service of the Kyrgyz Republic, recommendations to strengthen the policy and legislative frameworks were formulated in order to facilitate government response

in dealing with forced environmental migration, as well as to explore the various ways through which migration could be used as an adaptation strategy to environmental and climate changes. [1]

A shift of perspective

It is not surprising that until now, it is the most visible and dramatic manifestations of environment-migration interactions that have attracted most attention in the media and other fora. An illustrative example can be found in the case of these Pacific and Indian oceans' islands facing the very real risk of completely disappearing due to the rise of the oceans' level. Likewise, the catastrophic nature and massive human displacements caused by different kinds of natural disasters such as major floods, hurricanes and earthquakes are often making the headlines, while generating the international's community compassion and reaction towards affected populations in general and towards the displaced in particular.

However, the interplay between the environment, climate change and migration dynamics are much wider than these sensational events. Phenomena such as desertification, land degradation, changes in precipitation patterns or reduction of water resources are currently impacting people's decision to migrate, either temporarily or permanently, when they are not forcing them to do so. Indeed, recent research convincingly demonstrated that in contrast to sudden phenomena, "the effects of slow-onset disasters, for example, are often neglected or discounted" (IOM 2012). As will be seen throughout this report, in Kyrgyzstan the impacts of progressive, long-term phenomena on migration, even though often "hidden", are most probably more important than those of natural disasters. The present research thus devotes considerable emphasis on these long-term changes in the environment, both in the analysis and in the formulation of recommendations (chapter 7).

Relatedly, the present research also intends to step away from an overly "catastrophic approach" of environment-migration interactions, and proposes a more comprehensive, optimistic conception of the topic. Indeed, if actions should aim at the reduction of the risks and dangers associated with forced environmentally induced migration, efforts should also be devoted to promote migration as a positive adaptation strategy to a changing environment and climate.

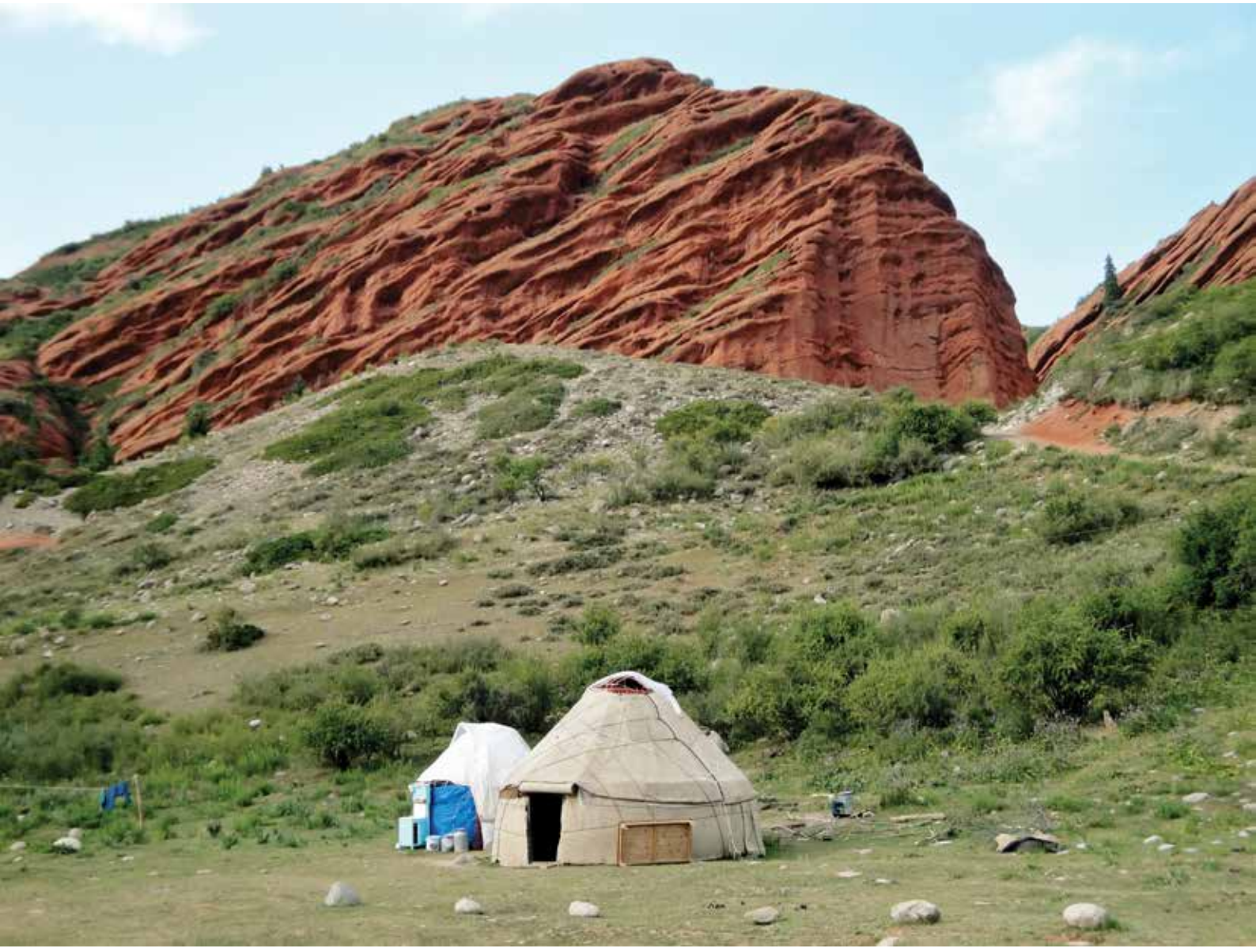
Sensitivity to context

An oft-cited conclusion of many studies of environmental migration is that it is a highly contextual phenomenon. Indeed, an extremely wide range of variables related to geography, society, politics, culture and even psychology interact with environmental factors in migration decision processes. Considering the contextual specificity of these variables, it seems very unlikely to uncover "universal laws" about environment-migration interactions. Consequently, context specific investigation (at the regional, national and local scales) is necessary to facilitate the development and implementation of adapted and effective policies. This research, by contextually investigating manifestations of such interactions in Kyrgyzstan, is expected to contribute to this endeavour.

The research report is structured the following way. After a brief presentation of the main geographical, environmental and socio-economic characteristics of the Kyrgyz Republic, a few pages are dedicated to conceptual and methodological issues related to the study of environment-migration interactions. Research questions, methods of investigation and the analysis' limitations will be outlined. Following this theoretical part, several thematic chapters will investigate in a more detailed manner the various aspects and manifestations of environmental migration in Kyrgyzstan. These chapters draw from various disciplinary backgrounds such as geography, sociology, anthropology and law. Lastly, recommendations related to diverse fields of action and intended for a wide range of stakeholders are formulated upon the analysis' results.

1 Specifically, propositions were made to mainstream the issue of environmental migration in the Conception of Migration Policy and in the Migration Codex, two important migration related policy documents currently in elaboration phase. A more thorough discussion of legislative and policy frameworks related to environmental migration can be found in chapter 6.

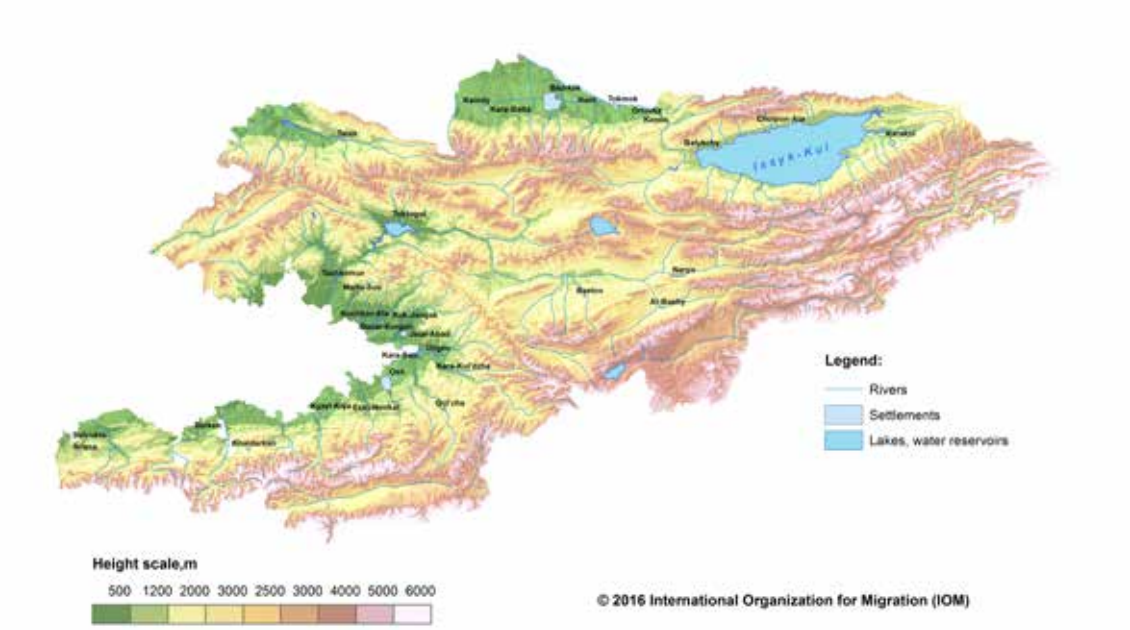
2. NATIONAL CONTEXT



This chapter is intended to present the overall geographical, environmental, social, economic and political characteristics of the Kyrgyz Republic. As mentioned previously, the highly contextual nature of environment-migration interactions requires a particular sensitivity to the physical and social peculiarities of the setting in which they take place. Hence, this chapter will first outline the general geographical characteristics of the Kyrgyz Republic before briefly describing its social and political organization, as well as some important phenomena specific to the country, particularly its migration dynamics.

2.1. GEOGRAPHY, ENVIRONMENT AND CLIMATE

Kyrgyzstan is a mountainous country covering an area of 199.9 thousand square kilometres. Over 80 per cent of the territory is located at an altitude higher than 1500 meters above sea level. Mountains account for 94 per cent of the territory (including high mountains – 70 per cent and other types – 24 per cent) and plains for 6 per cent. Around four per cent of the territory is covered with glaciers and 10 per cent of the area belongs to the zone of continuous permafrost presence (Map 1).



Map 1. *Relief map of the Kyrgyz Republic*

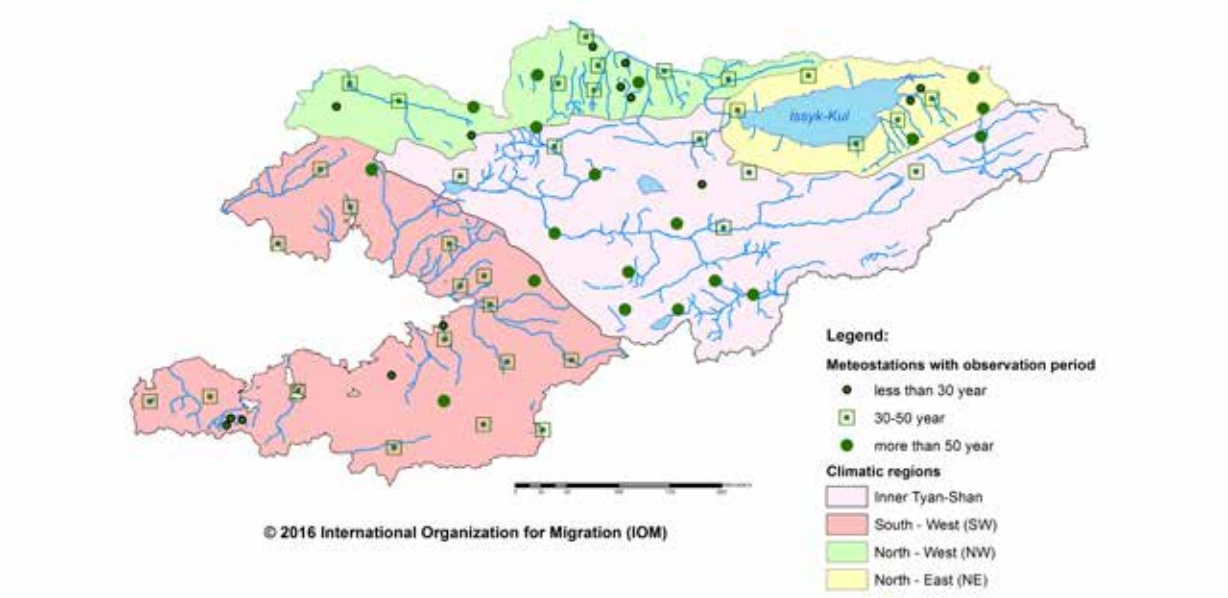
In accordance with its administrative divisions, the Kyrgyz Republic consists of 7 oblasts (Map 2), 40 districts, 25 towns, 28 urban-type settlements and 440 ayil aimaks (rural districts).

Map 2. *Administrative map of the Kyrgyz Republic*

The mountainous terrain led to the formation of a strongly branched river network. Five thousand rivers are found on the territory of the Republic, which belong to eight hydrological basins – Syr-Darya, Amu-Darya, Chuy, Talas, Ili (Karkyra), Tarim and the closed lakes of Issyk-Kul and Chatyr-Kul. Rivers originate from mountain ranges dividing these various basins, from where they flow into submontane and plain areas. Lakes play a special role in the hydrography of Kyrgyzstan. Over 1 923 lakes are found in the country, mostly located in its highland zones. The largest lakes – Issyk-Kul, Song-Kul, Chatyr-Kul and Sary-Chelek – are located in closed drainage basins. Others are a part of the Syr-Darya river's basin.

Lake Song-Kul in Naryn oblast

This complex terrain with differently oriented mountain ranges causes high changeability of climate in the spatial dimension and the formation of four climatic regions on the territory of Kyrgyzstan: northern and northwestern Kyrgyzstan which includes the Chuy, Talas and Kemin valleys and their surrounding mountain ranges; southwestern Kyrgyzstan, including Fergana, Chatkal and Alay valleys and surrounding ranges; northeastern Kyrgyzstan which includes the Issyk-Kul basin with surrounding mountains; and Inner Tien-Shan (Map 3).



Map 3. *Climatic regions of the Kyrgyz Republic*

In different regions, climate fluctuates from extreme continental climate to almost marine climate due to significant fragmentation of the terrain and the presence of Lake Issyk-Kul. Summers are hot and dry. Winter temperatures, particularly in the mountains and mountain basins, are quite low and can fall to -20 and -30°C. The average monthly temperature in July ranges from +25°C to +37°C in the Fergana valley, while at an altitude of 3600 meters, this temperature at the same time does not exceed +4°C. In the central mountains of Tien-Shan, average temperature difference per each 100 meters of altitude comprises 0.6°C. The western slope of the Fergana range receives the most annual precipitation (1090 mm) while the westernmost tip of the Issyk-Kul depression receives the least (144 mm).

Differences in the structure of terrain, hypsometry and orography, deep continental location and the long stretch of the Tien-Shan and the Pamir-Alay ranges have predetermined a significant spatial differentiation of climatic conditions and accordingly, the extent of glaciation. Glaciation is distributed across both main river basins and highland zones in a highly uneven manner: in some basins, glaciers cover only 650 square kilometres (basin of Lake Issyk-Kul), in others up to 3496.5 square kilometres (basin of the Tarim river). The maximal ex-

tent of glaciation in terms of size of glaciers and by total area is concentrated in the massifs of Pobeda and Khan-Tengri peaks. The largest glaciers of Tien-Shan, such as Northern and Southern Enilchek, are found there. The length of the former is 32.8 kilometres with an area of 181.2 square kilometres and the latter, 60.5 kilometres and 567.2 square kilometres accordingly. The role of glacial waters is particularly important for maintaining the water content of rivers in dry years. Therefore, a forecasted retreat of glaciers (National Report on the State of the Environment of the KR 2016, Second National Communication of the Kyrgyz Republic under the UN Framework Convention on Climate Change 2008), could lead to negative environmental and economic consequences on territories adjacent to the Tien-Shan and Pamir-Alay ranges.

Glacier feeding the Ala-Kul in Issyk-Kul oblast

The Kyrgyz Republic has significant water reserves: around 44 km^3/year of surface river flow, 13 km^3 of potential groundwater supplies, 1,745 km^3 of lake water and 650 km^3 are stored in glaciers (National Report on the State of the Environment of the KR 2016).

Intensive development of irrigation farming led to the creation of artificial water bodies intended for various purposes (water reservoirs for long-term and seasonal regulation, ponds, basins of daily regulation) the total area of which comprises around 400 square kilometres. The majority of water reservoirs are connected to riverbeds. The largest of them is the Toktogul water reservoir on the Naryn river.

Mountain forests of Kyrgyzstan also have an important effect on water supply present in rivers. Growing on the slopes of mountains and flood plains, they act as barriers to mudflows, impede the formation of landslides and avalanches in the mountains, and regulate water flow in rivers, evening it out throughout the year. This considerably decreases the prevalence of spring floods and, as in the snowless time, ensures evenness of water's flow into watercourses and underground aquifers. Forests reduce water and wind erosion as well as carbon emissions. This explains the unique role of mountain forests for both Kyrgyzstan and the whole of Central Asia, where arable farming is based on irrigation (Orolbaeva 2013). Forests are represented by four types: fruit tree forests, coniferous and spruce forests, pine forests and alluvial forests. Around one million hectares of forests cover the territory of the Kyrgyz Republic. After World War II, half of the territory covered by forests was lost. The main reasons for this loss were unregulated logging, overgrazing and the gathering of wood used as fuel. Forest areas of the Kyrgyz Republic are the state property and form a unified State Forest Fund.

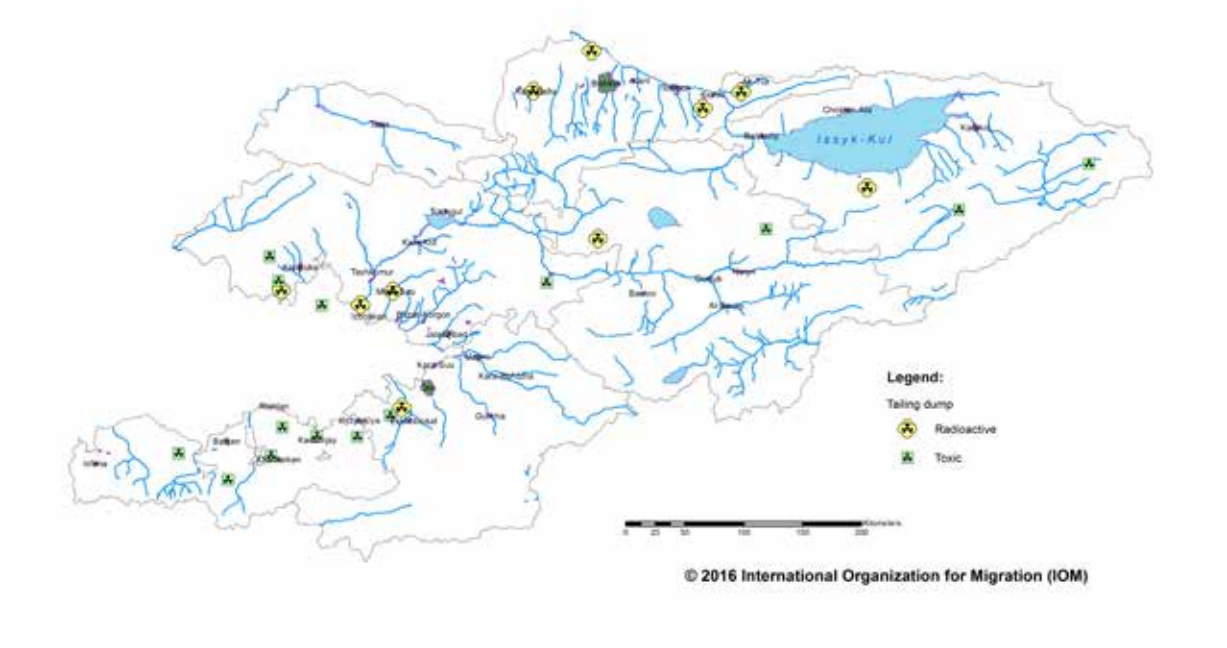
Forested valley in Issyk-Kul oblast

Land resources are one of the main natural resources ensuring the sustainable development of the country. The main type of land use in Kyrgyzstan is for agricultural production. Rural agriculture in the Kyrgyz Republic is vulnerable to the impact of hazardous natural, climatic, geological and anthropogenic processes, such as mudflows, floods, drought, frosts, landslides, land degradation, salinization and so forth. The condition of agricultural lands and extent of their degradation have serious impacts on agricultural production.

At the present time, the mining sector forms the basis of Kyrgyzstan's industry. The negative sides of mining activities in the Republic are not just the destruction of natural landscapes but also their contamination, the

irreversible degradation of the environment in areas of extraction and processing of mineral resources, as well as in adjacent regions.

However, threats to the environment and security are posed not only by currently functioning industrial enterprises. The legacy of industrial activities of the past years, particularly the mining industry, poses a no less and sometimes bigger hazard. A serious threat is related to toxic and radioactive tailing pits of functioning and closed down mining enterprises, made dangerous by their weak protection from natural disasters, proximity to water arteries, populated areas and agricultural lands (Map 4).



Map 4. *Schematic map of location of toxic and radioactive tailing pits*

The crisis experienced during the transition period following the end of the Soviet Union has rapidly exacerbated problems related to the preservation of natural resources. The poverty rate has grown dramatically. Unfavourable social and economic circumstances force rural residents to solve their problems at the expense of the environment through its active exploitation. For instance, in many villages, the energy needs for heating and cooking are met by cutting down and burning forests, trees and shrubbery vegetation.

Livestock owners are often not able to use distant pastures and have to graze their animals near settled areas, which leads to the degradation of the vegetation cover and the activation of erosion processes. Hazardous natural processes and processes of land degradation have a direct or indirect influence on the population's livelihoods. The occurrence of natural and climatic processes and their frequency often impact economic activities and when conditions are unfavourable, can force individuals and households to change their place of residence.

2.2 SOCIETY, POLITICS AND ECONOMY

Village in Jalal-Abad oblast

The Kyrgyz Republic became independent with the breakdown of the Soviet Union in 1991. It was one of the least developed republics in the Union and in Central Asia, particularly. After gaining independence, Kyrgyzstan faced the collapse of its economy, which mainly specialized in agriculture and the production of raw materials for the interconnected Soviet economy. It was one of the least urbanized republics of the former Soviet Union, with only one third of the population living in urban areas. Although a large percentage of its European population has been leaving the country since the nineties (which led to "brain-drain" of many highly qualified professionals), Kyrgyzstan still has an ethnically diverse population with Kyrgyz making up the majority of the population (71 per cent), followed by Uzbeks (14 per cent) and Russians (7 per cent.) Kyrgyz and Russian languages enjoy official status in the country. As of January 1, 2015, the permanent population of the Kyrgyz Republic reached 5 895 100 people, of which 66 per cent reside in rural areas and 34 per cent in cities (National Statistical Committee of the KR 2015).

Due to the lack of natural resources such as gas and oil, which some of its neighbours possess, Kyrgyzstan's first president Askar Akaev saw international aid as an important economic strategy and actively implemented rapid democratic and market economy reforms in the country (Pelkmans 2005, 143).

However, these reforms did not result in sustainable economic growth and the majority of the population lives under the poverty line. Due to a high unemployment rate and the precarious situation in rural areas, a great number of people engage in rural-urban migration and migration to foreign countries, mainly to Russia and Kazakhstan. In 2005 the so-called "Tulip Revolution" led to the overthrow of Akaev as the president of the country. Some viewed (mostly opposition leaders who replaced Akaev's government and the international community) the overthrow of the first president as a result of his betrayal of democratic principles and authoritarian tendencies. However, others argues that the revolution in Kyrgyzstan in 2005 should not be analysed through examination of "the imperfections of democratic reforms" in this country but rather by focusing on the fact that "democratization was accompanied by neo-liberal reform agendas that resulted in staggering poverty and inequality" in the country (Pelkmans 2005, 148).

In April 2010 another presidential crisis in Kyrgyzstan occurred, resulting in the ousting of the second president Kurmanbek Bakiev, who was also accused of corruption, nepotism and authoritarianism. This political crisis in Bishkek was followed by an interethnic conflict between Uzbeks and Kyrgyz in Osh in June 2010.

National economy

Kyrgyzstan is an agrarian country, as rural agriculture occupies a leading place in its economy. The GDP share of this sector is 15 per cent and the number of people employed in it amounts to 32 per cent (2014 data). Rural agriculture provides the population with food products for consumption and possibilities for employment in the agricultural sector and the processing industry. In the course of the last two decades, radical reforms have been carried out in the agrarian sector of the Kyrgyz Republic, including land reform and the establishment of associations and cooperatives. As of 1 January, 2015, agricultural lands composed 32 per cent of the total land resources and covered 6,542 thousand hectares. The largest area (85%) in the structure of agricultural lands is taken up by pastures (an area which is continuously decreasing) and croplands (irrigated and non-irrigated) compose 12 per cent of all agricultural lands. The poverty rate among the rural population is significantly higher than among urban residents and greatly depends on agricultural production.

In 2014, the share of crop products in the total volume of agricultural, forestry and fishery products composed 50 per cent and the share of animal farming products amounted to 48 per cent. As of the end of 2014, the

sheep and goat population was 5,829 thousand units and in comparison to the end of 2010 grew by 15.7 per cent. Livestock units amount to 1,458 thousand, with a 12.3 per cent increase since 2010. Horses amount to 433 thousand units (14.1 per cent increase since 2010) and poultry to 5,420 thousand units (14.1 per cent increase since 2010) (Statistical Committee 2015a, 11). Thus, we can observe a strong trend of increasing livestock numbers in the country. Due to this increase, the share of fodder crops has also grown in the structure of cultivated lands. In 2014 grain crops accounted for 55.7 per cent, fodder crops for 26.6 per cent, vegetables for 11.3 per cent and industrial crops for 6.5 per cent (Statistical Committee 2015a, 11). In comparison to 2014, in 2015, a 1.2 per cent decrease was observed in prices on sold agricultural products, particularly on potatoes and milk (Statistical Committee 2016, 14), which created difficulties for many farmers.

Small scale agriculture in Issyk-Kul oblast

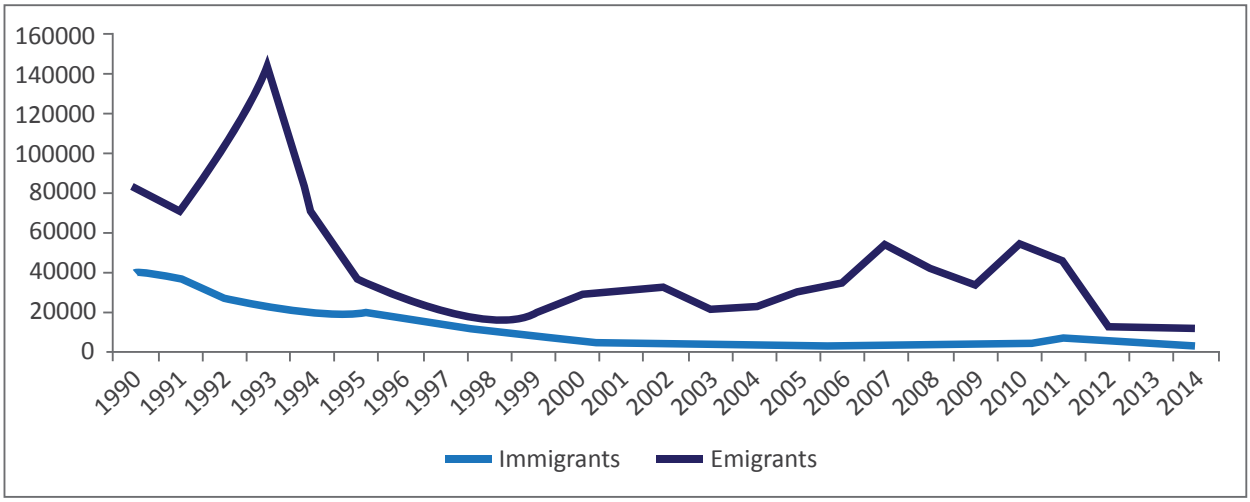
Extraction of mineral resources, production of electricity, textile and food industries also play an important role in the country's economy. Currently, Kyrgyzstan's national economy is strongly dependent on the gold mining industry, on exports of its products and on remittances of migrants working abroad (CIA, World Factbook 2014, 2016). According to preliminary evaluations, in 2015 the GDP amounted to 423.6 billion Kyrgyzstani soms (Statistical Committee 2016, 6).

During the transition period following the collapse of the Soviet Union, the country's economy suffered from a rapid decline which led to the growth of unemployment and decrease in the living standards of the population. The period between 1992 and 1995 was particularly critical as the GDP fell by almost 45 per cent. Relatedly, between 1998 and 1999 inflation grew by 36 per cent (Anderson 1999, 79; ILO 2008, 21). Despite social and economic reforms carried out during the years of independance, Kyrgyzstan remains in the group of poor countries with a low level of income (Sagynbekova 2016). The poverty level of the republic's population equalled 30.6 per cent in 2014 and was most pronounced in rural areas (32.6%) and in the three southern oblast – Batken (40.7%), Jalal-Abad (46.4%) and Osh (31.7%) (Statistical Committee 2015b, 76-77).

Migration dynamics

During the years of Kyrgyzstan's independence, population migration had a very dynamic character. In the nineties, after the collapse of the Soviet Union, external migration significantly grew, its activation occurring in 1993 when more than 143,600 people left the country (Statistical Committee 2002) (Figure 1). Emigration prevails in the structure of external migration. For instance, between 1991 and 2009, over 800,000 persons left Kyrgyzstan, while only over 200,000 people immigrated. The main destinations for emigration are the countries of the Commonwealth of Independent States (CIS), where 89 per cent of migrants emigrated during the period indicated above (Sagynbekova 2016). Moreover, emigration has a pronounced ethnic dimension, due to the emigration of the Russian-speaking population. Between 1989 and 2009, the share of Russians in the total population fell from 21.5 to 7.8 per cent, and those of Ukrainians from 2.5 to 0.4 per cent (Statistical Committee 2010a, 89). According to data from the National Statistical Committee (2015c, 51), in 2014, the migration balance was negative by 7,757 persons. The largest outflow was observed to Russia (6847) and Kazakhstan (1340), and outside of the CIS countries to Germany (60) and the USA (40). The largest gains from immigration were from Tajikistan, China and Afghanistan.

Figure 1. Dynamics of external migration of Kyrgyzstan's population



Sources: Statistical Committee 2002, 2010b, State Service for Migration under the Government of the KR (data obtained in March 2016).

Starting from the end of the nineties, international labour migration became more active and today its flows have reached significant numbers. Currently, an estimated 350 000 to 700 000 citizens of Kyrgyzstan are working abroad. International labour migration is mostly directed to Russia, where 585 526 Kyrgyzstani citizens currently reside, and Kazakhstan, where up to 85,000 citizens are engaged in labour and entrepreneurial activities. In addition, up to 30 000 labour migrants work in other, non-CIS countries (MLMY KR 2014, 14).

Migration from rural to urban areas prevails in the structure of internal migration. The most attractive destination for rural residents is the capital Bishkek, Chuy province as well as Osh and Jalal-Abad cities for inhabitants of the southern regions of Kyrgyzstan. In addition, rural residents often move to nearby district centres, towns and urban-type settlements. In the 1999-2009 period, mobility rate within the country was 30-40 thousand per year and during this period around 400,000 internal migrants were registered.

As a result of these movements, the population of Bishkek grew by 178,400 persons during this period, and the population of Chuy province increased by 86,500. A consequence of internal migration is a reduction in rural population, which annually decreases by 3,000 to 5,000 persons (Mkrtchyan and Sarygulov 2011). It should be noted that official statistical data do not accurately reflect internal movements, which is further complicated by temporary internal migration of rural residents for labour purposes.

3. CONCEPTS, EVIDENCE, QUESTIONS AND METHODS

The complex interactions between the environment, climate change and migration are gaining growing visibility worldwide, as they are being discussed in the media, in the academy and, increasingly, in policymaking circles. However, the various contexts in which the term "environmental migration" is used, the different motivations behind its utilization, and the multiplicity of phenomena it seeks to describe, render it difficult to define the concept in an all-encompassing manner. Additionally to this terminology issue, the study of the environment-migration nexus – which entails geographical, sociological, economic, political and even psychological aspects – requires a sound interdisciplinary methodological design, which poses many challenges.

Considering these challenges, this section is meant to "set the conceptual and methodological table" prior to presenting the research's results. Firstly, we will provide the reader with a theoretical background of the concept of environmental migration, which will underpin the analysis of environment-migration interactions in Kyrgyzstan. We will then briefly review the current state of knowledge and research about environmental migration, both worldwide and in Central Asia and Kyrgyzstan. Finally, we will present the research questions guiding our study, and the methods used to investigate them.

3.1. ENVIRONMENTAL MIGRATION AS AN OBJECT OF STUDY

As mentioned above, the term "environmental migration" in used in many different contexts, by different institutions and people, to designate different phenomena, and for different purposes. Academics may use the term to study the impact of environment and climate factors on human mobility at various scales, with the aim of predicting future migration flows. The media may employ it in a more dramatic, sensationalistic manner, for instance to describe sudden and massive displacement of people caused by rapid-onset natural disasters such as earthquakes and floods (the 2004 Indian Ocean tsunami being a case in point). Finally, political leaders may also use the concept of environment migration, an illustrative example being when the government of the Maldives held a cabinet meeting under water to advocate for the recognition of "environmental refugees" and sensitize the international community to the risks associated with rise of the oceans' level induced by climate change, which could potentially force populations of entire states to relocate.

Depending on the context in which it is used, "environmental migration" can be framed quite differently: as an issue of security, of humanitarian action, of emergency response, of disaster risk reduction, of sustainable development, of environmental protection, or even of geopolitics.[2] For the sake of bringing some clarity into this sometimes vague and slippery concept, the first necessary step is to ask this simple question: what is environmental migration?

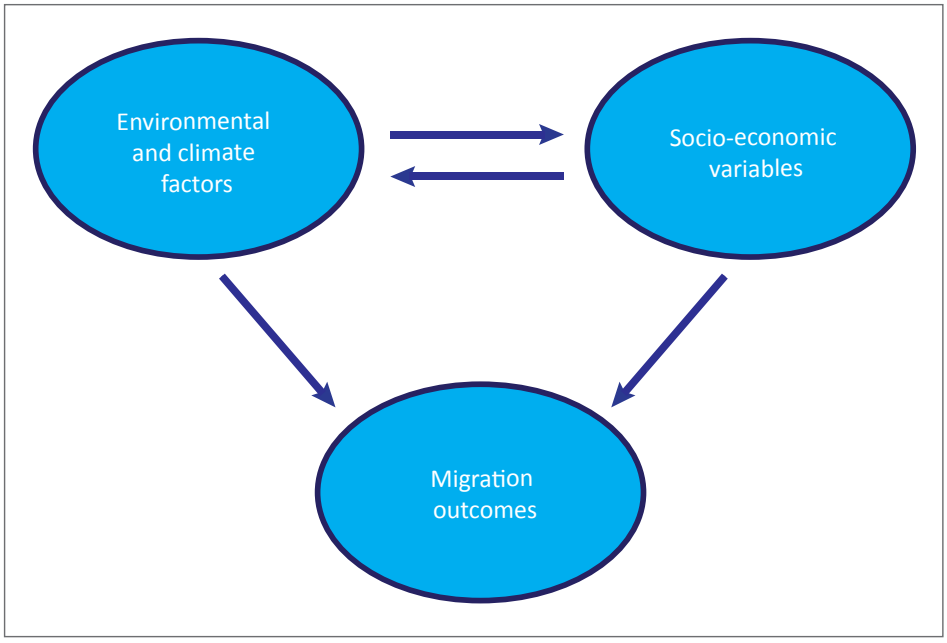
Firstly, it must be noted that environmental migration, even though a relatively new concept, is an ancient phenomenon, in fact existing since the very beginnings of mankind. Indeed, human mobility and migration patterns have always been influenced by environment and climate, which on a historical scale have probably been the most important drivers of human migration. Indeed, people have always been on the move to find places where living conditions were more propitious, or to escape natural disasters or climatic hardships. In some cases, particular patterns of migration (seasonal or other) based on geography and climate were adopted as a livelihood strategy (for instance in the case of pastoral nomadic peoples). If environmental migration considered in this broad way has always been a part of the human experience, it is only recently, however, that it has been formulated as a concept, describing either a problem to be solved – in the case of forced environmental migration – or as a part of a solution – when planned and voluntary migration becomes an adaptation strategy to a changing environment and climate.

