GENDER

ENVIRONMENT AND CLIMATE CHANGE

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GENDER, ENVIRONMENT AND CLIMATE CHANGE

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Nowadays climate change is no longer perceived as an environmental problem; it has become a global problem of development and it is important to understand how its effect will vary on women and men. Risks associated with climate change threaten to increase gender inequality and may even undermine the current progress made in achieving gender equality in many developing countries.

The current study, "Gender, Environment and Climate Change" reveals aspects of the dynamics of gender relations in the Kyrgyz Republic in a changing environment, the social aspects of climate change processes in Kyrgyzstan, with the emphasis on the situation of rural women and female headed households, and provides policy recommendations in the area of gender management and climate risks.

The study was conducted by "BIOM" Ecological Movement with the support of UNDP and the UN Women Office in Kyrgyzstan.

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Foreword

In 1992 during the Earth Summit in Rio de Janeiro (Brazil), women were named the "core group" in the field of sustainable development and environmental policy. Sustainable development has always been relevant in Kyrgyzstan, and became the main development agenda in 2013. A year earlier, in 2012, several development partners supported the initiative of the Government of the Kyrgyz Republic to shape a comprehensive development program, taking into account aspects of climate change. In the same year of 2012, the UN Development Programme (UNDP) in collaboration with the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), decided to conduct research on gender aspects of climate change. This step was strategically important for both organizations, as sustainable development, and issues of gender policy implementation in Kyrgyzstan are major agendas of UNDP and UN Women, especially in the context of the ongoing democratic reforms.

Gender aspects in the context of climate change are issues of justice, security and human rights. There is good evidence that women are more vulnerable to climate change than men: in poor areas women are often the poorest. In addition, some studies show that the mortality rate of women, as a result of natural disasters, is often much higher than that of men.

In 2012, there was another significant global event - the second Earth Summit in Rio de Janeiro, where Kyrgyzstan presented the first findings of the study "Gender, Environment and Climate Change", carried out by the experts of the "BIOM" Ecological Movement. The presentation aroused great interest, and presented findings confirmed that much like in the rest of world, women in Kyrgyzstan are key actors in achieving sustainable development and eradication of poverty, and gender equality issues should become a priority in the discussion of climate change and sustainable development programmes. In the process of drafting climate change policy, it is important to remain committed to gender mainstreaming, it is also necessary to adapt the mechanisms of implementation in such a way that they contribute to the reduction of gender inequality, or at least not contribute to its intensification. As the main managers of natural and environmental resources, women have the experience and knowledge to establish sustainability of their communities in regards to the growing natural threats, including climate change. Without the full participation and contribution of women in the decision-making process, real resilience of communities to climate change and disasters cannot be achieved. Therefore, in order to ensure a successful and sustainable adaptation, it is necessary to focus on gender issues, and specifically on the role of women.

This joint publication "Gender, Environment and Climate Change" is a significantly important foundation for the development of adaptation measures with a gender component at the level of country strategies, and at the level of local communities in Kyrgyzstan.

We are certain that current publication, its analysis, evaluation of gender dynamics in Kyrgyzstan, and recommendations of the improvement of the quality of life of men and women in adverse climate change, will be actively utilized for the development and implementation of policies related to sustainable development and gender equality.

A. Avanesov
UN Permanent Coordinator
UNDP Permanent Representative in the Kyrgyz Republic

S.Machl
UN Women Representative in the Kyrgyz Republic

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List of Abbreviations

WUA	Water User Association
CDIA	Community Development and Investment Agency
RES	Renewable Energy Sources
WHO	World Health Organization
SAEPF	State Agency for Environmental Protection and Forestry of the Kyrgyz Republic
HPP	Hydro Power Plant
GEF	Global Environment Facility
HC	Hexachloran, pesticide has expressed insecticidal properties
DDT	DDT (dichloro-diphenyl-trichloroethane) - chemical for liquidating insects (insecticide).
DDWSS	Development Department of Water Supply and Sanitation
Kyrgyz Hydro Met	Hydro-meteorological Agency under the Ministry of Emergency Situations of the KR
KR	The Kyrgyz Republic
MES	Ministry of Emergency Situations
NGO	Non-Governmental Organization
SPA	Scientific and Production Association Used for "Preventive Medicine"
AII	Acute intestinal infections
UN Women	UN Women is the United Nations Entity for Gender Equality and the Empowerment of Women
ARVI	Acute respiratory viral infections
CDWUU	Community Drinking Water Users Union
MM	Mass Media
UNDP	United Nations Development Programme
GKR	The Government of the Kyrgyz Republic
UNFCCC	United Nations Framework Convention on Climate Change
UNFAO	UN Food and Agriculture Organization
MOS	Medical and Obstetrical Stations
ES	Emergency Situation
CO2	Carbon Dioxide
GIZ	German Society for International Cooperation
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WECF	International Network: Women in Europe for a Common Future

INTRODUCTION

Climate change imposes serious problems in many regions of the world today, including in Central Asia. Climate change not only threatens people's lives, but also deprives them of means of sustenance; it deepens the gap between the rich and the poor and reinforces inequality between women and men. Women, especially those living in poor countries, are affected by climate change in a different way than men. Due to gender roles and inequality, climate change has a disproportionately negative impact on women, depriving them of means of sustenance, increasing workload, and reinforcing gender discrimination and the feminization of poverty. Women lead the household and are providing care to the family members; this often limits their mobility and participation in social work, and increases their vulnerability to unexpected natural disasters. Drought and erratic rainfall force women to work even more, in order to provide food, water and energy for their families.

Adaptation to a changing climate has a long tradition in Kyrgyzstan. Nomadism has long been a way of utilizing the nuances of the local climate throughout the seasons of the year. A nomad follows the trajectory in the country of his residence coinciding with relatively favorable climate characteristics, avoiding extreme conditions of hot and dry summer in the foothills and severe winter cold in the highlands[1]

A constant adaptation to various climates took place alongside with the improvement of gender interaction and cooperation. The division of functions and duties was combined with a mechanism of changeover. Pioneer researchers of the nomadic people noted that tense gender antagonisms were absent. According to a Kyrgyz scholar, professor Shukurov: "The essence of gender equality lies not in undistinguished specifics of gender groups, but rather in their full potential for cooperation in the process of achieving common goals. This primarily relates to the decision making process and joint activities. In the nomadic lifestyle, gender relations are part of rational organization of the society, which is capable to adapt to extreme conditions of the environment in the most suitable manner. This model is also applicable to non-nomadic lifestyles, as it is efficient not only within the framework of interaction with the environment, but also within other areas of life activities."[2]

The importance of integrating a gender approach into the analysis and adoption of decisions regarding climate change is in the fact that women and men are differently affected by consequences of climate change. Their reaction to various impulses of climate change is different, as well as their response; men and women make different decisions and differently perceive the consequences of climate change. This difference was highlighted in the First National Communication of the Kyrgyz Republic (KR) under the UN Framework Convention on Climate Change. Research in pathologies of embryo development showed that with the effects of temperature changes, the embryo development significantly slows down; moreover, the most severe damages are observed during formation of major organs and systems of the embryo. Even a short-term influence of high temperatures during the critical periods of pregnancy negatively affects the fetus. These findings have been supported by research studies conducted in the territory of Bishkek[3], which demonstrate that this impact is primarily related to the decrease of fractional oxygen pressure during hot seasons, which may result in fetal hypoxia.

> Presentation of the issue regarding a link between climate and gender inequality is relatively new for Kyrgyzstan; however as is seen from the experience of a number of other countries, the first people who start suffering from the consequences of climate change are marginal groups with no access to the decision-making process, information and resources, these groups include: women, children, and disabled persons. Unfortunately, gender dimension (as human dimension) is not represented in the state priorities on climate change, despite all our efforts. The major problem is lack of people in the country's discourse on ecological issues: there are glaciers, forests, biological diversity, and etc. and no people – this is a systematic problem. Protection of nature is often represented in the form of technocratic models with no consideration of various impacts on people.
>
> Absence of statistical data and studies in this area is also one of the serious problems, as climate change has a multi—dimensional impact on men and women. What actions should be taken, not only by the State Agency for Environment Protection and Forestry, but also by other actors, such as the Ministry of Health, the Ministry of Education, and mass media? There are many actors, but no one in our country is responsible for human dimension within the context of climate change.
>
> *Nurgul Asylbekova, UNDP Gender Coordinator*

According to the research findings, perinatal mortality is at the highest levels, both among full-term, and pre-term children conceived during the period of July-August.[4]

The differences are based on the fact that men and women play different gender roles and bear different responsibilities in the ma-

[1] Shukurov E.D., Gender Aspects of Climate Change, First Central-Asian Virtual Discussion, Gender Aspects of Sustainable Development and Environment Protection in Central Asia, Informational & Analytical Report, Bishkek, 2006, p. 53-59 http://www.gender.cawater-info.net/publications/pdf/gender_last.pdf

[2] Ibid., p. 56.

[3] First National Communication of the Kyrgyz Republic on the UN Framework Convention on Climate Change (Sharshenov AK Tuhvatshin PP, 2003)

[4] First National Communication of the Kyrgyz Republic under UN Framework Convention on Climate Change, Bishkek, 2003, p. 58-59, available at: http://climatechange.kg/files/55_67_adaptation_FNC.pdf

jority of societies, as well as different access to resources and decision-making process. This may be demonstrated by gender-differentiated statistical data. With this in mind, the current statistics and studies do not reveal gender aspects in all areas, and do highlight women as a vulnerable group subjected to climate change consequences. In the process of policy development, women should be taken into account not only as policy targets, but also as important agents of development and implementation of policy.

Both women and men are important actors in in the process of development and implementation of climate change policies. Women are generally more sensitive to the risks and changes of living conditions, whereas men tend to believe in technical solutions[5]. Targeted policy of climate change prevention and mitigation of consequences allows avoiding condemnation of certain groups and encouragement of others. This also relates to the process of development of a higher number of ideas. Disregarding any given social group leads to scarcity of visions, scarcity of ideas, and potential solutions, without which, development of a strong climate policy is impossible.

Manila Declaration for Global Action on Gender, Climate Change and Disaster Risk Reduction, signed by 250 participants of the Third International Congress of Women in Politics, emphasized the lack of gender perspectives in global agreements on climate change. Along with other sectors, 12 key declarations define equal participation of women and men in climate change and in the DRR decision-making process at the community level, at the national, regional and international levels; and that governments and international organizations should strive to include gender aspects in budgeting, in order to ensure sufficient financing of capacity development of women, especially among the poor and socially vulnerable groups, in order to strengthen their resilience to climate change and natural disasters.

The Beijing agenda for global action on gender-sensitive disaster risk reduction (2009), which should be achieved by 2015, provides governments and international organizations with action guidance to ensure a gender-sensitive resilience to disasters at the local and national levels. The program calls for political commitment to gender mainstreaming in disaster risk reduction and calls on governments to implement a gender-sensitive vulnerability assessment, risk and capacity assessment and monitoring activities.

Consideration of gender dimension in the issues of climate change is of critical importance for prevention of inequality in creation and mplementation of climate policy. Key elements of the current analysis are gender dimension of labor, access to various types of resources, participation in the processes of planning and decision-making.

The proposed study "Gender, Environment and Climate Change" was carried out with the purpose of analyzing the dynamics of gender relations in the Kyrgyz Republic (workload distribution, power, access to resources) in the changing environment, and providing recommendations to improve the quality of life of women and men with the need to adapt to the conditions of adverse climate change.

The main objectives of the study were:

- To identify the level of awareness among people and state leaders on climate change and risks associated with it;
- To identify practices of equality and gender inequality, gender regimes in the community and in families (women's participation in decision-making on water, land, and pasture management; in energy and agriculture issues; in time-management);
- To identify the level of access for women and men to clean water and irrigation, sanitation and health;
- To identify the level of access to natural resources, pastures, fields, etc.;
- To identify the level of awareness and the level of access of women and men to information on sanitation, renewable energy, agricultural and other environmentally friendly technologies and equipment.

The study utilized trend analysis of statistical data, estimates, reports, analytical research on gender relations in the Kyrgyz Republic, summarizing forecasting trends of climate change in Kyrgyzstan.