It is also necessary to mention that the impacts of environmental and climate factors on migration is a disputed topic among scientists and experts. In the literature, we can see a spectrum going from the so-called "minimalists", stating that environment and climate factors have limited or no effects on migration patterns and that the predominant push factors are mostly economic, to the "maximalists", affirming that environment and climate have a determining influence on migration (IOM 2009). However, there is increased consensus that climate and environmental factors are both drivers and pull factors of human mobility and that "they are mediated by economic, social, political and demographic aspects" (IOM 2014). The conceptual foundation of this study stands somewhere between these two extremes, acknowledging that the causation between environment and migration is not linear but rather "complex", and entails an interdependency of influences.

2 For instance, international negotiations on reduction of CO2 emissions, or on the relocation of some at-risk islands' population in a third country, undeniably entails geopolitical aspects.

Basically, this means that in an idealized "equation" of environmental migration, we would find migration as the dependant variable (effect) impacted by two interacting sets of independent variables (causes): environment/climate factors and "human factors" (social, economic, political, cultural, psychological, etc.) (see Figure 2).

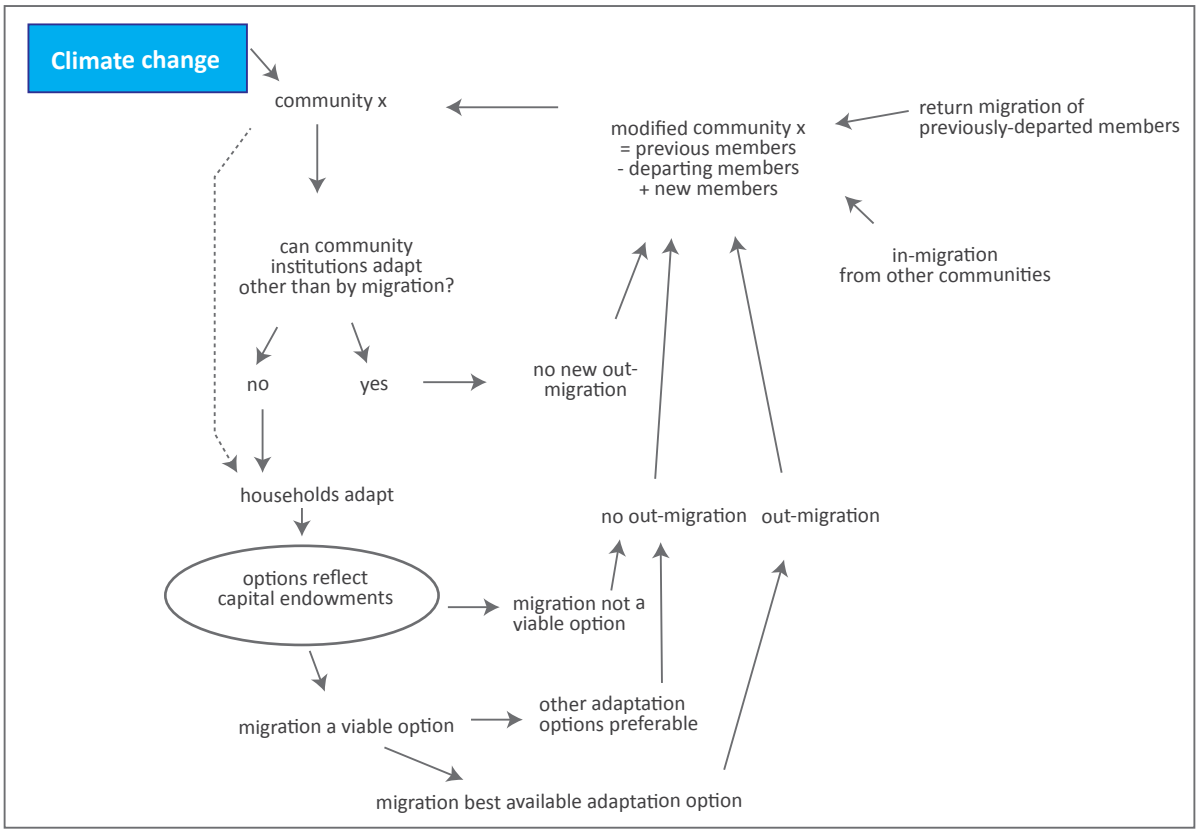
Figure 2: An "idealized equation" of environmental migration



Some scholars have designed much more complex schemes to conceptualize the impact of environment on migration outcomes, as visible in Figure 3.

Figure 3: Migration outcomes model.

Source: McLeman, R. and B. Smit. 2006. "Migration and Adaptation to Climate Change". Climatic Change 76: 31-53



We will now look more closely at two variables of this "equation": the environmental variable and the migration variable. Socio-economic factors will be examined subsequently in chapter 5.

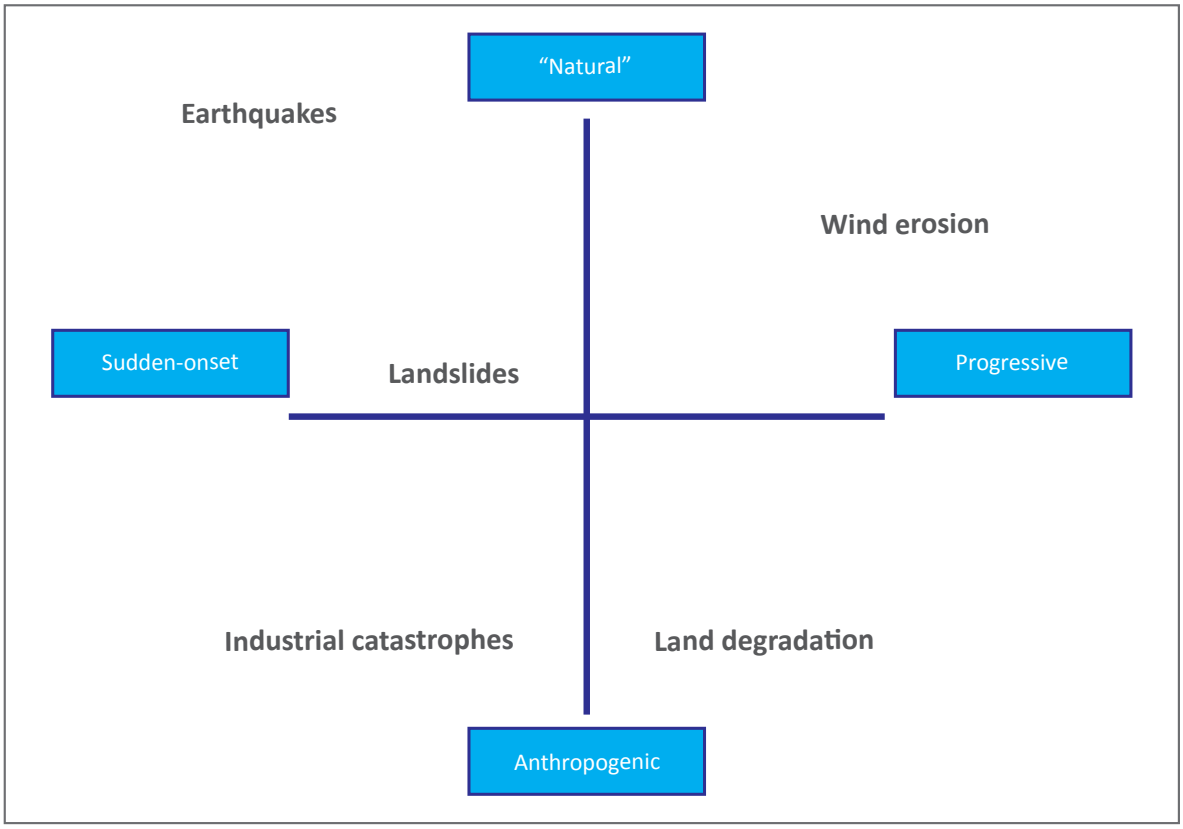
The environment variable

When one thinks about "environmental migration", the first images coming to one's mind are often dramatic and mainly relate to forced and sudden displacements caused by natural disasters such as earthquakes, floods or tsunamis, forcing thousands of persons to urgently relocate in difficult and dangerous circumstances. The not less dramatic images of slowly disappearing islands are also a case in point. However, even though these sensationalistic migration-causing phenomena are very real, the "environment variable" in the equation is much wider, and encompasses a broad range of both sudden and long-term/progressive phenomena impacting the decision of individuals, households or communities to migrate. Indeed, the impacts of slow-onset and progressive phenomena (such as water stress, land degradation and many others) on migration is at least as important as those of natural disasters, and will probably be even more so in the future due to climate change. Thus, as recent research has convincingly shown, a sound understanding of environment-migration interactions requires a shift of perspective from the short-term to the long-term, and an increased attention to progressive phenomena impacting migration patterns (Martin 2013).

Two principal dual characterizations can be made regarding the types of environmental factors potentially affecting migration (see figure 4). The first concerns the distinction between sudden-onset and slow-onset (or progressive) phenomena. Sudden-onset phenomena are more or less synonymous with "natural disasters": they often cause considerable damage, sometimes fatalities, and trigger most of the time immediate and forced displacement, which can be temporary or permanent, internal or international. In Kyrgyzstan, the most common and visible phenomena of this kind include earthquakes, landslides and floods.

Figure 4: Two axis of migration-impacting phenomena with examples.

As we will see later, most migration-impacting phenomena have "mixed origins". For instance, landslides are sudden-onset onset phenomena, but with long-term causes which are both natural and anthropogenic.



It is worth stressing once again that if the impacts of sudden-onset phenomena on human mobility are getting the most attention because of their dramatic and visible aspects, progressive phenomena, even though less apparent, presumably have the most important consequences on human mobility on a long-term basis (Obokata and al 2014). This is why this research, in addition to studying the migration impact of sudden-onset phenomena such as landslides, also dedicates considerable attention to the investigation of progressive phenomena. In Kyrgyzstan, these are best exemplified by problems related to water resources and land and pasture degradation.

In addition to the sudden-onset vs. progressive distinction, we can also differentiate between "natural" vs. anthropogenic (or "man-made") phenomena. Natural phenomena tend to occur independently of human action – even though human action is very often a contributing factor – while anthropogenic phenomena are a direct consequence of human activity. Among the anthropogenic phenomena potentially threatening to trigger forced displacement in Kyrgyzstan, we can mention the risk of water and land pollution deriving from mining activities, which can be either progressive or sudden, the latter case well exemplified by the 1998 industrial accident, when a truck spilled a large amount of sodium cyanide in the Barkaun river in the Issyk-Kul province, forcing people to temporarily move from their residence due to water and soil contamination. Radioactive waste, often stocked in antiquated infrastructure, also poses risks of contamination, for instance in Mailuu-Suu (Jalal-Abad) and Kaji-Sai (Issyk-Kul). The interested reader can refer to the EACH-FOR study (Nasritdinov and al. 2011) for more information about this particular topic.

These distinctions and categories, however useful to shed some conceptual light on this complex issue, should not however be interpreted in a rigid way, as most environmental phenomena actually or potentially affecting migration outcomes fall between these divisions. As we will examine further in this report, some migration-impacting phenomena occurring in Kyrgyzstan, such as landslides, may be "sudden" in their effects, but long-term in their causes. They are also "natural" in the sense that they do happen independently of human activity, but anthropogenic in the sense that human factors, such as overgrazing or irrational land use, significantly contribute to increase their frequency and intensity.

It is also necessary to mention that if this conceptual framework is mostly useful to capture the influence of environment on migration, the other way around – the impact of migration on the environment – is also important to consider, both in urban and rural areas. As it will be shown later in this report, in the case of Kyrgyzstan, remittances from international migration have very real and concrete impacts on the environment in rural areas, for the best and the worst. Hence, methodologies should be designed in such a manner that they are sensitive to these "reverse effects", namely to the environmental impacts of migration, both in rural and urban areas, on a short-term and long-term basis.

The migration variable

Just as environmental stimuli potentially impacting migration are various in nature and scale, human responses to these stimuli can also take many forms. Here again, some binary categories can be established. In a landmark IOM document on methods for the study of environmental migration (IOM 2009), the authors propose the following distinctions:

1. Forced vs. voluntary. We can firstly distinguish between forced and voluntary (or planned) environmental migration. In the first case, sudden or progressive phenomena oblige people to change their place of residence as living conditions due to deterioration of the environment or destructions reach an "intolerable threshold". This threshold is not "absolute", as it is determined by a set of social, economic and psychological variables, and may widely vary depending on the context and adaptive capacity of individuals, households and communities.

   On the other hand, voluntary migration can be considered as an adaptation strategy to a changing environment and climate. In this case, there is an actual choice about staying or migrating, and this decision will also be mediated by socio-economic variables and perceptions. Here again, we should consider this forced vs. voluntary distinction as a continuum rather than a rigid, binary opposition, as most real cases fall somewhere between these two extremes (Hugo 1996). As a first glance into the recommendations section of this report, it can be mentioned that policies and legislation related to environmental migration, instead

of aiming to halt all forms of environmentally induced migration, should rather aim at stopping forced migration and facilitate a shift to voluntary migration. In other words, they should to allow for agency and choice where there is urgency and compulsion.

2. Temporary vs. permanent. The second distinction concerns the timeframe of movement and differentiates between temporary and permanent migration. Again, this distinction should be seen as a continuum rather than a rigid opposition. Indeed, as it will be demonstrated later, some members of a household can move permanently upon an environmental stimulus, as other members of the same household only temporarily, or even decide stay in their original place of residence despite environmental hardships. In other cases, people may leave their place of residence with the idea of moving permanently, but are coming back after a few years.

3. Internal vs. international. If the vast majority of environmentally induced migration happens within national boundaries (IOM 2009), cases of transboundary displacements – which can be temporary or permanent – have also been recorded. Moreover, as it will be shown later in this report, in Kyrgyzstan international labour migration of one or several members of a household is often used as an adaptation strategy to cope with unfavourable environmental or climatic conditions affecting household income. It is thus necessary to examine this internal vs. international aspect of environment migration.

4. Vulnerability vs. resilience. Another important distinction, closely related to the socio-economic characteristics of populations, concerns the vulnerability and resilience aspects of displacement. In other words, does environmentally-induced displacement increases the vulnerability of individuals and households, or on the contrary, for instance in cases of voluntary migration, does it enhance their resilience (namely their capacity to adapt) to environmental and climate changes? This distinction is highly important in a policy perspective, as the action of governments and other actors should aim to create the conditions in which well managed migration, instead of increasing the vulnerability of individuals, households and communities, can enhance their resilience and adaptive capacity.

5. Rural vs. urban. To the four above mentioned binary categories, we can add the rural vs. urban distinction, as environmental and climate factors will affect differently the livelihood and general well-being of populations depending on the characteristics of their place of living. Indeed, natural disaster such as earthquakes, as well as progressive phenomena such as desertification will produce different migration outcomes on rural and urban populations. It is thus important to take into account the setting of the place of residence of those experiencing a changing environment and climate.

   Additionally, the rural vs. urban distinction is not only analytically relevant for the place of origin of migration, but also for the place of destination. In other words, when moving away from environmental or climatic hardships, will the migrants decide to settle in a rural of an urban area? What are the criteria determining this choice? Understanding this is important in order to investigate the tendencies of environmentally induced migration and try to identify its places of destination. Indeed, migration to cities – often at least partly motivated by environmental factors – is a growing trend worldwide, as currently more than half of the world's population is living in urban areas. Assessing this trend, and the social, economic and political consequences of rural-urban migration, is a necessary step to understand the potential for conflict in urban areas and design adequate policies to prevent them.

Environmental migration: a working definition

This brief conceptual discussion of environmental migration brings us back to the important question of the concept's definition, and of the corresponding category of "environmental migrant". Indeed, considering the complexities outlined above, the task of determining an all-encompassing and operational definition of "environmental migration" is a difficult one. In the framework of this study, the IOM working definition will be used, stating that:

"Environmental migrants are persons or groups of persons who, for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their territory or abroad." (IOM 2009)

When using this definition, it should be kept in mind that the environment is rarely the sole factor motivating migration, and that line between "environmental migration" and "economic" or other types of migration is a fine and blurry one.

3.2. AVAILABLE EVIDENCE: A BRIEF REVIEW

The state of the research worldwide

Environmental migration is a relatively recent topic of interest for researchers. Even though the impact of natural disasters on forced displacement has always attracted attention in the media because of their dramatic and sensationalistic aspects, the influence of progressive phenomena on human mobility is now beginning to be studied in a more comprehensive manner. For a more thorough review of the current state of research on environmental migration worldwide, the reader can refer to the selected bibliography included in this report. For the purpose of providing a short but useful overview, we will limit ourselves to mentioning a widely cited EU funded initiative, the Environmental Change and Forced Migration Scenarios project (EACH-FOR). It contained 23 case studies (including Kyrgyzstan) and utilized a set of methods – mainly desk review and qualitative interviews – in order to "to explore and describe the causes of forced migration in relation to environmental change" and to "provide plausible future scenarios of environmentally induced forced migration". It is worth outlining the main findings of this research, as some elements, as will be shown later, are consistent with the findings of our own.

MAIN FINDINGS OF THE EACH-FOR PROJECT

- Climate change is not the only potential environmental trigger for migration – the environmental problems faced by migrants, potential migrants and non-migrants in the case study areas are manifold.
- The magnitude and frequency of many environmental hazards are increasing and further environmental degradation will take place due to global warming, hence the pressures to relocate because of environmental factors is slowly but steadily increasing.
- Migration is a traditional coping mechanism to environmental changes, but in some areas these traditional patterns have changed in recent decades due to rapidly changing socio-economic and environmental conditions.
- Migration occurs when livelihoods cannot be maintained, especially when agriculture or herding is severely affected by environmental degradation or extreme events.
- Longer term or permanent migration, in contrast to seasonal or temporary migration, is becoming more common, particularly among younger generations.
- Migration decisions are complex and reflect the interconnectedness of environmental factors with economic, social and political variables.
- People who want to leave their villages/regions/country can only do so if they have the necessary financial means and access to networks that support migration decisions.
- The study of forced displacement as a result of dam construction provides valuable lessons regarding the resettlement process, in particular the need for participatory processes with significant support and information for those being resettled.

Source: Vag, Andras, 2009. EACH-FOR Final activity report

The state of the research in Central Asia and Kyrgyzstan

In Central Asia, the topic of environmental migration remains understudied, even as data and an enhanced understanding of the context-specific manifestations of environment-migration interactions are much needed in order to design effective policies aiming to mitigate the impact of environmental factors on forced migration. Among the few Central Asian studies produced on the matter, it is worth mentioning the IOM research project *Environmental Degradation, Migration, Internal Displacement, and Rural Vulnerabilities in Tajikistan* (Olimova and Olimov 2012). Similarly to the present research, their analysis used quantitative (survey) and qualitative (interviews) methods to study popular perceptions about environmental conditions in rural areas and their impact on migration decisions. Among results worth to mention, they found that more than 40 per cent of surveyed respondents indicated that environmental conditions in their place of residence deteriorated during the last years, a finding consistent with ours. The study also demonstrated that sudden-onset disasters (mostly landslides and floods) as well as progressive phenomena (the main concern there begin drought) were affecting migration decisions, and that international labour migration was widely used as an adaptation strategy to cope with the negative impacts of these phenomena on income-generating activities. As it will be demonstrated later in this report, similar phenomena can be observed in Kyrgyzstan as well. They also highlighted that among the main ingredients for successful adaptation were the active role of the state, economic development of vulnerable regions and the resilience of local communities in regard to the consequences of natural disasters.

In Kyrgyzstan, the only work fully dedicated to the study of environment-migration interactions was conducted by researchers from the American University of Central Asia in the framework of the above mentioned EACH-FOR project.

MAIN FINDINGS OF THE EACH-FOR STUDY IN KYRGYZSTAN

- The study confirms that the environment plays a considerable role in migration dynamics in Kyrgyzstan, stating that "the empirical evidences suggest that environment does shape the migration decision-making process". The main environmental factors impacting migration in Kyrgyzstan are landslides and land degradation or various sources, including water related problems and overgrazing. Man-made phenomena, such as the presence of radioactive uranium stocks, also have a considerable influence on people's decision to resettle.

- In general, in areas experiencing environmental hardships, non-migrants – those who decided to stay – are economically better off than migrants since unlike the latter, they preserve land and livestock. Nevertheless, non-migrants are affected by environmental disasters which affect their physical and psychological well-being – for instance in areas with a high prevalence of landslides, where many people, especially in springtime, live in a state of constant fear – or where radioactive stocks are affecting the residents' health. Environmental and climate related problems also affect the residents' livelihood, for example causing loss of livestock or decreased agricultural production. Hence, people living in areas negatively affected by environmental problems face a difficult dilemma between the option of migration, entailing uncertainty and often the loss of livelihood assets, and the option of staying, which can imply living under the threats of unpredictable danger (landslides), of health related problems (proximity of radioactive stocks), as well as reduced income due to decreased livelihood assets (in case of water related problems).

- One of the most important consequences of environmentally induced migration is the loss of socio-cultural ties within families and communities, as these more or less forced displacements, whether temporary or permanent, concerning the whole household or some members of it, can slowly erode social networks and weaken social solidarity at the household and community levels.

- Overall, the Kyrgyz chapter of the EACH-FOR project presents rather grim conclusions about the environment-migration interactions in the country, stating that the "Kyrgyz case shows that migration processes in Kyrgyzstan have a strong environmental flavour and that environmental problems causing migration and displacement of large groups of people bring only negative, deteriorating impacts on the life of local communities".

Source: Nasritdinov and al. 2011

The EACH-FOR project represents a landmark for the understanding of the environment-migration nexus in Kyrgyzstan's context, as it can be considered as the first attempt to do so. However, its relatively restricted means limited the research's scope in terms of geographical coverage and number of respondents for qualitative interviews. Furthermore, no nationwide survey was conducted to investigate popular perceptions at the national scale. The present study thus aims to further, widen and complement the EACH-FOR project,[3] while using its results as a baseline. The present study indeed owns a lot to the EACH-FOR team for the development of its approach and methodology.

Related research

The EACH-FOR project was the only research examining specifically the issue of environmental migration in Kyrgyzstan's context. However, other recent research initiatives indirectly dealt with the topic. Among others, we can cite the WFP produced *Atlas of Food Security,* which by combining both geographical[4] and socio-economic[5] indicators, creates an index which actually tells us about more than mere food security, as it could be utilized to identify areas where unfavourable environmental living conditions could potentially trigger migration flows. Particularly, it highlights how environment and climate, through their impacts on agriculture and livelihoods, can play a considerable role in migration decisions.

Other sources of data are indirectly related to the environment-migration nexus in Kyrgyzstan. The Ministry of Emergency Situations (MES) produces on a yearly basis a Monitoring and Prognosis of the Activation of Dangerous Processes and Phenomena on the Territory of the Kyrgyz Republic (the so-called "green book"). Data related to the prevalence and frequency of various "dangerous processes and phenomena" are available at the district level and associated material destructions and human causalities caused by them are listed. On this basis are established prognostics on the future prevalence and frequency of these phenomena. The present analysis widely used this useful data produced by MES.

3.3. RESEARCH QUESTIONS

As a useful reminder, the primary goal of this study is to further our understanding of the interactions between environment, climate change and migration in Kyrgyzstan in order to enhance government, civil society and the donors' community response in tackling the negative consequences of forced environmental migration, as well as to understand how migration can be used as an adaptation strategy to environmental and climate change. Considering this overall objective, the research team formulated a starting hypothesis as well as specific and adapted research questions to test it.

The starting hypothesis goes as follows: from available evidence – both from worldwide research and Kyrgyzstan-specific research – different environmental and climatic factors are currently playing a role in migration dynamics, whether by suddenly forcing people to relocate (in the case of natural disasters) or by progressively enticing them to migrate (for example in the case of slow-onset phenomena such as decreased agricultural productivity due to water stress or land degradation). It can also be added that in a context of climate change, the weight of these factors in migration dynamics will most probably increase in the future.

Hence, the main analytical goal of this research in not to determine whether environment and climate change is the primary driver of migration – in Kyrgyzstan, it is most certainly not – but rather to understand the degree to which these factors influence migration decisions, and how do they interact with other determinants of migration, as well as with social, economic, political and psychological characteristics of individuals, households and communities. In other words, it aims to "disentangle the specific environmental component among other drivers of migration" and to "question the role and weight of environmental factors in already occurring phenomena" (Piguet and al. 2011). It also aims to assess the sensitivity of the drivers of existing migration flows to future environmental and climate change in order to contemplate the tendencies of environmental migration for the upcoming years and decades. That said, the research questions guiding our analysis are as follows:

3 Case study locations of the present research were chosen to be complementary to those investigated by the EACH-FOR team. Additionally, since the EACH-FOR had a particular focus on anthropogenic phenomena (particularly the consequences of uranium stocks and landslides), this research will put more attention on longer-term, progressive phenomena (it was chosen to not cover the issue of radioactive wastes in this analysis). Complementarity with the EACH-FOR study will thus be assured both on a geographical and thematic basis.

4 Such as agricultural production, frequency of natural disasters, land degradation and forth.

5 Such as maternal mortality, access to health facilities, poverty rate and so forth.

- What are the environmental and climate related factors (both short- and long-term) currently playing a role in migration patterns in Kyrgyzstan? Which of these phenomena are expected to play in increased role in migration patterns in the future?

- What is the role that environmental and climate related factors play in the decision to migrate at the individual and household levels? In which areas of Kyrgyzstan do these factors are playing a significant role in migration decisions? Which factors are affecting which areas? It is possible to predict how these factors, on the basis of predictions about climate change, will affect migration dynamics in the future?

- How do socio-economic characteristics such as age, gender, ethnic background, income and others interact with environmental factors in the decision to migrate (or to not migrate despite environmental hardships)?

- Which socio-economic characteristics determine the vulnerability of populations to environmental factors? On the other hand, which characteristics contribute to their adaptability and resilience to environmental phenomena and could decrease the risks of forced migration?

- What are the population's perceptions about the general condition of the environment in their place of residence? Do they perceive the effects of climate change, and if so, how? Do they consciously link environmental problems, climate change and migration?

- What are the main destination areas of environmentally induced migration in Kyrgyzstan? Is there a potentiality for conflict in these areas between newcomers and settled communities? If so, what can be done to mitigate the risks for such conflicts?

- What are the policy and legislative frameworks related to environmental migration in Kyrgyzstan? Are they appropriate to face current and future challenges associated with this issue? How can these frameworks be enhanced to better address the current and future needs of people affected by environment and climate related problems?

- What are the plausible future scenarios of environmental migration in Kyrgyzstan?

It is worth restating that particular focus was put on slow-onset changes in environment – such as land degradation and water related problems – which on the long-term may have significant impact on Kyrgyzstan's population's livelihoods, and whose impacts on migration patterns remain understudied as compared to those of sudden-onset natural disasters.

3.4. METHODOLOGY

Approaches and methods used to investigate environment-migration interactions have an undeniable influence on research outcomes, and relatedly on the formulation of paths of action. It is thus of paramount importance to design sound research approaches and methods, adapted not only to the object of study, but also to the context in which it is studied. However, the complexities of the environment-migration nexus pose many challenges to the elaboration of such approaches and methods. Without going into details,[6] it can be mentioned that the main challenges are related to the lack of baseline data (or the poor quality of data), to the difficulty of combining environmental and geographic variables with socio-economic variables, and to methodological problems arising when ones aims to establish prognosis of future trends. Another data challenge is that even though there exist relatively good data about sudden-onset phenomena (natural disasters), data about long-term, progressive phenomena is less available and reliable, with the result of complicating the analysis of the impacts of these phenomena on migration patterns and obliging to rely on more qualitative sources such as experts' opinions and popular perceptions.

Considering these challenges and in order to bring answers to our research questions in the most comprehensive and effective manner, the present research used a combined methodology, entailing both quantitative

6 For a more thorough review of methodological issues related to the study of environmental migration, the interested reader can refer to Piguet, Etienne. 2010. "Linking Climate Change, Environmental Degradation, and Migration: A Methodological Overview. Focus Article vol.1: 517-524

and qualitative methods. Indeed, it has been convincingly demonstrated that these two sets of methods are complementary: if quantitative techniques "prove best able to identify actual and potential population movements in broad terms and at fairly large spatial scales", qualitative methods, by contrast, "appear to be most successful in identifying migrants' motivations, the role of environmental factors within those motivations, and the interplay of environment with non-environmental factors in causality." (Obokata and al. 2014). Let's have a quick look at the methods used in the framework of this analysis.

WHICH SCALE FOR ANALYSIS?

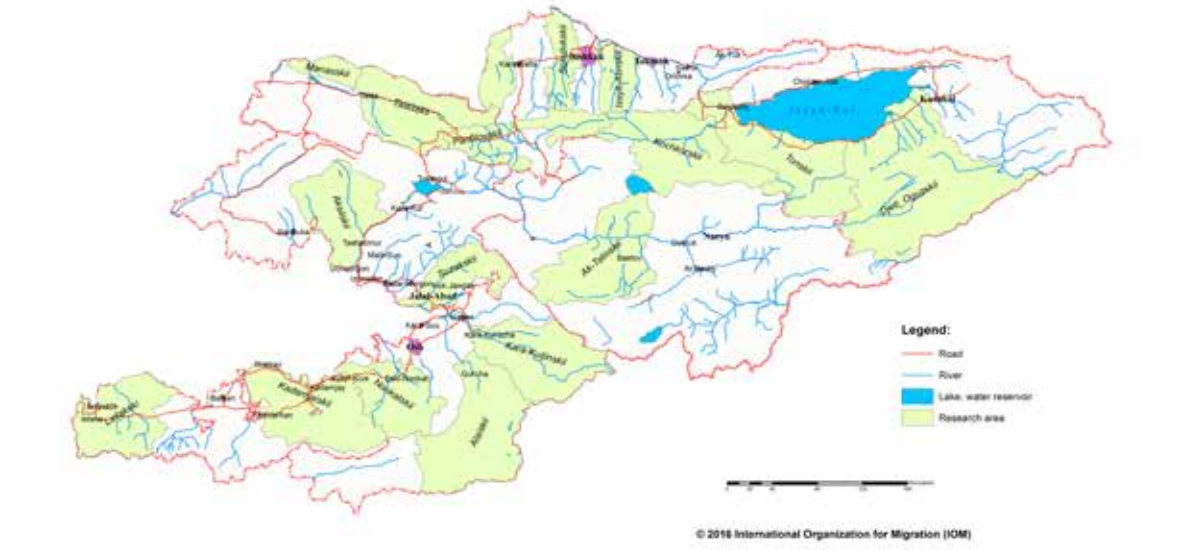
When investigating environment-migration interactions, which scale of analysis should be employed? In other words, should we examine the impacts of environment on migration patterns at the individual, household, community, or even at the national level? Ideally, analysis should be sensitive, as much as possible, to all these different scales. If it appears that migration decisions are taken mostly at the individual and household levels, larger systems, such as the community, should also be investigated. Indeed:

"Environmental aspects of the local community or region may also be important, since the loss of forests, degradation of soils, depletion of watersheds, or reduction of vegetation due to drought, for example, in the larger community, will affect local livelihood prospects. Soil degradation, for example, reduces the agricultural productivity of land, reducing the demand for labour in the community as a whole, which may lead to out-migration." (IOM 2009)

Hence, this research adopts a multi-scale approach in order to investigate how environment and climate impact livelihood – and hence migration patterns – at the individual, household and community levels.

Quantitative methods

The main quantitative method employed to investigate environment-migration interactions consisted in the conduction of a nation-wide household survey.[7] The sample was composed of 500 households[8] in 16 districts covering all of Kyrgyzstan's oblasts. The survey was conducted in rural areas. Half of the households were chosen in areas considered as "more vulnerable" upon the prevalence of phenomena potentially affecting migration,[9] and the other half was chosen randomly in areas of "lesser vulnerability". The sampling thus allows for the study of regional comparison (see map 5 and figure 5 for the repartition of respondents by oblasts).



Map 5: *Selected districts for the conduction of the household survey*

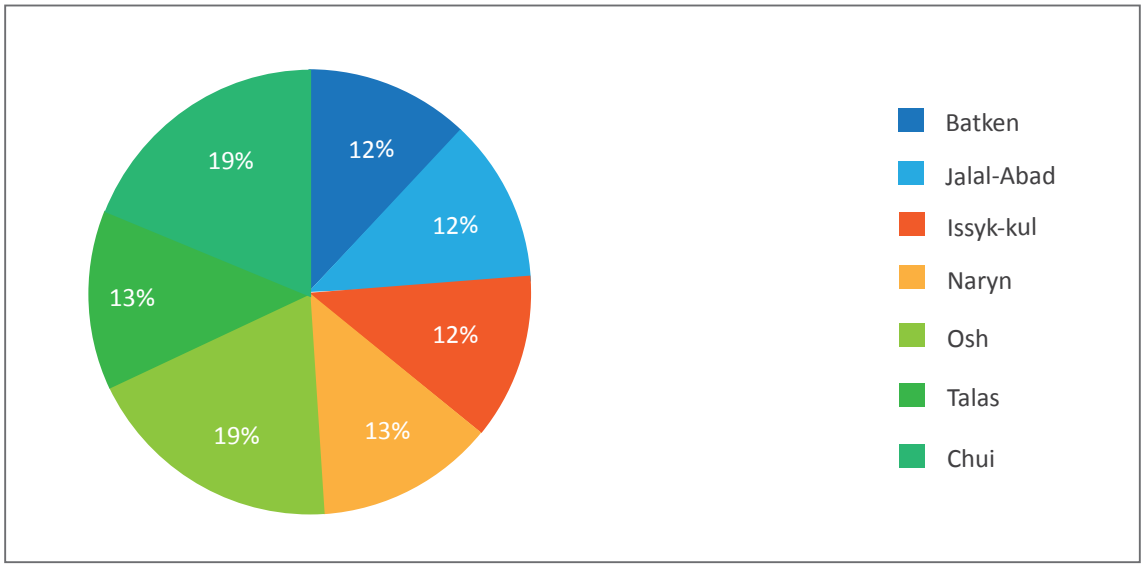
7 Field work was conducted by M-VECTOR in February 2016, with the involvement of 16 data collectors, 7 supervisors and 4 operators. A pilot was conducted to test the questionnaire, upon which slight modifications in the formulation of questions were made. 20 % of respondent households were verified for quality check. Double data entry was also done in order to reduce the possibility for error. The IOM research team independently analysed the database.