The current study carried out a gender analysis[6] of the following set of questions:

- Identification of different roles and behaviors of men and women in the process of climate change and its effects;
- Identification of various influences of climate change impact on men and women;
- Identification of various possibilities in prevention of climate change impacts and in adaptation to these impacts.

The current analysis is also based on the concept of "risk society" (developed in the framework of the European eco-sociological studies of Z. Bauman, Ulrich Beck and others).

In order to clarify and verify the statistical findings, a social analysis of pilot villages was conducted within the framework of the study. The main objectives of the social dimension were[7]: (I) identification of various roles and behaviors of men and women in the process of climate change and its effects; (II) defining various influences of climate change effects on men and women; (III) defining various possibilities in the prevention of the effects of climate change and adaptation to it.

"Gender and climate are similar in nature. Gender inequality is a complex problem that cannot be solved in one narrow specific sector; it requires changes in general policy and tools, as well as the involvement of all stakeholders and organizations at various levels. On the one hand, climate is a global problem; on the other hand, everyone faces it individually.

The root cause of gender and climate problems is backward state policy: commodification of natural resources, support for the existing order of society, which reproduces gender inequality and the non-inclusion of these problems in the priorities of the state."

Zulfiya Kochorbaeva, co-coordinator of the Alliance of Women's Legislative Initiatives, Director of NGO "Agency of Social Technologies"

[5] Gender aspects of integrated water resources management. Report on the study of representative households in the republic of Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, Tashkent, 2005.

[6] The concept of gender analysis. Gender relations permeate all spheres of life, which leads to the possibility of gender analysis in all enrichment programs, economics, politics and governance. One of the important focuses of gender analysis is to examine the involvement of the most vulnerable and poorly protected categories of people in the process of problem analysis, decision making, control over resources, enhancing their value and belief in themselves as active in the community.
Gender analysis - the process of assessing various impacts on women and men, existing or proposed programs, legislation, public policy course in all spheres of society and the state. Gender analysis, including the compendium of qualitative information and understanding of gender trends in the economy and society, the use of this knowledge to identify potential problems and to find proper solutions in the daily work. At the same time this is a tool for understanding social processes. It allows us to see and compare: how and why the political, economic, social and other factors affect women and men. (Shvedova N.A. Simply about the complex: gender education (Manual): Essays on political theory and history).

[7] The study was conducted in December of 2012, in 3 villages of the Kyrgyz Republic.

CHAPTER 1. ANALYSIS OF THE DYNAMICS OF GENDER RELATIONS IN THE PROCESS OF CLIMATE CHANGE

1.1. Climate change: core trends in Kyrgyzstan

Global climate change is one of several unprecedented, large-scale environmental changes that are occurring globally. The Kyrgyz Republic recognizes the high importance of this issue and joined the UN Framework Convention on Climate Change[8], ratified the Kyoto Protocol[9] as well as joined the "Annex B" of the Kyoto Protocol.

Targeted efforts are being undertaken in the implementation of the commitments made by the country under these international documents. The first National Communication on Climate Change in the Kyrgyz Republic was prepared in 2004, as a reaction to commitment to the UN Convention on Climate Change. Technological requirements of the country for reduction of greenhouse gas emissions in the sectors of energy, forestry, waste and construction were identified; and barriers to the successful introduction of new technologies were researched.

The second National Communication of the Kyrgyz Republic in response to the commitment to the UNFCCC was prepared between 2005 and 2008. The following actions were taken: inventory of greenhouse gas emissions for the period of 2000-2004; assessment of the potential impact of climate change on the regions; analysis of potential actions for reduction of greenhouse gas emissions in the country, and climate change adaptation measures.

SAEPF, together with experts of ministries and agencies is working on the development of National Action Plan on the country's adaptation to the conditions of a changing climate with support of UNDP. Alongside with this, sectorial programs, aimed at mitigation and adaptation to climate change, are in the progress of development. Specifically, with the support of the BMU project (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) "Protecting Health From Climate Change", in cooperation with the European Regional Office of WHO, a strategy to adapt the healthcare sector of the Kyrgyz Republic to climate change has been developed.

[8] Act on Accession of the Kyrgyz Republic to the UN Framework Convention on Climate Change, of 14 January 2000, № 11

[9] Law of the KR "On Ratification of Kyoto Protocol: 15 January 2003, № 9

Among the international development agents today, there are two main approaches to the implementation of programs in the field of climate change - adaptation and mitigation. Many international organizations are working based on both approaches.

The adaptive approach is focused on the implementation of initiatives aimed at lowering the effects of climate change on society and nature. GEF, UNDP (UNDP GEF initiative on adaptation (CBA program), WHO, UNICEF, Act Central Asia, the Government of Japan (JIKA), Switzerland, the AusAID program, FAO, the European Commission, WECF, GIZ, GERES and others are implementing their initiatives under this approach.

The mitigation approach is focused on the implementation of initiatives aimed at preventing and eliminating the causes of climate change (deforestation, degradation of natural ecosystems, CO2emissions and other gases that cause the greenhouse effect). Under this approach, a number of initiatives have been implemented in the country by the Norwegian Society for the Conservation of Nature, the "Friends of the Earth" NGO with financial support of the Norwegian Ministry of Foreign Affairs and local partners, Act Central Asia, FAO, GIZ and others.

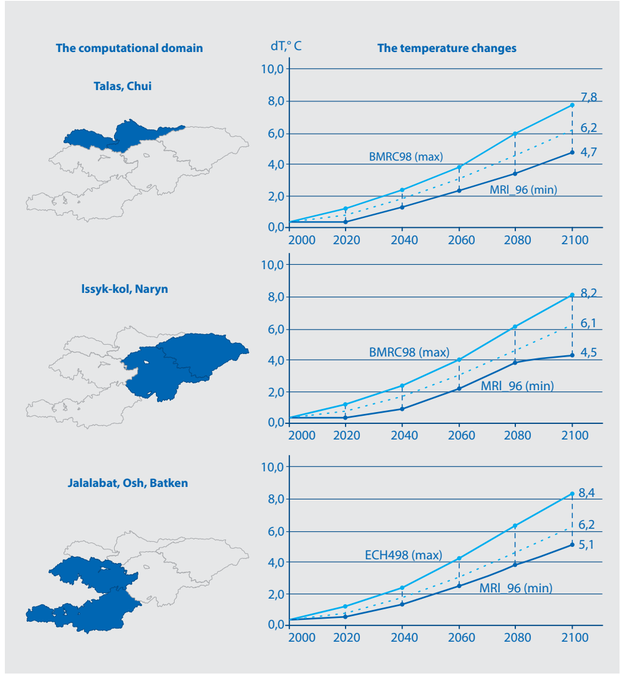
According to the Second National Communication on Climate Change, with small changes in the amounts of precipitation, there is projected substantial increase of air temperature in Kyrgyzstan (average for the summer and average annual). The results of glacier modelling (glaciers are the main sources of drinking and irrigation water in the country) indicate their significant reduction, based on the probability for all considered variants of climate scenarios. For the country as a whole, the volume of glaciers is projected to decrease by 64% to 95% between the years of 2000 and 2100, depending on the adopted option of climate scenarios.

Significant changes in surface water flows for the most probable climate scenarios are expected. It is predicted that the increase of surface water will take place in the period up to 2020-2025, as a result of increase of glacier components. After that, a decrease of the water flows is expected at about 42.4 – 20.4 km,[3] which equals to 43.6 – 88.4% of runoff volume in 2050. Eighty five percent of the country's territory is in the conditions of positive water balance (along the river flows). The remaining fifteen percent is in the conditions of negative balance, where water is lost during irrigation, underground leakage and vaporization. This is observed in Chui valley, peripheral areas of the Ferghana valley, plains surrounding lakes and foothills, as well as in the overflow lands of other valleys[10].

- The international community carries out joint activity through implmentation of provisions of the UN Framework Convention on Climate Change and the Kyoto Protocol.
- The Kyrgyz Republic is aware of the special importance of environmental protection and rational use of natural resources and takes all necessary measures for implementation of provisions of the Framework Convention and the Kyoto Protocol.
- The First National Communication of Kyrgyzstan (2003) to the parties of the UN Framework Convention on Climate Change has become the first step of our country in fulfilling its obligations in this area (http://climatechange.kg).
- The Second National Communication of the Kyrgyz Republic under the UN Framework Convention on Climate Change (2008) demonstrated that the Kyrgyz Republic intends in close coordination and cooperation with the world community to further work and expand its activities aimed at solution of the climate change issues (http://unfccc.int/resource/docs/natc/kyrnc2r.pdf)
- Both the first and Second National Communications have been developed under the project of the State Agency for Environment Protection and Forestry (SAEPF), with the support of GEF/UNDP.

[10] Review of efficiency of ecological activity. Kygryzstan, UN, NYC and Geneva, 2009 http://www.nature.kg/images/files/Kyrgyzstan%20II%20ru.pdf

Today's temperature change in comparison with 1961-1990. Emissions scenario A2-ASF[11]



[11] Second National Communication on Climate Change, Bishkek 2009

This indicates the likely significant risks for the population due to drought. During the period of 1965-1990, compared to the previous period form 1930-1964, the frequency of droughts of various degrees has increased by twice.

According to SAEPF KR, climate change impact on the condition of glaciers raises significant concerns. There are 8,208 glaciers in the country. To this day, the area of glaciations has decreased by 20%. According to estimates, there is a real threat that by 2100 there will be no glaciers in the country, which may have drastic effects on agricultural productivity and energy security of the country[12].

Due to the temporary increase in volume of precipitations, the role of underground water will significantly increase. On the one hand, it is a positive factor as it contributes to a smooth flow of rivers. On the other hand, an increase of water content of rocks will result in activation of exogenousx[13] geological processes, such as land and mud slides, land falls, avalanches, floods, etc[14].

[12] Second National Communication on Climate Change, Bishkek, 2009. Visualization of: Climate change and health. Manual for health workers. - Bishkek: BIOM, the Ministry of Health, 2013. p. 32.

[13] Exogenous geological processes due to the external world with respect to energy sources (mainly sunlight) in combination with gravity. Yakushova AF, Dynamic Geology, Moscow, 1970 GP Gorshkov, Yakushova AF, General Geology, Moscow, 3rd ed., 1973, General Geology, Moscow, 1974.

[14] Exogenous geological processes due to the external world with respect to energy sources (mainly sunlight) in combination with gravity. Yakushova AF, Dynamic Geology, Moscow, 1970 GP Gorshkov, Yakushova AF, General Geology, Moscow, 3rd ed., 1973, General Geology, Moscow, 1974.

Dynamic Indicators Related to Climate Change in Kyrgyzstan[15]

Dynamic Indicators Related to Climate Change (As predicted for the year 2100)	Provinces of the Kyrgyz Republic: Chui (Talas)	Issyk-Kol (Naryn)	Jalalabat (Osh, Batken)
Climatic Scenario			
Average (model) changes in annual precipitation sum	↔↗	↔↗	↔↙
Average temperature	↗↗	↗↗	↗↗
Glaciation area	↙↓	↙↓	↙↓
Macroeconomic Scenario			
Fuel and energy resource consumption	↗	↗	↗
GDP	↗	↗	↗
Demographic Scenario			
Population	↗	↗	↗
Vulnerability assessment			
Water resources: glacier area	↙↓	↙↓	↙↓
River discharge	↗↙ (before 2050) and (after 2050)	↗↙ (before 2050) and (after 2050)	↗↙ (before 2050) and (after 2050)
Agriculture: aridization	↗	↗	↗
Grain yield	↙	↔	↔
Vegetable and melon yields	↗	↗↗	↙
Grape and fruit yields	↙	↙	↙
Population health: infectious diseases	↗	↗	↗
Diseases of blood circulatory system	↗	↗	↗
Mortality linked to diseases caused by climate change	↗	↗	↗
Intensification of emergency situations (mudslides and mudflows)	↙	↙	↗
Increase of avalanche danger on the roads	↗	↗	↔

↗ - Insignificant increase; ↙ - Significant increase; ↔↗ - Insignificant decrease; ↔↙ - Decrease; ↙↓ - Significant decrease; ↗↗ - Increase; ↔ - Without any changes

[15] Second National Communication on Climate Change, Bishkek, 2009. Climate change and health. - Bishkek, 2013.

Consequences of such a significant forecasted effect of climate changes will surely influence the living conditions and economic activity of the population and will have consequences of various degrees for different social groups, men and women.