8 Margin of error = 4,4 %

9 Data from the Ministry of Emergency Situations were used for this purpose.

The questionnaire, developed by the IOM research team, is composed of three sections[10] aiming to capture the different aspects of environment-migration interactions. The first section, "Perceptions about environment and migration", is designed to investigate the role of various environmental factors in migration decision. The second, "Livelihood and the environment", aims to understand the degree to which households' income and livelihoods in Kyrgyzstan are sensitive to changes in the environment and climate, and if these changes, through their impacts on livelihoods, can actually or potentially trigger migration. Finally, the third section, "Perceptions about the involvement of the government, local and international organizations", investigates the implication, role and effectiveness of different actors engaged in such fields as environmental protection, response to natural disasters, provision of social services, the development of infrastructure, and other issues related to the environment-migration nexus. The results of this survey will be presented throughout the report, and put into dialogue with qualitative information gathered during interviews and focus group discussions.

Figure 5: Repartition of survey respondents per oblast



Qualitative methods

The household survey and other quantitative methods provided invaluable information for the understanding of environment-migration interactions in Kyrgyzstan. However, such data can only show one part of the picture, and should be balanced with qualitative information, more adapted to investigate decision-making processes and perceptions at the individual and household levels.

The research team thus conducted focus group discussions (FGD) with community members living in areas considered vulnerable to different environmental phenomena potentially or actually impacting migration decisions. In total, six FGD were conducted, with an average of 15 to 20 participants. Locations of FGD were selected with the aim of attaining a representativeness of the various phenomena impacting migration at the country level. [11] Hence, three FDG were conducted in two districts of the southern Jalal-Abad oblast, where the prevalence of sudden-onset disasters (mainly landslides and floods) is particularly high and has caused destructions, fatalities, temporary displacements and

Focus group discussion in Naryn oblast

10 Excluding the "general information about respondent" section.

11 FGD were conducted in the following villages: Kyzyl-Tuu (Aksy district, Jalal-Abad oblast), Kirzhol and Sary-Bulak (Suzak district, Jalal-Abad oblast), Lipenka (Jeti-Oguz district, Issyk-Kul oblast), Ugut (Ak-Ta district, Naryn oblast) and Cholpon (Kochkor district, Naryn oblast).

permanent resettlement. The remaining three FGD were conducted in Naryn and Issyk-Kul oblasts, where more progressive, long-term phenomena (particularly water stress and land/pasture degradation) impact migration decisions through changes in livelihood assets and income.

GENDER BALANCE DURING QUALITATIVE DATA COLLECTION METHODS

As convincingly demonstrated in the literature, the impact of environmental and climate factors on migration decisions is mediated by a set of intervening variables, among which gender plays an important role (see chapter 5 for a deeper analysis of the various gender aspects of environmental migration in Kyrgyzstan). Hence, during the data collection process, particular emphasis was put on obtaining gender balanced information. For instance, efforts were made to allow women to make their voice heard during focus group discussions (FGD). It was thus asked of FGD organizers in selected villages to reach gender parity among the participants. Yet, despite these efforts the vast majority of participants were male. To compensate this imbalance, the moderator of the discussion repeatedly encouraged women to speak their mind and voice their concerns, which led to relatively good results in terms of gender representativeness in gathered information. Gender sensitive questions were also asked during discussions in order to investigate the specific needs of women residing in areas affected by or vulnerable to environmental change.

In addition to FGD, in-depth interviews were conducted with two categories of respondents: 1) people who have migrated from their place of residence because of natural disasters (landslides) and who have been resettled with support of the Ministry of Emergency Situations and 2) people living in areas vulnerable to natural disasters and/or progressive degradation of environmental conditions, but who decided not to move from their place of residence. These interviews, conducted by the team's anthropologist and using a more subjective approach, were highly valuable to understand the different factors playing a role in migration decision processes, as well as popular perceptions about the environment.

In-depth interview in Jalal-Abad oblast

Even though popular perceptions are crucially important, a balanced and comprehensive account of environment-migration interactions requires the investigation of expert opinion. Hence, interviews were conducted with specialists of various backgrounds working in governmental and non-governmental institutions. The knowledge, opinions and experience of these informants were put in contrast with popular perceptions in order to draw a more comprehensive picture of the topic. Interviewees included representatives of relevant government institutions,[12] as well as experts from international organizations.[13] Interviews were conducted at the central, oblast and district levels, considering that perceptions and opinions from people working in the capital may differ from opinions of those working closer to the "field".

The present analysis is mostly concerned about the manifestations of environment-migration interactions in rural areas. However, a component was also included in the research design to study some aspects of these interactions in an urban setting. Indeed, it has been shown that in most cases, the largest part of migration flows caused by environmental and climate related factors happens within national boundaries and has a strong rural-urban orientation (Obokata and al. 2014). A dozen semi-structured interviews were thus conducted with residents of the capital city Bishkek. Two specific objectives underpin these interviews. Firstly, they aim to investigate the perceptions of urban dwellers about internal migrants (permanent or temporary) moving into the city, to assess the potentiality for conflicts between settled urban populations and newcomers

12 Mainly the Ministry of Emergency Situations, the State Agency for Environmental Protection and Forestry and the State Migration Service. At the oblast and district levels, local administration representatives were interviewed with participation of thematic experts, mainly on water and irrigation issues, livestock, agriculture, migration and social development.

13 Including the WFP, the FAO, the Central Asian Institute for Applied Geosciences and others.

and, if the potentiality for such risks exist, to understand how they can be reduced. Secondly, as not only rural areas are affected by environmental and climate factors, interviews aimed to investigate urban dwellers' perceptions about the environmental condition in the city and its potential impacts on migration decisions. These semi-structured interviews were conducted by students of the American University of Central Asia (AUCA), an exercise which contributed to raise the awareness about the issue of environmental migration and increase national research capacities for its study. The findings of this "urban component" are presented in chapter 5.

WHY CONDUCT INTERVIEWS? THE VALUE OF QUALITATIVE DATA

The information gathered during FGD and various types of interviews (expert, in-depth, semi-structured) proved invaluable to investigate popular perceptions about the specific manifestations of environment-migration in various regions of Kyrgyzstan. Indeed, as it has been argued in the literature:

> *"it is of paramount importance to take into account not only the objective characteristics of the environmental degradations but people's perceptions and representations of their evolution and of their potential migration consequences. The measure of the impact of environmental factors on displacement should be complemented by an examination of the socio-cultural perceptions and representations of these threats among concerned populations, a turn recently advocated in relation to climate change studies in general." (Piguet and al. 2011, 16-17)*

Additionally to these quantitative and qualitative methods, a desk review of available literature on environmental migration (both in Kyrgyzstan and worldwide) was conducted, and relevant data from diverse governmental and non-governmental institutions were gathered and analysed.[14]

Other approaches

The present analysis uses elements from various approaches that have been developed for the study of environment-migration interactions. On the geographical side, we can mention the "spatial vulnerability mapping" approach (also called "hotspots approach" or "spatial vulnerability modelling"), consisting in the identification of areas particularly vulnerable to migration-impacting environmental phenomena. Data related both to the prevalence of natural disasters and to progressive phenomena (land degradation, pasture degradation, salinization, risks of underground flooding and others) were analysed in order to determine the areas with unfavourable environmental conditions likely to impact migration decisions. However, results of such "vulnerability mapping" exercises should be interpreted with caution, as geographical factors alone cannot be considered as accurate determinants of migration decision processes. Elements from this approach are mostly apparent in chapter 4.

In order to balance this geographical "hard facts" approach, the analysis also borrows elements from the "Sustainable Livelihood Approach", which "seeks to explain the responses of households to external vulnerabilities in terms of the natural, physical, financial, human, and social assets and different coping strategies available to households" (Kniveton and al. 2008). This approach, by focusing on the necessary conditions for sustainable livelihood in its multiple aspects, has proven effective to investigate the various ways through which the environment and climate affect livelihood assets, and thus migration decisions. Furthermore, this approach's sensitivity to how intervening socio-economic variables contribute to determine migration outcomes at the micro level renders it analytically potent and useful. Elements from this approach are described in chapter 5.

3.5 CHALLENGES AND LIMITATIONS

Several challenges related to methodological constraints, availability of baseline data, and to the project's timeframe limited in different ways the scope of this analysis. It is thus necessary to outline these challenges and limitations before presenting the research's findings.

14 This data mainly originates from the Ministry of Emergency Situations, from the State Agency for Environmental Protection and Forestry and from the National Statistical Committee.

Firstly, it was decided not to undertake the complex – and maybe unrealistic – task of producing an "index of environmental migration", which by aggregating different environmental, socio-economic and migration related indicators, would quantify by areas the role of environment factors in migration dynamics and/or the vulnerability of these areas to environmental migration. Considering the complexity of environment-migration interactions, the many factors playing a role in migration decision processes and the insufficiency of good quality data,[15] it is doubtful that such an index would reach its goal.

Secondly, it is important to mention that even though an important goal of this research is to investigate future dynamics and trends of environment-migration interactions in Kyrgyzstan, the complexities of these interactions, as well as the many intervening socio-economic variables playing a role in the equation, do not allow for the formulation of accurate predictions about the number of "environmental migrants" that the country should expect in the coming years and decades. Our own experience confirm an opinion which has been convincingly argued in the literature, stating that "migration induced by climate change cannot be modelled in the same 'hardware modelling' way as the climate itself, and the idea of producing quantitative predictions of migration, assorted with probabilities of occurrence, is little more than a dream." (Piguet 2010)

Furthermore, as previously mentioned researchers in this field often have to work with partial, imperfect information, often originating from the perceptions of respondents, which may not always reflect the reality in an accurate manner. This is why sensitivity to context is necessary when gathering and analysing qualitative data, as there could be possible bias in respondents' answers due to the context of interviewing and FGD.[16] Hence, differences between subjective perceptions of the environmental situation and objective data represent an additional challenge standing in the path of understanding environment-migration interactions, and should be taken into account (Obokata and al 2014).

Finally, another obstacle related to the formulation of predictions is the uncertainty about the behaviour and strategies of agents (individuals and households). Recently developed methods, such as agent-based modelling, could be promising to further investigate the complex relationships between migration, environment and climate change. However, they require longitudinal, multi-year data, that the limited timeframe of this research did not allow to produce.

15 For instance, the only available nationwide data on internal migration is derived from the registration of the place of residence of the country's citizens. However, an important number of people do not live in the place where they are actually registered, rendering the data largely unreliable for analytical purposes.

16 For instance, some participants might exaggerate the scale of the problems they are experiencing because they have particular expectations in terms of the assistance they could receive from donors.

4. THE GEOGRAPHY OF ENVIRONMENTAL MIGRATION IN KYRGYZSTAN

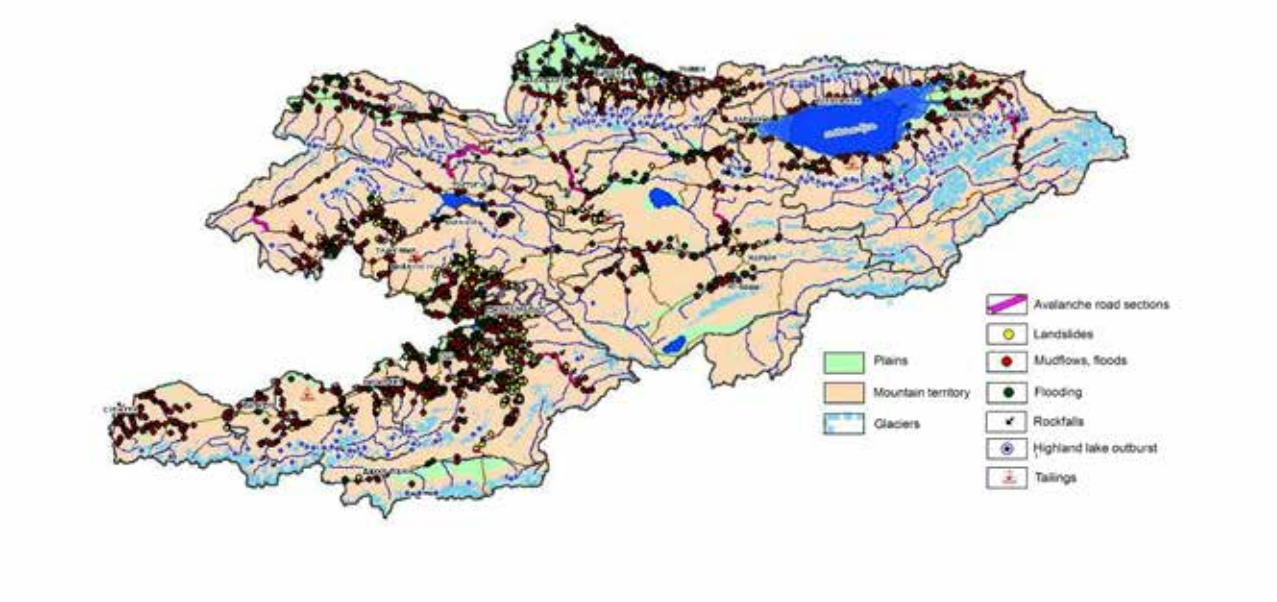
This chapter aims to establish the mapping, at the national scale, of the various environmental factors and phenomena currently or potentially impacting migration dynamics. It uses the "vulnerability mapping approach" (sometimes referred to as the "hotspots approach") which seeks to identify the areas where environmental factors can potentially affect migration patterns. However useful this approach is to identify the potential "hotspots" of environmental migration, it is necessary to be aware of its limitations. Indeed, it has been shown that:

> *"Spatial vulnerability models often use a straight-line assumption that an increase in exposure to a particular climatic stress stimulates a corresponding increase in the potential for displacement and/or migration (Piguet 2010). This assumption is not consistent with the broader scholarly understanding of the various ways by which migration movements develop, nor is it reflected in past examples of climate-related migration, which have shown climate-related migration to be heavily moderated by intervening economic, social and cultural variables, and which occur in conjunction with or as subsequent to other forms of adaptation" (McLeman 2012)*

Despite these limitations, the study of the geographic distribution, frequency and intensity of the various dangerous natural processes present on the country's territory represents a necessary and important step for the understanding of environment-migration interactions.

4.1. DANGEROUS NATURAL PROCESSES AND PHENOMENA

The territory of the Kyrgyz Republic is characterized by the complexity of its geological structure and terrain and its high seismicity. A specific feature of Kyrgyzstan is fairly harsh natural conditions and high vulnerability of mountain ecosystems, which determine conditions of living in the foothills, plains and valleys, where settlements are located. Hazardous natural processes and phenomena manifest themselves throughout the entire territory of the Republic (Map 6).



Map 6. *Schematic map of hazardous processes and phenomena occurring on the territory of the Kyrgyz Republic (MES KR).*

Three-quarters of the population reside at the foothills of mountain slopes or along flood basins of rivers, which makes settlements particularly vulnerable to climatic and man-made hazards. The most destructive hazardous natural processes and phenomena that inflict significant damage to the population and the economy include earthquakes, mudflows, floods, landslides, avalanches, heavy rains, floods, salinization of soils, rise of groundwater levels and others.

Some types of hazardous natural processes and phenomena occur in the form of sudden and short-term events (earthquakes, landfalls, landslides, avalanches, mudflows, floods) causing huge material losses and sometimes casualties. Others, such as waterlogging, erosion and glacial surges develop over a long period of time and rarely cause casualties; however, the material losses they cause are often considerable.

House nearly destroyed by a landslide in Jalal-Abad oblast

Province	Number of ES in the province during the observation period		Types of processes																	
			Mudflows and floods		Landslides and rock falls		Avalanches		Earthquakes		Waterlogging		Meteoro-logical (rain, snow, hail, wind, ice jams)		Man-made accidents and large fires		Infections		Other	
			num-ber	%	num-ber	%	num-ber	%	num-ber	%	num-ber	%	num-ber	%	num-ber	%	num-ber	%	num-ber	%
Batken	**378**	100%	229	60,6	16	4,2	2	0,5	17	4,5	2	0,5	34	9,0	44	11,6	20	5,3	14	3,8
Jalal-Abad	**1023**	100%	371	36,3	98	9,6	208	20,3	51	5,0	9	0,9	91	8,9	121	11,8	66	6,5	8	0,7
Issyk-Kul	**350**	100%	54	15,4	3	0,9	57	16,3	31	8,8	8	2,3	103	29,4	69	19,7	16	4,6	9	2,6
Naryn	**229**	100%	40	17,5	16	7,0	43	18,8	17	7,4	8	3,5	39	17,0	31	13,5	27	11,8	8	3,5
Osh and Osh city	**799**	100%	236	29,5	148	18,5	117	14,6	112	14,0	10	1,3	63	7,9	80	10,0	22	2,8	11	1,4
Talas	**195**	100%	67	34,3			4	2,0	8	4,1	20	10,3	45	23,1	28	14,4	21	10,8	2	1,0
Chuy	**449**	100%	53	11,8	22	4,9	42	9,4	24	5,3	36	8,0	80	17,8	163	36,3	23	5,1	6	1,4
Bishkek city	**167**	100%	4	2,4	3	1,8			1	0,6	16	9,6	7	4,2	109	65,3	5	3,0	22	13,2

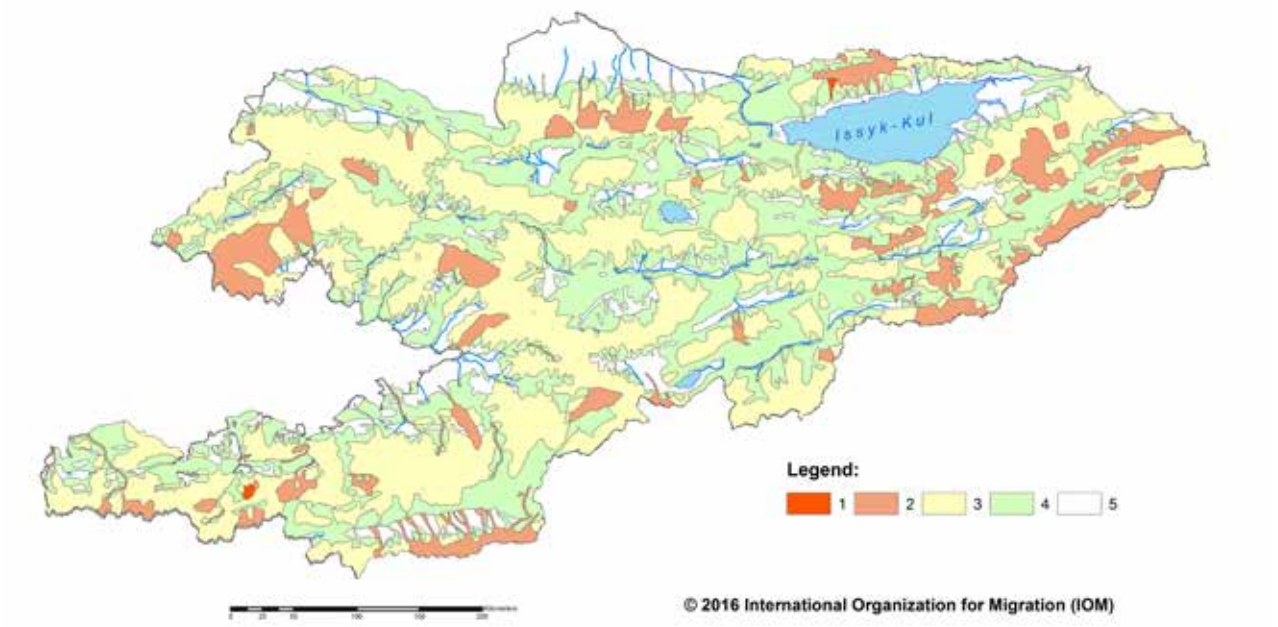
Table 1: Breakdown of registered emergency situations (ES) related to the main types of natural and man-made processes by oblasts for the period 2000-2014 (MES 2015)

According to the analysis of observations over many years, the most dangerous phenomena for the population and economy of Kyrgyzstan are earthquakes, mudflows and floods, landslides and landfalls, waterlogging, avalanches, late (spring) frosts and snowfalls. Table 1 presents data from the Ministry of Emergency Situations on natural hazards and weather phenomena on the territory of the Kyrgyz Republic for the 2010-2014 period that have inflicted material damage or led to human deaths.

Landfalls and landslides mainly occur on the territory of southwestern Kyrgyzstan (where 3500 out of existing 5000 landslide zones are located), where over 30-40 landslides take place per one square kilometre in certain areas. Long-term observations show that the majority of landslides form in high-water years. The number of landslides grows annually. This is due to the activation of current interacting geodynamic movements, seismicity, the rise of groundwater levels, the anomalous amount of atmospheric precipitation as well as engineering and economic activities that impact the integrity of slopes in mountainous areas. According to preliminary cartographic assessments, the total area of lands affected by landslide processes and occurrences composes around 7.5 per cent of the Republic's territory. The most landslide active areas include the basins of rivers Kugart, Mailuu-Suu, Kara-Unkur, Kara-Suu, Sumsar and Chatkal. The most hazardous areas in terms of landslides are concentrated in the basins of rivers Yassy, Kara-Kuldja, Tar, Gulcha, Ak-Buura and Kyrgyz-Ata. In total, around 300 settlements are situated in landslide prone areas, the threat of which will continue to persist in future.

Landslide in Jalal-Aba oblast

Mudflows and floods. Due to their exceptionally widespread character and frequency, mudflows and floods occupy the first place among all other natural hazards (see Table 1) by overall damage inflicted. Almost the entire territory of the republic is subject to the impact of mudflows (Map 7). Three thousand one hundred and three (3,103) mudflow rivers are found in Kyrgyzstan.

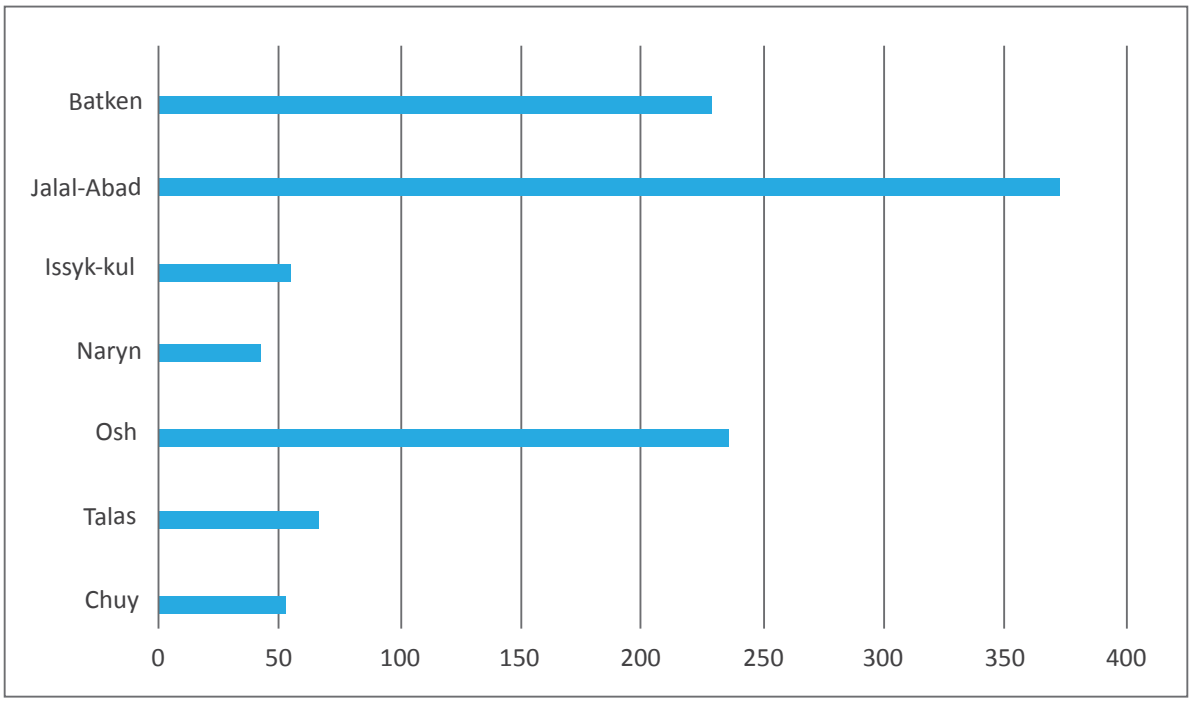


Map 7. *Schematic map of mudflow hazards on the territory of the Kyrgyz Republic.*
1 = extreme risk 2 = high risks 3 = medium risks 4 = low risks 5 = no risk

Ninety-five per cent of all settled areas of the Republic are affected by mudflows and floods. The largest amount is observed on the territory of Jalal-Abad, Osh and Batken provinces (Figure 6).

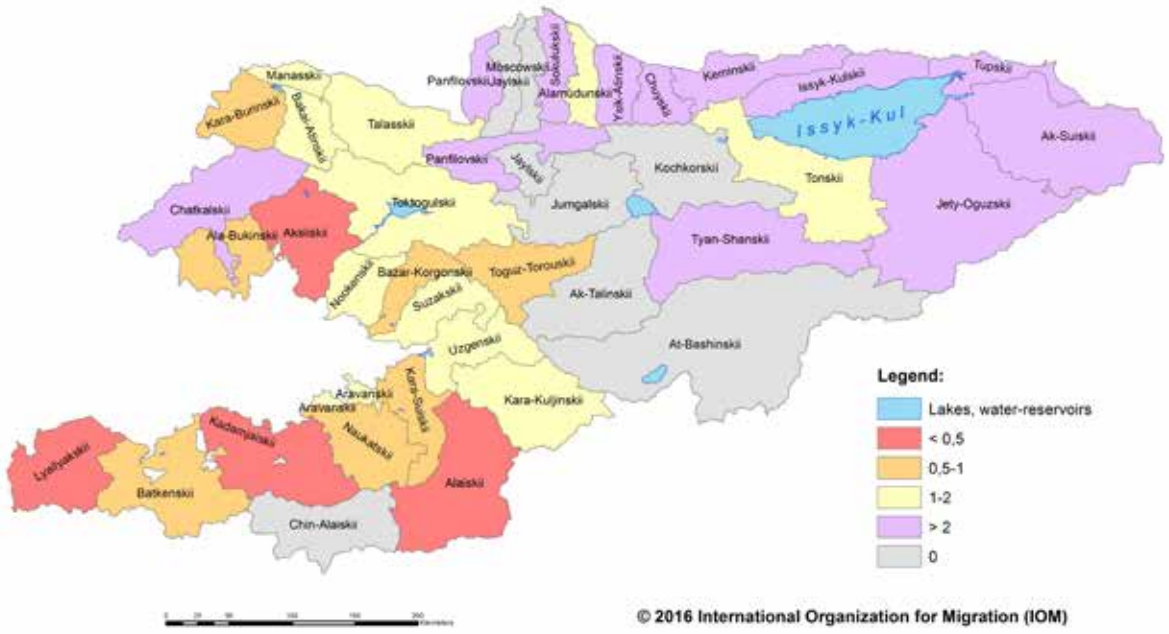
Mudflows are characterized by saturation with hard material, the short-term nature of their occurrence, their speed and destructive force. Transport and communication infrastructure, agricultural lands, irrigation structures and other objects are affected by mudflows and floods. Mudflows and floods also aggravate river bed erosion and gullying, lead to the flooding of territories and to the silting of irrigation structures. Causes of destructive mudflows can be outbursts of mountain lakes and impounding reservoirs formed after the occurrence of landslides, landfalls and avalanches. These hazards coupled with the man-made dangers (mountain dumps and tailing pits situated in valleys of mountain rivers) represent a high risk of contamination of water resources and the environment (MES 2015, Orolbaeva 2013).

Figure 6. Number of registered emergency situations related to mudflow and flood processes for 2000-2014 by oblast (MES 2015)



The flood regime of mountain rivers is characterized by the peculiarity of rise and fall of floods and duration of their occurrence. Around 65 per cent of rivers in Kyrgyzstan have a mixed glacial-snow or snow-glacial feeding with floods taking place in the first or second half of summer. Rivers fed by mixed sources may experience two-three and more floods per year. Maximal flows during floods happen in April-May. Besides snow and snow-glacial floods, short-term floods caused by heavy rains leading to mudflow formation may be observed in some rivers.

The most vulnerable areas are the southern and western parts of the country, particularly districts of Osh province (Nookat, Kara-Suu and Alay districts), Jalal-Abad province (Ala-Buka, Aksy, Bazar-Korgon and Toguz-Toro districts), one district of Talas province (Kara-Buura district) and all districts of Batken province (Map 8). The number of flood, mudflow and landslide processes is growing with the increase in the amount of precipitation and more intense melting of glaciers observed in recent years (Food Security Atlas FAO, MES KR 2015).



Map 8. *Aggregate frequency of floods and mudflows on the territory of administrative districts for 1999-2009 (Food Security Atlas of the Kyrgyz Republic 2014)*

In terms of their destructive impacts, ***earthquakes*** occupy a particular place among natural hazards, since they happen suddenly and are often accompanied by secondary impacts (landslides, landfalls, fires and so on). Kyrgyzstan covers a large part of Tian-Shan and northern regions of Pamir and is one of the most seismically dangerous regions of Central Asia. The Republic's oblasts differ in seismicity. The southwestern part of the territory is distinguished by a high level of seismicity, where over 2,000 earthquakes take place annually. In the northeastern part, seismic activity is significantly lower but, at the same time, there have been very strong earthquakes in the past. On average, over 3,000 earthquakes per year are registered annually on the territory of the Republic; out of these, ten-twenty can be felt and have a magnitude of over five points.

Avalanches belong to the most hazardous hydro-meteorological natural phenomena that pose a threat to people, transport and energy infrastructures and energy lines; cases of mass death of cattle and damage of woodlands during avalanches are not uncommon. Avalanches affect 105 thousand square kilometres, which composes 53 per cent of the entire territory of Kyrgyzstan. Over 30 avalanche sites have been identified within areas of avalanche formation, three percent of which pose a concrete danger to human security.

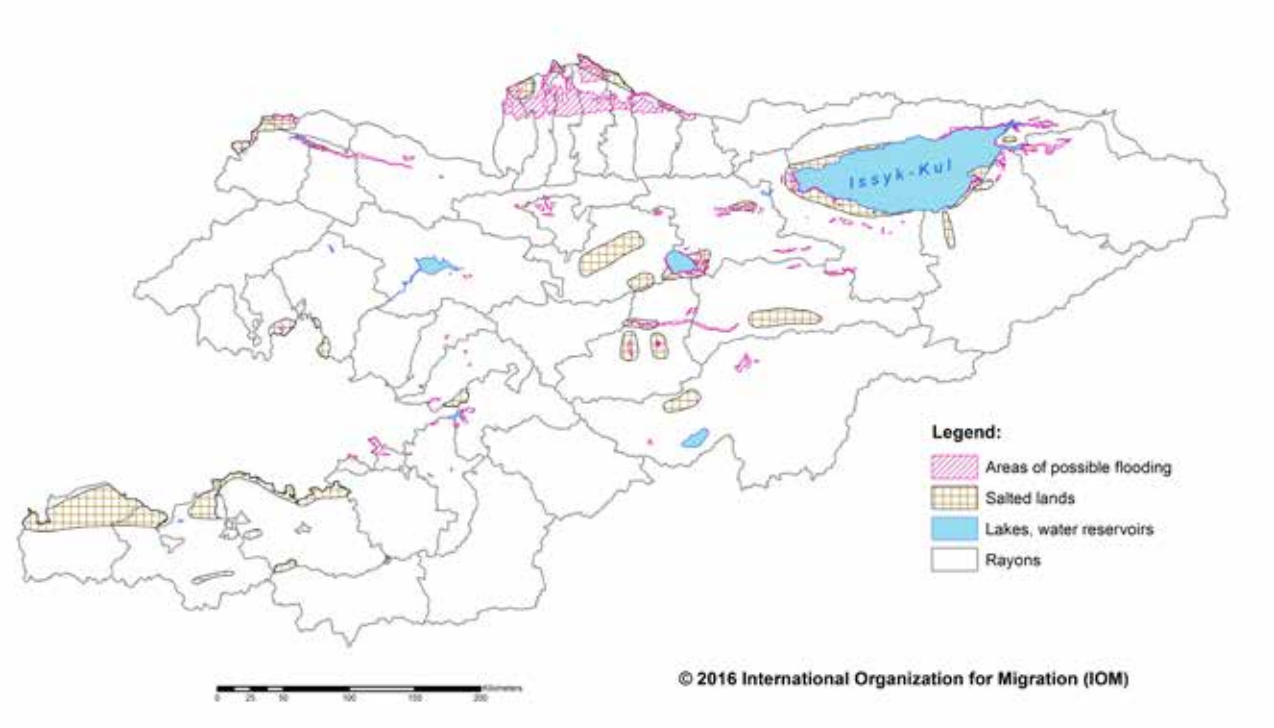
High mountain territory prone to avalanches

Meteorological hazards (wind, atmospheric precipitation, air temperature and others) account for 13 per cent of all emergency situations, but, at the same time, they often lead to other dangerous processes. Activation of landslides, rock falls, around 70 per cent of mudflows and floods and the rise in the level of groundwater depend on the amount and distribution pattern of liquid atmospheric precipitation, accumulation and melting of snow cover and glaciers.

Late spring and early autumn frosts and sudden weather changes do not pose a danger to the lives and health of the population but cause exceptionally large material and indirect damages to agriculture – the basis of the Republic's economy. A sudden change in weather observed from 30 March to 3 April in 2015 is an example of a negative occurrence of late spring frosts. In this time, after a long period of high day temperatures, the territory of the country was subject to an influx of northern cold air with a heavy snowfall and a significant and rapid decrease in air temperatures across the entire territory of Kyrgyzstan. In the agricultural regions of the

republic, frosts reaching from –5 to -17°C, that lasted 2-3 days, resulted in the death of the majority of fruit crops, potato and cabbage seedlings, sprouts of several crops and fall wheat (National Report of the KR 2016). Hazardous natural and man-made processes that develop over a long period of time include waterlogging, erosion, sinkholes and glacial surges. These processes rarely lead to human deaths, nevertheless, they may incur significant material damage.

Waterlogging. In recent years, plain areas of Kyrgyzstan, where the majority of the Republic's population is concentrated, have witnessed the activation of waterlogging processes (Map 9) leading to the death of plants and degradation of significant areas of agricultural lands, to the worsening of the environmental situation, the complication of sanitary and hygienic conditions, as well as to the increase of seismic hazards (see Table 1).



Map 9. *Schematic map of areas in the Kyrgyz Republic with waterlogging and salinization processes*

Waterlogging is caused by natural factors conditioned by geologic, hydrologic, climatic conditions as well as artificial conditions related to human activities. Among the latter, the prevailing are changes in feeding and discharge of ground waters by economic activities due to irrational increase of irrigation water use, leakages from irrigation structures, breakdowns of irrigation and collector and drainage networks, irrational planning and development of territories, decrease in withdrawal of ground waters and others (Orolbaeva 2013, National Report 2016).

Hazardous natural processes and occurrences manifest themselves across all regions of the mountainous Republic and affect all foothills, slope areas and river valleys suitable for living and agricultural activities, namely territories with initially high risks of hazardous processes. When the natural balance in mountain ecosystems is damaged, there is an increase in the frequency and scope of the emergence of hazardous processes which leads to natural disasters, to negative impacts on livelihoods, to disturbances in the functioning of the economy and to worsened living conditions for the population.

The extent and frequency of damage caused by sudden-onset hazardous natural and man-made processes and phenomena fluctuate from year to year, but at the same time, as MES statistics show (see Table 1) the most dangerous in terms of incurred damage and human losses are earthquakes, mudflows, floods, landslides and avalanches. The following case study conducted in two districts of Jalal-Abad oblast, where the above mentioned dangerous processes and related natural disasters often occur, illustrates the impacts of changes in the environmental situation on population's livelihoods and migration decisions.

4.2. CASE STUDY: HAZARDOUS NATURAL PROCESSES ON THE TERRITORY OF AKSY AND SUZAK DISTRICTS OF JALAL-ABAD OBLAST

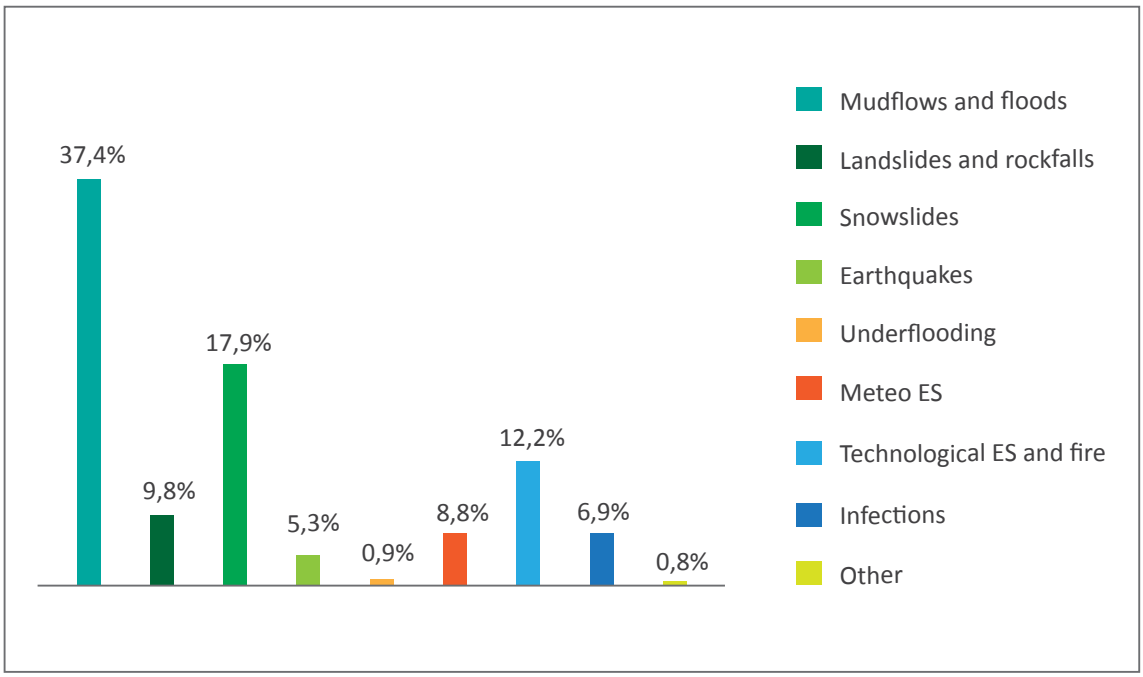
Jalal-Abad oblast covers an area of 32,418 square kilometres and includes eight administrative territorial districts: Aksy, Ala-Buka, Bazar-Korgon, Nooken, Suzak, Toguz-Toro, Toktogul and Chatkal. The first five districts are located in the Fergana valley and in intermountain basins, and settlements are situated at an altitude below 1700 metres. Toguz-Toro, Toktogul and Chatkal districts are located in basins between mountain ranges and even though they are situated at an altitude below 1600 metres, in the coldest periods of the year, difficulties to access the settlements of these districts may arise due to avalanches.

The total permanent population of the oblast comprises 1,146,500 people. Out of these 248,500 reside in urban and 898,000 in rural areas (NSC 2016). It is worth noting that an annual increase in the number of inhabitants is observed in almost all districts of the province. In general, the average population density in the province equals 35 persons per square kilometre.

Dangerous natural processes dependent on climate, terrain, lithologic features of mountain formation, tectonic movements and so forth, are widespread in Jalal-Abad oblast. According to MES data, from 41 to 147 emergency situations (ES) take place annually in the oblast (68 in average). Anthropogenic emergency situations and large-scale fires compose 12 per cent. Among prevailing emergency situations of natural character are those caused by mudflows and floods (37.4%), avalanches (17%), landslides and rock falls (9.8%) and meteorological hazards (8.8%).

The greatest number of resulting registered casualties is from avalanches and landslides (10.0%). During the period between 2000 and 2015, the province witnessed 1,094 emergency situations, caused by different types of dangerous natural and anthropogenic processes. At the same time, over one third (37.4%) of the overall number of ES were hazards connected to mudflows and floods, avalanches (17.9%), landslides and rock falls (9.8%) (see Figure 7).

Figure 7. Share of the number of ES caused by various dangerous natural processes on the territory of Jalal-Abad oblast for 2000-2015 (MES 2016)



Such distribution of ES on the territory of the oblast is explained by the fact that almost all river basins in Jalal-Abad are prone to floods and mudflows. The activation of mudflow and flood processes takes place upon

intensive melting of large areas of snow reserves, retreat of glaciers and snowfields, anomalous temperatures in highland areas, heavy rain precipitation in time of seasonal floods and outbreaks of highland lakes and water reservoirs. On the large snow-fed rivers of the oblast, seasonal floods begin in March, while heavy floods occur in April. On mountainous rivers, floods exacerbate processes of bank and riverbed erosion, alterations of riverbeds and flooding of near-shore territories, which strongly affect the livelihood of mountain communities.

Out of the total number of ES, the second place by the frequency of occurrence is occupied by avalanches (17.9%). The main causes of avalanches in mountain areas are significant accumulation and recrystallization of snow, as well as sudden thaw periods. Risks of avalanche are high in mountain passes. The maximal peak of avalanching risk takes place at the end of winter and early spring. The most avalanche prone areas are Fergana and Chatkal ranges.

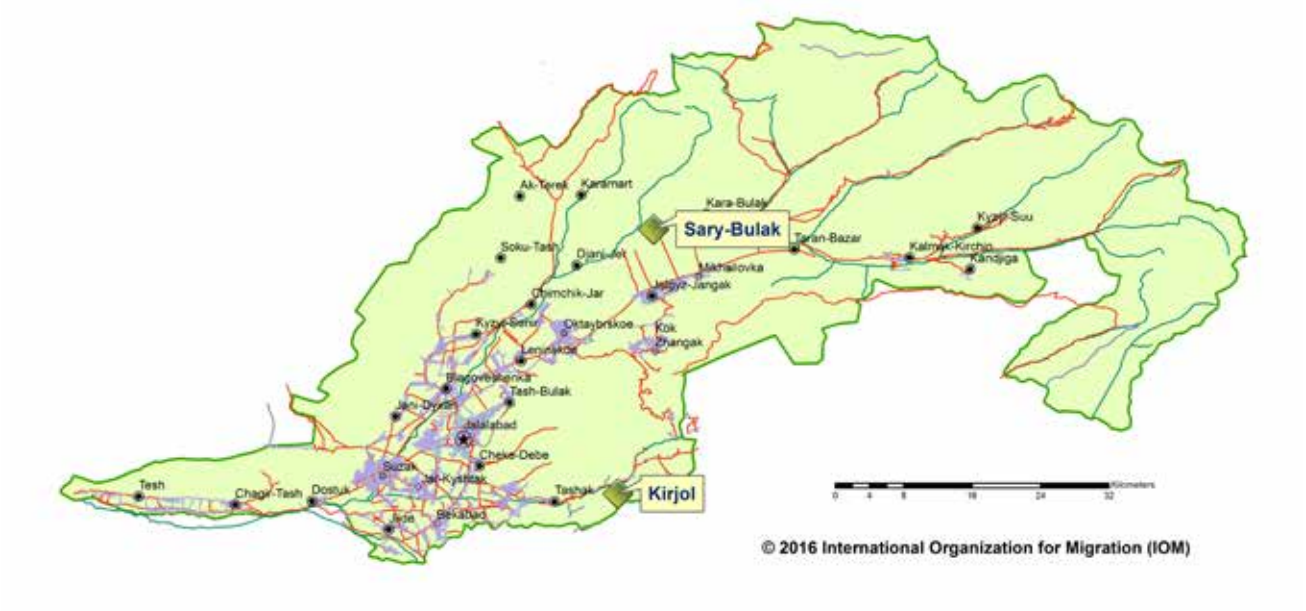
Landslide prone territories in Jalal-Abad oblast are situated on the periphery, in lowlands and in areas where they merge into mid-mountain zones in the southwestern branches of the Fergana range. Virtually all districts of Jalal-Abad province are subject to risks of landslides. Activation of landslides may be connected to deposition of winter sediments, a high level of precipitation in the spring-summer period and an increase in the level of ground waters. The largest number of registered landslide areas are situated in Suzak (97) and Aksy (83) districts. For the period from 1969 to 2010, the districts with the most number of formed landslides were Suzak, Bazar-Korgon and Aksy districts (MES KR, Ibatulin 2012). According to the data of MES, territories of Suzak and Aksy districts are also registered as districts with the most number of mudflows and floods.

Landslide in Suzak district, Jalal-Abad oblast

The Aksy district covers an area of 4,578 square kilometres (Map 10). The number of permanent population is 127,000 people and average population density is 27.8 people per square kilometre (NSC 2016). Sixty-eight settlements are located on the district's territory. The administrative centre is Kerben village. Aksy district is situated in the northeastern submontane part of Fergana valley, surrounded by the At-Oinok range in the north and the Chatkal range in the west; its eastern border passes along the Naryn river. Around 94 per cent of district's territory is covered by mountains and six per cent belong to the plain terrain. The valley part is represented by river terraces, submontane hills and adyrs at an altitude of 500 – 1500 meters.

Map 10. *The Aksy district of Jalal-Abad oblast.*

The Suzak district covers an area of 3,019 square kilometres. The population amounts to 264,000 persons, with a high density of 87.7 persons per square kilometer (NSC 2016). There are 123 rural settlements in the district. The administrative centre of the district is Suzak village. The district is located in the south of the oblast, in the western part of the Fergana valley within the river valleys of Kara-Darya, Kek-Art and their tributaries. In the northwest, the district is limited by the Fergana range. The valley is located between spurs and adyrs, formed by river terraces at an altitude of 650 to 3892 metres.



Map 11. *The Suzak district of Jalal-Abad oblast.*

According to MES prognoses, a high risk of activation of landslides in Aksy and Suzak districts is present in the following areas:

- In Aksy district: in the foothills of the area between Chanach-Sai, Padysha-Ata and It-Agar rivers, on mountain slopes of the It-Agar, Aflatun, Kara-Suu interfluve area, on the left bank of the Kara-Suu river between the villages of Raikomol and Ak-Jol, on the right bank of the Kara-Suu river valley between Ak-Suu village and the town of Tash-Kumyr.

- In Suzak district: on the right bank of the river Kök-Art, in lateral valleys of Achy-Say, Karamart, on the slopes between the Karamart, Urum-Bashy and Kök-Art rivers, near the town of Kok-Jangak, in submontane areas between Kok-Jangak and Jalal-Abad towns, on the mountain slopes of the Changhet river valley and between Changhet and Jylandy rivers.

In Jalal-Abad oblast, for the period between 1994 to 2015, 2,407 households were ordered to resettle due to the high possibility of dangerous natural processes, including 1,809 households due to landslide risks, 587 due to mudflows, bank erosion and increase in the level of ground water, 11 as a result of rock falls. Such order is issued on the basis of an evaluation by an MES expert about the possibility of an ES occurring in a specific place. In the period between 2002 and 2015, the largest number of households ordered to resettle were located in Aksy districts and composed 46 per cent of the total number of those registered in the oblast for resettlement. They are followed by Suzak district, where 21 per cent were designated/ordered to resettle, the town of Mailu-Suu (14 per cent) and the Bazar-Korgon district (12 per cent). In all other remaining districts of the province, less than 10 per cent of households were designated for resettlement.

In the Aksy district, the reasons for designated resettlement for more than half of the households (52 per cent) were mudflows, waterlogging and bank erosion, and for the other half of the households (48 per cent), the risk of landslides. Out of the total number of households, 45 per cent of those designated for resettlement received state support, land plots, and were subsequently relocated; 16 per cent obtained support and land plots from the state but did not resettle. Forty per cent did not receive state support and plots for various reasons and hence did not resettle.

In Suzak district, the reasons for designated resettlement for the majority of households (76 per cent) was landslide risks, while the remaining part of households had to resettle due to risks of mudflows, waterlogging and bank erosion. At the same time, 27 per cent of the total number of households designated for resettlement received state support and were relocated, while approximately the same percentage of households (24 per cent) obtained state support and did not resettle. Half of the designated households (49%) did not receive loans and land plots and thus did not leave their place of residence.

It should be noted that the number of resettled households includes households destroyed due to natural disasters. Thus, the overall number of households that were ordered to relocate include households that were already affected by disasters and those at risk. In both surveyed districts, about half of the households did not resettle despite high risks of disasters. There are many reasons for such decisions and these are not always connected to the failure to obtain state support. A combination of social and economic factors that determine the vulnerability of the population and the possibility of adapting to changing environmental conditions is examined in chapter 5.

House destroyed by a landslide in Jalal-Abad oblast

№	District		Total				Landslide				Mudflow, bank erosion, IGWL				Rock falls			
		Total number of areas at a risk of land-slides	Designated for for resettlement	Obtained state support and land plot (resettled)	Did not obtain state support and land plot (not resettled)	Obtained state support and land plot, but continue to live in a dangerous area (not resettled)	Designated for for resettlement	Obtained state support and land plot (resettled)	Did not obtain state support and land plot (not resettled)	Obtained state support and land plot, but continue to live in a	Designated for for resettlement	Obtained state support and land plot (resettled)	Did not obtain state support and land plot (not resettled)	Obtained state support and land plot, but continue to live in a dangerous area(not resettled)	Designated for for resettlement	Obtained state support and land plot (resettled)	Did not obtain state support and land plot (not resettled)	Obtained state support and land plot, but continue to live in a dangerous area (not resettled)
	By province 1994-2015		**2407**	**639**	**584**	**1184**	**1809**	**408**	**296**	**1105**	**587**	**225**	**283**	**79**	**11**	**6**	**5**	**0**
									2012-2015									
	By province	**443**	**1338**	**639**	**495**	**204**	**774**	**408**	**207**	**159**	**553**	**225**	**283**	**45**	**11**	**6**	**5**	**0**
1.	Aksy district	83	614	273	245	96	294	189	30	75	317	82	214	21	3	2	1	0
2.	Ala-Buka district	10	64	44	20	0	20	20	0	0	43	23	20	0	1	1	0	0
3.	Bazar-Korgon district	19	139	81	11	47	84	37	8	39	55	44	3	8	0	0	0	0
4.	Nooken district	3	10	10	0	0	3	3	0	0	7	7	0	0	0	0	0	0
5.	Suzak district	97	236	63	116	57	180	34	101	45	56	29	15	12	0	0	0	0
6.	Toktogul district	15	16	16	0	0	9	99	0	0	7	7	0	0	0	0	0	0
7.	Toguz-Toro district	6	4	0	0	4	0	0	0	0	4	0	0	4	0	0	0	0
8.	Chatkal district	7	48	33	15	0	18	16	2	0	29	17	12	0	1	0	1	0
9.	Jalal-Abad town	1	26	3	23	0	26	3	23	0	0	0	0	0	0	0	0	0
10.	Mailuu-Suu t.	200	158	104	54	0	132	92	40	0	26	12	14	0	0	0	0	0
11.	Kara-Köl t.	1	14	5	9	0	8	5	3	0	3	0	3	0	3	0	3	0
12.	Tash-Kömür t.	1	9	7	2	0	0	0	0	0	6	4	2	0	3	3	0	0

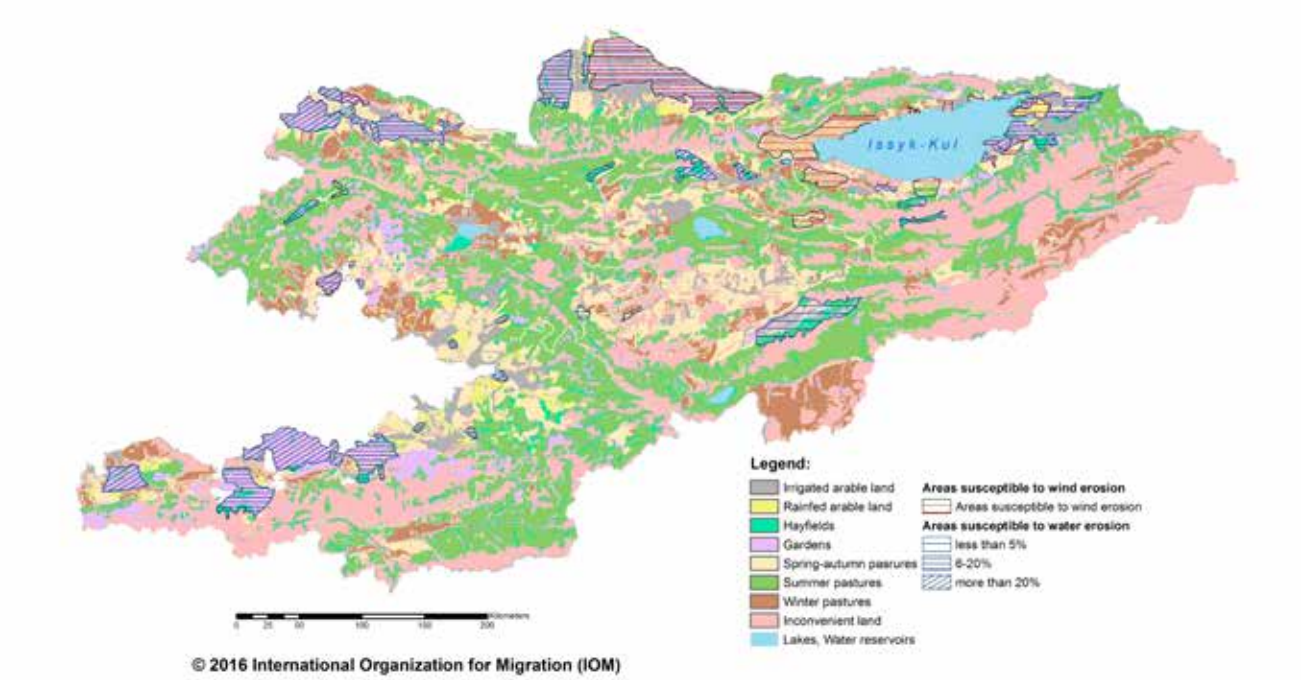
Table 2. Data on households in Jalal-Abad oblast which were designated for resettlement from areas prone to landslides and other natural hazards for the periods 1994-2015 and 2012-2015

4.3. LAND USE, AGRICULTURAL SUSTAINABILITY AND MIGRATION

As demonstrated in previous chapters, agriculture represents an important sector of Kyrgyzstan's economic life, as well as a key element of the population's subsistence strategies. This chapter presents the main characteristics of the agricultural sector in Kyrgyzstan. It particularly focuses on land degradation processes which negatively impact agricultural activities, and thus migration decisions at the household level.

Land Use

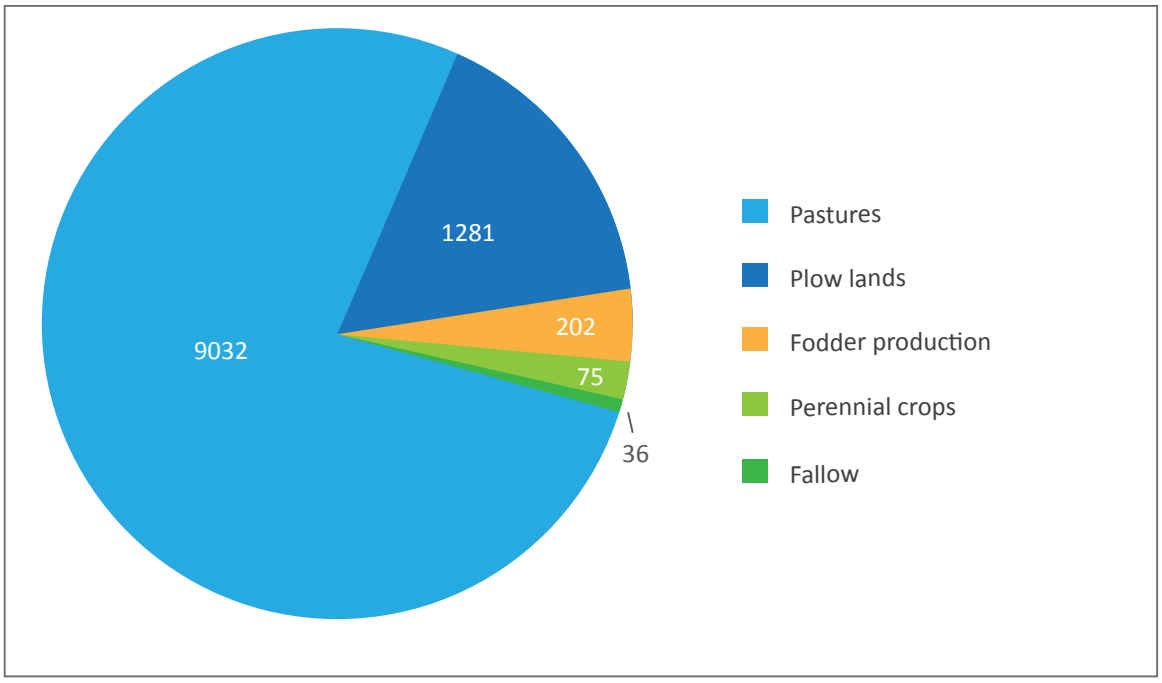
The Kyrgyz Republic is an agriculture-based country, with 66.3 per cent of the population residing in rural areas. The agro-industrial sector is the most important sector of the economy of the country. During the last two decades, radical reforms of the agrarian sector had been carried out in the Kyrgyz Republic. In the course of the land reform, over 300,000 peasants and farm holdings and around 1,300 various associations and cooperatives were created. Private ownership of land has been introduced. The main producers of commercial agricultural goods are small peasants and farm holdings. Over 90 per cent of agricultural production is manufactured in the private sector while the share of peasant and farm holdings is more than 44 per cent.



Map 12. *Land use in the Kyrgyz Republic*
Source: Kyrgyz GIPROZEM

The main type of land use in Kyrgyzstan is for the production of agricultural goods. As of 1 January, 2015, the total area of agricultural lands in the Kyrgyz Republic was 10,625,200 hectares (53% of total land reserves), listed under various land categories in state land registries, including croplands, perennial plantations, deposits, hay fields, pastures, tree and shrubbery plantings, marshes, forest lands and others. The largest share (85 %) of agricultural lands is comprised of pastures, the area of which is constantly decreasing, and croplands (irrigated and non-irrigated) compose 12.1 per cent of all agricultural lands (Figure 8).

Figure 8. Composition of agricultural lands as of the beginning of 2015, in thousand of hectares



In 2014, the output volume of agricultural, forestry and fishery products equalled 58,976 million Kyrgyz soms. In 2014, the share of crop products in the total volume of domestic output of agricultural, forestry and fishing products was 50.1 per cent, the share of animal farming 47.6 per cent, forestry and fishing 0.2 per cent and agricultural services 2.1 per cent.

The share of state and collective agricultural enterprises in the total output volume of domestic agricultural production was around two per cent in 2014. As for peasant and farm holdings, their share comprises 60.2 per cent, while the share of individual subsidiary plots of citizens amounts to 35.7 per cent.

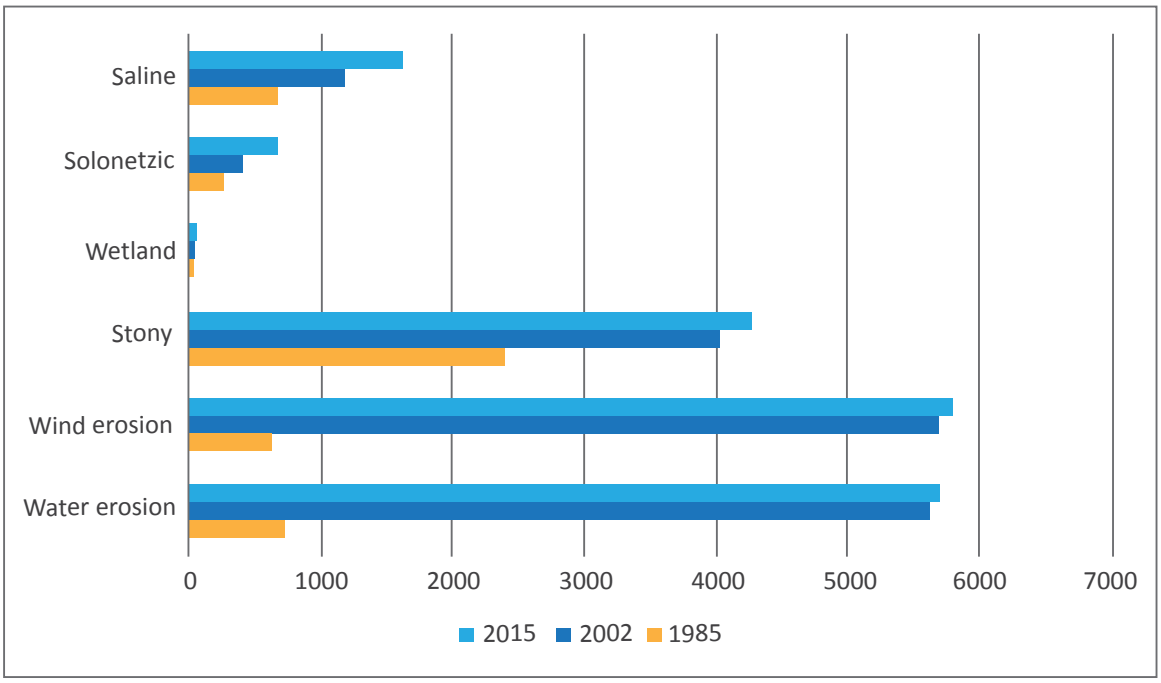
In 2014, the entire cultivated area under agricultural crops comprised 1,182 thousand hectares. Areas cultivated under grain crops composed 657 thousand hectares, areas under fodder crops 314 thousand hectares, technical crops equalled 77 thousand hectares and potato, vegetable crops and gourds, 0.5 and 133.1 thousand hectares respectively.

Animal farming in the Kyrgyz Republic is one of the leading agricultural activity and a key component of the agro-industrial sector. Natural and climatic conditions of the republic are favourable for the development of all sectors of animal husbandry (cattle, sheep, horse breeding, poultry and bee farming).

Conditions of land resources

The main feature of cropland is the distribution of lands among numerous small users, implemented as part of the land reform in the end of the nineties. Lands were divided in such a way that 84 per cent of individual farming holdings received croplands with an area less than 1 hectare. While in central and northern parts of the country (Chuy, Naryn, Talas, Issyk-Kul) there is an approximately equal and sufficient amount of land, in southern regions of the country this indicator is lower by 2.5-3 times. The average size of land plots in the southern regions of the country ranges from 0.3 to 0.20 hectares. With such land plot sizes and separate farm holdings, it is not feasible to observe appropriate agricultural techniques: maintaining crop rotation, organizing anti-erosion activities, which allow to preserve and improve fertility of arable lands. According to the data of the Kyrgyzgiprozem Institute, during the last twenty years, steady degradation trends are being observed with regard to the land reserves designated for agricultural purposes (Figure 9).

Figure 9. Characteristics of agricultural lands by degradation symptoms, in thousand hectares for the 1985-2015 period



Degradation of land in Kyrgyzstan is caused by natural and man-made factors or their combination (National Report on the State of the Environment of the KR for 2012-2015, Environmental Outlook of the KR 2009). This is related to processes of water and wind erosion, salinization, bogging (waterlogging) and the decrease in fertility of soil layers due to ineffective technologies. Activation of water and wind erosion processes is determined by many factors and causes of both natural and man-made character. Among natural factors, it is necessary to note, first and foremost, high fragmentation of the republic's terrain, including of hydrographic formations (watersheds, slopes, hollows, gullies, river valleys).

Types of degradation depend on the altitude at which lands are located:

1. In mountainous areas: rock falls, landslides, degradation of pastures and deforestation;
2. In the foothills: water and wind erosion, mud slides, irrigation erosion and loss of fertile soil layer;
3. In valleys: salinization, bogging (waterlogging) and irrigation erosion.

Soil properties have a considerable impact on the development of erosion processes (loess and loess-like loams wash away much easier than clay due to their porousness). The most vulnerable to water erosion are arable lands, particularly irrigated croplands. Precipitation and wind pattern also have a significant impact on the development of erosion processes. Over two-thirds of arable lands are affected by wind and water erosion.

Plough land in Naryn oblast

Erosion is a natural process, but it is often intensified as a result of human activity. In the majority of cases, erosion is a result of unsustainable use of agricultural lands, overgrazing as well as ineffective systems of irrigation and water management. Man-made factors causing erosion processes are directly connected to agricultural

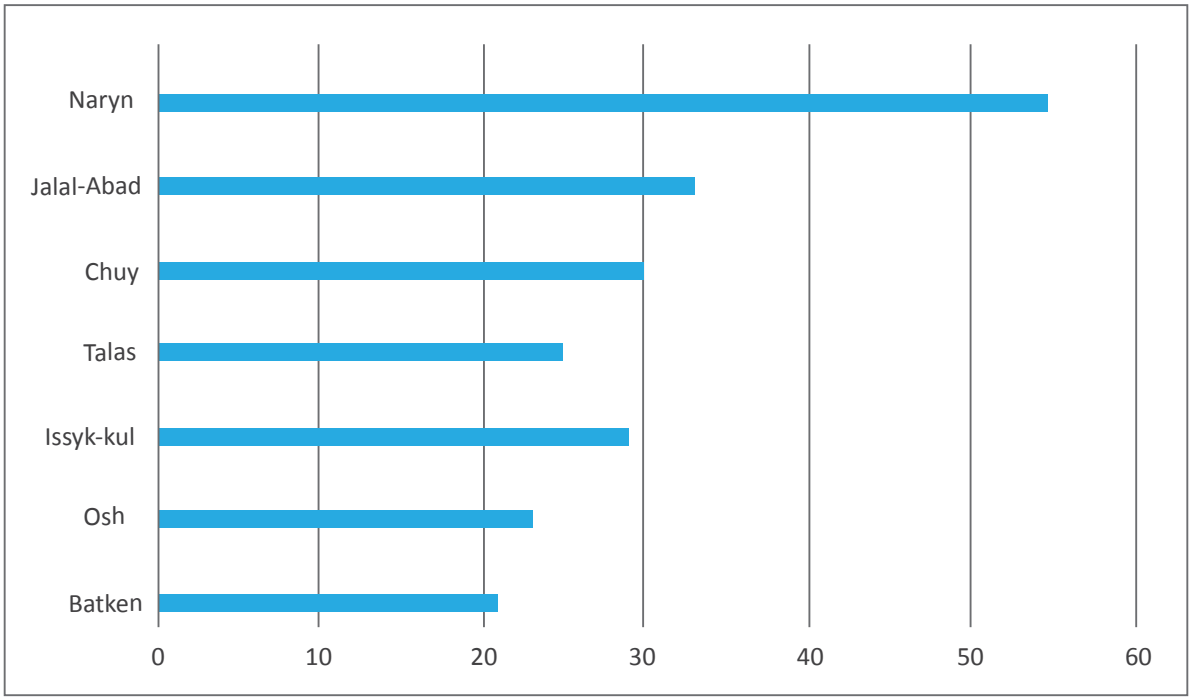
activities, mainly with the irrational use of irrigated arable lands and unregulated grazing of cattle on natural pastures. At the present time, man-made factors dominate among causes of land degradation processes.

Systems of agricultural management are one of the most important factors affecting the quality of soils. In its turn, soil erosion is one of the most illustrative indicators of the negative impact of agro-techniques that lead to the loss in productivity of crops and often irreversible damage to soils.

Wind erosion hotbeds are localized in Western Trans-Issyk-Kul, in the eastern part of Chuy province, the western part of Talas province as well as in a number of districts in Osh and Batken provinces (Figure 10).

Southern regions of the country are particularly vulnerable to water erosion, with over 70 per cent of all natural and man-made disasters related to mudflows, avalanches, landslides and so on occurring there.

Figure 10. Extent of degradation of agricultural lands by provinces, in %



According to the Republican Soil and Agrochemical Station, almost all arable lands are affected by degradation to various extent as a result of different factors, including soil erosion, salinization, alkalinization, bogging, waterlogging, shortage of mineral fertilizers, and non-observance of crop rotation. Processes of primary salinization of irrigated lands are determined by the influence of mineralized groundwaters, while their secondary salinization is mainly connected to technical deterioration and unregulated operation of collector and drainage infrastructure. Due to the unsatisfactory condition of collector and waste networks in zones of plain areas, an increase is observed in groundwater level, leading to waterlogging of agricultural lands and settlements. Thus, there is an increase in the area of degraded and unproductive lands.

According to the land registry of the ameliorative condition of irrigated lands, the largest areas of lands in an unsatisfactory condition are found in Chuy, Naryn, and Issyk-Kul oblasts. Salinization processes also have become active in the last years in Batken and Osh provinces (see Figure 10).

The condition of agricultural lands and extent of their degradation has significant impacts on the production of agricultural goods and leads to decreased income level and poverty among the population living in rural areas. The poverty rate of the rural population is 37.1 per cent (National Statistical Committee 2015). Poverty is also one factor causing land degradation. Indeed, needy rural inhabitants are not able to observe agro-technical norms (crop rotation, use of fertilizers, correct treatment of soil and so on) which leads to waning productivity of arable lands.

Condition of pastures

The more than 60 per cent of Kyrgyzstan's total population residing in rural areas are directly dependent on natural resources for livelihood. The main natural resource is mountainous pastures, which compose 40 per cent of the country's territory and 86 per cent of all its agricultural lands. Pastures cover a total area of over nine million hectares, including winter pastures (2.1 million hectares), summer pastures (4.1 million hectares) and spring/autumn pastures (3 million hectares). As a result of a reform carried out after the adoption of a new Law on Pastures in 2009, pastures are currently managed by local authorities.

Regulating the utilization of pastures is one of the most important elements of their sustainability and high productivity. Traditionally, pastures have been used in the system of distant-pasture cattle rearing. All pastures are thus divided into spring-autumn, summer and winter pastures. Mountainous terrain and related differences in the timing of grass growth have determined the patterns of pasture usage. Starting from spring, cattle are taken to the foothills, then, as grass develops, transferred to mid-mountain area and finally to the highland alpine pastures. In summertime, cattle grazed on highlands on natural high-altitude pastures when the productivity of pastures was high. In the autumn period, they were transferred to pastures situated at lower altitudes and then back to the lowlands for the winter period. The duration and timing of grazing periods on these various pastures is determined by both climatic factors and vegetation type, the closing and opening dates of mountain passes due to snow, the possibility of transferring cattle and other economic and social conditions (Penkina 2009). A combination of grazing on winter pastures, dried hay and by-products of crop farming provided cattle with fodder in wintertime. At the present time, distant pastures are not used to such wide extent as before, and for the entire year, cattle graze on nearby winter pastures, thus contributing to substantial overgrazing and their degradation, while remote summer pastures remain underused. Indeed, the effective use of distant pastures entails important transportation costs and adequate roads, which are often in unsatisfactory conditions (Kerven 2011, Shigaeva and al. 2016).