Climate-related problems that the local communities face, such as cold and severe winters, late frost, are currently observed. Wind may become more active and access to water resources may decrease.

Adaptation practices proposed by specialists for local communities concerning heat and energy saving and efficiency are asymmetric in terms of gender, in particular, with respect to the distribution of workload and access to resources. The measures below often require male labor, yet they do not relieve women's workload:

- Use of renewable energy sources by local communities for heat, power and hot water supply;
- Heat insulation of houses by using locally accessible organic insulating materials and adapted technologies;
- Use of sunlight greenhouses;
- Energy efficient construction;
- Construction of energy efficient heating stoves, and etc.

These measures are often expensive a burden for the family budget. Moreover, a decision to spend money for implementing such measures will typically be taken by men; consequently such measures are often not implemented.

It should be noted that gender equality issues are not included in the climate policy of the state at the moment; the country pays insufficient attention to this issue at the level of various actors of climate policy, from local self-government authorities to the authorities of the highest ranks, international development agencies and business structures. No research studies have been conducted, and no indicators of climate change impact on men and women have been developed (on changes in social roles, gender relations, etc.).

According to the forecasts, the most vulnerable sectors in Kyrgyzstan are the following:

1. Water resources (melting of glaciers, lake shallowing, increase of surface water flows volume);
2. Health (increase of morbidity and mortality rate due to diseases caused by climate change);
3. Agriculture (decrease of yielding capacity of various types of agricultural crops and pastures);
4. Climate emergencies (increase of mudflows, landslides, lakes outbursts and avalanches).

With this in mind, there is an urgent need for development and implementation of the national plan on gender-sensitive adaptation to climate change.

1.2. Access to clean drinking water

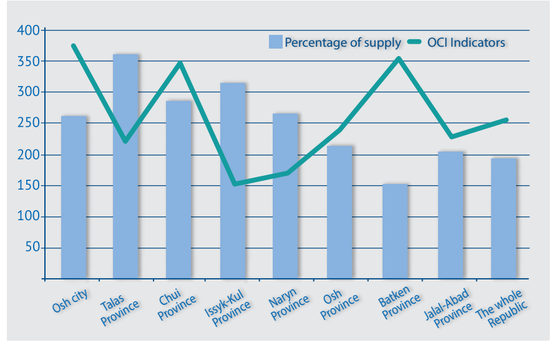
Nearly one billion people on the planet live without access to clean water; over 2 billion people live in the absence of basic sanitary conditions[16]. Water resources deficit is aggravated by climate change, chemical production emissions, and biological pollution. Considering the importance of future generations' health protection, and health of women who are more vulnerable to toxic chemical substances during pregnancy, there is a need to ensure access to clean water for women and their families.

Gender specific challenges may include risks related to the quality of drinking water and health. According to statistical data, the highest mortality rates due to parasitic and other infectious diseases are registered among men. This can be primarily explained by the fact that men follow the stereotypic perceptions, such as: "men do not take care of their health, as it is an indicator of weakness". Thus, men often turn for medical help when it is too late[17].

The correlation between indicators of access to clean drinking water and child mortality rate is also observed. The highest level of infant mortality (the number of children who died at the age of up to 1 year per 10,000 born) caused by infectious and parasitic diseases is observed in Batken Province (43.4 in 2006; 40.2 in 2007; 33.3 in 2008; 20.8 in 2009; 21.6 in 2010) and Osh Province (23.9 in 2006; 36.32 in 2007; 27.2 in 2008; 21.7 in 2009; 15.4 in 2010). Those provinces that have less access to safe drinking water. For instance, in Bishkek the mortality and infant mortality rates are much lower (6.7 in 2006; 6.9 in 2007; 1.7 in 2008; 4.1 in 2009; 1.4 in 2010)[18].

The average national rate of overall incidence of intestinal infections[19] is fixed at a consistently high level, in some years reaching levels from 332.4 (2001) to 612.3 (2012). The highest incidence was registered in Batken 4724 (1061.6) and Jalalabad, 6724 (643.2) provinces, surpassing the national rates by 1.7 times. High incidence of acute intestinal infections in Batken region is associated with the low quality of drinking water[20].

Correlation of morbidity and OCI of the regions with centralized water supply [21]



[16] Women's Major Group, Rio+20, November 2011. http://www.uncsd2012.org/rio20/index.php?page=view&nr=574&type=230&menu=38

[17] Survey of potential impact of small and mini HPS on social and gender development of local communities of the Kyrgyz Republic living in planned places of installation thereof, GEF, UNDP, Bishkek, 2010.

[18] Annual Demographic Bulletin of the KR, 2006-2010, available at: www.stat.kg

[19] The number of cases of infectious and parasitic diseases by 33 nosological forms http://www.dgsen.kg

[20] State report on the sanitary-epidemiological welfare of the population of the Kyrgyz Republic. - Bishkek, 2010.

[21] Source: The Department of Sanitary and Epidemiological Surveillance under the Ministry of Health of the Kyrgyz Republic.

The Beijing Platform for Action (adopted in 1995) highlights the environmental problems in the Critical Area of Concern K "Women and the Environment", where strategic objectives have been formulated as follows:

K.1. Involve women actively in environmental decision-making at all levels;

K.2. Integrate gender concerns and perspectives in policies and programmes for sustainable development;

K.3. Strengthen or establish mechanisms at the national, regional and international levels to assess the impact of development and environmental policies on women.

Drinking water of poor quality is the major reason for infant mortality, the rate of which will be increasing in case the water quality worsens and timely measures are not taken.

Pursuant to the UN Resolution "Human Right to Water and Sanitation" of 28.07.2010, access to clean water is deemed to be a basic human right and a common good. Therefore, distribution and administration of water must be subject to public control. Women must be included in the decision-making process and management of water resources.

Gender-sensitive water resources management has been recognized in many bilateral and multilateral documents at various levels, such as the International Conference on Population and Development (Cairo, 1994), the Fourth World Conference on Women (Beijing, 1995), UN Millennium Summit (New-York, 2000), World Summit on Sustainable Development (Rio 92, Johannesburg, 2002). Principle 20 of the Rio Declaration states that: "Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development."

At the same time, general awareness of gender issues in this area is virtually absent; there is no quality data and research studies on consideration of gender issues in water resources management, and finally there are only a few specialists with practical skills of application of general gender basics in water resources management.

The Kyrgyz Republic is an active member of international action. It has declared its commitments to these principles at the level of international processes. At the same time, the current policy in the area of access of citizens to safe drinking water is not gender-sensitive, thus it leads to gender imbalance, lack of equal access of women and men to water, etc.

Systematic problems, endemic for the entire population of the country, may include sustainable tendency toward water supply and sewage degradation. Many of the 1,091[22] centralized water supply systems (water pipelines) operate inefficiently. About 90% of water supply systems use water from the underground sources, including springs, and about 10% use water from the surface sources. Many citizens do not have access to the centralized water supply whatsoever (they have neither tap water at home nor a water pump near their houses). About 70% of water networks, built back in the 1970s, are in bad conditions and in need of repair. There are known factors that adversely affect the quality of drinking water. This, above all, concerns physical deterioration of water supply systems, natural nuances, and anthropogenic sources of the industrial pollution, and lack of modern water treatment technologies. The extremely weak development of sanitation is a significant risk.

In many cases, protected sanitary areas of water reservoirs have no fences; the livestock is grazing near the reservoirs and drinks water from it. In rare cases, the distributed water goes through a process of filtration. About 48% of water supply facilities are not equipped with disinfecting devices[23].

[22] Setting targets in the context of the Protocol on Water and Health in the Kyrgyz Republic, Bishkek, 2012.

[23] National dialogue on industry policy of funding urban and rural water supply and disposal in the Kyrgyz Republic, Final report, 2009, at 36-37.

1.3. Access to adequate sanitation

According to the joint study of WHO and UNICEF, 75% of urban and 51% of the rural population of Kyrgyzstan have access to adequate sanitation facilities. The extremely weak development of a sewage system is a significant risk. Only 6-17% of housing stock in the Republic has a system of disposal and treatment of sewage.

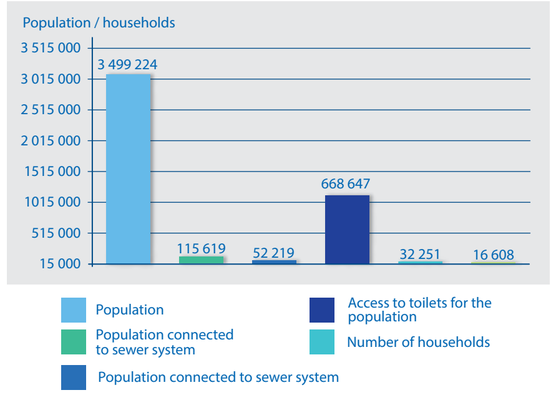
51% of the urban population, and only 3% of the rural population use flushing toilets; according to the household survey of 2012[24], 97% of rural dwellers use outhouses.

Sewage and sanitation components were not part of the strategic documents for the development of drinking water supply. Such flawed policy has led to the current trend in a declining share of population with access to sanitation: from 32.8% in 2000, to 25.4% in 2011.

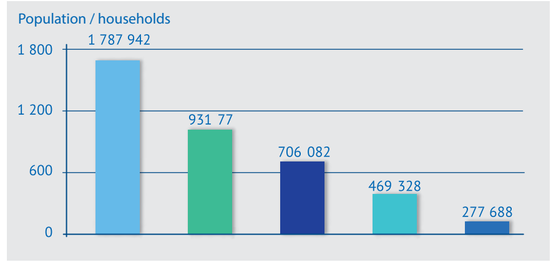
Domestic waste water is treated at 20 wastewater treatment plants with the capacity of 719,800 m3/ per day. Centralized sewage systems with treatment facilities are provided only to 28.4 % of the population. More than half of small towns and regional centers of the country do not have centralized sewage systems and sewage treatment plants. The accumulated household and industrial sewage, which makes-up more than 27% of the total wastewater, is annually collected in cesspools and dumped in catchment areas (low terrain, drainage networks, dry lands and riverbeds, etc.) or directly discharged into the water bodies. This practice causes contamination of the soil and water of trans-boundary rivers, it damages flora and fauna, and poses a threat of bacterial contamination of the population.

[24] Strategy for development of drinking water supply and sanitation settlements of the Kyrgyz Republic, in March 2013.

Data on population's access to sanitary systems



Data on access to sanitary systems



> In the coming twenty years the country's capacity to adapt to climate change will be determined largely by socio-economic factors and legacy issues - namely the dismal environmental situation and the poor state of infrastructure, rather than climate change itself. Water scarcity will be determined primarily by non-climatic factors such as inefficient water use and continuing unsustainable water use.
>
> *Koshoev M., Ph.D., former National Coordinator of the GEF / SGP in Kyrgyzstan*

Out of the existing 350 wastewater treatment facilities in the Republic, over 40% do not provide regulatory wastewater treatment, 178 of them do not perform water disinfection. After pre-treatment, the industrial wastewater is sent to treatment facilities along with the household sewage. Some enterprises have independent treatment plants and sewage systems.

Of particular concern is the poor state of sewage treatment plants in the cities of Karakol, Balykchy, Cholpon-Ata, and villages of Jergalan, Kaji-Say, and Aksuu - located at the shore of Lake Issyk-Kul. The problem of construction of a sewage pumping station in Jalalabad, and local treatment facilities in Mailuu Suu remain unresolved, which causes a constant pollution of Changetsay and Maili-Suu rivers. Wastewater in Naryn only goes through mechanical treatment and is then discharged into the river of the same name (Naryn). Sewage treatment plants in Minkush and Dostuk villages of Naryn province are essentially not functioning. Treatment plants in the city of Kara-Suu have not been functioning since the year 1990.

For people living in the countryside, one of the main problems is the need to draw water from sources located far away from their place of residence. Due to the destruction of infrastructure caused by natural disasters, the amount of people lacking access to drinking water in their own households will increase, forcing them to spend more time on the water delivery.

According to "Kyrgyzgydromet" (KR Hydro Meteorological Center), the basins of the Chu and Syr-Darya rivers are most susceptible to contamination. In the rivers Chu, Alamedin, Chon-Kemin, Issyk-Ata, Kechi-Kemin, Naryn, Akbura, Kara Darya, Tar, Iasi, and Kurshab, an increase of nitrogen content, ammonium and nitrite compounds of copper, zinc, petroleum and petroleum products, organic substances, as well as residuals of DDT and HCH pesticides is systematically observed. High concentrations of copper, zinc, petroleum, and nitrite nitrogen were observed in the rivers Tup, Jergalan, Jeti-Oguz, Cholpon-Ata, Aksu and others[25].

Thus, risks associated with the use of poor quality water are increasing, as these risks are directly linked with the aging infrastructure and the effects of climate change. Under the scenario of the Second National Communication, between the years of 2020 and 2025 a drastic increase in water flow is expected, which can cause mudflows, floods, etc., which may cause destruction of infrastructure (water supply, water intakes, sewage) and water pollution. Water pollution can be a result of the erosion and destruction of hazardous waste storage facilities, cemeteries, and animal burial grounds. With the given inefficient treatment facilities, these dangers will be difficult to control.

In Kyrgyzstan, 66% of the population lives in rural areas and is directly dependent on the quality of land and water resources. In 2012, ARIS conducted a study on the sources of drinking water for the residents of 1,889 villages. In the course of this study, data on water and sanitation were collected in each village, including the information

[25] State report on the sanitary-epidemiological welfare of the population of the Kyrgyz Republic. - Bishkek, 2010, p.34

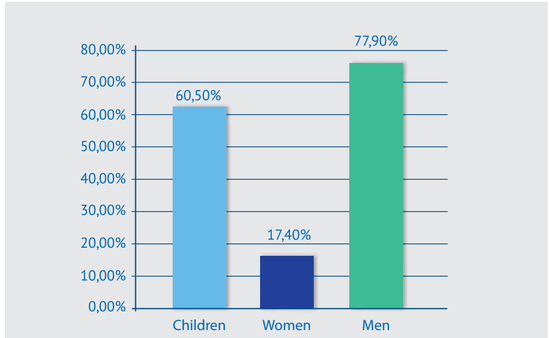
on centralized water supply systems, the sources of water supply, frequency, the availability of social facilities and their water supply, and CDWUU and so on. To date, 59.9% of the rural population receives water from water supply systems (38% via the outdoor standpipes, and 22% via the intra-house systems). The remainder (40%) finds water in ditches, rivers, canals, springs, and uses delivered water.

For example, according to a survey of rural households in 2007[26], the vast majority of Naryn residents do not have running water in their lots; they provide themselves with drinking water from the street water pump (91.7%), and 0.9% use water from ditches and canals. The graph above shows that most water delivery to the house is performed by men (77.9 %) and adult children - 60.5%. Fetching water takes from 30 minutes to 1.5 hours daily. With the destruction of infrastructure, due to natural disasters, the percentage of people without access to drinking water in the territory of their own households will increase and they will be forced to spend more time fetching water.

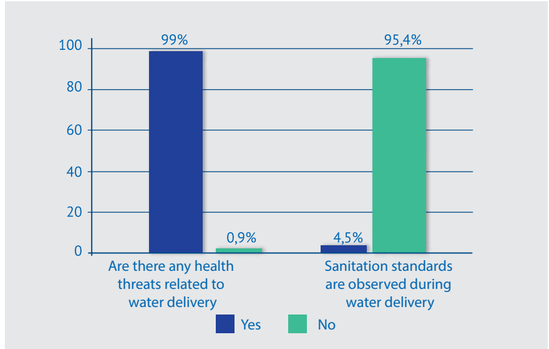
A very important question of sanitary condition of the delivered water, its quality and safety, is not particularly recognized by the villagers. The water that they use, and the process of its delivery to the household is often not safe for health. Locations of water intake channels are not always equipped with safe devices. Water is delivered on bikes and specially equipped pushcarts. With regard to water quality in terms of hygiene regulations, villagers mainly believe that it is enough to boil the water, and it will meet all safety standards. Answering the question whether the sanitary standards are observed, 95.4% of the respondents stated that the water is consistent with sanitary standards and is of no danger to use. 99% believe that transportation of water may be a health risk.

[26] Results of household gender survey 2007: Kazybek; Bash Koindy; Aga Koindy; Bolshevik; Kyzyl Tuu, Atbashy districts of Naryn province, Moldosheva A., available at: http://www.gender.cawater-info.net/index.htm

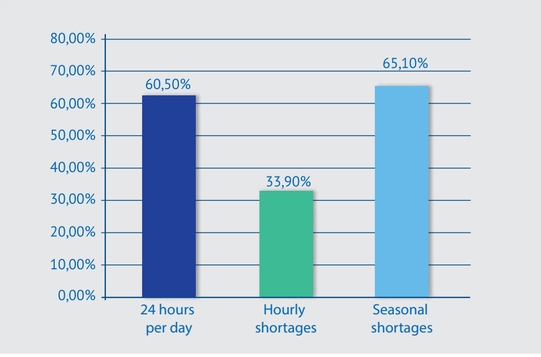
Responsibility to bring water into the house



Sanitation standards and safety



Availability of Water Pumping Senices



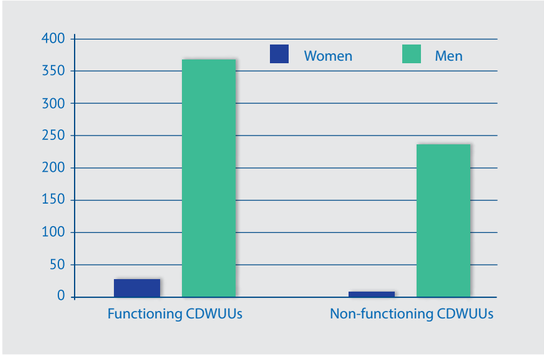
Nearly 63% of the population has access to water for less than 12 hours per day, not every day. 37% does not have access to water, and only 37% of the rural population has access to water for 12 or more hours per day and is satisfied with the frequency of water supply[27]. Only a few households have the opportunity to fully enjoy the water pipe system[28].

Under the World Bank's Rural Water Supply and Sanitation Project (RWSSP-1), from 2002, rural Community Drinking Water Users Unions (CDWUU) have been established. These are the main organizations responsible for management of water systems at the village level. CDWUU is registered as a legal entity that administers funds, opens bank accounts and organizes the collection of income on the basis of the Agreement on the provision of water between CDWUU and "Ayil Okmotu" (village administration). CDWUUs are responsible for planning, financing and management of water supply. It was expected that upon completion of the project CDWUUs would be the main entity ensuring sustainability of water and sanitation. CDWUUs will provide technical support to members of CDWUUs and will create conditions for the improvement of material and technical base of CDWUU. Currently, according to the DWMT, 633 CDWUUs have been established, of which 390 work and cooperate with the Department. Due to the lack of institutional organization of rural drinking water (CDWUU), a number of aqueducts are in poor condition. Thus, aqueducts built by the donors are not functioning in 35 villages. There are no structures which possess a sufficient capacity at regional levels that can provide service-maintenance to water utilities.

[27] Draft Strategy for drinking water and sanitation 2013-2023 - Aris, 2012. - p.65

[28] Results of household gender survey 2007: Kazybek; Bash Koindy; Aga Koindy; Bolshevik; Kyzyl Tuu, Atbashy district of Naryn province, Moldosheva A., available at: http://www.gender.cawater-info.net/index.htm

Out of 633 CDWUUs, 390 are functioning today. 38 CDWUUs are headed by women[29].



As the study indicates, low representation of women at the executive level limits their access to natural resources. Consequently, men are the predominant consumers of natural resources. Inequalities and disproportionate access to natural resources have a significant influence on the progression of women's poverty.

There is a lack of equal access for men and women to the decision-making systems for water at all levels in the Republic. In the water sector of the Kyrgyz Republic the total number of specialists is 5,063 people, of whom 956 are women, which equals to 19% of the total number. The number of managers, their deputies and heads of structural units is 10% of the same number, and not a single woman is represented in these higher positions.

[29] According to the Water Supply and Treatment Agency

Management of the sectors and departments in the Ministries of Water Resources is also entrusted predominantly to men. The vast majority of key specialists in the sector are women - about twice as many as men, and most of the workload is performed by key specialists. It should be noted that the water sector in Kyrgyzstan is facing issues of gender inequality due to predominantly male leadership[30].

Within the framework of USAID "Water User Associations Support Program" (WUASP) Water User Associations in the Republic have been established. Of 4,175 people working in the Water Users Associations[31]. in 2009, women made up only 18%. In 436 WUAs republic-wide, only 6 women were in a director position, 160 worked as Accountants, 2 as Chairmen of WUA, and 9 as Vice-Chairmen of the WUA[32]. To date, the 469 registered WUA are headed by men in 98. Thus, women have very low representation at the WUA level and are the most vulnerable group in the water distribution system.

Women's low access to irrigation water is also confirmed by the results of the "Gender aspects of access to natural resources" study[33].

[30] Tynalieva A.B., Chief Specialist at UEGMS, "Gender in the water sector of the Kyrgyz Republic" - Issue number 8, February 2012.

[31] Water User Association (WUA) - a voluntary, non-governmental, non-profit organization that is created and managed by a group of water users along one or more water channels. Water users - farmers or "dehkan" homestead land owners who combine their financial, material and technical resources to improve the productivity of irrigated agriculture in the territory of the association through the equitable distribution of water, and efficient operation of irrigation and drainage systems. - http://www.wuasp-car.com

[32] From the report of B. Koshmatov, Director General, Department of Water Resources MAWRPI of the Kyrgyz Republic at the World Water Forum, Istanbul, 2009.

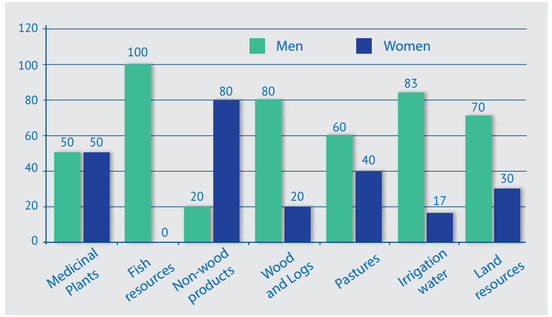
[33] Gender aspects of access to natural resources, Bishkek 2006-2007.

The data from a number of sociological studies[34] has shown that in the course of determining the priority issues in the use of water, women expressed the utmost attention to the issues of water quality and protection of water sources (men ignored these problems), which suggests that indeed, sustainable management of water resources is impossible without the involvement of women in the decision-making processes. Men tend to illegally exploit natural resources more often than women. Gender stereotypes largely contribute to this notion, when the man, as the family breadwinner, is expected to find income for his family, regardless of circumstances. Women, who illegally use resources, are condemned by the society significantly harsher than men for doing the same thing[35].

Therefore, it is crucial to get women involved in various bodies of water resources management, from water user associations (WUAs) to the bodies of water management at the national level.

Weak development or absence of agencies and organizations on water management often lead to domination of local elites. Villagers indicate that wealthy people with good connections and land in the upstream canals have the opportunity to take water first, leaving the remaining water for the less well-off water users downstream. There is also a widespread practice of stealing water from irrigation canals, often times this is done by more affluent farmers[36].

Average rating of access by men and women of different kinds of natural resources, performed by the study participants [37]



Lack of access to land is also an underlying cause of women's limited access to water. Thus, land reforms that distribute land ownership among the household heads or permanent agricultural workers (who are mostly men) lead to imbalance of women's access to water and land, while the laws guarantee equal rights. Even if women have the legal right to land, traditions often hinder their effective control over land and water resources, which are a crucial economic capital for further development, determining access to opportunities to participate in the decision-making processes.

In 84.9 % of cases the legal owners of farms are men - a pattern existing throughout the country. Only in cases when there is no husband and adult male child in the family, a woman is recognized as the owner of the farm[38].

[34] Ferghana gender research GWP CACENA-SIC, 2004.

[35] Gender aspects of access to natural resources. - Bishkek: UNDP, «El-Pikir», 2006-2007.

[36] Irrigation in Central Asia. Social, Economic and Environmental Aspects. - The World Bank, February 2003.p.8.

[37] Ibid.

[38] Men and women in the Kyrgyz Republic. Compendium of gender-disaggregated statistics 2005-2009. - Bishkek, 2010.