Near village pasture in Naryn oblast

Data obtained upon monitoring of pastures and arable lands conducted by the Kyrgyzgiprozem Institute indicate an overall high degree of degradation. Indeed, approximately half of pastures (49 per cent) are degrading to varying degrees. Near-village pastures (70.5 per cent) are in the worst condition as they are used particularly intensively due to their proximity to settlements, and often in an irrational manner. Distant pastures and high-altitude pastures are less affected by degradation processes (36 per cent) due to their remoteness and difficult accessibility. Nevertheless, degradation processes are taking place at a low to moderate extent. In the recent past, when these pastures suffered extensive damage due to overgrazing, the natural balance of pasture ecosystems was disrupted and currently, after more than 20 years, they have still not fully recovered.

The livestock load per hectare on near-village pastures is especially high in the south and in districts with a high extent of forest cover. Irrational and unrestrained grazing of livestock at high-altitude pastures leads to the replacement of valuable herbage with low-value grass. In many cases, one can observe exposed soil cover and active erosion development.

Chuy, Batken, and Osh oblast have exhausted their potential for growth of livestock heads and future efforts should be aimed at increasing the productivity of animals and optimizing breed composition, especially considering that the last years have seen an increase in share of large livestock in all regions of the republic, which is ecologically dangerous for pastures of the Kyrgyz Republic (National Report of the KR 2015).

The distribution of responsibilities for near-village, interim and distant pastures between communities, districts and oblast administrations, separates pasture user from management and creates barriers to using investments and income created by pastures to enhance their condition. The Law "On Pastures" adopted in

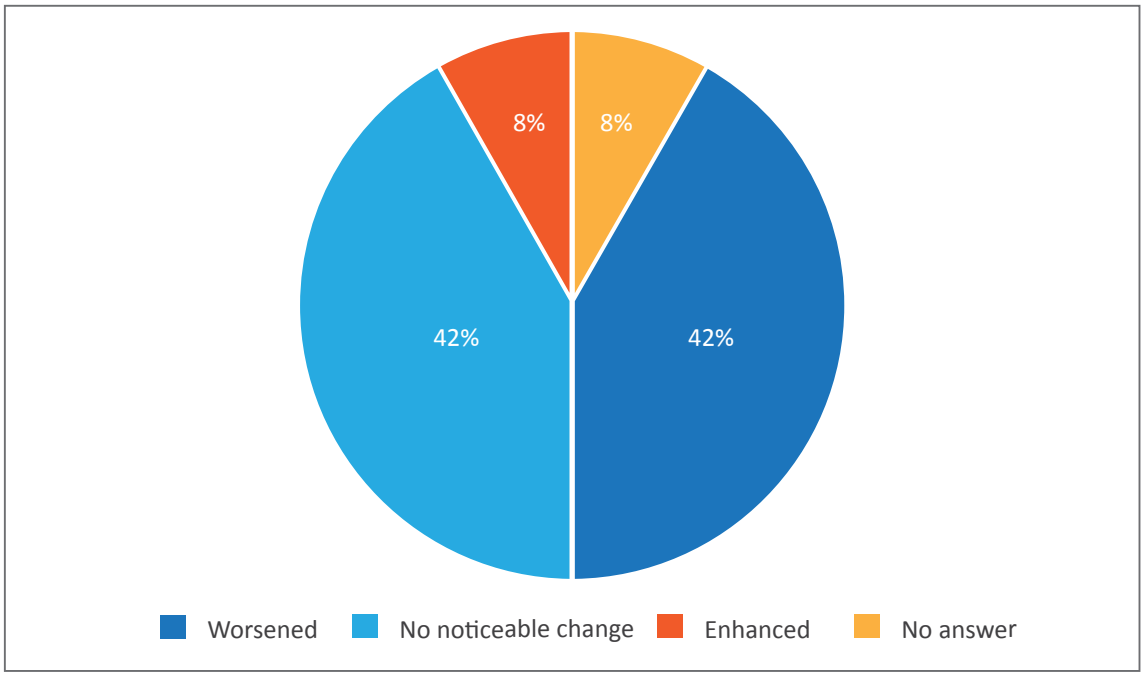
2009 and amended in 2011, granted legal rights and responsibilities for managing pastures to Pasture Users Associations and Pasture Committees at the local level. Thus, Pasture Committees have to submit five-year management plans and assessments of pastures' conditions, as well as implement the collection and distribution of resources for the use of pastures. However, monitoring is difficult to conduct due to insufficient human, technical and financial resources (Shigaeva et al. 2016).

Unregulated grazing has significant impacts on erosion processes of pastures, leading to widespread degradation. With the destruction of grass stems of natural forage lands, water-retaining properties of the soil are lost, leading to soil dispersion, compaction, destruction of its structural components and eventually to its washout.

The increasing degradation of agricultural lands leads to a reduction of cropland and pastures areas. This results in decreasing income of rural inhabitants with all the ensuing negative consequences. Deterioration of land quality and changes in their structure lead to unprofitability of agricultural labour and thus impacts rural residents' migration decision processes.

The household survey revealed interesting results related to perceived degradation of near-village pastures by the population. Indeed, 42 per cent of respondents noted that they do not observe any changes in the condition of pasture lands near the village, while the same number believe that the overall condition of pastures has worsened (Figure 11). Relatedly, according to data from the Kyrgyzgiprozem Institute given above, over 70 per cent of near-village pastures are in an unsatisfactory condition. Accordingly, degradation processes and the population's perceptions of these processes should be further studied.

Figure 11. How would you rate the condition of pastures around your village during the last 5 years?



Thus, a combination of natural and man-made factors causes degradation and reduction of the area of usable agricultural lands. The most important of these factors are overgrazing and degradation of pastures, erosion, salinization and bogging of soils, insufficient irrigation systems, waterlogging due to poor collector and drainage networks and their clogging with reed, ineffective use of lands and violations of agronomical norms due to the multiplicity and fragmentation of land in small land plots, and poverty of the rural population.

4.4. CASE STUDY: THE AK-TALA DISTRICT OF NARYN OBLAST

Naryn oblast covers an area of 44,160 square kilometres. The territory of the oblast is divided in five administrative districts: Ak-Tala, At-Bashy, Jumgal, Kochkor, and Naryn. The total permanent population in the province comprises 277,000 persons, including 38,200 urban and 239,400 rural residents (NSC 2016). The average population density is 6.3 people per square kilometre.

The studied Ak-Tala district covers an area of 7,266 square kilometres. The permanent resident population is 32,100 persons (NSC 2016) and the average population density is 4,4 persons per square kilometre. There are 19 rural settlements on the territory of the district. The administrative centre is Baetovo village. Ak-Tala district is situated in the western part of Naryn oblast and is surrounded by mountain ranges on all sides; the altitude of the district's territory fluctuates from 2600 to 4737 meters and from 1500 to 2600 meters in the valley area (MES 2015). Harsh climatic conditions of the mountainous area allow mostly animal husbandry, while significant pasture areas provide an opportunity to increase livestock population.

Respondents during the qualitative study stated that the main problems in the district are bogging of territories, increase in the area of salinized lands, increase in the level of groundwater, insufficient irrigation infrastructure and degradation of pastures. According to opinions of local experts, there is a high level of land salinization in the district. Inhabitants are forced to use water from springs, characterized by high mineralization. Local residents think that climate change can be clearly observed, since the amount of precipitation has decreased and dry years have become more frequent.

> *"The livestock population is growing. But since there is not enough grass, we have to reduce it. We sell cattle in the autumn when they return from the jailoo [summer pastures], since we are not able to feed them in the winter. In the last 15-20 years, the situation has changed drastically. There is little rainfall, summers are hot and the grass burns out. Even though the livestock number is five times lower than in the Soviet times, there is still not enough grass in the pastures."*
>
> ***Resident of Ugut village, Ak-Tala district***

The main reason enticing rural residents to migrate is the lack of employment opportunities and harsh livelihood conditions. Many local residents, upon the unprofitability and losses related to the investment of labour and financial resources for the cultivation of two of three hectares, decide to leave to find work in the Chuy oblast or abroad.

Insufficient knowledge, as well as inadequate technical and financial means for changing customary agricultural practices, force a part of the population to migrate to more well-off regions in terms of both social and economic conditions, as well as to regions more favourable for farming.

It should be noted that currently the obstacles impeding the use of distant pastures to decrease overgrazing on near pastures is being resolved. Roads and bridges to highland pastures are being restored through the efforts of local communities, with the support of international agencies. Work is carried out on land rotation and restoration of pastures' productivity by sowing seeds of mountain grass.

However, at the present moment, these efforts have a sporadic nature. Maps of pastures are being developed, but at the same time, problems with internal borders of pastures remain, as well as issues with the delimitation of outer district borders of some pastures. To effectively address salinization and bogging of lands, a set of special measures is required for each region, taking into account specific conditions of each areas. Necessary measures should be determined on the basis of recommendations of experts and may, for instance, include rinsing works on salinized plots, as well as sowing grass (for instance sainfoin for normalizing the mineral content of soils).

4.5. WATER RESOURCES AND MIGRATION

The issue of water resources in Kyrgyzstan is extremely important, actual and raises a set of complex questions. What are main popular perceptions about water resources, livelihood strategies and migration dynamics? How is the rural population experiencing various problems related to drinking and irrigation water? What is the current state of water resources, reserves and related infrastructures in the country? Finally, what can be done to mitigate the negative impacts of water related problems on livelihoods, and thus on migration dynamics? This section aims to bring some answers to these complex questions, both from the sociological and geographical perspectives.

The importance of water issues in Kyrgyzstan and their connection to migration

Each year, the improvement of living conditions, including the access to drinking and irrigation water, is increasingly important for the population. Despite Kyrgyzstan's rich water resources (rivers, lakes, ground waters, reservoirs and glaciers) residents living in some areas still experience a shortage of water for both agricultural and domestic purposes. As 66 per cent of Kyrgyzstan's population is composed of rural residents and as agriculture occupies one of the main sectors in the country's economy, the role of water resources and management is paramount.

In 2014, 7.7 billion cubic meters of water have been extracted from natural sources, including ground and fresh waters, which is 1.3 per cent more than in 2010. The amount of water used is 4.8 billion cubic meters, out of which 95 per cent were used for agricultural and irrigation purposes. The largest water users in this regard are Chuy (22.7 per cent) and Osh (18.5 per cent) oblast. It should be noted that around 27 per cent of extracted water are lost during transportation. Residents of Chuy oblast, Talas oblast and Bishkek city enjoy the best access to clean drinking water (Statistical committee 2010, 10-11).

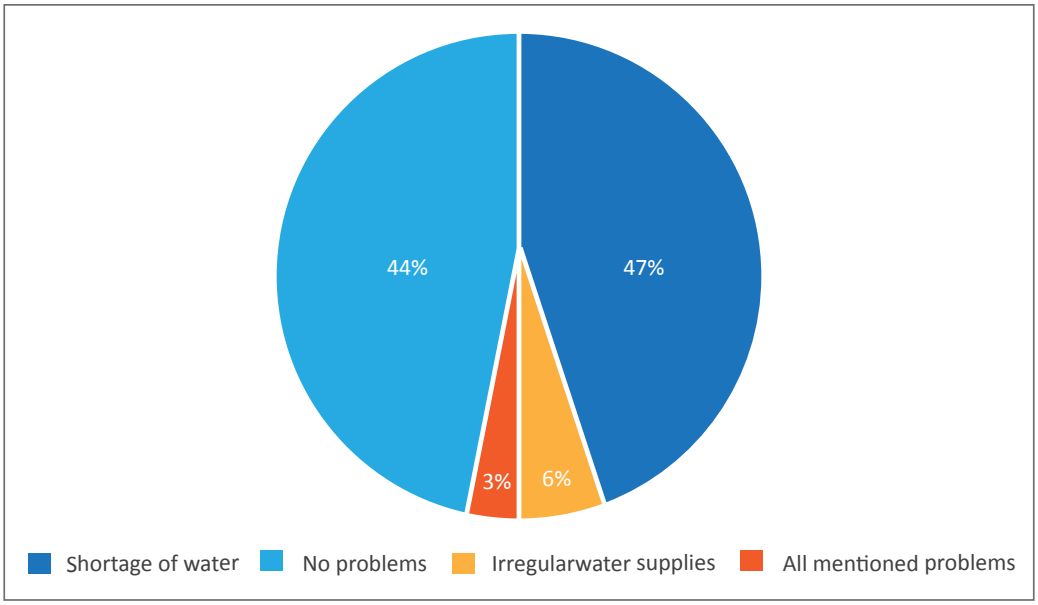
River in Naryn oblat

As survey results show, the extent of water supply and level of income from agriculture have an impact on both internal and external migration dynamics.

Popular perceptions related to water resources

According to survey data, 296 out of 500 surveyed households have water for irrigation. However, despite the availability of water, the majority of them experience problems related to its use (Figure 12).

Figure 12. Do you experience any of the following problems related to irrigations of your crops?

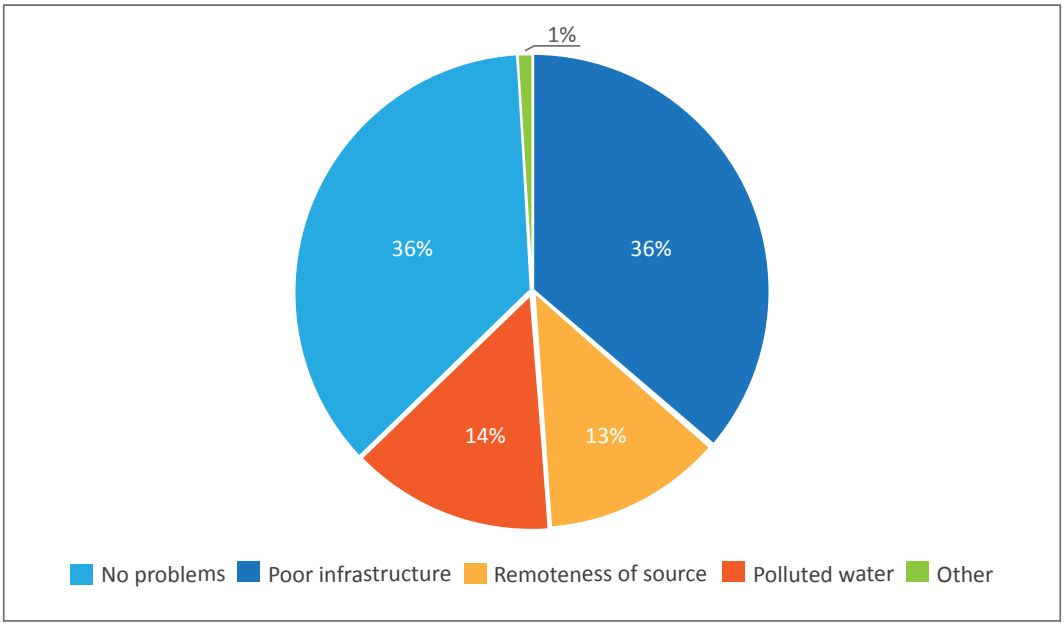


Around 80 per cent of households who face problems with delivery and use of water for irrigation indicated poor infrastructure as the cause of these problems, 12.9 per cent pointed out lack of cooperation in water use between farmers, and the rest connect causes to poor work of murabs, pollution of water, weather conditions and so on.

Water pipes (35.8 per cent), rivers (22.0 per cent), standpipes and water pumps (18.2 per cent), canals (15.6 per cent) and wells (4.4 per cent) serve as the main sources of drinking water. Many residents in surveyed regions also experience specific problems with drinking water (Figure 13).

Irrigation ditch in Jalal-Abad oblast

Figure 13: Do you experience the following problems connected to drinking water?



Conducted focus group discussions have also identified a number of problems connected with access to irrigation and drinking water and its use. For instance, in the rural district of Sary-Bulak there is a problem of access to irrigation water and due to this conflicts arise among the population.

In the rural district of Kyzyl-Tuu located near the Sary-Chelek reserve, water, according to the opinion of some residents, is polluted by tourist activities and domestic waste disposal. For this reason, residents no longer take water from the river for drinking. An increase in livestock numbers also leads to contamination of water in rivers. The head of rural municipality noted that there are many people sick with Botkin's disease (infectious jaundice) in the district, particularly students of elementary classes. Moreover, there are difficulties with bringing water to new plots where residents are resettled due to mudflow and landslide risks.

Residents of Kyrjol village have also mentioned problems of polluted drinking water.

> *"Water is murky, we take water and wait for the particles to settle. Experts of the sanitary and epidemiological station have taken samples. We have a problem with clean water, its quality is bad. Both people and cattle drink water from the river. The cattle enter the river and we drink water from the river."*
>
> ***Resident of Kyrzhol village***

When discussing about water problems in the village of Lipenka (Issyk-Kul oblast), residents noted that there is no clean drinking water. The local population extract water from wells and not all residents are willing to pay additional money for improving the water management infrastructure and the quality of drinking water. For instance, during a discussion a participants stated:

> *"We have been drinking [from the well] all our lives… our grandfathers drank, our grandmothers drank, and we will also drink."*

In addition, the village faces problems related to access to irrigation water. One of the main causes of the shortage of irrigation water is related to the significant losses of water due to poor and outdated infrastructure. Residents also noted that the problem of drinking water is more urgent than the problem of irrigation water.

Cholpon village in Kochkor district (Naryn oblast), where problems of drinking and irrigation water are critical, represents a typical case. Agricultural lands are not cultivated due to the shortage of water. Only two out of seven villages are supplied with drinking water corresponding to quality requirements. Water for drinking is extracted from 6-15 meters of depth using manual water pumps. From 200 to 600 hectares of land are not cultivated because of the lack of water. Due to irrational management more water arrives to some areas, while others experience shortage. Often, conflicts take place between residents, villages and rural authorities over water resources. As a result of shortage of water for agriculture, residents leave their plots and migrate within the country or outside of it in search of earnings or better living conditions.

Experts' viewpoints: Opinions and quotes from interviews with experts

Experts' opinions also confirm the presence of water issues. For example, experts of the Aksy district administration note problems related to the irrigation system. According to them, in the Soviet period, the irrigation system passed through the territory of several states. In the case of Aksy district, the canal passed through the territory of Uzbekistan and there had been certain difficulties during the vegetation period which affected harvest of agricultural crops in the district.

> *"Many simply stopped doing farming and were abandoning their lands, leaving for other places."*
>
> ***Expert from the Aksy district administration***

The yield of planted crops increased due to a new canal launched as part of a state project in 2014. Work is also being carried out on drop by drop irrigation. So far, about six hectares have been allocated to it. It was also

noted that these initiatives depend on the support of investors and donor organizations working in the area of agriculture.

There are also unresolved problems in this district related to drinking water supply. One expert stated that:

> *"We began to address problems with drinking water through our own efforts; we have implemented several small-budget projects – within one million soms – that what we can do ourselves (...). Projects on drinking water were effective in the town of Kerben but because of some technical mistakes the result did not justify the invested means; the results should have covered the entire district, but at present only half of the district is supplied with drinking water".*
>
> ***Expert from the Aksy district administration***

With regard to problems related to the access to irrigation and drinking water and their use, experts of Naryn oblast noted the following trends:

- Disruption in the infrastructure of irrigation systems and the urgent need to clean and rehabilitate the canals.
- A significant percentage of agricultural lands remain unused due to water shortages. Lands which were previously regularly supplied with water thanks to the use of pumps have now become unused due to increases in prices for electricity, which is needed for pumps to function.
- Lands requiring to be irrigated three times during the vegetation season are irrigated only once thanks to the natural factor – melting of glaciers and snowfields.
- The distribution of irrigation water causes conflicts within and between communities.
- There is an issue of shortage of drinking water.
- A part of the population using water from the seasonal melting of snowfields and glaciers is more vulnerable than those who use a pump for extracting water for irrigation.

It should also be noted that there are twenty pumping stations for extracting water for irrigation in Naryn oblast. They were all built in the 1960s and the operating service life of these stations has long expired. Every year the Department of Water and Melioration repairs the mechanisms of these stations, but unfortunately, these repairs last only for one irrigation season. Often, the solution to these problems depends on financial resources, and until they are resolved they continue creating hardships for the population. As a result, people are forced to take certain measures to adapt to these problems, including internal and external migration.

The state of water reserves

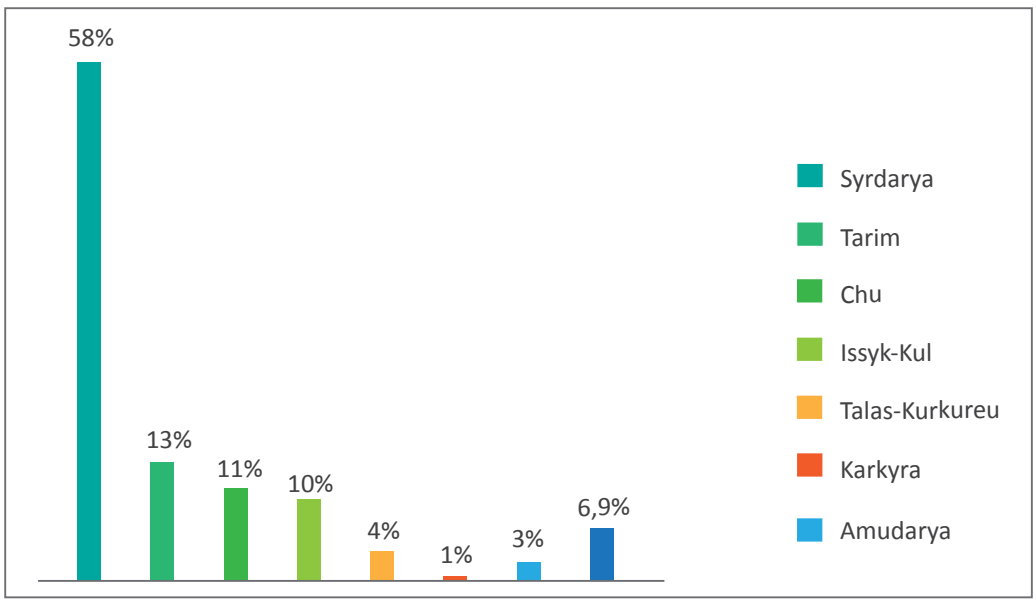
The significant supplies of ground and surface waters are present within the borders of the Kyrgyz Republic's territory. There are no water sources coming into the republic from the outside, which represents a hydrological peculiarity and advantage. Renewable resources of fresh water in the Republic mainly consist in river and ground waters, formed under natural conditions as a result of precipitation and the melting of glaciers on the territory of the country.

Alaj-Kul Lake in Issyk-Kul oblast

The largest hydric volume is formed in the basins of rivers Syrdarya, Tarim, Chuy and Lake Issyk-Kul. The volume in the basin of Amudarya and Talas-Kurkureu rivers is significantly smaller (Figure 14). Hydric networks of plain territories include rivers formed by the spring flow (karasu). The total stable discharge of rivers fed mainly by ground waters is estimated at 1,911 million cubic metres per year.

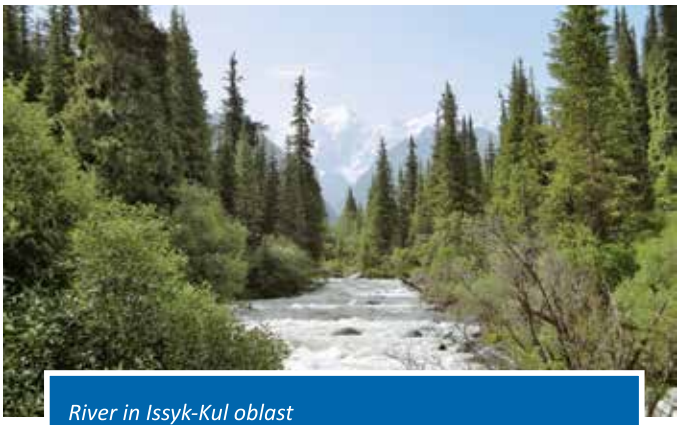
On average, no more than one-fourth of the water volume from rivers is used annually to cover the national water needs, the remaining part flows to territories of neighbouring countries. The amount of return flow has been studied poorly and according to estimates composes around three cubic kilometres per year. Volumes of collector and drainage waters do not exceed 1.3 cubic kilometres per year. The annual volume of waste waters is 0.71 to 1.02 cubic kilometres per year. However, this estimate seems too low, since it does not take into account discharges of waste waters from decentralized systems of water discharge in rural areas (National Report on the State of the Environment of the KR, 2016).

Figure 14. Distribution of flow volume by river basins of the Kyrgyz Republic, in %.



Water reservoirs play an important role in water supplies intended for irrigated lands and for the production of electricity. Currently, twelve large water reservoirs of irrigation-energetic and seasonal regulation are operating, with a total volume of 21.1 billion cubic metres. The largest are the Toktogul reservoir with a full volume of 19.5 billion cubic metres, Kirov (550 million cubic metres), Orto-Tokoy (470 million cubic metres) and Papan (260 million cubic metres).

One-hundred six deposits of fresh water have been identified on the territory of the country, out of which twenty are used for domestic and industrial purposes. Forecasted reserves of fresh ground waters comprise over 13 million cubic kilometres per year. At present, 44 groundwater deposits with a potential fresh water supplies of 11 cubic kilometres per year and exploitable reserves of 5.3 cubic kilometres per year have been studied thoroughly. All fresh ground water reserves are used for domestic, industrial and technical (irrigation) needs. The extent of utilization of resources in groundwater deposits is low (20-30 per cent). On the whole, with the exception of some territories in the southern regions of the Republic, the country is well supplied with drinking water in the long-term perspective. Analysis of climate change trends and of their impact on water resources points to an increase in river volume due to increasing amounts of precipitations and decreasing glaciation in upcoming years (Second Communication on Climate Change 2008).



River in Issyk-Kul oblast

Water use and population's access to safe drinking water

The structure of internal water use in the republic has been fairly stable for the past decades. On average, 95 per cent of the total annual water volume is used for irrigation farming purposes, while 80-85 per cent is used during the vegetation period. Around 1.7 percent is used for the needs of the industry and less than 3 per cent for communal and household needs, including the supply of drinking water for urban and rural residents. Forestry, fishery, energy, and other sectors of the economy taken together use less than 0.3 per cent of the total internal water consumption (National Statistical Committee of the KR, 2015).

Agricultural production based on irrigation farming is the leading sector of Kyrgyzstan's economy. Areas of irrigated lands compose 1.02 million hectares. Irrigation infrastructures include 1,030 irrigation and collector/drainage systems, out of which 326 systems are owned by state bodies and the rest are the property of local authorities, federations and associations of water users. Irrigation systems are rarely used as sources of domestic and drinking water.

According to data of the National Statistical Committee, the indicator of population's sustainable access to safe drinking water was 88.9 per cent at the beginning of 2015. The highest levels of rural population's access to drinking water are registered in the Chuy, Talas and Issyk-Kul oblasts (100, 99.6 and 95.5 per cent respectively), while the lowest are found in Batken and Osh oblasts (64.8 and 70.7 per cent).

Alpine river in Issyk-Kul oblast

Pollution

According to the current classification system, the majority of natural waters of Kyrgyzstan are rated as clean. Analysis of the quality of natural waters does not point to significant trends of worsening of water resources over the last decade. Nevertheless, periodic breaches of water pollution norms are observed in the basins of the Chuy and Syrdarya rivers, mainly near large settled areas. Local contamination of surface and ground waters near the cities of Bishkek and Osh and other large settlements are registered on a regular basis. Agricultural and industrial enterprises, municipal sewage systems and domestic waste remain the main sources of water pollution.

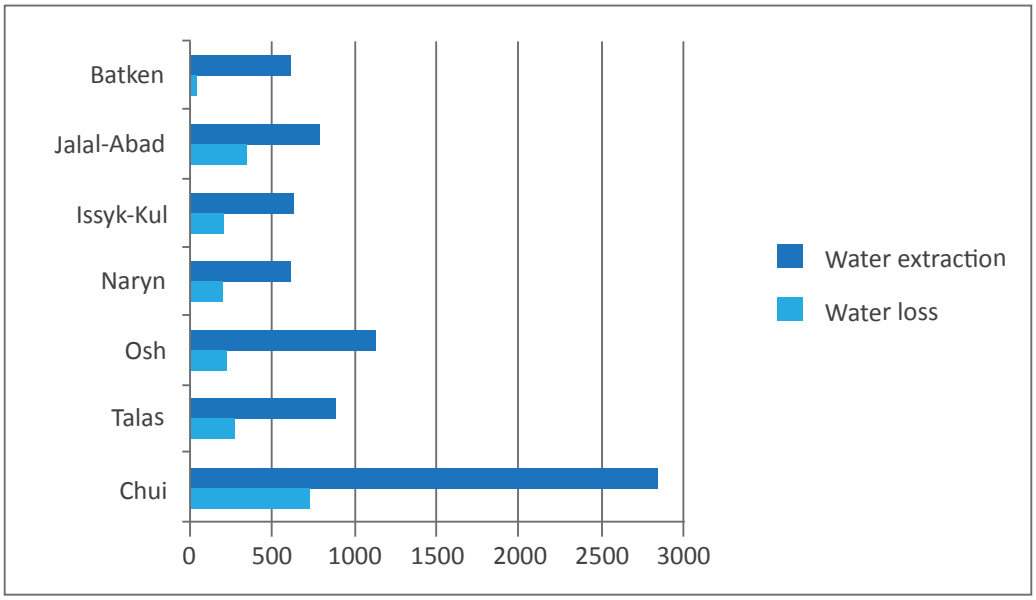
A substantial factor affecting the quality of water resources is unregulated economic activity in water protection areas and zones of surface water bodies, as well as the poor conditions of sanitary protection of groundwater reserves.

Mountain dumps and tailing pits of mining industries located in alluvial fans and flood plains of rivers – which often contain radioactive material, cyanide substances and heavy metals – pose potential threats to water resources.

Water losses

According to official data, around one-third of all extracted water resources are lost during transportation due to poor and outdated transportation systems and low effectiveness of water use. Between 2006 and 2010, the average water loss during transportation amount to 1,852 million cubic metres per year. The highest amount of loss was observed in Jalal-Abad and Naryn provinces, reaching 63 and 31.8 per cent respectively during certain years. In the rest of the Republic's oblasts, this indicator fluctuated between 20 and 30 per cent (Figure 15). For the period between 2010 and 2014, there has been a steady tendency of increasing water losses during transportation. Thus, if in 2010 this indicator was 23.4 per cent from total water intake, in 2014 it reached 26.5 per cent (National Statistical Committee 2015).

Figure 15. Water extraction from water objects and losses (in million cubic meters) during transportation (by oblast)



Condition of water management infrastructure

The majority of water infrastructure objects in Kyrgyzstan were put into operation in the fifties and the eighties. In the irrigation sector, they sometimes date as far back as the first half of the twentieth century. The volume of financing intended for the irrigation sector in the last 20 years decreased by 4-5 times in comparison to the eighties and the beginning of the nineties (in adjusted prices considering inflation). Many irrigation and

collector and drainage systems today are worn out. In these circumstances of acute shortage of investments, state enterprises and individual users in the agricultural sector are forced to operate irrigation infrastructure at a minimally permissible technical level, with a growing risk of anthropogenic disasters. As a result, cases of destruction of canals' lining, damages to structures of hydro-technical facilities and deterioration of communications (roads, lines of communication and power supplies) are observed everywhere. Due to insufficient and irregular cleaning of irrigation and collector-drainage networks from silt and dirt, the capacity of canals decreased by 15 to 25 per cent (National Dialogue on Water Policy in Kyrgyzstan, 2013).

The largest deterioration is observed with regard to internal irrigation and collection-drainage networks. Indeed, the majority of pumping stations, irrigation and drainage wells and sprinkling machines have been put out of use or dismantled and up to 50 per cent of regulating mechanisms have been partially or fully destroyed.

Moreover, the presence of complex problems related to water management and land use is characteristic of mountainous and upstream river areas. Floods, mudflows, waterlogging, salinization and irrational water utilization are all factors negatively affecting irrigation and agricultural productivity. Furthermore, local government structures experience chronic budget deficit, limiting opportunities to manage water supply and management systems.

Kyrgyzstan is rich in water resources both at the present time and in the long-term perspective; however, approximately only one fifth of the entire total water volume is used, while one third of it is lost during transportation. Access to water resources is limited by either lack of a water management infrastructure (irrigation and water supply networks) or its poor condition.

Mountain river in Chuy oblast

4.6. CONCLUSION

The understanding of the geographical "hard facts" (namely the geographical distribution, prevalence, frequency, intensity and activation processes of several environmental phenomena) is important for the study of environment-migration interactions. However, these geographical facts by themselves are not sufficient to explain environment-migration interactions. Indeed, they are merely the "stage" of these interactions, or in other words, the baseline variables on which individuals, households and communities base their migration behaviour. Geographical facts by themselves do not allow to infer any trends, let alone predictions, about environmental migration, since they interact in complex ways with many variable of social, economic, political and cultural nature. The next chapter aims to incorporate these social variables in the complex "environment-migration equation".

5. THE SOCIO-ECONOMIC ASPECTS OF ENVIRONMENTAL MIGRATION IN KYRGYZSTAN

5.1. MAIN MIGRATION FACTORS IN KYRGYZSTAN AND THEIR SENSITIVITY TO ENVIRONMENTAL VARIABLES

Internal and external migration in Kyrgyzstan is caused by a number of social and economic factors. Several periods of crises following the collapse of the Soviet Union led to a worsening of social and economic situation in the Republic, to an increase in unemployment rate (particularly in rural areas), to decreased living standards and growth of poverty. As a result, many people were forced to migrate within and outside of the country in search of work, higher income and better living conditions.

The de-industrialization caused by the rupture of economic ties between the republics of the former Union, as well as the dissolution of collective (kolkhozs) and state farms (sovkhozs) and the implementation of an agrarian reform led to changes in the structure of the labour market. As a result of these transformations, in the first decade of Kyrgyzstan's independence, the level of economically active employed population fell from 83.0 to 65.4 per cent (RIAC and NISS KR 2015, 15). Economic decline and job cuts led to a rapid aggravation of labour market conditions as no jobs were being created in many towns, particularly for the youth (Abazov 2009, 16). The unemployment rate in the republic equals 8.3 per cent and its highest figure is registered in Batken province (12.7 per cent) (MLMY KR 2014, 4). It is necessary to note that official data on unemployment do not show the full picture, as they cover only a small part of the population who is searching for work. Lack of employment opportunities in the place of residence and low income from agricultural activities on the one hand, and a hope for finding employment abroad on the other represent the main push factor of migration (Schmidt and Sagynbekova 2008, 118).

Level of wages and income rates determine the population's standards of living. Low wages in Kyrgyzstan and expected high earnings abroad are another important push factor for migration. For instance, in comparison to Kyrgyzstan, the average wage in Russia was five times higher in 2007 and four times higher in 2011 (Sagynbekova 2016). The possibility to earn better income in Russia, Kazakhstan (Sagynbekova 2016) or in other countries contributes to external migration in Kyrgyzstan. In addition, the demand for foreign labour in Russia and Kazakhstan increases employment opportunities for Kyrgyzstani citizens; indeed, over one third of companies in Russia require additional foreign labour resources (IOM 2008, 92).

Slope erosion due to overgrazing in Jalal-Abad oblast

Connected to the low level of income is the growth of poverty, which increased from 31.7 per cent in 2008 to 38 per cent in 2010 (RIAC and NISS KR 2015, 17). Poverty and unstable income sources, as well as the lack of opportunities for improving households' material situation, are important push factors of migration (Schmidt and Sagynbekova 2008, 118). Labour migration, particularly for households of the southern regions of the country, is thus a necessary strategy for escaping poverty and improving households' wellbeing (OSCE and ACTED 2009, 34).