As can be seen from data, resources are distributed unevenly; the gap between rich and poor is growing. Women tend to be excluded from the process of resource distribution and have less access to them. Therefore, the implementation of these trends will worsen the situation for women. With the current climatic trends, the decrease in the amount of essential resources (water, food) will lead to further exclusion of women from the decision-making system, will increase the vulnerability of the poor and increase the number of conflicts among the population.

The current absence of comprehensive mechanisms for fair access to natural and social resources, in the context of global social challenges imposed by the process of climate change, may lead to a spark of social conflicts. According to the forecasts of the Second National Communication on Climate Change, rise of social tension is scheduled to take place between the years 2050 and 2100, when the peak reduction of water availability in the region is predicted to take place.

It should be noted that women have traditionally favored non-violent methods of conflict resolution and stabilization of relations. They show greater initiative in conflict prevention and rehabilitation activities, but rarely have access to the structures of emergency management and law enforcement agencies[39]. Thus, it is necessary to consider women as important actors in the system of resource distribution and conflict reduction today, in order to alleviate severe consequences of climate change in Kyrgyzstan tomorrow.

[39] Kochorbaeva Z., "Gender aspects of Conflict Prevention." - Bishkek: UNDP, 2004.

1.4. The impact of emergency situations and natural disasters

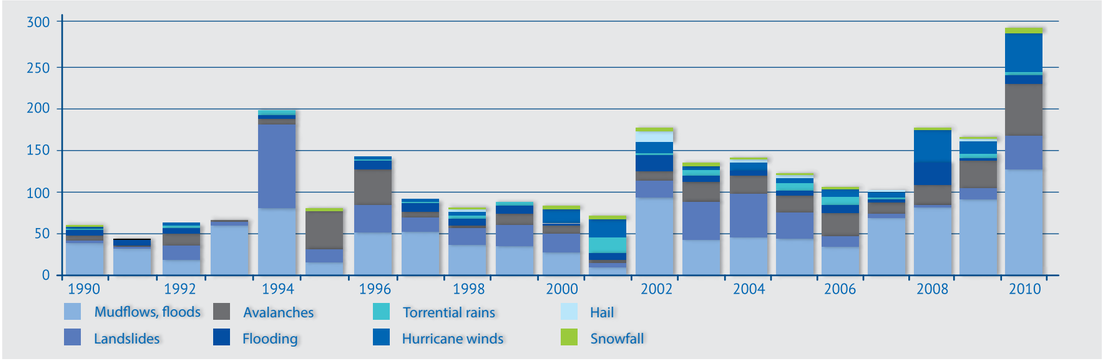
The territory of the Republic is largely exposed to dangerous processes and phenomena. The most common types of emergencies in Kyrgyzstan are emergencies related to water flow: mudflows, avalanches, and landslides.

Almost 95% of settlements in Kyrgyzstan are in close proximity to water sources, and are often located along the river banks.

The poorest social layers bear the risks of exposure to extensive emergency situations. In the situation of destruction of homes, these people do not have the opportunity to move or to purchase new housing in safer locations, while the state compensation is often not sufficient enough to restore the previous living conditions. In the process of the decline of living standards[40], the people's consciousness washes away complex social and cultural needs, leaving only the economic needs that are aimed at the immediate survival: the need to care for the environment and natural ecosystems, which are the systems that constraint climate change is not in people's consciousness.

[40] Ibrayeva G."Gender Aspects of Poverty." - Bishkek: UNDP, 2004.

Emergency situations growth dynamics [41]



[41] Second National Communication on Climate Change, Bishkek 2009

The existing gender trends between men and women in disaster risk reduction are closely linked to the role and responsibilities of women and men in the home and in society. These roles define different identity, social responsibility, attitudes and expectations. Such differences are mostly unfavorable to women, and lead to gender inequality in the socio-economic development as a whole, including the different vulnerability to disasters, as well as the different ability to reduce the risk and respond to disasters. Beyond anything, limited access to information and knowledge inevitably increases the vulnerability to disasters and risks for them and for their families[42].

Studies[43] show that disasters increase, highlight, and escalate gender inequality, and further exacerbate the severe conditions of women. At the same time, the potential contribution that women could offer to reduce the risk of disasters globally is often not taken into account, much like the participation and leadership of women in improving the resistance of the population to disasters. Gender differences are present at all levels of disaster response: from exposure, perception, physical and psychological effects, and preparedness, to direct response, restoration and reconstruction processes. In other words, men and women differently suffer from the consequences of natural disasters and, often, women are least protected from natural disasters.

Women are particularly vulnerable to the effects of natural disasters. Women are also more vulnerable than men in the aftermath of disasters. Along with limited access to resources, they also face the need to perform additional responsibilities of caring for household members in more adverse conditions. According to the climate change scenarios, the frequency of extreme weather events associated with water will increase. It is necessary to develop gender-sensitive approaches in research and other activities to prevent and prepare for the emergencies.

[42] Risk reduction from a gender perspective. Strategy and practical guidance. Posted by NISDR, UNDP and IUCN, Geneva, Switzerland, June 2009

[43] Ibid. – p.19.

Challenges faced by the local community in adapting to hazards were identified. The biggest challenge is that the settlements are out of reach of media, there are no good roads, i.e., they are in remote locations. Due to this remoteness, it is difficult for the people residing in these areas to get information about what natural disasters to expect. The second issue, we believe, is the widespread violation of the building code. In the Soviet times it was precisely regulated where you can build a house and where you cannot. Nowadays, people build-up wherever they please, and local councils grant the permits. Buildings are built on floodplains where mudflows and landslides can occur.
The population is not very well aware that the landslides and avalanches may occur in these places, and that one should not collect firewood in the hills in the winter, because there is a chance of distracting the formation of snow and triggering an avalanche. Furthermore, there is no infrastructure in rural areas (no power, dilapidated buildings, etc.), high levels of poverty and hopelessness.

Inna Mayatskaya, Deputy Head, Department of Hydro-meteorological Research, Forecast and Information under the Ministry of Emergency Situations of the KR

Particularly vulnerable are women who have special needs (pregnant women, women with infants, women caring for the sick and elderly members of the family). They are more dependent on the environmental conditions, as they have specific needs and are more sensitive to the inability to meet these conditions. In the offices of the Ministry of Emergency Situations the decision-making levels and levels of local authorities hold a critically low representation of women. Thus, women are not represented at all at the highest positions of the MES, while women account for 12% in core positions,and 42% in senior positions[44].

[44] Women and Men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics

According to statistics, in 2012 the country experienced 449 emergencies, which killed 47 people. Of them 15 people were killed by avalanches; large fires and debris flows killed 8 people. One person died as a result of rock fall, and 4 people as a result of the collapse of public toilets, 5 people died from poisoning in the mine, another one was killed in a mine collapse. In 2011 the number of fatalities in emergencies was 82 people. Material damage in 2012 amounted to 924 million 921 thousand soms, while last year this number was at 939 million 912 thousand soms.

Speech by the Minister of Emergency Situations of the Kyrgyz Republic Mr. Boronov K. A. January 10, 2013 http://www.knews.kg

This leads to the fact that the interests of women and children are not considered in the process of developing plans and taking measures in emergency situations. With the increasing number of emergencies, vulnerable groups (women, children, and the elderly) will be exposed most to health and life risks.

At the international level, the issue of gender mainstreaming in preventing and responding to emergencies has been recognized. The Hyogo Framework, adopted by the World Conference on Disaster Reduction by the governments of 168 countries, provides the most precise definitions of gender mainstreaming in CRP compared to other international strategies. The program specifies that "the gender perspective should be integrated into all policies, plans and decision-making processes in the field of disaster management, including in the field of risk assessment, early warning, information management, education and training."

In 2006, at the 61st General Assembly, the governments recognized lack of attention to the needs, concerns and contributions of women in disaster risk reduction, and adopted a resolution on the need to intensify the promotion of gender mainstreaming and women's participation in the decision-making initiatives in the field of disaster risk reduction[45].

Thus, there is an urgent need to:

- Develop plans for emergency response at the local, regional and national levels, taking into account the specific needs of different target groups.
- Provide an effective warning system through various channels available for the various groups. Separate trainings for young mothers, for families of the disabled, and for single fathers should be conducted in order to actively involve different target groups in the process of creating plans for emergency response.
- Create databases and statistics on the impact of disasters on gender differentiation.
- Perform vulnerability, risk and capacity assessment, taking gender into account, and develop gender-sensitive indicators for monitoring and measuring progress.
- Support research institutions in the study of the economic benefits and the effectiveness of policies and programs that take gender into account for disaster risk reduction, adaptation to climate change and poverty reduction.
- Improve gender-sensitive disaster preparedness, response and contingency planning, in order to bring them in line with the specific needs and problems of men and women.
- Increase the participation of women in the coordination of humanitarian aid and ensure equal access to humanitarian aid for men and women.
- Raise the level of education in local government, so that local government is able to raise public awareness.

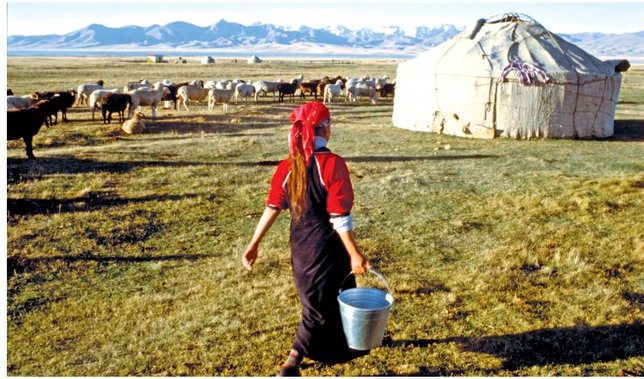
2005-2009. Bishkek, 2010. - p. 105.

[45] Risk reduction from a gender perspective. Strategy and practical guidance. Posted by UNISDR, UNDP and IUCN, Geneva, Switzerland, June 2009

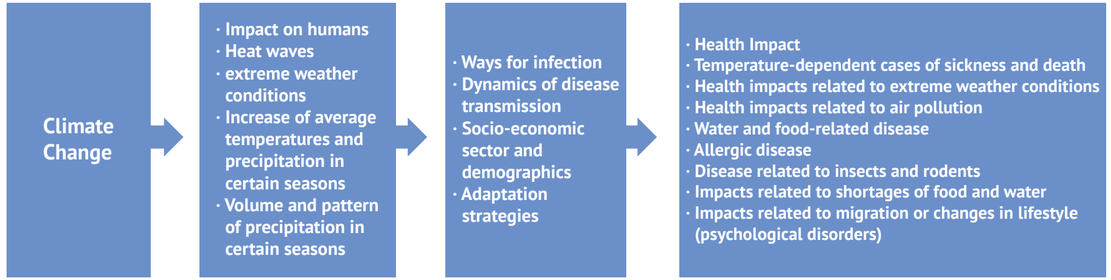
1.5. The impact of climate change on health

According to statistical data, the healthcare sector is the most developed sector to withstand the impact of climate change on the population.

It is known that abrupt changes of meteorological factors significantly affect the physiological processes in the human body, causing the development of pathological conditions and exacerbation of chronic diseases. Such a response to the change of weather was named a meteopathic reaction. Although people have a great capacity to adapt to changing climate conditions and the environment, they become vulnerable when weather conditions are seriously changing[46].



Ways of Climate Change Impact on Health[47]



[46] Il'yasov, Sh.A., Shabaeva, O.N. "Climate Change and Human Health". KRSU Journal / № 6, 2003

[47] Patz, J. A., McGeehin M. A., Bernard S. M., Ebi K. L., Epstein P. R., Grambsch A., Gubler D. J.,Reiter P. The potential health impacts of climate variability and change for the United States: executive summary of the report of the health sector of the U.S. National Assessment. Environmental Health Perspectives, 108, 2000, p. 367–376;

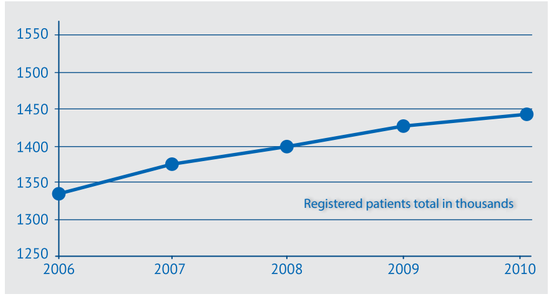
It is evident that diseases most sensitive to changes are those transmitted through water and food, illnesses (deaths, injuries, disabilities) during natural disaster; conditions and diseases related to malnutrition.

Among other possible health effects, scientists predict the following factors caused by climate change:

- Level of air pollution and aeroallergens;
- Possible emergence and changing modes of transmission of other infectious diseases;
- Violation of production technology, storage and transportation of food, due to the impact of climate change, intensification of pests and diseases of plants;
- Impact of drought on food security of the population, threat of famine;
- Significant migration of the population due to natural disasters, crop failures, water shortages;
- Destruction of healthcare infrastructure in natural disasters;
- The emergence of various conflicts as a result of increasing competition due to lower availability of natural resources;
- Direct impact of heat and cold on the human body, especially among the vulnerable groups.

In the Kyrgyz Republic, despite a series of measures taken by the government to reform the healthcare system in recent years, the incidence of morbidity among the population tends to increase[48], which, evidently, along with other reasons, is caused by climatic influence. The NGO "Preventive Medicine" has research on the comparison of the correlation between the incidence of all causes and climatic factors[49].

Morbidity of the population (number of cases registered in patients with a first diagnosis)



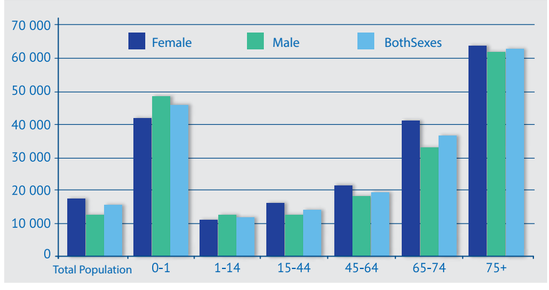
The Second National Communication of the Kyrgyz Republic on the UN Framework Convention on Climate Change gives the expected levels of monthly average morbidity incidence for 100 thousand people, in the period up to 2100, for the northern and southern regions of the country. The results obtained, show that - with one exception - there is a significant increase in the incidence of circulatory system diseases when compared to 2005. Equal incidence of morbidity is expected in the northern and southern regions of the country. A less significant growth, and even a slight decrease in morbidity incidence in the Issyk-Kul region is explained by the significant difference between the climatic conditions of the region due to the smoothing effects of Lake Issyk-Kul to extreme temperatures.

Respiratory diseases traditionally take the leading place in the overall morbidity. In these gender-segregated statistics, only mortality data is available, and not morbidity, which makes it difficult to develop comprehensive adaptation strategies.

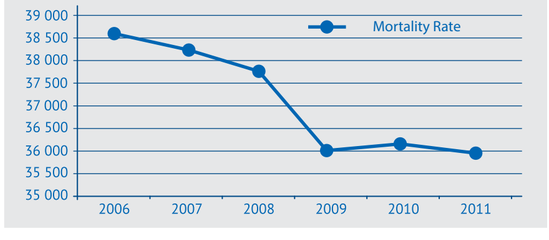
[48] See: Statistical Yearbook of the Kyrgyz Republic. 2005-2010; Kyrgyzstan in figures. Statistical compendium. 2011 / / www.stat.kg

[49] Ibid.

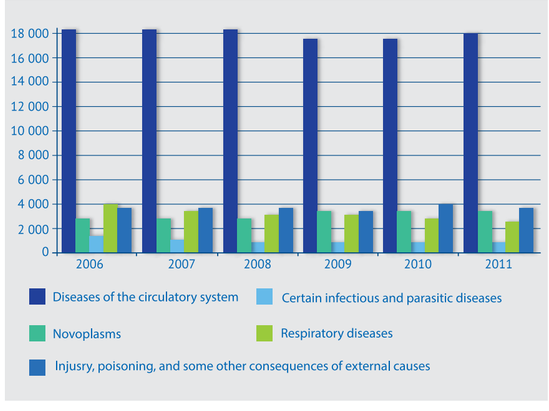
Distribution of morbidity by age and sex for the years 2007-2009 (100 thousand people)[50]



Mortality Rate (total number of deaths)[51]



Death causes correlation[52]



Mortality rate by main causes of death

Traditionally, male mortality rates exceed female indicators. The graph below shows the data on the mortality of women and men from all causes.

[50] Presentation: "The effects of climatic factors on the health of the population", prepared by prof. Scientific and Production Association "Preventive Medicine" MOH, Sharshenova A.A.

[51] See: Statistical Yearbook of the Kyrgyz Republic. 2005-2006; Kyrgyzstan in figures. Statistical compendium. 2011 / / www.stat.kg; Women and Men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 - Bishkek, 2012

[52] See: Statistical Yearbook of the Kyrgyz Republic. 2005-2006; Kyrgyzstan in figures. Statistical compendium. 2011 / / www.stat.kg; Women and Men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 - Bishkek, 2012

Mortality of men and women from all causes[53]
Death as a result of the main causes in 2011 (number of people)

	Total			Including the employable age		Number of deaths for every 100,000 People
	Both sexes	Women	Men	Women	Men	
Total deaths from all causes	35 941	15 815	20 126	3 514	9 600	651,7
From disease of the blood circulatory system	17 992	8 948	9 044	948	3 273	326,3
From disease of respiratory system	2 602	1 087	1 515	119	371	47,2
From neoplasms	3 379	1 592	1 787	702	925	61,3
From infectious and parasitic diseases	1 028	336	692	183	510	18,6
Tuberculosis	638	181	457	145	415	11,6
Digestive diseases	2 426	850	1 576	438	1 243	44,0
Injuries, poisonings, some other effects of external causes	3 613	815	2 798	548	2 359	65,5
From:						
Transport injuries	933	238	695	172	608	16,9
Accidental alcohol poisoning	300	46	254	38	238	5,4
Accidental drowning	300	78	222	32	138	5,4
Suicide	471	108	363	89	318	8,5
Murder	303	72	231	56	211	5,5
* Women between 16-57, men between 16-62						

[53] See: Statistical Yearbook of the Kyrgyz Republic. 2005-200; Kyrgyzstan in figures. Statistical compendium. 2011 / / www.stat.kg; Women and Men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 - Bishkek, 2012

Circulatory diseases are the most frequent cause of death among the population, amounting about half of annual deaths (50.1 percent of the total number of deaths in 2011); it mainly concerns people of retirement age.

The second most common causes of death in the structure are: injury, poisoning and certain other consequences of external causes (10.1 percent of the total number of deaths in 2011).

In this category unnatural and violent death causes are combined.

The third most common mortality causes are neoplasms (cancers - 9.4 percent of the total number of deaths in 2011).

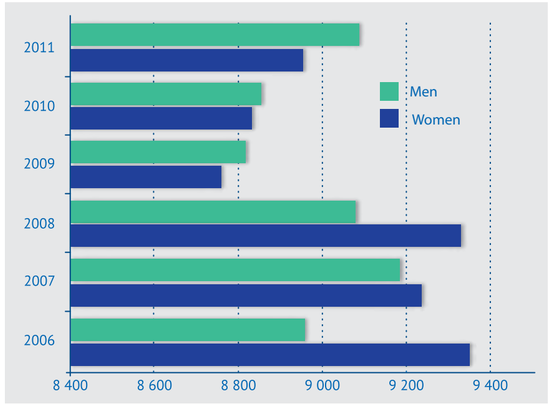
Next in the structure of death causes come respiratory diseases (7.2 percent of the total number of deaths in 2011).

Mortality from infectious and parasitic diseases (2.9 percent of total deaths in 2011), is typically a male issue. The vast majority (638 deaths, or 62.1 per cent of deaths from these causes) were diagnosed with tuberculosis. Out of 100 deaths from this disease 72 were male, over 90 percent of them were of working age.

It is evident that the causes of death have a gender asymmetry; men suffer twice as many deaths from the diseases of the digestive system and as well as injuries, poisoning and certain other consequences of external causes.

The following diagram shows the correlation between male and female mortality from diseases of the circulatory system.

Mortality ratio of men and women from diseases of the circulatory system[54]



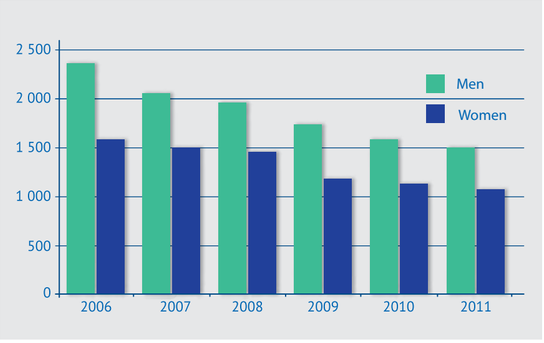
Cardiovascular and bronchopulmonary diseases mostly affect people suffering from stress under the influence of excessive heat. There is a correlation of mortality from coronary heart disease (CHD) and the influence of elevated temperature in individuals older than 45 years. There is also a clear relationship between mortality and heat stress: during unusually hot weather, the number of deaths from all causes may exceed the average by more than 50%, with greater risk for the elderly55.

[54] Demographic Yearbook of the Kyrgyz Republic. 2006-2010 / / www.stat.kg, Women and Men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 - Bishkek, 2012

[55] Weather and water in cities WMO - World Meteorological Organization. - Geneva, 1997. - № 853.

Il'yasov believes that in the future we should expect an increase in morbidity and mortality from cardiovascular diseases caused by heat stroke. Studies conducted in Shanghai indicate that air temperatures above 34°C significantly increase the death rate of people over 65. In Kyrgyzstan this negative factor is further enhanced as the Tien Shan mountain range goes through the Republic. The average altitude is 2,750m, and almost the entire population lives at an altitude of more than 800m, and at high altitudes, where the partial pressure of oxygen is reduced[56].

Mortality ratio of men and women from respiratory diseases[57]



There is a need for comprehensive epidemiological studies. A link with urban policy is essential. The development of master plans is relegated to city councils, without regional planning projects that take into account gender and environmental aspect: how many kindergartens to build, how they should be equipped, how many schools are needed and what type of water supply is needed, etc. During the planning of the so-called "sandwich schools" (schools built with concrete panels that are pressed together, thus resembling a sandwich) there had been no analysis in the context of climate change. In the hot season, children faint from overheating, and in the winter they used blankets to cover the desks, because it was very cold. Such temperature differences and ventilation systems are not reflected in the general plans today.

Nina Vashneva Chief Specialist of the State Sanitary and Epidemiologic Surveillance Department, under the Ministry of Health of the Kyrgyz Republic SSESD Republic

Statistics show that men are more likely than women to die from respiratory diseases, which is obviously connected with such risk factor as smoking and employment in manufacturing industries in hazardous conditions.

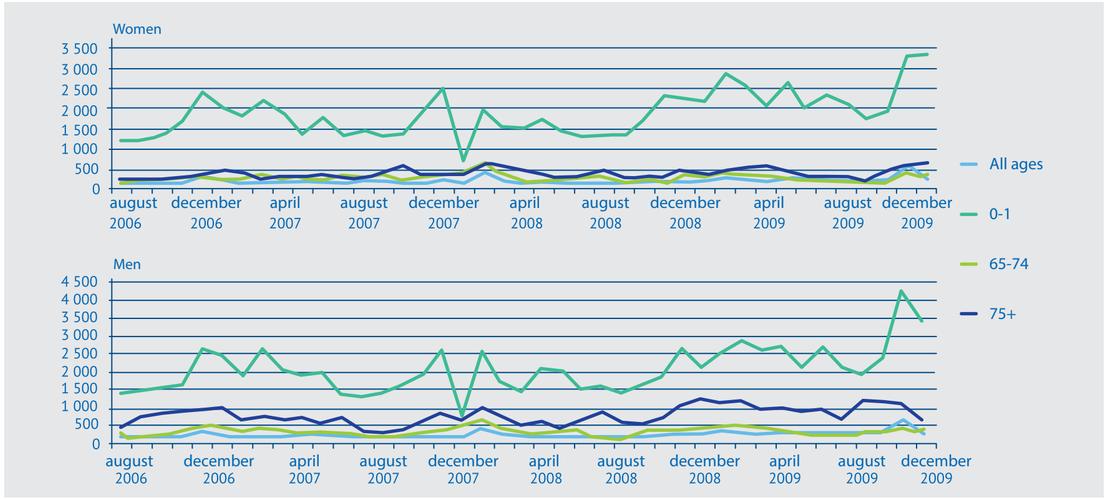
Cardiovascular diseases are the leading cause of death in Kyrgyzstan. The main contributors (90%) to mortality in this category are acute myocardial infarction and hypertension.