The social and economic factors examined above are directly and indirectly linked to environmental factors. For instance, in the harsh economic circumstances of the transition period, animal husbandry became one of the important sources of income for the population. However, a significant increase in livestock numbers and excessive use of pastures have led to overgrazing and pasture degradation. As a result of anthropogenic impacts on the environment, environmental problems such as soil erosion, landslides and mudflows became more frequent. In turn, these environmental problems began to play an important role in populations' migration decisions (Nasritdinov et al. 2010).

Thus, a set of social and economic factors mostly connected to unemployment, low level of income, growth of poverty and limited opportunities for improving the material welfare play an important role in internal and external migration dynamics of the population. However, these social and economic factors tend to be very

sensitive to environmental factors and very often, their direct or indirect interconnection affects migration decisions.

Indeed, as we will see, socio-economic dynamics contributing to migration are sometimes partly caused by environmental factors, even if in an indirect and "hidden" way. These drivers of migration are also sensitive, to various degrees, to changes in the environment and climate, as in Kyrgyzstan, the dependency of livelihoods on agriculture, which in turn depends on the environment and climate, is high.

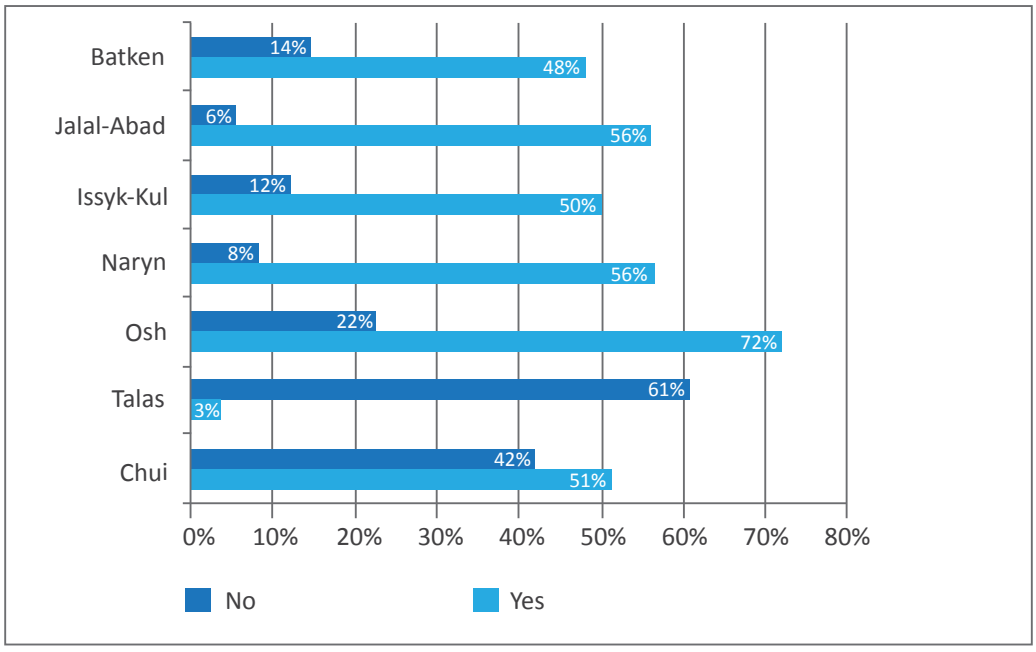
5.2. THE ROLE OF ENVIRONMENTAL FACTORS IN MIGRATION DECISIONS: PERCEPTIONS AND REALITY

One of the main goals of the present study is to identify the role of environment in migration decision processes and assess popular perceptions related to interactions between migration and the environment.

General perception of the environmental situation

Firstly, it is useful to examine the population's general perceptions and understanding of the environmental situation in their place of residence, as well as the environmental problems they face. Survey results show that 67 per cent of residents experience some sort of environmental problems in their place of residence. Results disaggregated by oblasts are shown in Figure 16. The overwhelming majority of surveyed residents in Osh province and over half of the respondents in Jalal-Abad, Naryn and Chuy province noted the presence of environmental issues, while 61 per cent of residents in Talas province indicated the absence of problems.

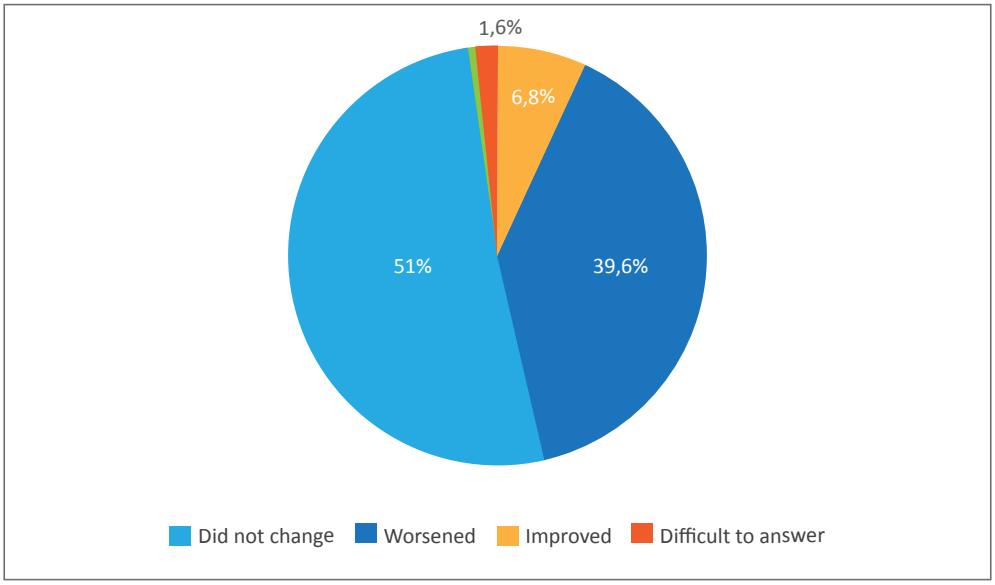
Figure 16. Do you experience environmental problems in your place of residence?



Survey results also show that residents most often face problems with water shortage and irregular water supply (51%), floods caused by mudflows and high water (29.3%), landslides (14.9%) and degradation of agricultural lands and pastures (3.9%). Residents of the southern oblasts of Kyrgyzstan most commonly complained about the occurrence of mudflows and landslides, while residents of northern oblasts emphasized problems with water shortage and degradation of agricultural and pasture lands. Surveyed inhabitants of Chuy oblast also mentioned industrial and chemical pollution of the environment.

Furthermore, 39.6 per cent of respondents claim that during the last five years, the environmental situation has worsened (Figure 17), because of increase occurrence and intensity of natural disasters, water related problems, land degradation processes (soil erosion, salinization, depletion of nutrients, contamination and so on) and industrial and chemical pollution.

Figure 17. In your opinion, how has the environmental situation in your village changed over the last five years?

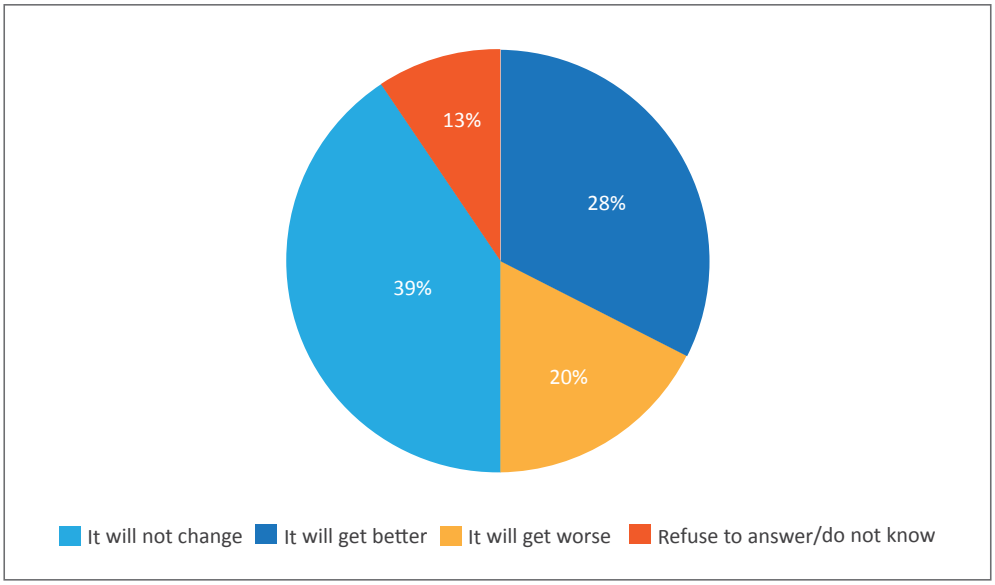


The worsening environmental situation is perceived to be caused by an increase in livestock numbers (this reason was mentioned by 22.7 per cent of surveyed people), an increase in the number of cars (18.5%), by agricultural activities (15.6%), by industrial, commercial activities and construction (6.6%) and other man-made factors. In addition, participants of focus group discussions mentioned the cutting down of forests and problems with domestic waste disposal among causes of the aggravation of the environmental situation.

> *"I think we have a lot of negative impact on nature. For instance, we had problems with the number of goats; since we have reduced their number, the trees grow new branches".*
>
> ***Resident of Kyzyl-Tuu village***

In the course of the survey, 28 per cent of respondents expressed optimistic views about environmental prospects in the next 5-10 years, while 20 per cent were pessimistic and said that the environmental situation will worsen (Figure 18). Furthermore, the female part of the population turned out to be more optimistic, since more women than men thought that the environmental situation will improve.

Figure 18. In your opinion, how will the environment situation in your village change in the next 5-10 years?



Disaggregated by oblasts, a large share of respondents in Talas, Osh, Batken, Jalal-Abad and Chuy oblasts noted that the environmental situation will not change and a comparatively larger number of respondents in Batken, Jalal-Abad and Chuy oblasts were inclined to think that the situation will get better in the next five to ten years. The most optimistic in this regard were surveyed residents of Issyk-Kul province, where half of the respondents indicated an improvement of the environmental situation, while the most pessimistic were residents of Naryn province where 45.3 per cent pointed to an aggravation of the environmental situation in near future.

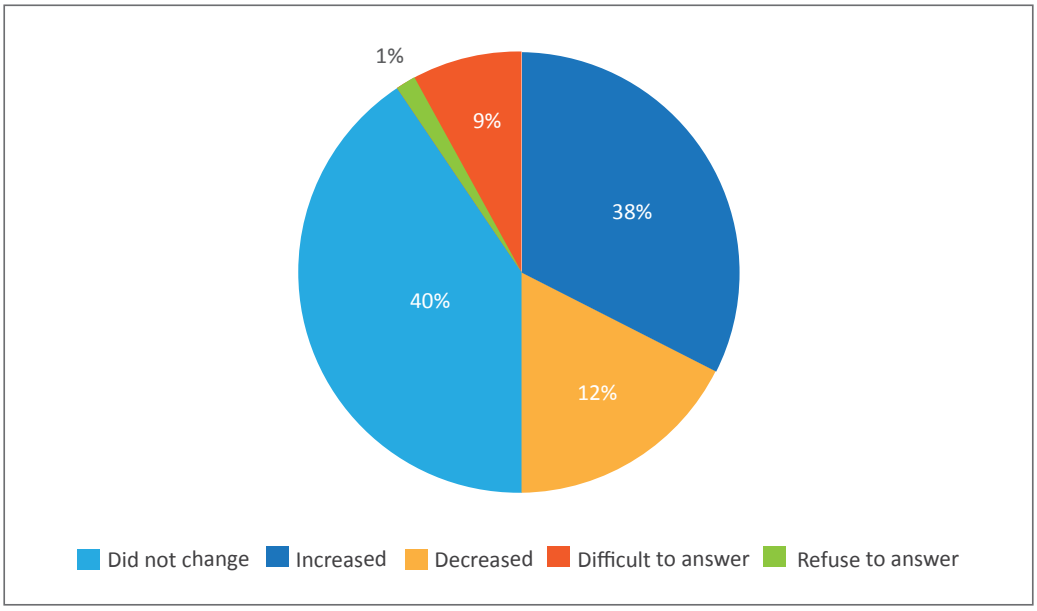
Population's perception on migration dynamics

In the course of the study, it was also important to analyse the rural population's perception of migration dynamics and causes. Relatedly, it was interesting to look at factors affecting the decision to migrate or not to migrate.

Low mobility was observed among surveyed residents, as 81.8 per cent of them have never moved from their place of residence before. Respondents who indicated a move of the entire household or of a household member mentioned motivations of socio-economic character, environmental issues, conflicts and the presence of relatives at the place of destination. Meanwhile, over 28 per cent of respondents noted that they have relatives who migrated from their area of residence. These relatives migrated mainly abroad (65.9%) and to other towns of the republic (29.2%) in search of work and higher income for improving living conditions, to study, due to family circumstances as well as such natural factors as drought, water shortage and natural disasters.

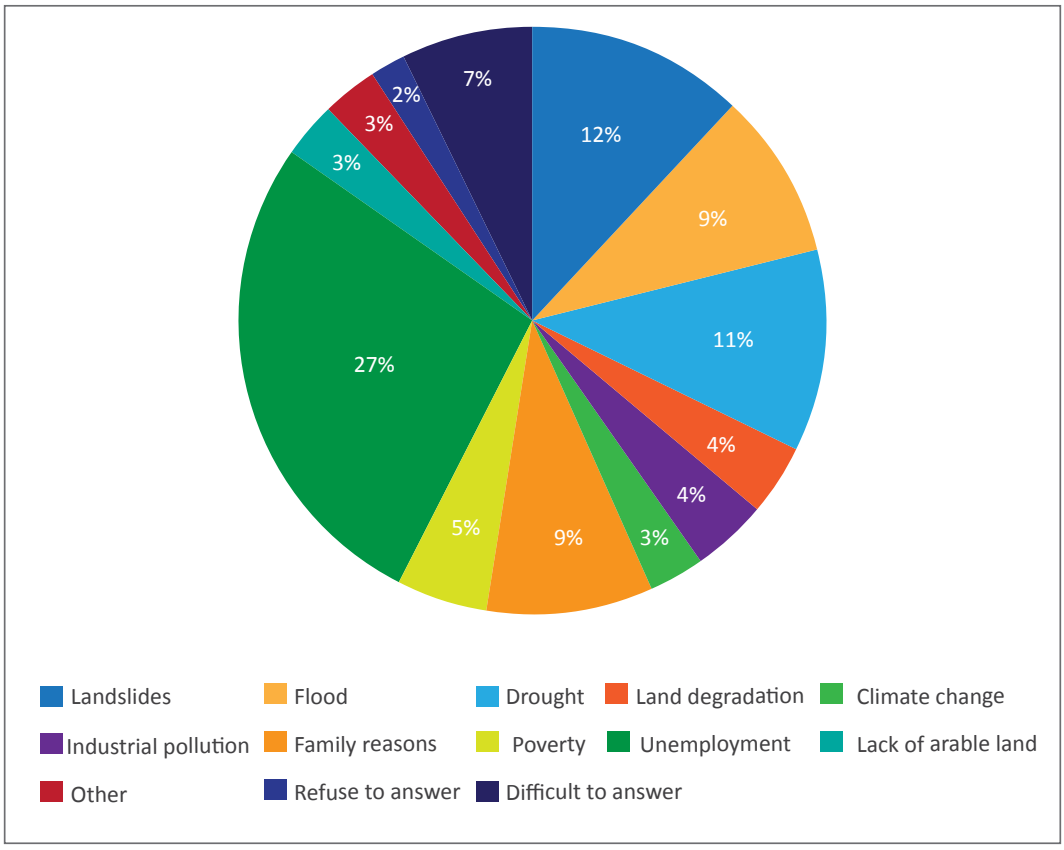
Around 48 per cent of respondents believe that many people are leaving the village and 38.4 per cent stated that migration dynamics have grown in the last five years (Figure 19). In addition, 15.4 per cent of those surveyed noted that natural disasters and climate-related problems are causes for people's migration.

Figure 19. How has the number of people migrating from your village changed in the last 5 years?



Both socio-economic and environmental factors were emphasized among reasons prompting villagers to migrate (Figure 20). It should be noted that during the survey, respondents have assigned relative importance to such environmental problems as landslides, floods (mudflows and high water), land degradation and drought.

Figure 20. What do you think are the reasons motivating people from your village to migrate?



An important paradox was uncovered by this study. Indeed, despite the fact that the prevailing majority indicated the presence of environmental problems and that 40 per cent of respondents noted that the environmental situation in their settlement has worsened in the past five years, 78 per cent of surveyed residents would not decide to leave their current place of residence. Such an attitude can be explained by factors such as the emotional connection with the place of residence (ancestral land) and economic reasons such as employment owning of property.

Awareness raising material in Jalal-Abad oblast: "The enemy of the nature is the enemy of the people"

At the same time, among factors that could affect respondents' decision to migrate, environmental one played an important role. In particular, 9 per cent of respondents mentioned floods (mudflows and high water), 11 per cent drought and 12 per cent landslides. According to the respondents' opinions, land degradation (4%), industrial pollution (4%) and the impact of climate change (3%) are also significant. Among social and economic factors, unemployment (27%), family-related reasons (9%) and poverty (3%) were listed most often, while political factors such as community conflicts (0.8%) or religious conflicts (0.4%) play a minimal role in the decision to migrate.

During focus group discussions, it was also found that existing environmental issues such as degradation of lands and pastures, waterlogging and salinization of soils, droughts, food shortage and the insufficient income resulting from these processes contribute to migration decisions. For instance, in Cholpon village of Kochkor district, there are 617 officially registered households, but in reality, less than 400 are residing there,

since due to difficulties with land cultivation, shortage of pastures and unemployment, many reside in rented apartments in Bishkek and work on salary. Those who have left cannot lease their land plots, as they are not in demand due to lack of water. In Suzak district, people noted that when farmers earn low income from their farming activities and are unable to repay loans obtained for farming, this leads to labour migration. Besides that, various natural disasters (some of which being of anthropogenic nature) force people to migrate. For instance, in the village of Kyrzhol in Suzak district, risks caused by landslides and mudflows as well as a shortage of land, unemployment and poorly developed social infrastructure are the main causes of migration.

The most preferred places of destination among respondents for internal migration are Bishkek city and its nearby suburban and rural settlements. Disaggregated by oblasts, the highest indicators of such preference were shown by respondents in Talas (50%), Naryn (48.4%), Osh (23.7%) and Issyk-Kul (19.4%) provinces. Many also prefer to resettle within one district or oblast or to other urban centres.

Thus, qualitative and quantitative data show that environmental factors have both direct and indirect impacts on migration dynamics. Most often, they are closely linked to other migration factors. For instance, residents of surveyed villages often mention social and economic causes of labour migration such as unemployment, low income from farming and shortage of land plots. During a more detailed discussion of these causes, a respondent identified "hidden" factors connected to environmental issues, including soil erosion, waterlogging and salinization, degradation of pastures, drought and climate change manifestations as well as loss of land plots due to mudflows, landslides and floods.

5.3. ADAPTABILITY AND VULNERABILITY OF POPULATION TO ENVIRONMENTAL FACTORS

After having investigated the sensitivity of existing drivers of migration to various environmental phenomena, the next step is to understand to what extend individuals and households in Kyrgyzstan are vulnerable – or by contrast adaptable – to environmental factors potentially affecting their migration decisions, and what are the determinants of this vulnerability and adaptability.

Focus group discussions and interviews conducted in Naryn, Jalal-Abad and Issyk-Kul oblasts, made obvious the fact that the majority of the population is vulnerable, to different degrees, to various environmental factors. This is mostly due to the fact that most households' subsistence strategies are highly dependent on their immediate environment. However, individuals and households do not react the same way to these environmental factors. Indeed, the impacts of environmental factors on migration decisions are mediated by a complex set of socio-economic variables such as gender, age, income, household composition, education and other socio-economic assets. The identification and understanding of these variables is paramount to the development of effective policies. This section thus examines the main factors of vulnerability and adaptability of populations to environmental factors.

Subsistence strategies and livelihood dependency and diversification

Qualitative data showed that the most important factor affecting individuals' and households' vulnerability and adaptability to migration impacting environmental phenomena is related to subsistence strategies, more specifically to dependency or diversity in income generating activities. Simply put, a high dependency of livelihood strategies on the environment and a low diversity of income generating activities increase vulnerability to environmental changes and shocks, thus increasing the role of the environment in migration decisions. Conversely, when subsistence strategies are less environment-based, on when they entail a wider range of income generating activities, adaptability to environmental changes and shocks is higher, and thus environmental factors play a lesser role in migration decisions.

This fact becomes apparent upon regional comparison of the impact of similar phenomena on livelihoods. For instance, in villages of Naryn oblast, respondents mentioned that their subsistence strategies have been affected by several environmental phenomena in the last few years, including drought, insufficiency of irrigation water, salinization of agricultural land and pasture degradation. The main consequence of these combined phenomena is a drastic decrease in fodder production intended for animal husbandry. Considering that in

Naryn's rural areas, subsistence strategies are largely based on livestock production, this has led to serious impacts on people's livelihoods. For instance, a respondent said that:

> *In our village, our main economic activity is cattle breeding. But we don't have enough grass and grains to properly feed our animals. This is due to problems with irrigation water. If we breed more animals, we then have problems to feed them, and we need to buy grass and grains instead of using the one we produce ourselves. This obliges us to sell our cattle for a very low price.*

In many of the studied villages, we can notice variations of similar problems, varying in scale and intensity. However, despite this similarity of these basic "hard facts", vulnerability of populations to them greatly varies. For instance, villagers of Issyk-Kul oblast (and to a lesser extend of Jalal-Abad oblasts), despite a relatively high reliance on livestock, also perform economic activities such as tourism, small scale gardening, dairy production and processing and others. By contrast, subsistence strategies in Naryn oblast are less diversified. Hence, the vulnerability of Naryn's villagers to long-term environmental problems is higher than in studied villages of other oblasts, which makes them more prone to environmentally induced migration.

In other words, dependency of livelihoods on a few agrarian activities such as livestock production is generally a factor increasing vulnerability to migration-impacting environmental phenomena. However, in order to cope – and adapt to – environmental problems, some villagers have started to diversify their livelihood strategy. For instance, a villager from Naryn oblast began to breed chickens to mitigate the problems she is experiencing with her traditional subsistence strategies. In a village of Issyk-Kul oblast, respondents noted that the fact that they can sell milk to dairy companies help them to cope with problems related to other income-generating agricultural activities. Thus, in contrast to dependency on a few activities, diversity in income generating activities is a factor contributing to adaptability and resilience to migration-impacting environmental phenomena. The promotion of measures aiming at the diversification of income generating activities is thus an important part of our recommendations (see chapter 7).

Public infrastructure and social services

Another important factor contributing to population's vulnerability is related to public infrastructures and the provision of social services such as access to clean and safe drinking water, sufficient irrigation water, asphalted roads and the presence of appropriate schools, kindergartens and medical centres.

In some cases, infrastructural problems directly cause environmental and health hardships. For instance, villagers in Issyk-Kul and Jalal-Abad oblasts observed that the absence of asphalted roads, combined to a drastic increase in the number of automobiles in recent years and to periods of dry climate, is creating much dust in the atmosphere, in turn generating respiratory health problems.

Another illustrative case of how infrastructure can lead to environmentally induced health problems can be found in a studied village of Issyk-Kul oblast, were villagers observed that the poor quality of drinking water was detrimental to their overall wellbeing and health. They observed that this was due to poor maintenance of the village's well. Some villagers wanted to collect money to collectively solve this problem by digging a new well with enhanced material and technology. However, some residents reacted negatively to the initiative, stating that *"we have drunk from the well our whole life, our grandfathers and grandmothers drank from it and we will also drink from it"*. It is interesting to notice that the invoked motives to maintain the status quo are partly cultural and underpinned by tradition and ancestry. However, the real reasons to refuse to support to this initiative are most probably economic, as many villagers do not possess the means to financially contribute to it. Problems related to lack of clean and safe water are also acute in many villages where the study was conducted, notably in Kochkor district (Naryn oblast) and Suzak and Aksy districts (Jalal-Abad oblast).

In the above cases, environmental and health related problems are not caused by the environment itself. Rather, the inappropriateness of public infrastructure contributes to generate and increase their impacts on the population's wellbeing. Most often, the link between public infrastructure and environmental problems is not direct and obvious. Indeed, in many cases, the appropriate provision of social services such as health and education is greatly contributing to increase people's adaptability to environmental changes and shocks. For instance, the enhancement of education in terms of facilities, human resources and educational programming

in rural areas could contribute to develop the necessary knowledge and skills for economic diversification which, as demonstrated above, is a primary factor of adaptability to environmental hardships. Increasing and enhancing education opportunities – in particular vocational education – in rural areas could thus indirectly but significantly increase population's adaptation capacity to environmental and climate changes in the medium- and long-term perspectives.

Social, demographic and economic characteristics

In addition to the above mentioned factors, qualitative and quantitative data demonstrated that several social, demographic and economic characteristics of individuals and households also contribute to their vulnerability and adaptability.

Age. Age plays a considerable role in determining people's vulnerability and adaptability to migration impacting environmental phenomena. Unsurprisingly, we found that elderly people in rural areas are less able to adapt to environmental and climate changes. For instance, an interviewed elderly Russian woman residing in a small village of Issyk-Kul oblast observed that despite deteriorating environmental conditions – mostly due to the insufficiency and poor quality of water resources – she considered that it is better to stay in her village rather than migrate elsewhere. She argued that "in the city there is no job and we can die from hunger". She added that the small garden she possesses in her village allows her to fulfil her basic nutritional needs. Thus, her age narrows down her needs and ambitions as well as her ability to adapt to a new life in a new location.

Old age also negatively affects people's adaptation capacity in the sense that it limits their use of one of the main adaptation strategy to livelihood impacting environmental factors, namely labour migration. Indeed, international labour migration (mainly to Russia) is mostly available to young males, as jobs there often entail physical work. Therefore, employers are most often looking for young males that can stand harsh working and living conditions. This significantly increases elderly people's vulnerability, as they get trapped in a situation where on the one hand they do not have good opportunities for making a living at home due to environmental and other factors, and on the other hand cannot use labour migration as an coping strategy. As an elderly male respondent puts it:

> *"They tell me that I am too old for labour migration in Russia. In Russia they do not employ those who are older than 50 years old or even less. If I were younger, I would go to Russia because I want to have decent life and support my children and grandchildren".*

By contrast, younger respondents – especially young men – stated that they were willing to migrate, either temporarily or permanently, internally or internationally, to adapt to unfavourable environmental conditions affecting their livelihood. This phenomenon will be examined in more details further in this chapter.

At the other end of the age spectrum, children often indirectly suffer from migration, as one or both of their parents may migrate for work purposes due to the insufficiency of livelihood opportunities. Indeed, interviews and discussions conducted with community members during this research have pointed out to the worrying problem of "children left behind". As a result, many children grow up without sufficient parental presence and in some cases experience physical, sexual and emotional violence from their relatives. A school teacher in a studied village mentioned that in some cases, parents working in Russia or Kazakhstan do not see their children for several years due to insufficient financial resources to make the trip home. She stated that:

> *"there are 17 children who live with their grandparents. As most of them are of old age, they cannot take good care of the children. The absence of parents affects the kids negatively. They get exhausted, do not have social and communication skills and poorly perform at school."*

Most often, it is the elderly people – grandparents – who have to take care of the children whose parents left for labour migration. At their age, it is often psychologically, emotionally and financially difficult to do so. In several interviews and discussion with community members, grandparents mentioned that up to 4 or 5 grandchildren are living with them due to their parents' absence, which are away to work in Russia or elsewhere. Additionally, Kyrgyzstan's society has lately witnessed numerous news stories about children of migrants who became victims to physical and sexual violence from their relatives.

This phenomenon is, of course, not only due to environmental factors. However, as it has been demonstrated earlier, these factors, by negatively impacting livelihood strategies, household income and thus migration behaviour, contribute in an indirect but concrete manner to such social problems as the "children left behind phenomenon".

Young child at school in Jalal-Abad oblast

Gender. In addition to age, gender is also a key characteristic determining vulnerability and adaptability. Women – both those engaged in labour migration and those who "stay behind" while their husband is abroad – are generally more vulnerable than men. For instance, participants to focus group discussions and interview respondents pointed out that women engaged in labour migration are more subject to fall victim to different kinds of sexually or labour related exploitation.

On the other hand, women who remain in the village while their husband is abroad for work purposes often face the burden of having to take care of children and do the domestic tasks alone, with little practical support. This situation is sometimes aggravated by the irregularity and insufficiency of remittances sent home by their husband working abroad, which makes it difficult to maintain a decent level of wellbeing.

In order to further highlight how gender is related to increased vulnerability, it is worth mentioning the case of Tajikistan, another major origin country of labour migration in the region, even though the situation there differs from Kyrgyzstan. Indeed, in Kyrgyzstan labour migrants are both women and men, as in Tajikistan, labour migration is a predominantly a male phenomenon. In the latter case, women represent the most vulnerable group as they usually "stay behind" and thus become highly dependent on remittances of their bread-winning husband abroad. Moreover, in many cases Tajik men "divorce via SMS" and remarry in Russia, thus abandoning their wife in a difficult situation. This issue is less acute in Kyrgyzstan, but recent media reports have demonstrated that such phenomena unfortunately exist.

Social networks. Active professional and family networks help people cope with the consequences of natural disasters and progressive environmental factors affecting livelihoods. For instance, recent ethnographic work has found that the social networks of many Russians living outside the capital have weakened due to the massive departure of ethnic Russians following the collapse of the Soviet Union (Umetbaeva 2015). Those who stayed rarely enjoy the financial and practical help of relatives to help them cope with environmental problems. On the other hands, people with extended families and professional networks can more easily benefit from such help, develop alternative income generating activities, and thus better adapt to environmental and climate changes.

Hence, the most vulnerable groups to environmental problems and related migration are of different kinds. Generally, they are those whose age (young or old), weak social networks and poor economic and cultural capital do not allow to use labour migration as an adaptation strategy to cope with environmental problems negatively impacting their livelihood. Migration as an economic strategy is not available to everyone and is mostly manageable for those with appropriate age, gender, socio-economic status, ability to quickly learn new skills, as well as those who possess different kinds of resources (social, cultural and economic)

5.4. LABOUR MIGRATION AND REMITTANCES AS AN ADAPTATION STRATEGY

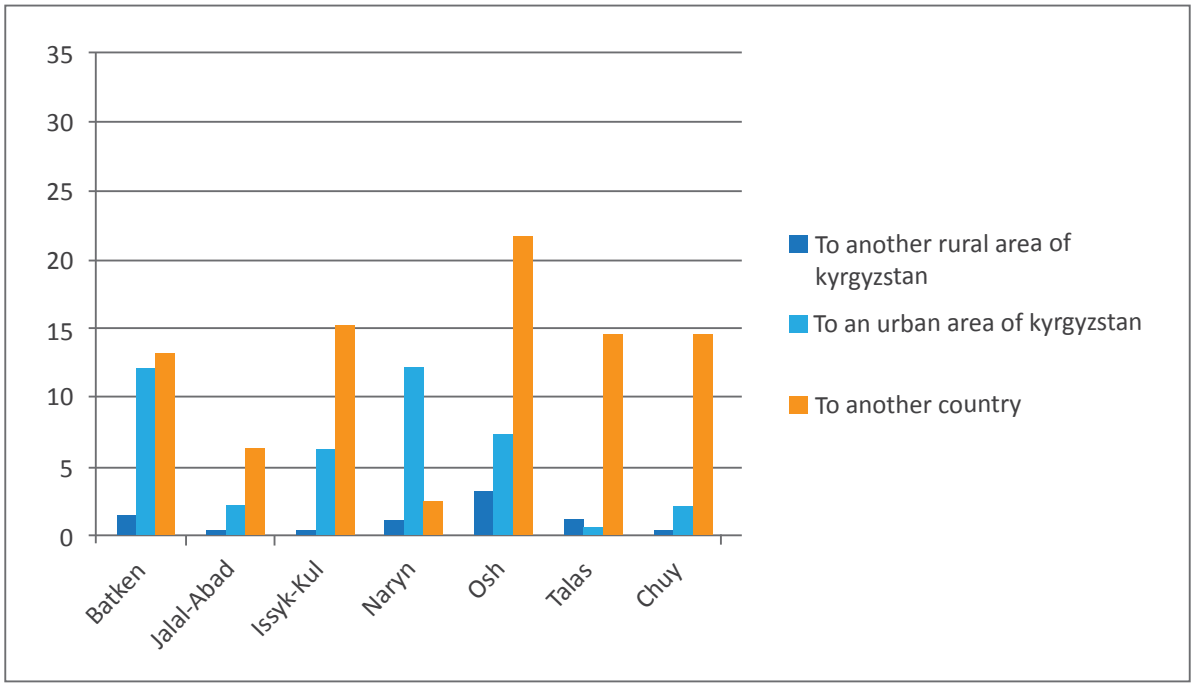
The present analysis highlighted the important fact that one of the main strategies to adapt to environmental problems – and more generally to unemployment in Kyrgyzstan's rural communities – is internal and international labour migration. When livelihoods and income are negatively affected by environmental and other factors, it is a common strategy for one or several household members to go find work where they can send money home.

Qualitative data showed that internal migration represents an important adaptation strategy to environmental problems. Most of internal migration flows (especially in the northern regions of the country), are directed towards Bishkek and its surrounding, where internal migrants in search of work settle down temporarily or permanently. In addition to these north-north flows, people from southern Kyrgyzstan also migrate to the cities of Osh, Jalal-Abad and others.

Naryn oblast represents a case in point when it comes to environmentally induced internal migration. For instance, in the Ak-Tala district, many people try to buy land and houses in Chui or Issyk-Kul oblasts due to the harsh environmental conditions of the region, like high altitude, long and cold winters and problems related to animal husbandry (mainly pasture degradation and water related problems). There, young people who gathered capital from previous labour migration experiences often aim to move away from the region. Thus, respondents mentioned that labour migration do not contribute to regional development, as many people try to permanently migrate once they accumulated sufficient capital. There is such a belief that "it is better to build a house in Bishkek rather than here". Those who stay are often poor people who herd the animals of those who have migrated. According to a respondent, "people who move away leave their cattle, land and sheds in Ak-Tala since it is impossible to take all of it with them, and poor people stay to herd them". This highlights the fact to the most vulnerable people are not necessarily those who actually migrate, but those who stay behind.

However important internal migration is for the country's economic and social life, survey results demonstrate that international labour migration is by far the dominant trend (see Figure 21 showing migration dynamics desegregated by regions). Indeed, we can observe that the most frequent destination of labour migration (in all regions except Naryn oblast) is abroad (mainly Russia and Kazkahstan). Osh oblast is on the lead for the percentage of international labour migrants, while Naryn is the only region where migration to other cities of Kyrgyzstan exceeds migration abroad.

Figure 21. Where would you or members of your household migrate?



One of the main reasons for migration in all studied communities is the absence of jobs and decreasing opportunities for farming, gardening and animal husbandry due to environmental factors. As an interviewed woman from Issyk-Kul oblast puts it:

> *"Many people went to Russia. Why stay here if there is no job? Before there was a kolkhoz and everyone used to work in it. Since it was closed, there is a big unemployment problem in the village. We can only work in the fields but the yields are not enough due to problems with irrigation water. Also, today the youth does not want to work in the fields".*

A male respondent from the same village said that he can earn twenty thousand rubbles in one month in Russia. By contrast, at home he used to earn the same amount in one harvest season (several months). Thus, it is apparent that many farmers in Issyk-Kul oblast and other regions of Kyrgyzstan do not earn decent income from agriculture.