In the past two years, male mortality from the blood circulatory system diseases exceeded female rates, which is probably due not only to the climatic influences, but also caused by behavioral characteristics that determine the increase in risk factors.Climate change scenarios predict an increase in the incidence of respiratory and blood circulation disease among the population due to the changes in temperature, Research on the differential impact of these changes on men and women has not been conducted.

[56] Il'yasov Sh.A., Shabaeva O.N. "Climate Change and Human Health". KRSU Journal / № 6, 2003

[57] Ibid.

The dynamics of respiratory diseases morbidity indices in Bishkek (J00-J99) (100 thousand people)[58]

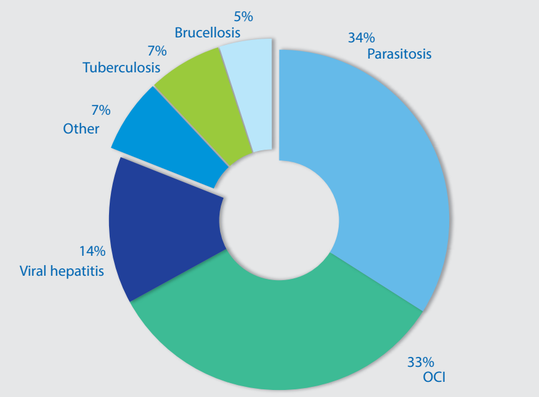


Infectious diseases. General temperature warming and increased precipitation will lead to an increase in the range of insects that transmit infections (mosquitoes, ticks, flies), which in certain circumstances poses a threat to health. The risk of intestinal growth and parasitic diseases is increasing. Without harsh quarantine measures, the increased mosquito range can lead to intensive growth of malaria. Global warming, in terms of active cross-border relations, increases the risk of transmitting the mosquito hemorrhagic fevers to the territory of Kyrgyzstan.

Higher temperatures could lead to changes in the geographical distribution of various types of disease transmitters, i.e. thermophilic habitats of animals and insects (e.g., encephalitic mites) will be distributed to the north and will increase the duration of seasonal pathogens transmission.

[58] The study «Impact of climatic factors on the health status of the population," Sharshenova, A.A., Scientific Production Association «Preventive Medicine» MOH, 2011

The structure of infectious diseases (excluding influenza and SARS) in 2010 (%)[59]



Incidence of intestinal infections will largely depend on temperature, as this will have an impact on the quality of water in water sources and in the water-supply network, and on the degree of food infection, which directly depends on climatic parameters.

[59] State report on the sanitary-epidemiological welfare of the population of the Kyrgyz Republic for 2010.

Global warming leads to increased rates of intestinal infections, which occur most frequently during warm seasons. Organic pollution and temperature changes in aquacultures have an impact on the survival of bacteria that's present in intestinal infections. The lowest inoculation of 1.8% was tracked in the reservoirs of the Central Tien Shan, which is characterized by a harsh climate. The number of positive samples starts to increase in March and reaches a maximum in July-August. Analysis of data on Lake Issyk-Kul reveals a direct correlation between the inoculation and water temperature: the lowest at 5° C (2.8%) and the highest at the temperature above 16° C.[60]

The average national rate of the overall incidence of intestinal infections is at a consistently high level, in some years reaching the record of 332.4 (2001) to 490.2 (2010). The highest incidence was registered in Batken 4,161 (980.0) and Jalal-Abad 5,400 (552.8) regions, surpassing the national figures by 1.8 times, which is directly linked to low quality of drinking water[61].

Climate change, in particular the increase in temperature and precipitation, will lead to an increase in the number of infectious and parasitic diseases. Since 1996 an increase in cases of malaria has been tracked[62].

Geohelminthiasis will gain high epidemiological significance: ascariasis and trihotsefallez (whipworm), which should mature in soil

[60] See: M.G. Aminov and others. Vibrant landscape in various climatic and geographical areas of Kyrgyzstan, some factors affecting their survival, Thesis Report. First Congress on Hygiene. Epidemic Infection. Kyrgyzstan. - Bishkek, 1998. p. 131.

[61] State report on the sanitary-epidemiological welfare of the population of the Kyrgyz Republic for 2010

[62] See: Program on malaria elimination in the Kyrgyz Republic for 2010-2015, approved by the Decree of the Government of the Kyrgyz Republic dated March 30, 2010 №188.

until the infective stage. In a hot and humid climate, the risk of mass infection will increase directly in proportion to the duration of the warm period[63]. Parasitosis in the structure of infectious pathology occupies 34% of all reported infectious diseases (except for influenza and SARS) and remains to be one of the most pressing health problems. The main diseases associated with water are characterized by a high epidemic potential:

- Bacterial diseases: cholera, typhoid, salmonella, bacillary dysentery;
- Viral etiology: hepatitis A, polio, enterovirus infections, noroviruses;
- Parasitic diseases: giardiasis, amoebiasis, ascariasis, enterobiasis.

New projected diseases: campylobacteriosis, cryptosporidiosis.

Climate warming may lead to increased intestinal infections; their rise is typical during warm seasons. The influence of organic pollution and temperature on the survival of vibrio reservoirs is traced[64].

The average national rate of the overall incidence of intestinal infections is at a consistently high level. In the age structure of infected people, children under the age of 14 account for 81.6%, including 40.6% of children younger than 1. In Kyrgyzstan, one of the causes of child deaths is diarrhea (6%), along with other infectious diseases. Water scarcity, and, consequently, low access to clean water, especially in rural areas, is directly related to the increase in cases of diarrhea. For the most part it is common among children, as the usual hygienic measures are neglected in the family due to the more "important" needs of water use, such as drinking and cooking.

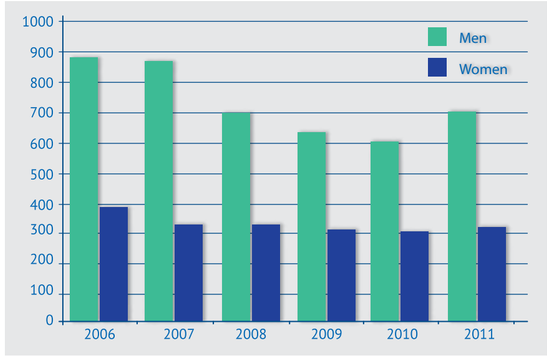
Mortality from some parasitic and infectious diseases remains traditionally high among the female and male population[65].

[63] Il'yasov Sh.A., Shabaeva O.N. "Climate change and human health", KRSU Journal / № 6, 2003

[64] State report on the sanitary-epidemiological welfare of the population of the Kyrgyz Republic for 2010.

[65] Women and men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 – Bishkek, 2012.

Mortality of men and women from certain infectious and parasitic diseases

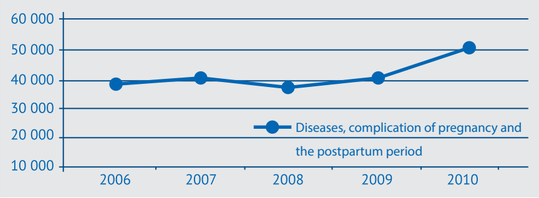


As can be seen from the graph, male mortality is clearly predominant. This once again demonstrates the need for development of an adaptation strategy based on gender-disaggregated statistics.

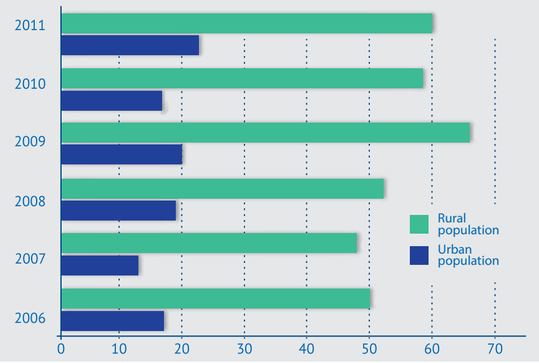
Climate change and related social changes can lead to threats to maternal and child health. Thus, it is noted that pathologies of embryo development are equally determined by a decrease or an increase of the ambient temperature.

The number of disease complications of pregnancy, childbirth and the postpartum period, and congenital anomalies (malformations) remains high. The latter is directly related to the reproductive health status of women and men.

The incidence of newly diagnosed complications of pregnancy, childbirth and the postpartum period (cases) [66]



Mortality of urban and rural population (women) from causes related to pregnancy, childbirth and postpartum period [67]



[66] Women and men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics of 2007-2011 - Bishkek, 2012

[67] Ibid.

Mortality from diseases associated with pregnancy, childbirth and the postpartum period are significantly different in urban and rural areas. In rural areas complications occur 3-4 times more frequently than in cities. Moreover, almost 80 percent of maternal deaths are also recorded in the countryside.

In solving the problems related to health, a crucial role is played by health and education systems. At the institutional level, these systems mainly involve women with low wages; they also have a lot of unpaid additional functions (e.g. cleaning the medical and obstetrical stations, classes, buying washing materials, napkins, etc.). Thus, society imposes on them the bulk solution of a strategically important task without providing them with adequate resources.

Ensuring equal access for men and women to sanitation is one of the biggest challenges for our region. Studies have shown that sanitation facilities, especially in rural areas, are present at a low level. The use of cesspools in the yard, instead of the proper conditions, adversely affect the reproductive health of the population, especially for women, and the spread of infections, since these kinds of toilets are easily accessible by flies.

Unsatisfactory provision of sanitation facilities in schools and medical and obstetrical stations are alarming, as these organizations have a direct impact on the quality of people's lives. According to the Ministry of Education and Science of the KR, in the framework of multivariate analysis of the investigated 330 of 438 educational institutions, the most difficult situation with water supply observed in schools of Talas, Jalal-Abad and Batken regions.

Practically all rural schools have toilets that are located on the school grounds or nearby, and only 14.3% of urban schools have toilets that are located inside the buildings. School toilets, in most cases are old, dirty, built of boards, bricks or cinder blocks contained in unsanitary conditions.[68] Frequent diseases of children (intestinal, due to the lack of water in schools for hand washing), colds, because

[68] Basic assessment of access to water, sanitation and hygiene in schools and hospitals northern regions of Kyrgyzstan (Issyk-Kul, Naryn, Talas), Ministry of Health, UNICEF, BIOM 2011.

the toilets are located far away from the school buildings, etc. are the reason that women are forced to spend more time on childcare.

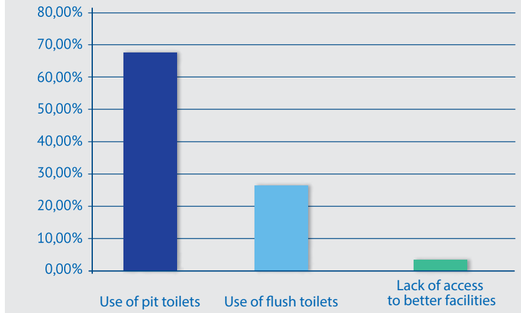
Among other things, lack of sanitation and poor hygiene increases the burden on women, as they cause the spread of water-related diseases: diarrhea, dysentery, typhoid and others. According to the statistical data and publications of international organizations, the damage to human health from the consumption of poor quality drinking water commensurate with the losses from natural disasters, adverse environmental situations, hunger and other global factors.

The situation is aggravated by the outflow of professionals, and men from the regions: migration to Chui Province and Bishkek and external migration (CIS countries: Russia, Kazakhstan). This trend is observed in all occupational groups (builders, doctors, teachers, engineers) and, to a greater extent for men. This leads to a reduced quality of life of the population of regions (the degradation of infrastructure), increase the burden on women and reduce the adaptive capacity of the population to climate change.

Local governments do not allocate the necessary level of budgetary means for the repair and maintenance of school infrastructure (water, sewage). Women, despite their contribution to social development, are marginally represented at the level of municipal political positions - 5.6% (the lowest percentage is in the Osh region of 1.1 %, and the largest in Chui 7.6%) [69], and have little opportunity to make proposals on the LSG agenda, also to participate in the distribution of the local budget.