From the opinion of interviewed villagers, an important cause for this is the absence of market and information for their agricultural business. Indeed, many agriculture dependent respondents mentioned that they would need more information about the most profitable agricultural products, the use of fertilizers, the tendencies of agricultural markets, the technical means to address the illnesses of fruit and vegetable plants and trees, and so on. Relatedly, those who substantially depend on animal husbandry (mostly in Naryn and in the country's southern regions) mentioned the need to build meat and dairy processing industries, which would boost the economic dynamism in rural areas, greatly enhance work opportunities and thus contribute to reduce unemployment and the need for international labour migration.

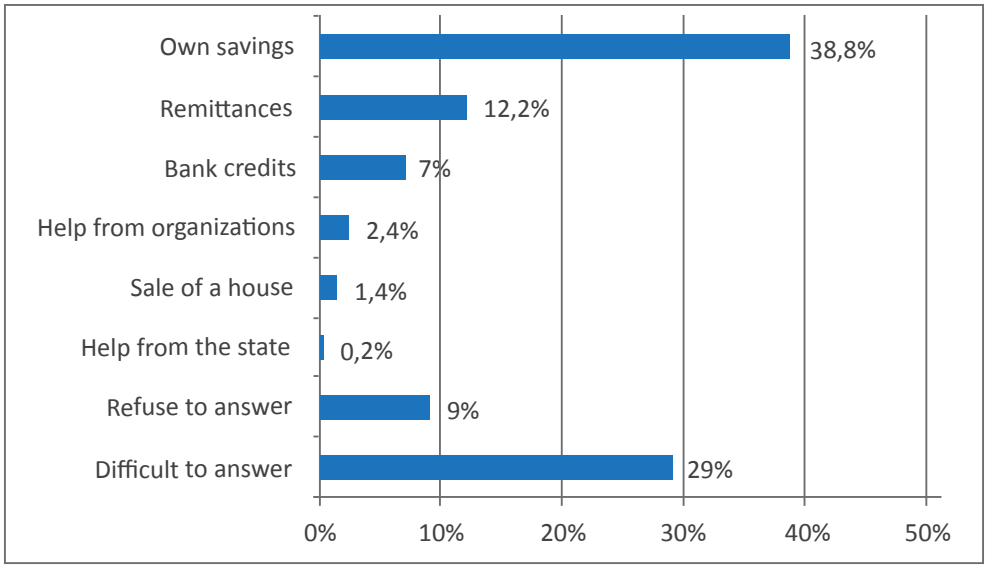
Thus, optimization of the agricultural sector, improvement of irrigation infrastructures, assistance with marketing strategies for farmers and herders, combined with initiatives promoting the diversification of income generating activities appear as the necessary conditions for Kyrgyzstan's rural population to cope with the economic difficulties caused in part by environmental factors. In turn, such actions would contribute to reduce the negative consequences of a high reliance on labour migration (see below for a more detailed discussion of these problems).

How do people migrate? Resources used for migration.

Respondents made it clear that international labour migration is considered as an investment, as the costs of transportation and of living abroad often represent considerable expenses for rural residents of Kyrgyzstan.

According to survey results and qualitative data, most labour migrants use their own savings to migrate. Others use remittances from other migrating household members, take credits, or even sell their house (see Figure 22). It is worth noting that taking credits to finance international labour migration is often a considerable risk, as some migrants who expect to repay the loan with the salary received in destination places do not succeed in doing so, thus creating a vicious circle of indebtedness that negatively affect individual and household well-being.

Figure 22. In case you would decide to migrate, what financial resources would you use to do so?



Social connections (relatives, neighbours, friends, acquaintances and so on) play an important role when deciding destination and assessing work opportunities. Many seek information and recommendations from their

contacts about job opportunities in Russia and elsewhere. As a respondent in his forties puts it: “Nowadays, in the era of technologies, we just need to call them [our acquaintances], ask about their health, then about work and salary and then decide to go here or there”.

In some cases, migration decisions are more thoroughly planned. For instance, some young respondents mentioned that in order to migrate to South Korea and Turkey to find profitable and interesting work opportunities, they undertake language and vocational education studies for several months. Most of those who engage in such activities are young unmarried males who do so after their army service.

Thus, international labour migration as an adaptation strategy is not available for all as it represents considerable initial costs that not everyone can afford. Indeed, most respondents mentioned that households living in relative poverty cannot engage in such activity. Those who do not possess sufficient financial means to go abroad often go to Bishkek or other cities for temporary or seasonal work.

Assessing international labour migration as an adaptation strategy

The question now arises about the effectiveness of labour migration as an adaptation strategy to environmental factors. Are international labour migrants generally successful? If so, how do their family uses the remittances they send home? Does labour migration positively contribute the development of Kyrgyzstan’s rural areas?

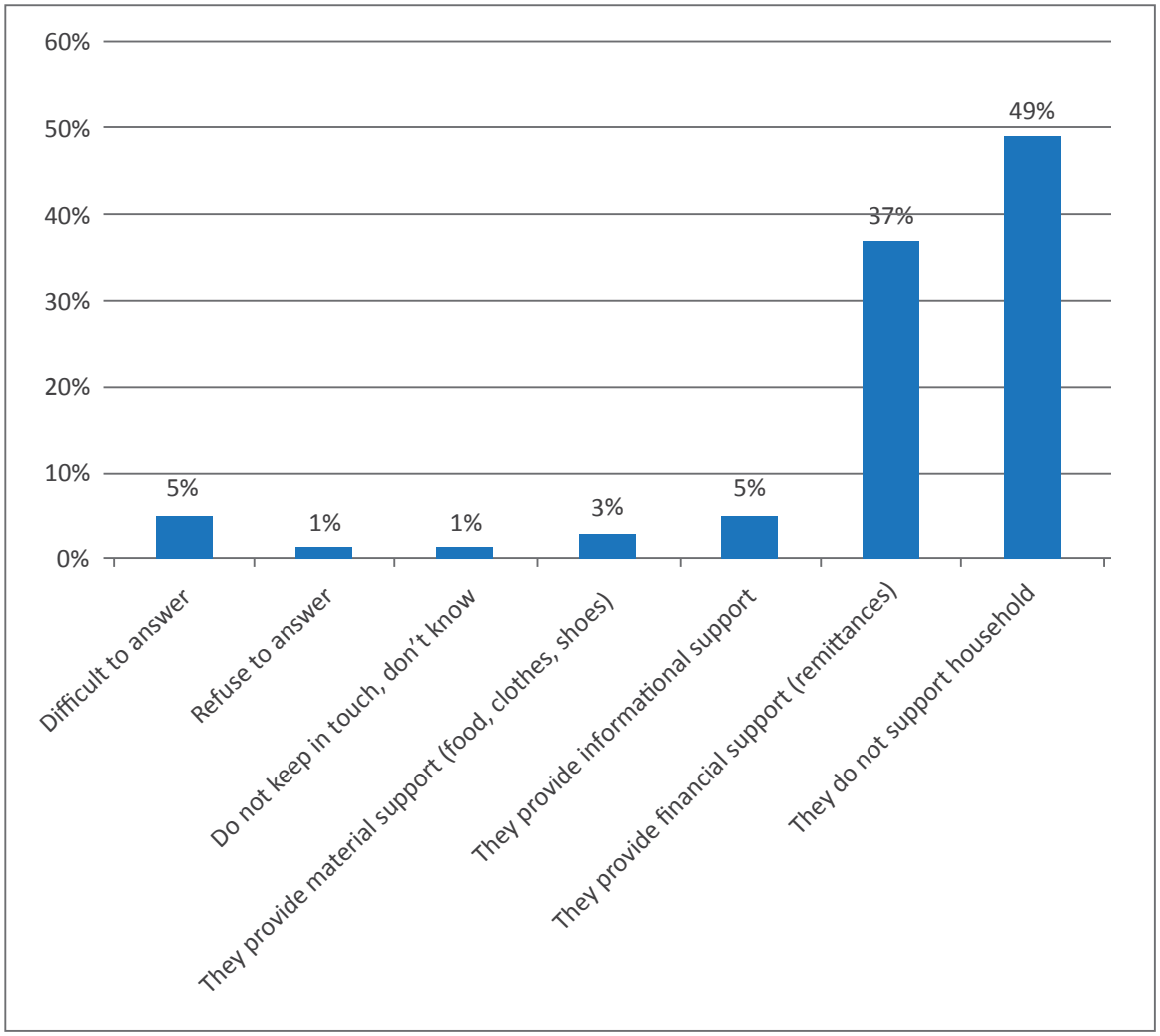
Before all, it can be said that there is no doubt about the fact that labour migration – especially international labour migration – is profitable. Indeed, respondents throughout the country were unanimous in saying that migrants in Russia can earn much more than what they could earn in their village. However, how is these resources used? Qualitative data showed that respondents mostly use remittances to buy livestock, cars, land, save money for wedding and build houses. For instance, a respondent from Jalal-Abad oblast stated: “My daughters and sons-in-law bought land plots in the village Sadovoe and in Muras-Ordo [Bishkek] with the money they earned in Russia.”

Abandoned house in Jalal-Abad oblast

It is interesting to mention that most of the respondents could not recall if someone in their village invested remittances into a business project. Relatedly, most survey respondents (see figure 24 below) replied that migration does not have any significant impact on their villages. We can induce from this that respondents do not consider that migration can bring major changes that would positively affect their community through the creation of jobs, the development of infrastructures and the overall improvement of the economic life.

Interestingly, survey results show that perceptions about the immediate benefits of labour migration are not as positive as we might think. Figure 23 shows the answers of respondents related to the different kinds of support they receive from members of their household engaged in international labour migration. Most of them (49 per cent) replied that members of their household who have migrated do not support their households at all. Only 37 per cent of respondents said that they receive financial help from them.

Figure 23. Do household members who have migrated support your household?



Thus, from available evidence, it appears that even though international labour migration does help villagers to cope with environmental hardships in an immediate, short-term manner, it does not significantly contribute to develop rural areas' economic life on the long-term, and does not address the very root causes of the international labour migration, which is often more a worst case scenario than a voluntary choice.

Furthermore, international labour migration, even though sometimes effective as an adaptation strategy to environmental problems, unemployment and insufficient income, entails many downsides for those who engage in it. Many migrants experience difficulties at their place of destination, which are often of a bureaucratic nature and related to the registration procedures of foreign workers. The poor knowledge of Russian of some migrants further complicates this issue. For instance, a respondent said that:

> *"They [migrants] do not know where to apply for registration and some of them lose their documents. Moreover, migrants experience difficulties due to lack of knowledge of the language in the country where they work".*

Other problems experienced by labour migrants abroad include delays in receiving their salary, health problems and human trafficking. A respondent with international migration experience stated that:

> *"Only 60-70 % of migrants are working more or less successfully, while 30-40% cannot manage it and have to come back home. At this moment 2 migrants from our village have disappeared. Migrants who work in Kazakhstan experience problems with payments and some of them become slaves. Most of the times migrants get into such problems because they lack information".*

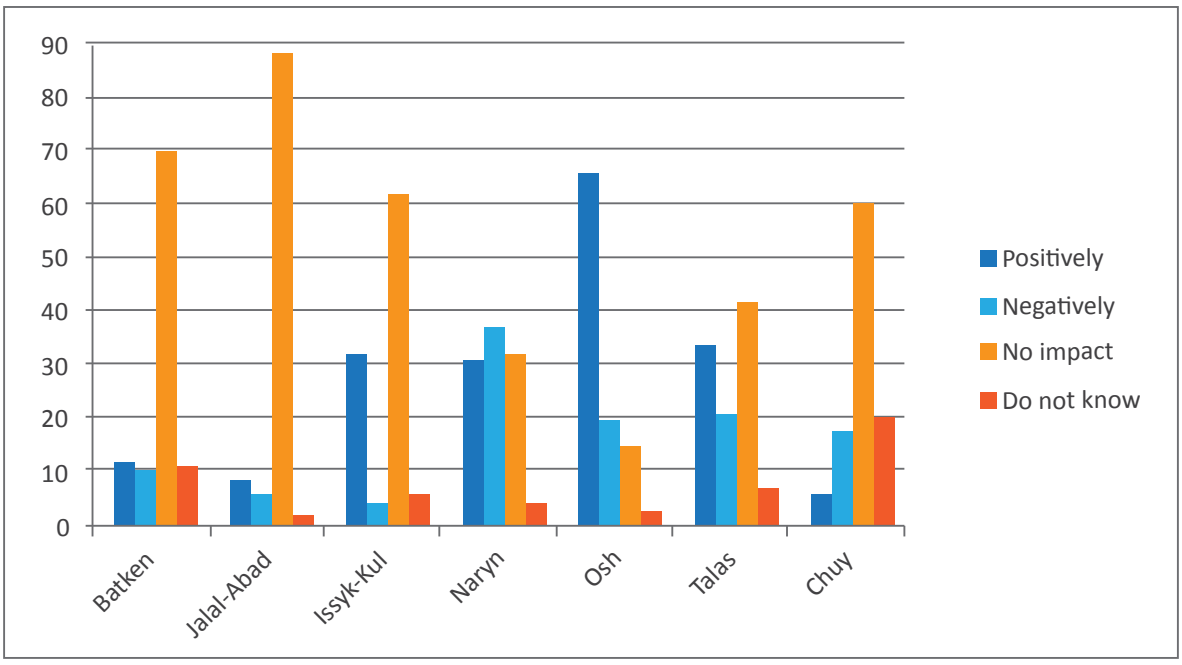
5.5. PERCEPTIONS RELATED TO THE POSITIVE AND NEGATIVE ASPECTS OF MIGRATION

Both quantitative and qualitative data gathered during this research show that perceptions on the role of migration are contrasting and not clear-cut. According to survey results (see Figure 24), respondents who consider that migration has mainly positive impacts on their community is slightly higher (27 per cent) than those who think that it has negative impacts (16 per cent). However, half of respondents (50 per cent) answered that migration has no impact at all.

Interestingly, regional differences in the answers are significant. In Batken oblast, only 11 per cent of respondents insisted on the positive impacts of migration on their village, 10 per cent on the negative impacts, while 69 per cent replied that it has no impact at all. Responses are similar in Jalal-Abad oblast, where the vast majority of respondent (87 per cent) thought that migration has no impact. By contrast, in Naryn and Issyk-Kul oblasts, respondents have more positive perceptions on the impacts of migration on their community (30 and 31 per cent respectively). However, in Issyk-Kul oblast, a very small number of people (3 per cent) insisted of negative impacts, while in Naryn oblast this proportion amounts to 36 per cent.

Chuy and Osh oblasts stand out from other regions and represent the two extremities of the spectrum of opinion. Indeed, while in Osh the majority (65 per cent) thinks that migration entail positive impacts on the community, only 5 per cent think so in Chuy oblast.

Figure 24. How does migration impact your community?



In addition to survey results, qualitative data also show contrasting views on the role of migration. Unsurprisingly, rural community members mentioned that the two main positive aspects of migration are related to the increase in household financial means and in acquired skills and knowledge during migration experience. As a female respondent puts it:

> *"Migration is good because when they [the migrants] come back to the village, all benefit from their knowledge and skills. Our houses also get improved from the money they send".*

Another respondent mentioned that:

> *The youth today is hard-working and skilful. Nowadays young people can do everything related to construction work. The market leads to this. They understand they need to know different skills to participate to the economy. They don't just study and expect to become an official. They participate in migration because they understand where they can find money. By doing so, they also help their parents.*

Another mentioned positive aspect of migration is the fact that young people can become independent earlier and more easily, as well as invest in their education. In that sense, migration contributes to transform the structure of the Kyrgyz family, in which the traditional authoritative role of parents is reduced by the fact that their children now possess more autonomy and freedom and can more easily rely on themselves. Traditional child-parent relationships are also changing in Kyrgyzstan due to economic opportunities made available for the youth by migration, as more young people now decide to go work abroad without their parents' permission.

Moreover, respondents mentioned that the current economic conditions and migration trends have pushed people to work harder. Overall, they believe that the quality of their life has improved in comparison to the early nineties, a period of dramatic economic decline in Kyrgyzstan. As one villager puts it: "We are living better now because people started to rely on themselves. It's better than it was in the nineties because people are doing their best." The same respondent observed that households in which members are engaged in labour migration can now more easily afford to build a new house or buy livestock. However, those households in which no member is able or willing to migrate do not have such benefits. Thus, we can witness that due to increased mobility of the population in the context of a market economy, the dynamics of inequality have increased in Kyrgyzstan, even in its most remote villages.

According to respondents, internal labour migration entails several negative impacts for communities, the main one being the depopulation of rural areas. For instance, a respondent in Naryn – a region where internal migration to Bishkek, as we have seen, is significant – argued that many internal migrants, even though their original intention was to return to their village, try to buy a land plot, build a house and stay in Bishkek or in its surroundings. He stated that:

> *"They [migrants] don't come back because there is not job here [in Naryn] and the quality of the land is poor. Usually, only the youngest son stays with his parents in the village and the others try to settle down in the city. Because of this, the village is not growing but is being slowly depopulated."*

Thus, there is an actual phenomenon of depopulation in some of Naryn oblast's villages caused by the absence of employment opportunities and by environmental problems related to animal husbandry, which is the main subsistence strategy in this region.

Relatedly, as a result of migration – or of the desire to migrate – of the young and active members of rural communities, there are constant problems related to shortages of workers. A respondent of Naryn oblast said that:

> *"Many young people are absent from the village. When we need their help during harvest time, we have to call them so that they can help us".*

The mayor of a village of Jalal-Abad oblast described a similar situation:

> *"We recently received 3 tons of cement and 400 kilograms of fittings from the government to repair a road in the village. But the problem is that we cannot find people in the village to do the physical work for this project, as many young people have migrated".*

As a conclusion to the previous sections, it can be argued that in Kyrgyzstan, environmental factors in combination with other socio-economic variables, play a substantial role in people's decision to migrate, either temporarily or permanently. At the same time, internal and international labour migration represents the main adaptation strategy to environmental problems in rural communities. However, not everyone has equal opportunity to effectively use this strategy, as it depends on individuals' and households' financial, social and cultural resources.

Furthermore, the effects of migration on those who actually migrate and those who stay behind are contrasting. Positive aspects of migration include the increase of income, the enhancement of living conditions, the learning of new skills, greater freedom of choice when it comes to place of residence and the capacity to move to more environmentally friendly locations. Migration also enables the youth to acquire necessary skills for livelihood, and gain independence and self-sufficiency through this process.

To the above mentioned negative social consequences of migration, it can be added that remittances contribute to further degrade the environment through the increase in the number of livestock causing land and pastures degradation and augmenting the risks of landslides (the "reverse effect of migration").

5.6. THE ISSUE OF RESETTLEMENT

In addition to long-term, progressive phenomena, natural disasters (mainly landslides) affect migration dynamics to an important degree. A case in point is the Suzak district of Jalal-Abad oblast, where landslides regularly cause fatalities and material destructions (see chapter 4 from a more detailed description of these phenomena). However, despite risks and dangers, many people continue to live in such vulnerable zones, and most often decide to not relocate even when they receive land plots, houses and financial support from the state. Why is that so?

House destroyed by landslide in Jalal-Abad oblast

In-depth interviews (conducted both with respondent living in dangerous zones and respondents who have been resettled) made clear that the main reason for this paradox is related to the perceived absence of livelihood opportunities after resettlement. Most respondents feared that their potential new place of living will not provide the same advantages in terms of agriculture, animal husbandry, public infrastructure, the provision of social services and employment opportunities.

Houses built by the government for resettled households in Jalal-Abad oblast

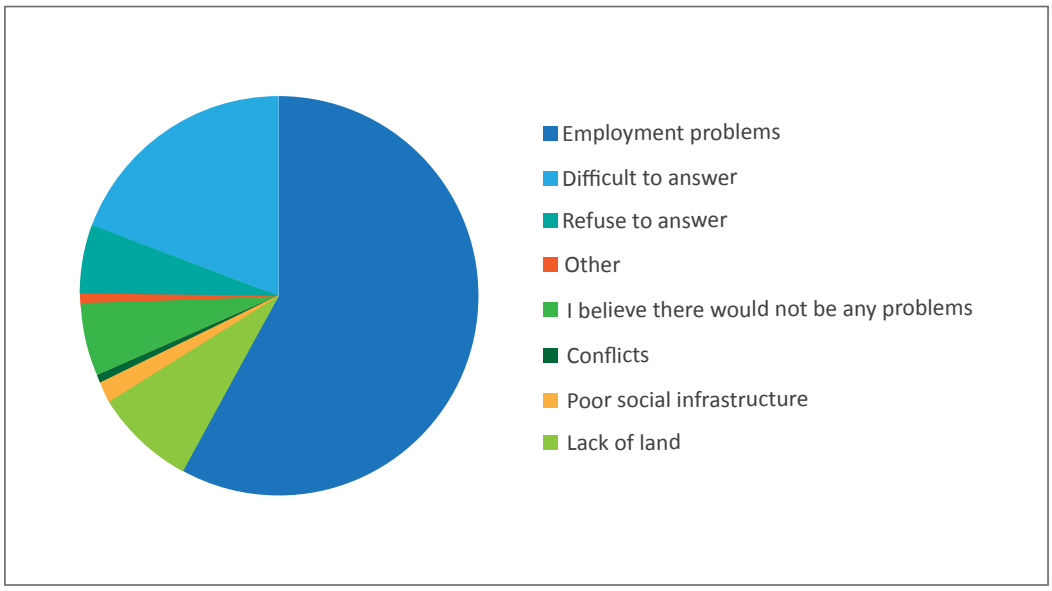
Indeed, relocated households often experience various kinds of difficulties in their new place of residence. An illustrative example is the case of a man in his late fifties living in Jashasyn village of Suzak region, where his family was resettled after the destruction of their house in Kyr-Zhol village by a landslide in the spring of 2015 and provided with a comfortable and nicely built house by the government. However, he is experiencing difficulties due to the lack of pastures for herding his animals and insufficient land for farming, a problem aggravated by the fact that there are few employment opportunities in Jashasyn. Moreover, this man expressed a longing for the social ties he had with his relatives and friends in Kyr-Zhol. He also does not have adult children who could help him financially by engaging in labour migration to Bishkek or Russia.

This example – among numerous other encountered during the conduction of the research – shows that resettled people represent a particularly vulnerable group. Generally, this vulnerability is caused by the absence of work opportunities, by insufficient skills and knowledge that would allow people to adapt to new locations, by the lack of financial resources and by psychological hardships due to the feeling of isolation.

Indeed, people are often resettled either to a plough-land or in places where basic infrastructure is lacking, and where animal husbandry and farming is difficult due to lack of space. This demonstrates that in most cases, despite considerable efforts and resources dedicated by the state to resettle populations residing in areas with high risks of natural disasters, incentives are not sufficient for people to decide to relocate. Moreover, eventual resettlement can create new economic and social problems, as some households are resettled on lands that are often already used by local population.

Quantitative survey data (Figure 25) echoes this problem, as the majority of respondents think they would face difficulties with employment upon relocation to a new place. Other mentioned difficulties are the shortage of land and poor infrastructure.

Figure 25. What kind of difficulties do you think you would face in a new place of living?



Qualitative data shows that another factor preventing people to resettle is linked to credits that people take to finance their farming or animal husbandry activities. A respondent from Suzak district mentioned that his loans make it more difficult for him to resettle, since he fears that their new place of residence will not offer the same income generating opportunities in terms of animal husbandry, farming and other economic activities, and hence he will not be able to repay them. Despite the fact that he currently resides in a place where landslides are a constant threat to his family's security, this place allows him to run stable economic activities and thus to repay his debts.

It should be noted that credit has contrasting impacts on people's vulnerability and adaptability to environmental factors. On the one hand, it can enable them to optimize their livelihood strategies by improving their farming work or animal husbandry. On the other hand, in times of hardships (poor harvest, decline of prices of livestock and agricultural products), people are forced to engage in labour migration to repay their debts. In other cases, credit prevents them to move away from dangerous or environmentally unfriendly zones because of the perceived or real risk of lower income in a potential new place of residence.

These different phenomena and cases clearly show the difficult dilemma many people face between, on the one hand, residing in a place where they live under constant threats of destructive natural disasters, and on the other hand relocating to a place where they face "certain uncertainties" in terms of livelihood. As discussed earlier, there is an important paradox in the fact that despite the environmental problems and dangers that many people experience, most of them do not relocate.

Moreover, resettlement assistance from the state is not always used as intended by beneficiaries. Indeed, in many cases, we found that families use lands or houses provided by the state to relocate only some members of the household (usually the eldest son and his wife and children), while the rest of the household will continue living in the dangerous place. In other cases, beneficiaries of state assistance sell the received lands or

houses in order to conduct renovation work on the house located in the dangerous zone. This, obviously, does not fulfil the objectives of resettlement procedures.

The main conclusion can be drawn from the above is that a more comprehensive approach to resettlement is needed, which would include a particular sensitivity to livelihood strategies, income generating activities and to the knowledge and skills necessary to develop them. Indeed, resettlement should not be conceptualized as a mechanical process of displacing people from dangerous areas to safer areas, but should integrate social aspects as well.

5.7. ENVIRONMENT AND MIGRATION IN URBAN AREAS

This study is mainly concerned about the various manifestations of environment-migration interactions in rural areas, where livelihoods are highly dependent on the environment, making populations more vulnerable to environmentally induced migration. However, limiting the analysis to rural areas would be misleading and provide only one part of the picture. Indeed, the study of the environment-migration interactions in urban areas is important for two main reasons.

Firstly, in Kyrgyzstan as in many developing countries, rural-urban migration (often at least partly motivated by environmental reasons) is a significantly growing trend. In Kyrgyzstan, this phenomenon is best exemplified by the "novostroikas" surrounding the capital Bishkek. Novostroikas, meaning literally "new settlements" in Russian, are informal neighbourhoods built by internal migrants at the outskirts of the city, which often lack basic infrastructures and services. As previously mentioned, it is very difficult to establish predictions about the number of rural-urban migrants (including environmental migrants) that can be expected in future years. However, considering current environmental and demographic trends – different processes of environmental degradation, water resources depletion caused by melting glaciers which in upcoming decades will undoubtedly affect rural livelihoods in some rural areas, and finally population growth – we can expect an increasing number of rural-urban migrants in Kyrgyzstan. Such internal migration dynamics entail potential for social tensions and conflicts between newcomers and settled urban populations. Hence, adaptation strategies to climate and environmental changes should be sensitive to the social impacts of environmentally induced rural-urban migration.

Secondly, it can be argued that migration impacting environmental phenomena are not only relevant for rural areas. It is thus important to investigate perceptions about the environmental conditions in cities as well, as urban residents may be experiencing problems of a different nature than their rural compatriots.

In order to investigate this important topic, 10 semi-structured interviews[17] were conducted by students of the American University of Central Asia (AUCA). Interview design was meant to study respondents' attitudes related to internal migrants settling in the capital, as well as their perceptions about the environmental situation in their city. It must be noted that the results of these interviews should be interpreted carefully, as the small number of respondents and the fact that they were conducted by non-professionals do not allow to draw wide and definitive conclusions. However, they were successful in investigating the "repertoire" of urban residents' contrasting attitudes and perceptions about rural-urban migration and related themes.

Regarding the causes of rural-urban migration flows, respondents mostly mentioned the lack of job opportunities in rural areas and the desire of migrants to attain better and more comfortable living conditions in terms of infrastructures and social services such as health and education. They pointed out the significant gap in living conditions and quality of life between urban and rural areas of Kyrgyzstan. Most of them agreed that it is understandable and "normal" that villagers are desirous to relocate in cities, particularly in Bishkek. Most respondents agreed that the government should do more to address the root causes of rural-urban migration by establishing better living conditions and livelihood opportunities in rural areas.

Despite this understanding of the causes of migration, the overall trend apparent in the interviews can be summarized by the opinion that internal migration to Bishkek negatively affects the overall quality of life in the city, including its environment. For instance, most respondents thought that internal migrants in Bishkek do not

17 The interviews were conducted in April 2016 with long-time residents of Bishkek (living in the city since 20 years of more). Respondents were of various ethnicities (8 Kyrgyz, 1 Russian and 1 Dungan). Half were female and half male.

know how to behave properly in the city and lacked proper cultural education. Respondents also mentioned that internal migrants contributed to increase crime in the city. It can thus be argued that stigmas and stereotypes towards this group are frequent and persistent, and seem to have steadily increased with the progressive arrival of internal migrants during the last 20 years. Interestingly, many respondents associated environmental problems in their city with the presence of internal migrants. For instance, they mentioned that migrants are important contributing factors – if not the only cause – to such problems as the excess and bad management of garbage, the increased number of cars causing constant traffic jams, illegal logging in urban zones, overpopulation in city parks and discomfort in public transportation (marshrutkas).

Is conflict a real risk?

It is difficult to determine the degree to which rural-urban migration carries the potential of social tensions and conflicts between settle urban communities and newcomers. This depends on a wide range of factors, which the present study cannot investigate comprehensively. One sure thing is that conducted interviews with urban residents show that the overall opinion about internal migrants is negative and that stereotypes are strong and persistent.

However, the degree to which these perceptions and stereotypes can actually feed social tension and conflict is unclear. Interestingly, the opinions of most respondents were more balanced when asked if they personally knew internal migrants. For instance, an elderly male respondent, who was born in Bishkek and lived there during his whole life (and was thus witness to the major rural-urban migration flows which followed the disintegration of the Soviet Union) was particularly virulent about the negative consequences of internal migration. But when asked whether internal migrants were living in his neighbourhood and what were the nature of his relations with them, the interview shifted to a more positive tone, as he named several migrants living in his building and with whom he had good relations.

This particular interview – as well as others– illustrates an interesting paradox: if most urban dwellers seem to have negative perceptions of internal migrants in a general, abstract manner, their opinion about members of this group shifted to the positive side when they were asked about concrete persons with whom they interact on a daily basis. When talking about “Nurbek from Jalal-Abad” or “Jyldyz from Naryn” living in their neighbourhood, stereotypes suddenly disappear, and the “fear of the migrant” significantly fades. This illustrates the constructed, artificial aspect of the perceived “threat of internal migration”, widespread among urban dwellers, and the fact that stereotypes and stigmas do not match reality. This paradox also represents a strong argument to at least partly discount the thesis following which increased and sustained internal migration could trigger major social tensions potentially leading to conflict.

Moreover, some respondents pointed out that migrants are most often forced to take up the most difficult, low-paid and less prestigious jobs in the city. Despite the overall negative attitude, respondents showed understanding – and sometimes even compassion – towards members of this group. This compassion was particularly strong for those internal migrants who were forced to move due to natural disasters.

However, the thesis following which increased internal migration flows could exacerbate social tensions in the country’s cities (particularly in its capital) should not be completely discounted. Indeed, the persistence of stereotypes and the overall negative attitude towards internal migrants settling in urban areas represent dangerous ingredients, which could be “activated” in times of economic hardships, when resources (jobs) are scarce and the competition more fierce. Additionally, even though it is not realistic to establish rigorous predictions about the future dynamics of environmental migration, current trends show that the impact of environmental and climate factors on migration have increased in the last years, and will most likely continue to increase in upcoming decades.

In order to prevent and mitigate potential social tensions caused by internal migration, policies should aim to: 1) address the root causes of internal migration by developing livelihood opportunities in rural areas, 2) bridge the social gap between urban dwellers and internal migrants through tailored programmes aiming to fight stereotypes and stigmas and 3) enhance urban management mechanisms to increase the “welcoming capacity” of cities (Bishkek in particular).

6. THE POLICIES AND POLITICS OF ENVIRONMENTAL MIGRATION IN KYRGYZSTAN

6.1. ANALYSIS OF CURRENT LEGISLATIVE FRAMEWORKS RELATED TO ENVIRONMENTAL MIGRATION

Definitions of environmental migration in international law and national legislation

During the past years, migration policy has been becoming a state issue of increasing importance. Moreover, it has been recognized as a dominant trend in virtually all areas of economic, political and social life of the country.

Among all other types of migration, forced internal migration is the most burdensome for destination areas as it entails not only significant material costs but considerable political responsibility.

Lately, migration caused by deteriorated environmental conditions or as a result of natural disasters (so called "environmental migration") was added to the list of generally recognized causes of forced migration.

However, environmental migration is not sufficiently studied both globally and in the Kyrgyz Republic. In international documents, this category of migrants is little mentioned. A generally recognized definition of "environmental migrant" is absent. Only some references to "ecological migrant" and "ecological refugee" can be found in the UN Convention of 1951 and the Protocol of 1967. Data on environmental migration and records in statistical registers are missing; only the categories of refugee, displaced person and internal migrant are listed.

Starting from the seventies, the Office of United Nations High Commissioner for Refugees (UNHCR) has been participating in UN humanitarian operations upon suggestion of UN Secretary General. The UNHCR possesses "specific abundant knowledge and experience" and provides support to various groups of individuals who are not a subject of the UNHCR's Charter, but who need assistance.

Environmental migrants are often included in these groups, but generally, this category of individuals is considered as "individuals forced to escape immediately and suddenly in great groups from their residence as a result of natural or anthropogenic disasters" (Goodvin-Gill G. 1997. "Refugee's status in the international law". M.: UNITI, 1997. p. 315).

The most widely accepted definition of environmental migration, referred to by various authors, was adopted in 1996 at the conference in Geneva. According to it, "environmental migrants are people who are forced to leave their home region and migrate within the boundaries of their country or cross its borders due to sudden worsening of the environment or environmental disasters" (Regional Conference addressing problems of the refugees, displaced persons, other forms of involuntary displacement and returnees in the CIS countries and relevant neighbouring states: Geneva, May 30-31, 1996, p.41).

Another definition is provided in the report of the Global Commission on International Migration: environmental migrants are individuals who are forced to resettle due to natural disasters (Migration in the Interrelated World: new areas of activity: Report of the Global Commission on International Migration. M.: Orgservice-2000, 2006).

The International Organisation for Migration (IOM) provided its own definition of environmental migrant – a person who is forced to leave his/her residence due to sharp or gradual changes in the environment.

At the 2008 conference in Bonn dedicated to environmentally induced migration, the following categories of migrants have been emphasized:

- environmental emergency migrants who are fleeing from a hazardous environmental events to save their lives;
- environmental forced migrants who leave their permanent place of residence in order to avoid inevitable and negative consequences of environmental degradation;
- environmentally motivated migrants who have the opportunity (including financial resources), to leave their place of permanent residence where the environmental situation is worsening in order to find a better place for living.

Similarly to other types of migration, environmental migration can be divided into external (international) and internal (domestic).

Another category of environmental migration is related to its permanent or temporary nature. Permanent environmental migration can be defined as migration aimed to change a place of residence due to the inability to stay within area of ecological hardship in case of major natural disasters, substantial damage to the environment and the impossibility of returning to the original place of residence due to threat to life and health caused by long-term environmental and sanitary-epidemiological situation or to the unwillingness to return to the previous place of residence because of such concerns.

Similarly, temporary environmental migration can be defined as migration with the aim of changing the place of stay because of threat to life and health in area of ecological hardship in case of major natural disasters, substantial damage to the environment and later return to the original place of residence due to the stabilization of the environmental and sanitary-epidemiological situation. Temporary environmental migration can be divided into two classes – short-term migration (up to 1 year outside the original place of residence) and long-term migration (more than 1 year).

Environmental migration can be divided into three types by a way of activation: Compelled, forced and voluntary.

1. Compelled environmental migration is compulsory resettlement organized or authorized by the state from areas of natural or man-made disasters causing harsh deterioration of the environment and leading to the impossibility for people to stay in the affected region.

2. Forced environmental migration is the displacement of people who leave their place of residence due to justified concerns related to danger and health as a result of ecological or anthropogenic disasters or because of severe changes in the environment.

3. Voluntary environmental migration is the displacement of people who leave their home because of less significant changes in the environment or climate.

Considering the above-mentioned, environmental migration can be defined as *displacement of people with the aim of changing their place of residence or stay because of the inability and unwillingness to live in areas affected by natural disasters, negative environmental change, sanitary-epidemiological or climatic situation and inability to return to the same place of residence before the stabilization of the ecological or sanitary-epidemiological situation due to threats to life, harm to health or the unwillingness to return because of such concerns.*

It is worth to say that the term “environmental migrant” is legally defined in the Kyrgyz Republic through the Law “On internal migration” as of July 30, 2002, №133, and the Regulation on recognition of the citizen of the Kyrgyz Republic as forced migrant was adopted by the Resolution of the Government of the Kyrgyz Republic as of April 5, 2004, №229. Thus, the following persons are considered as forced migrants:

a) environmental migrants: citizens who left their place of residence and moved based on a decision of the Government of the Kyrgyz Republic to other location within the Kyrgyz Republic due to drastic deterioration of the environment or natural disasters;

b) migrants on sites of natural disasters, major accidents or catastrophes: citizens who left their residence as a result of an emergency situation within the territory of their residence in accordance with the Constitutional Law of the Kyrgyz Republic “On Emergency Situation”.

However, in accordance with Article 32 of the Law of the Kyrgyz Republic “On internal migration”, economic migration and labour migration are not included in the notion of forced migration. This approach is disputable since citizens can leave their residence because of worsening of their economic situation as a result of ecological factors such as land degradation (for instance desertification), and therefore are not able to conduct profitable agricultural activities.

The main reasons for environmental migration in Kyrgyzstan are:

- Sudden natural disasters, mainly landslides;
- Slow deterioration of environment;
- Health problems caused by harmful environment;
- Poor water and soil quality, shortage of water, draught and poor harvest;
- Anthropogenic disasters.

Legislative base in the migration sphere

At the legislation level, the migration sphere in Kyrgyzstan is regulated by a number of documents guaranteeing all basic rights and freedoms to all people staying within territory of the Kyrgyz Republic and under its jurisdiction.

Constitution of the Kyrgyz Republic. The Article 25 sets forth that everyone has right to freedom of movement, to chose their place of stay and residence within the Kyrgyz Republic.

Law of the Kyrgyz Republic "On internal migration". Internal migration in Kyrgyzstan is regulated by the Law of the Kyrgyz Republic "On internal migration", which defines the legal and operational basis of internal migration processes and the required conditions in the new place of residence or stay for individuals and families of internal migrants.

Movement of citizens of the Kyrgyz Republic for various motives with the aim of permanent or temporary change of place of residence is defined as internal migration by the Law. An internal migrant is a citizen of the Kyrgyz Republic who moved due to various reasons from one location to another within the Republic's territory, for permanent or temporary change of residence.

Among others, the Law specifies that the key goal is to ensure protection of the rights and legitimate interests of internal migrants. The Law envisages that every citizen of the Kyrgyz Republic has the right to protection against non-voluntary displacement from their place of residence or stay.

According to the Law, every citizen of the Kyrgyz Republic has to be registered domiciliary and in its place of stay within territory of the Kyrgyz Republic. Thus, citizens permanently living on the territory of relevant administrative-territorial unit of the Kyrgyz Republic (city, town or village) are subject to registration. Registration of temporary residence is for citizens who temporarily left their permanent residence and moved to another location for a period longer than 45 calendar days without withdrawing from registration on the permanent residence.

The law legally defines the term "environmental migrant"; however, citizens can be recognized as environmental migrants in case of threat to their life and health as a result of natural disasters or drastic deterioration of the environment. Thus, a proportion of migrants leaving their permanent residence because of gradual degradation of the ecological or sanitary-epidemiological situation, climate change and so forth, is not covered by the Law and create substantial worsening of their financial status while forcing them to move to more environmentally friendly regions.

Other regulations regulating migration issues are:

- the Constitutional Law of the Kyrgyz Republic "On Emergency Situation";
- the Code of Administrative Liability;
- the Law of the Kyrgyz Republic "On Citizenship";
- the Law of the Kyrgyz Republic "On external labour migration";
- the Law of the Kyrgyz Republic "On external migration";
- the Law of the Kyrgyz Republic "On legal status of foreign citizens in the Kyrgyz Republic";
- the Resolution of the Government of the Kyrgyz Republic "On approval of the Regulation on recognition of citizens of the Kyrgyz Republic as forced migrants" as of April 5, 2004, №229.

These regulations set forth that both men and women have equal rights and freedoms and equal opportunities for their self-realization in Kyrgyzstan. In the Kyrgyz Republic, slavery and human trafficking are not permitted. Child labour and forced labour are prohibited. Everybody has the right to freedom of movement, the choice of residence within Kyrgyzstan, and the right to leave freely the Kyrgyz Republic. The right of the citizen to return to the Kyrgyz Republic is not restricted.

The following was formalized in the legislation: procedures of exit of citizens for employment abroad, attraction of foreign labour to the Republic, legal norms of protection and procedures of activity organization of labour migrants and the authorized state institution in the migration sphere. However, issues related to labour migration are regulated by different laws, and a clearer division is needed.

In the Kyrgyz Republic, foreign citizens and persons without citizenship have the rights and duties on an equal footing with citizens of the Kyrgyz Republic. Exemptions can be set by the Law of the Kyrgyz Republic "On legal status of foreign citizens in the Kyrgyz Republic" or international treaties to which the Kyrgyz Republic is part.

Foreign citizens are equal under the law in the Kyrgyz Republic regardless of sex, race, language, invalidity, ethnicity, religious beliefs, age, political or other positions, education, origin, property or other status and other circumstances. Regarding citizens of states where special restrictions of rights and freedoms for citizens of the Kyrgyz Republic exist, the legislation of the republic can set retaliatory restrictions. Today, there are no examples of such restrictions.

Migration policy in the Kyrgyz Republic

The formation and development of institutional mechanisms in the area of migration policy in Kyrgyzstan is characterized by instability and inconsistency. Weak institutional mechanisms is a key problem in the formulation and implementation of adequate migration policy. During the last 20 years, the following institutions were involved in migration management activity:

- Department on Population Migration (1993-1999);
- State Agency on Migration and Demography (1999-2001);
- Department of Migration Service (2001-2005);
- State Committee on Migration and Employment (2005-2009);
- Ministry of Labour, Employment and Migration of the Kyrgyz Republic (2009);
- Department of External Migration (February 2012);
- Ministry of Labour, Migration and Youth of the Kyrgyz Republic (March 2013);
- State Migration Service (2016).

Regular institutional reorganizations had negative effects on migration policy since such institutional instability leads to poor institutional memory and poor capacity of institutional mechanisms for the implementation of delegated functions. The weakness of institutional mechanisms led to a situation where migration issues are not regulated properly and have an ad hoc nature. The delegation of migration management issues to the ministries, which already cover several areas, led to the actual "dilution" of migration policy aspects among other priorities of the ministries.

Key programme documents of the Kyrgyz Republic

"National Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017", adopted by the Decree of the President of the Kyrgyz Republic as of January 21, 2013, № 11. Today, the strongest pressure on ecosystems is observed under conditions of population growth. High poverty rates, increased consumption of resources, infrastructure development and demographic growth aggravated by irrational management of natural resources and environmental pollution are key factors of this growing pressure.

Economic growth and structure of economy of the country are based mainly on man-made extensive and nature intensive developments. In that respect, the country fully depends on the good condition of natural ecosystems. Risks of serious worsening of economic parameters in case of depletion of natural resources and environmental pollution are emerging.

The negative consequences of economic systems impacting environmental migration are the following:

1) Ecological problems and depletion of the natural capital (climate change caused by anthropogenic activity, mostly greenhouse emissions – carbon gases, chemical pollution, loss of biodiversity, degradation of agricultural land leading to desertification, shortage of irrigation and fresh water);
2) Increased poverty rate;
3) Threat to food and energy security.

The new state policy in the field of environmental protection and environmental security aims to:

1) Step-by-step transition to a system of strategic planning of sustainable development in all sectors of economic, social and ecological activity regardless of property form, which envisages equal attention to economic, social and ecological aspects;
2) Minimization of negative environmental consequences of economic growth through environmental impact assessment (EIA) of planned economic and development projects;
3) Establish fees for the use of ecosystem services to remedy environmental damage caused by violations of environmental protection legislation;
4) Availability and openness of environmental information;
5) Participation of all stakeholders in decision making on environmental protection and rational use of natural resources, both at the national and local levels.

In the field of the protection of the population and territory against emergency situations, the Kyrgyz Republic follows the five priorities of the Hyogo Framework for Action 2005-2015 "Building the Resilience of Nations and Communities to Disasters":

1. Ensure that disaster risk reduction is a national and local priority and ensure the existence of a strong institutional base for its implementation.
Goal: develop the regulation base for effective disaster risk management.
Specific objective: improvement of the legal and institutional base for effective disaster risk management.

2. Identification, assessment and monitoring of disaster risk factors and improvement of early prevention.
Goal: improvement of risk assessment, monitoring and early prevention of disasters in the Kyrgyz Republic.
Specific objective: identify threats, vulnerability and disaster risks for all settled territories of the Kyrgyz Republic.

3. Use of knowledge, innovative solutions and education in order to create safe conditions and capacity to counteract at all levels.
Goal: mitigate disaster consequences through improvement of knowledge exchange and education.
Specific objective: establish the national infrastructure on awareness rising regarding possibilities and ways to reduce disaster risks via information sharing.

4. Fundamental disaster risk reduction.
Goal: measures on disaster risk reduction are incorporated in the development strategy of the Kyrgyz Republic.
Specific objective: create mechanisms to define and include issues of disaster risk mitigation and management in the development policies, programmes and projects of the Kyrgyz Republic.

5. Enhance preparedness to disasters in order to respond effectively at all levels.
Goal: reduce human and material losses caused by disasters.
Specific objective: capacity building on preparedness and response to disasters at the national, regional, district and local self-governance levels (including development of early warning systems), and capacity building on disaster risk reduction.

Thus, it can be assumed that these efforts will facilitate the reduction of migration flows caused by environmental problems.

However, the Strategy does not consider specific issues related to environmental migration. Aspects of labour migration are more or less covered, especially when taking into account that some migrants are forced to move because of ecological reasons.

Thus, state policy on labour market and migration in Kyrgyzstan needs to aim at the regulation of internal migration, at the establishment of conditions for international labour migration conducted in dignity and at the enhancement of competitiveness of the economically active population. For these purposes, it is necessary to:

- Facilitate the necessary socio-economic conditions for accelerated economic development, develop the national and regional labour markets and implement employment promotion interventions;

- Reinforce the employment system for labour migrants, which shall guarantee the protection of economic and social rights and increase education and career development opportunities in new places of residence.

"Programme on Employment Promotion and Regulation of Internal and External Labour Migration until 2020", approved by the Resolution of the Government №485 as of September 6, 2013. The aim of this Programme is to create the conditions for productive employment of the population, to reduce unemployment and the misbalance of demand and supply in the labour market through measures promoting employment and taking into account full and rational use of labour resources while ensuring the protection of rights of the citizens of the Kyrgyz Republic working abroad.

The Programme does not consider challenges and problems related to environmental migration, but focuses on labour migration. Among issues causing migration, environmental factors and natural disasters are not considered, despite the fact that parts of the population actually migrate because of these reasons.

Earlier in 2004, the concept of the State Migration Policy of the Kyrgyz Republic until 2010 and the Action programme on its implementation have been adopted. Thereafter, since 2010, no strategies or programmes were adopted.

6.2. REVIEW OF INTERNATIONAL LEGISLATION AND BEST PRACTICES AND ASSESSMENT OF THEIR POTENTIAL ADAPTATION FOR KYRGYZSTAN'S CONTEXT

International standards and commitments

Migration field. The Kyrgyz Republic has ratified 53 ILO conventions, which contain an important number of regulations in the migration area.

In the Kyrgyz Republic, rules and guidelines are considered as valid legislation in the migration sphere according to principles of international treaties and other commitments of the Kyrgyz Republic, to norms of the Constitution of the Kyrgyz Republic, to the Labour Code of the Kyrgyz Republic, to the Laws "On External Migration" and "On External Labour Migration", to resolutions of the Government and to directives of the ministries, among others.

Rights of environmental migrants are based on fundamental human rights: right to life, right to personal freedom, right to protection against discrimination, right to freedom of movement and so forth. These fundamental principles were laid down in ILO international standards, in the inter-government agreements of the CIS and the Eurasian Economic Union countries, and are reflected in the national legislation of the Kyrgyz Republic. The main international documents regulating environmental migration in the Kyrgyz Republic are:

- Universal Declaration of Human Rights;
- International Convention on Civil and Political Rights;
- International Convention on Protection of Rights of all Labour Migrants and Members of their Families;
- Convention of Legal Status of Labour Migrants and Members of their Families of the Commonwealth of Independent States.

In line with these documents, Kyrgyzstan recognizes the following rights for citizens of the Kyrgyz Republic and persons residing outside the country:

- Right to move freely and chose place of residence within every state;
- Right to work, free choice of work, fair labour conditions and protection against unemployment;
- Right to equal payment for equal work without any discrimination;
- Right to fair and satisfactory remuneration ensuring decent life for the individual and his/her family and complemented, if necessary, with other means of social welfare.

The above mentioned rights in Kyrgyzstan should not be a subject to any restrictions except those envisaged by the legislation of the Kyrgyz Republic. The Kyrgyz Republic undertook commitment to respect and ensure rights of all labour migrants and members of their families who reside on its territory or under its jurisdiction without any discrimination.

Environment field. The Kyrgyz Republic has joined the UN Framework Convention on Climate Change (UNFCCC) by the Law of the Kyrgyz Republic as of January 14, 2000, №11, and the country submits the National Communication on Climate Change on a regular basis. Besides, the Priority Areas of Adaptation to Climate Change in the Kyrgyz Republic until 2017 were adopted (Resolution of the Government of the Kyrgyz Republic as of October 2, 2013, №549). However, these documents do not contain provisions reflecting problems of migration caused by environmental reasons despite the fact that climate change and its consequences for environment, economy and society impact migration dynamics.

Thus, the adaptation policy on climate change adopted in Kyrgyzstan does not contain priority areas related to environmental migration, and does not allow, for example, applying for project proposals to the Global Environmental Facility (GEF). For instance, the National Adaptation Action Plan (NAAP) of Haiti and Dominican Republic defines internal migration (rural-urban) as a critical and urgent problem within a context of climate change and recognizes environmental migration with regard to draughts (Government of Haiti, 2006:16), (Government of Dominican Republic, 2008:58,61). NAAPs of both countries consider migration as a mechanism for vulnerable groups of the population to cope with environmental change and recognize the importance of migration management with a special focus on planned urbanization and development of livelihood opportunities. The experience of other countries (Kenya, Papua New-Guinea, Vietnam and others) also demonstrates the links between issues of climate change and migration in their NAAP and National Communications (UN FCCC, 2007:4).

Disaster risk management. Policies of disaster risk management have set the goal to reduce the impact and damage caused to the environment and society by natural disasters. Globally, many countries face various natural disasters, which directly affect population movement. For example, the National Strategy of Vietnam on Prevention, Elimination and Liquidation of Natural Disasters until 2020 anticipates measures to complete resettlement and accommodation of the people from sites prone to landslides, but without specific actions (UN Vietnam, 2014).

In the Kyrgyz Republic, the Strategy of Integrated Safety of the Population and Territories of the Kyrgyz Republic in Emergency and Crisis Situations Until 2020 (Resolution of the Government of the Kyrgyz Republic as of June 2, 2012, № 357) was adopted. The Strategy defines that up to 10,000 houses are located in potentially dangerous areas, where anti-landslide interventions or resettlement of people on safe territories shall be carried out in the future. The resettlement of people from dangerous areas is one intervention aiming at the prevention of consequences of avalanches, landslides, mudflows and floods.

6.3 CONCLUSIONS

- The legal system of Kyrgyzstan, in all its elements – regulation base, composition of governmental and non-governmental legal institutions, legal ideas and visions, legal culture, ideology and science – does not correspond to modern needs and challenges. Legislation on migration is not an exception.

- The transition to sustainable development set forth in the National Sustainable Development Strategy of

the Kyrgyz Republic for 2013-2017, requires the inclusion of environmental factors in systems of economic indicators of development. The underestimation of environmental factors in decision making is related to the absence of these variables in traditional economic indicators of development. Other concepts and variables which are not properly reflected in traditional economic models include the use of natural capital, the balance of natural resources and the economic assessment of environment degradation. Additionally, this underestimation of environmental variables impedes the determination of current and potential migration flows associated with environmental factors, which in turn prevents the development and implementation of adapted policy.

- The main risk of ineffective governance is large-scale movements, which may lead to excessive exploitation of natural resources and disappearance of livelihoods in communities, a phenomenon which in turn can cause further migration and displacement, additionally to existing tension in host communities.

- In the last years, migration issues have been delegated from one institution to another, and these different agencies have insufficiently worked on them.

- Data on migration provided by various agencies are fragmented and often contradictory. Systems of data collection and sharing in the field of migration require further improvements.

- Effective implementation mechanisms of above mentioned strategies were not adopted and the national strategy on labour resource management was not developed.

- The overwhelming majority of environmental migrants is employed independently both inside the country and abroad, without state engagement.

- Public and private partnership is weak in the migration sphere.

- Processes of environmental migration should not be “controlled”, but managed based on the legislation.

6.4 RECOMMENDATIONS

1. At the legislation level, it is necessary to widen the definition of environmental migration. This category should not only include people vulnerable to sudden natural disasters, but also the population exposed to progressive phenomena of environmental degradation. Relevant amendments should be made in the draft Migration Codex of the Kyrgyz Republic upon discussions at the Jogorku Kenesh (Parliament) of the Kyrgyz Republic.

2. It is necessary to identify who will address the issues of environmental migration, how the responsibility will be shared and how the cooperation will be built between different ministries and institutions.

3. Key programme documents of the country approved by the President and by the Government of the Kyrgyz Republic such as the national strategies, concepts and programmes, should have a stronger vision in terms of actions to be implemented in case of major migration flows caused by environmental change. It is necessary to plan the interventions to be undertaken by responsible state bodies in such potential circumstances. It is also necessary to plan the needed actions if flows of environmental migrants should arrive in the country from other states. Additionally, local communities should be further involved in decision making, development and implementation of programmes related to environmental migration.

4. Relevant and accurate data on internal migration trends should serve as guidance for decision-makers in the formulation of policy on adaptation to environmental change and development policy in general.

5. Establish intersectoral dialogue between national and local authorities to maximize the benefits from migration. Policy implemented by local authorities should take into account local realities and the evolving needs of actual and potential environmental migrants.

7. RECOMMENDATIONS

The next logical step to answering the question "what is happening?" is to ask "what to do?". Research should be directed towards action and designed to facilitate policy making and targeted interventions by government and other stakeholders. Indeed, a deepened understanding is but the first step towards effectively tackling the negative consequences of environmental migration.

This chapter will first outline the underlying principles upon which recommendations were formulated and briefly discuss important ethical aspects related to the management of environmental migration. It will then present thematic recommendations related to various fields of action and intended for a wide range of stakeholders. These recommendations have been extensively discussed during a round table held in Bishkek in May 2016, to which participated government officials, representatives of international and local organizations, research institutes and independent experts. Finally, specific input from round table participants will be presented.

7.1. UNDERLYING PRINCIPLES AND ETHICAL ASPECTS

Actions – in terms of legislation, policies and other measures – related to environmental migration can be divided into two categories, each having its own objective and logic, and both being complementary to each other.

1) The first category includes actions aiming at reducing the negative consequences of environmentally induced migration. This can be done in two distinct manners:

a) Reduce the scale, intensity and impact of environmental factors. These actions should address both the root causes and symptoms of environmental phenomena affecting livelihoods and thus migration decision processes. They are mainly related to such fields as environmental protection and disaster risk reduction.

b) Increase the adaptive capacity of populations to environmental factors impacting migration. Complementary to reducing the impacts of environmental factors, actions should also target the "human variable" of the equation by enhancing populations' awareness, preparedness, knowledge and skills to cope with environmental and climate changes. As demonstrated in the sociological analysis of this report, socio-economic variables are highly important in determining the migration outcomes of environmental factors. Consequently, actions should aim to develop characteristics which have been found to increase populations' adaptive capacity (such as education and economic diversification), and address those characteristics which, by contrast, increase their vulnerability.

2) The second category of actions aims to promote and facilitate well managed, planned and voluntary migration as a positive adaptation strategy to a changing environment and climate. In other words, legislation and policy, instead of halting environmental migration altogether, should also facilitate a shift from forced to voluntary migration. These actions represent a complex and long-term undertaking, requiring not only time, but considerable political will, the involvement of a wide range of stakeholders, a long-term vision and corresponding resources.

Prior to presenting thematic recommendations, there is an important ethical aspect one should keep in mind when designing actions related to environmental migration. Indeed, it should always be remembered that whether people should move or not, should live here of there, is not for researchers or policymakers to decide. People have their own reasons to reside where they do, even in locations vulnerable to natural or man-made hazards of various origins. Legislation, policies and other actions should thus aim to foster the conditions for people to live in a sustainable manner, with minimum negative impact on the environment, where they want to live. In order words, actions should allow for agency and choice where there is urgency and compulsion.

7.2. THEMATIC RECOMMENDATIONS

Recommendations aiming at the reduction of the negative consequences of environmentally induced migration

Reduce overgrazing and improve pasture management. The research has shown that many environmental problems experienced by rural populations are directly or indirectly related to livestock and pasture management. Indeed, the increasing number of livestock – a phenomenon partly due to remittances from international migration – and the weak implementation of rules related to pasture utilization has lead to overgrazing in many areas. In Kyrgyzstan's southern oblasts, where population density is high and households' livelihood strategy generally highly dependant on livestock, overgrazing leads to increased risks of landslides. Aggravating this danger, houses are often located nearby and below pastures. Respondents during in-depth interviews in Jalal-Abad oblast were well aware that overgrazing was a direct cause of destructive landslides in many areas. However, rules related to pasture utilization are poorly understood and respected. In addition to increasing risks of landslides, overgrazing also has longer-term consequences, as it contributes to processes of land degradation detrimental to agricultural activities. Both these short-term and long-term consequences of overgrazing due to large numbers of livestock are contributing, to varying degree, to environmentally induced migration. Considering the importance of livestock in the economic life of Kyrgyzstan and the negative consequences of overgrazing and poor pasture management, several sets actions should be considered:

a) Educational and informational initiatives should continue to raise awareness about the risks and dangers associated with overgrazing. Furthermore, these initiatives should promote quality over quantity when it comes to livestock.

b) Consultative and communication work with local stakeholders and community members should be carried in order to reinforce rules about pasture utilization.

c) In order to reduce the dependency on livestock for income, alternative livelihood opportunities should be promoted and facilitated (see below).

It is worth noting that several projects have already been implemented to reach these goals, and some are planned or in course of implementation. As livestock production is both an important source income and a contributing factors to several environmental problems, these efforts should be pursued with an increased sensitivity to the migration consequences of poor pasture management, with active involvement of local civil society.

Reducing deforestation and supporting reforestation initiatives. Similarly to overgrazing, illegal logging reduces the vegetation cover near habitation zones, which also contributes to intensify risks of landslides, thereby increasing the vulnerability of many households. Hence, in parallel to sensitization and educational initiatives about livestock and pasture, awareness raising about the preciousness of the forest capital of Kyrgyzstan should be carried out with the aim of reducing illegal logging. Targeting children in schools seems like a promising way to raise awareness among young generations of rural dwellers. Furthermore, the root causes of illegal logging – namely the need for heating in winter and the use and sale of timber for construction purposes – should be taken into consideration in measures and projects. Such interventions should be carried out in priority in communities residing near important forest resources and where population density in high. In parallel, reforestation initiatives should be pursued, such as those being implemented by UNDP across Kyrgyzstan (the so-called "green projects").

Improving water management. An important finding of this research is that most significant migration-impacting environmental problems are, in one way or another, related to water resources. In the national survey as well as in case studies, respondents repeatedly mentioned that their access to safe and sufficient water for consumption and agriculture was a major problem affecting their livelihood, income and overall quality of life. As was demonstrated in chapter 4, these problems are more caused by human factors (namely poor infrastructure and irrational use of water resources) than by an actual decrease in water supplies. Indeed, as demonstrated earlier, the loss of water resources due to poor infrastructure amounts to more than 50 per cent in some oblasts. On top of that, climate change, causing glaciers to melt, is expected to dramatically increase

the “water stress” in Kyrgyzstan in the future, even though the timeline remains a disputed topic among specialists. What is almost certain, however, is that in upcoming decades, the impact of water related problems on people’s livelihood will most likely increase, potentially causing forced migration out of affected areas. Hence, future actions should aim to pursue efforts aiming at a more effective water resources management in Kyrgyzstan.

Water management is a salient and complex issue in Kyrgyzstan, has received considerable attention and is high on the policy agenda. However, despite many efforts and resources devoted to the issue, much remains to be done in order for the country to possess decent water management systems and infrastructures. Indeed, reaching this goal does not only require sufficient resources, but also strong political will and interinstitutional coordination, which are currently not sufficient to effectively tackle the issue. It is hoped that the present demonstration of the migration consequences of poor water management will bring an additional argument to the dire need of pursuing efforts in that direction.

Building local technical and human capacities for environmental monitoring. Information, knowledge and good quality data are decisive to attain an appropriate and sustainable management of ecosystems and natural resources. Hence, local governmental institutions with an environmental mandate – mainly the State Agency for Environmental Protection and Forestry and, to a lesser extent, the Ministry of Emergency Situations – should have the human and technical resources to conduct environmental monitoring on a regular basis. However, expert interviews showed that these resources are very unevenly distributed between the country’s different regions. An illustrative example can be found in Issyk-Kul and Naryn oblasts. The IOM research team, when visiting the facilities of the State Agency for Environmental Protection and Forestry in Cholpon-Ata (Issyk-Kul province), noticed the presence of a state-of-the-art laboratory used to conduct chemical analysis of air and water in the oblast. Corresponding human resources and expertise were also present. By contrast, in Naryn province, the Agency’s resources to do such work were very limited, not to say practically absent. Efforts should thus be devoted to:

a) Assess local institutions’ capacity (at the oblast and district levels) to conduct environmental monitoring in order to identify gaps and needs.

b) Build human and technical capacities of local governmental institutions to conduct environmental monitoring and facilitate the acquisition of equipment to do so.

Enhancing public awareness about natural disasters. Our assessment allowed to conclude that the Ministry of Emergency Situations, despite its relatively limited means, is working quite effectively to inform populations living in dangerous areas (mostly landslide-prone areas) about the risks and dangers they face. However, the ways and channels through which such information is distributed could be enhanced. For instance, the involvement of social workers and psychologists in the dissemination of this information would allow for a more balanced, human approach to informing populations about the dangers they face. Indeed, in-depth interviews demonstrated that mere facts about dangerous natural processes are most of the time not sufficient to encourage people to move. A more comprehensive approach, in which the social and economic aspects of resettlement would be included, would most likely bear better results.

Improving resettlement procedures and laws. State assisted resettlement from dangerous zones is a complex issue. Considering the significant impact of natural disasters (principally landslides) on people’s decision to migrate – or in most cases, to not migrate – this research dedicated two field studies to this issue. As discussed in chapter 5, current resettlement procedures of populations living in dangerous zones have mixed results. Indeed, even though vulnerable households are provided with financial, material and logistical resources for resettlement, many people refuse to move. In other cases, only some members of the household will move, the remaining staying in the dangerous areas. In still other cases, land plots provided for relocation are sold by the beneficiaries themselves, and the profits used for renovations of houses located in dangerous zones. Legislation should thus be amended in order to avoid such misappropriation. Finally, in some cases the entire household will relocate, but eventually return to the previous place of residence. These facts mean that there is room for enhancement of current resettlement procedures, which should be more sensitive to the socio-economic conditions and livelihood opportunities in the proposed new places of residence. Indeed, resettlement should

not be viewed as a mechanical process of moving people from one place to another, but as a comprehensive approach entailing various and complex socio-economic aspects.

Promoting and facilitating alternative livelihoods opportunities. In Kyrgyzstan's rural areas, livelihoods are often dependant on a few agricultural activities such as livestock breeding and monoculture (for instance potatoes). This dependency renders households highly vulnerable to various environmental changes and shocks, as there are few "fall back options" to reduce their negative impacts on livelihoods and income. But this dependency on particular agrarian activities is not a permanent, unchangeable fact. Indeed, in many areas, there is significant potential for the development of alternative livelihood opportunities. Varying sources of income would significantly reduce the impacts of environmental factors on livelihoods, decrease the role of these factors on migration decisions and consequently make more room for choice and agency where previously was compulsion. Initiatives should thus aim to assess, at the regional and district levels, the potentiality for alternative income-generating activities, and to facilitate their development. Vocational education in rural areas should also be promoted and supported in order to develop the necessary skills for the diversification of these regions' economy.

Informational and technical assistance for agriculture-dependant households. The research demonstrated that the problem of insufficient income from agricultural activities in many rural areas – a contributing factor to internal and international labour migration – could be mitigated if agriculture-dependant households were provided with enhanced informational support from competent governmental bodies. For instance, discussions with farmers in Issyk-Kul province showed that they are lacking very basic information about such aspects as crops cycles, seeds and diseases of fruit trees. Information about agricultural market, much needed to plan income generating agricultural activities, were also lacking. Community members even told the researchers that they had to look for themselves on the internet to find such information. Efforts should thus be dedicated to improve the informational and technical assistance for agriculture-dependant households. For instance, a system using mobile devices to disseminate in a timely manner information on agricultural markets could be established, similarly to the system used by the Ministry of Emergency Situations to warn the population about various dangerous processes.

Recommendations aiming at promoting and facilitating migration as a positive adaptation strategy to a changing environment and climate

Pursue research initiatives. The present research represents a first step in furthering our understanding of environment-migration interactions in Kyrgyzstan. However, its short timeframe did not allow to collect longitudinal data about these interactions, which are needed to understand long-term trends related to the impacts of environment and climate on migration and to design appropriate policies. In order to achieve this, research efforts should be pursued and linked to other initiatives through strengthened interinstitutional coordination. For instance, an effective and low-cost way to collect longitudinal data would be to include questions related to environmental migration in national censuses and other surveys.

Sensitivity to vulnerability. This research has confirmed a trend than has been demonstrated in other contexts than Kyrgyzstan's: most often, the most vulnerable groups to environmental migration are not those who actually migrate, but those who cannot move from environmentally dangerous or unfriendly locations because they lack the means to do so (see chapter 5). Hence, legislation and policies should dedicate particular attention to those vulnerable groups and design tailored policies that would provide them with more agency and choice in their migration decisions.

7.3. STAKEHOLDERS' INPUT

In addition to the above recommendations, this section outlines the valuable input of various stakeholders gathered during a round table held in Bishkek in May 2016, in the framework of which the research's results were presented and discussed.

Ministry of Emergency Situations

- Generally, measures to promote well-managed and voluntary migration should be reinforced.
- The concept of "environmental migrant" is new for the Kyrgyz society. Its general understanding by governmental and non-governmental stakeholders should be increased by awareness raising activities, with the ultimate aim of rendering it relevant and policy oriented.
- It is important to understand that no provisions in the actual legislation allows the state to force persons to resettle.
- Cultural aspects (such as attachment to ancestral land) should be taken into account in resettlement procedures and policies.
- Migration should be more thoroughly reflected in national strategies for climate change adaptation. In addition, interinstitutional cooperation should be strengthened in order to develop and implement more effective climate change adaptation strategies, as those are related to many different policy fields. For instance, the State Agency for Environmental Protection and Forestry, the State Migration Service and the Ministry of Emergency Situations should collaborate more closely to understand and manage the current and future dynamics of climate induced migration in Kyrgyzstan. Civil society should also be involved in these efforts.
- Increased technical, human and financial resources should be devoted to environmental monitoring, as appropriate monitoring and prognosis of dangerous natural processes effectively contribute to reduce the vulnerability of the population.

Tian-Shan Policy Center (American University of Central Asia)

- In future research on environmental migration, it is necessary to apply more thoroughly the principle of symmetry, namely to identify and study both areas of origin and destination of environmental migration.
- Considering that a important proportion of the country's water resources are stored in vegetation biomass (plants and trees), reforestation initiatives need to be pursued, as they can effectively contribute to mitigate problems related to water resources.
- Strategic documents related to migration management should benefit from increased political attention prior to their elaboration. They also need to define in a clearer manner the state's vision on migration issues, to determine the stakeholders' responsibilities and to strengthen interinstitutional coordination mechanisms.

Institute for Climate and Green Technologies

- The issue of environmental migration should be properly reflected in relevant policy documents, such as in the Environmental Protection Act.
- It is necessary to define in a clearer manner who should deal with issues of environmental migration and how responsibilities should be distributed.
- Climate change should not be defined only as an environmental problem. It is indeed a cross-cutting issue entailing many different aspects. For instance, the economic aspects of climate change are not given proper attention. Consequently, the issue should be better reflected in development strategies.

- The State Agency for Environmental Protection and Forestry, which is the implementing body of the United Nations Framework Convention on Climate Change in Kyrgyzstan, cannot cope alone with the issue. Additional governmental institutions such as the Ministry of Economy should be involved the Convention's implementation. Cross-sectoral coordination should be reinforced throughout this process.

- The Constitution of the Kyrgyz Republic states that every citizen should have the right to a safe and healthy environment. However, no mention is made of the right to environmental information. Legislation should be amended accordingly, as the right to environmental information constitutes the basis to the right to a safe and healthy environment.

- Legislation related to environmental protection lacks clarity and overall direction. It is necessary to reinforce interinstitutional collaboration and increase the civil sector's involvement in environmental protections efforts.

The National Statistical Committee

- Reliable statistics about internal migration are needed in order to formulate appropriate policies. However, in Kyrgyzstan, such statistics are of poor quality and reliability since they are based on citizens' registration procedures, which are poorly observed. Hence, migration inside territorial units (districts and oblast) and rarely reported and officially recorded. This is mostly due to the fact that citizens have no incentive to communicate their relocation to the state. Such incentives should be established to encourage people to report their relocation. For example, Lithuania recently introduced a fine for people who don't report their relocation to the authorities.

Food and Agriculture Organization

- Efforts should be pursued to improve the management of arable land in grassland areas considering their importance in Kyrgyzstan's population's livelihood strategies.

State Agency for Environment Protection and Forestry

- The State Agency, in coordination with other government structures, need to pursue the development of sectoral programmes on climate change adaptation, to develop measures to reduce the degradation of pastures and to combat drought, as well as study the possibility for crop substitution and enhancement.

Public Fund for Sustainable Development "Yrystan"

- Pastures and livestock breeding is one of the main economic activities in the Kyrgyz Republic. In recent years, the country witnessed a dramatic increase in pasture degradation, leading to serious problems such as increased risks of landslides. Considering this issue, levels of soil degradation need to be assessed on a nationwide basis, with particular attention for vulnerable areas. In addition, resettlement procedures should take into account pasture degradation in order to not recreate these problems in areas dedicated to resettlement.

- It is necessary to carry out educational initiatives to raise the awareness about the need for enhanced pasture management.

Ministry of Agriculture

- The role of local governmental institutions regarding the restoration of degraded land and pasture management should be strengthened. In addition, NGO should be more involved in these processes.

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