[69] Men and women in the Kyrgyz Republic. Collection of gender-disaggregated statistics 2005-2009. - Bishkek, 2010, p. 104.

Monitoring of the situation of women and children .UNICEF cluster survey. 2006, p. 49



Environmental risks give rise to new inequalities. It is important to track how climate change discourse reproduces new inequalities globally and locally. It is important to understand who decide what risks are to be prioritized, and what risks are "kept in the shade".

Sometimes, in an attempt to help the poor we fall into a situation when we stigmatize these social layers. For example, in Maili-Suu, settlements near the uranium tailings are mostly inhabited by women. Most men migrated for labor, and women take on the risks associated with the expectations in relation to male behavior. Why women need water? To continue performing the traditional female roles and thereby further root them [these roles]? Maybe there is a need to help rebuild the traditional male and female roles?

In the context of climate change, the issue of change of the discourse on femininity and masculinity must be raised.

Anara Moldosheva, gender expert

1.6. The impact of climate change on agriculture and food security

The planning process for food security virtually ignores the contribution of women and their needs, due to the lack of gender-sensitive methodology. At the same time, women produce most of the food in the world. They need secure land, and have the rights to resources in order to ensure performance productivity. Women's traditional knowledge on seeds, planting, and non-timber forest products, agricultural skills and specific livestock skills (milkmaids, poultry keepers, etc.) should be recognized and demanded. Given that women make up more than 50% of those who "go to bed hungry every night", [70] the system of food security needs to address the equitable distribution of food products and income generated from these products.

The Kyrgyz Republic currently has no system of monitoring and early warning of negative global and domestic trends in the food market. In its current state, the control system of material and technical resources does not ensure the country's food needs, not only quantity wise, but also in the assortment and quality of stored food. Control of food safety and compliance with the specifications is extremely weak, which poses a threat to health and life of the population. The expansion of foreign economic relations of Kyrgyzstan caused an increase in the import of a variety of agricultural products and processed products. This fact increases the proportion of genetically modified and counterfeit goods, some of which cause direct harm to human health or does not possess the qualities for the appropriate labeling.

According to the obligations of the Kyrgyz Republic to ensure food security commitments under the Rome Declaration, the recommended security level must not exceed 16% of imports in total consumption. Based on the balance of food safety products, imports of this group in total consumption are currently at about 25%.[71]

At the moment, the Kyrgyz Republic does not possess a satisfactory level of self-sufficiency in the basic food products, which currently represent the following numbers for domestic production: bread products - 42.8%, vegetable oil - 31.7%, Sugar - 9.1%, meat - 56.4%, fruits and berries - 21.8 %. This fact imposes a threat to the country's high dependence on the global food markets, as well as the foreign policy of states that export food into our country.[72]

[70] World Disasters Report 2011- Focus on hunger and malnutrition. - http://www.ifrc.org/publications-and-reports/world-disasters-report/wdr2011/

[71] National Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017, (draft)

[72] Ibid.

Rural women in Kyrgyzstan are actively involved in the agricultural sector, as employment in the agricultural sector is an important source of income. Among the leaders of the peasant communities (farms) women constitute 15.1%, according to the NSC, as of January 1, 2010.[73]

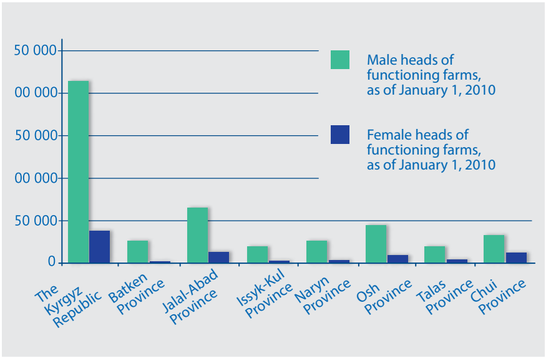
Women are busy with feeding and breeding cattle, with crop production, with processing dairy products, fruits and vegetables, household and socio-cultural services for the rural population.

At the same time, the greatest volume of untracked (informal) economy is in the agriculture sector.[74] Unfavorable conditions for business, small scale agribusiness and its instability, high taxes, lack of support and poor institutional capacity "pushes" a large section of business into shadow economy, where it is much more difficult for women to defend their rights than it is for men.

The involvement of women in non-agricultural business activity traditionally includes the following areas:

- Crafts – souvenirs and functional products made of felt, embroidery;
- Opening of hairdressers and beauty salons, the quality of which is usually very low;
- Trade, both wholesale and small retail and "shuttle business" – (grey trade);
- Tourism: ethno/folklore/eco, etc.;
- Small-scale production: custom tailoring and objects of cultural significance (dowry for the bride, etc.);
- Organization of catering services (restaurants, snack bars, cafes, bars).[75]

Equal access to land is a matter of human rights and, as is noted by the Economic and Social Council of the UN on the Status of Women:



"Violation of land rights is a violation of human rights." The Gender Equality Act prohibits gender discrimination in the benefit to rights to land, and also provides both sexes with equal rights to land use and equal protection of the right to land (p.13).

In general, land and agrarian reform has allowed the villagers to get free land shares. As a result of the elimination of 500 collective and state farms, 75% of the lands have already been distributed as shares of agricultural land.

In 2003, 96% of the households had the right to the land, and in 2006 there were established 331,601 private farms.[76]

[73] Women and Men in the Kyrgyz Republic. - Bishkek: NSC., 2010, p. 99.

[74] Analysis of the nature and size of the shadow economy in the Kyrgyz Republic. - Bishkek.: UNDP., 2006.

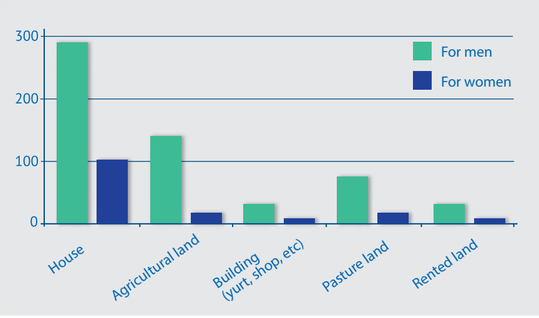
[75] The participation and contribution of rural women in the development of Kyrgyzstan's rural economy. - Bishkek, 2012.

[76] Report on the monitoring of implementation of the Law of the Kyrgyz Republic "On State Guarantees of Equal Rights and Equal Opportunities for Men and Women" (that ensure the economic empowerment of women). - Bishkek: 2013, p.76

The level of representation of women and men - heads of households shows the inequality in terms of legal ownership of assets of the household. At least at the symbolic level the model where the man is the head and owner of property is preferred by the population.

It is important to note that the process of land reform was not gender-oriented, which resulted in the massive registration of family land on men (see chart below). This contributed to a stereotype that, "the man is the head of the household, and the family."

Property Rights Entitlement[77]



[77] I. Baynazarov A. Madraimova. Evaluation report on the protection of women's rights, access to land, Bishkek NGO "Citizens against corruption", 2012, p. 24.

There is an interesting opinion about how horse and sheep breeding has changed in our country. For instance, those breeds of horses that initially existed in Kyrgyzstan had been eating dry grass, thus having created favorable conditions for development and preservation of pastures. The new breeds of horses that were brought from Russia (these horses ate all grasses, not mere dried ones), the type of load on pastures had become different and these new breeds of horses perhaps fully transformed the impact of agro biodiversity on the local territory that had been formed during many centuries.

Honored Scientist of the Kyrgyz Republic, professor Shukurov E.D., Aleine NGO

Years of experience of the Women Entrepreneurs Support Association (WESA) and other women's NGOs working in the field of development, highlight the complexity of the implementation of women's right to participate in decisions on the use of family land share (sovereign right), despite the fact that, along with other family members, women have their own share in the property (as in the process of land distribution, all household members, including women, were accounted). There is also a problem of access to credit for businesses, since the spouse in whose name all property is registered, does not support her endeavors.[78]

Due to the projected decline of precipitations and irrigation water after the year 2025, a reduction of the area of sown fields may appear, which will consequently reduce crop yields. This will inevitably impact food security, particularly in the most vulnerable areas. Reduction of food can lead to malnutrition and hunger, which have a long-term impact on health, particularly among children. According to WHO, by the middle of the 21st century crop yields in Central Asia may decrease by up to 30%, which can threaten food security.

[78] Ibid., p.12.

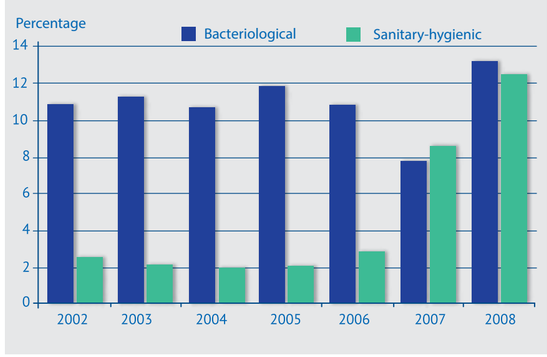
Women play a crucial role in ensuring household food security, dietary diversity and health of children. While men are mainly occupied with field crops, women are usually responsible for cultivation and preparation of food consumed in the household. Reduction of personal consumption of food is a significant survival strategy for the family. The latter is reflected in two ways: in the increase of the proportion of people with a lack of sufficient weight, or in the increase of the proportion of people suffering from overweight and obesity as a result of unbalanced diet. For example, the energy value of food for poor households is 36% lower than for non-poor. Chronic energy deficiency is observed in 4% of men and 5% of women, and overweight to varying degrees affects 31.8% of men and 37% of women.[79] Even today, access to nutritious food for children and pregnant women, especially in the regions of the Kyrgyz Republic , is complicated, resulting in a lack of vitamins and minerals (including iron and iodine) which causes a number of diseases (anemia in pregnant women, retarded growth and development in children).

In the year of 2009, 4.6% of children aged 1-6 years were underweight in the country, and in 2011 this number already reached 6.9%. Among them, in 2009, 4.5% of the boys and 4.6% of the girls were identified as malnourished, and in 2011 - 6.7% and 7.2%, respectively. [80]

Due to the need of limiting food consumption, traditional stereotypical requirements for the ideal of femininity are revived, and these requirements include limited food consumption.

With increasing temperature, food safety is becoming a significant issue, as more favorable conditions for the growth of bacterial flora are directly related to higher temperatures. At an ambient temperature of more than 5° C, every increase in weekly temperature by one degree leads to an increased incidence of salmonellosis by 5-10%. [81]

Food safety: the proportion of non-standard samples of food [82] (as a percentage of the total number of samples)



The growth of conflicts over natural resources is predicted in the context of climate change and the abrupt transformation of temperature amplitudes (for example, between pasture, local communities and mining companies). It is important to increase the participation of local communities, including women and youth, in the planning and control of natural resources.

[79] Ibrayeva G. Gender aspects of poverty. Bishkek, UNDP, 2004.

[80] Women and men of the Kyrgyz Republic, 2005-2009. Compendium of gender-disaggregated statistics. - Bishkek, 2010.; Women and men of the Kyrgyz Republic, 2007-2011. Compendium of gender-disaggregated statistics. Bishkek, 2012.

[81] The impact of climate change on human health: the solid facts. Fact Sheet. Copenhagen and Parma, March 12, 2010 / www.who.int

[82] SES, Presentation "Climate change and food security", Davydov L.N.

The level of energy security In the Kyrgyz Republic is under constant threat. The domestic production of energy is concentrated primarily in the production of electrical energy, more than 90% of which is generated by hydropower. The country imports more than 90% of all consumed hydrocarbons. This results in a high level of dependence on water availability, as well as world prices for oil, oil products and gas. Tariff policy in the energy sector is too heavily dependent on the social aspects of development. The level of physical deterioration of the power equipment is: Cascade Toktogul HPP - 57.6%, Bishkek CHP - 64.0%, Osh CHP - 77.8%.

From the report "Challenges and risks of the KR in the transition to sustainable development", Bishkek, May 2013
Adviser to the Minister of Economy of the KR
Ten, L.I.

In the predicted conditions, the following issues in the field of agricultural development, that will increase poverty and reinforce existing gender inequalities, are highlighted: the use of monocultures in the field (for example, beans in Talas), burning of crop residues, the ignorance of cultivation practices for crop production, lack of strategy on agrarian policy countrywide and at the local levels.

Among the measures of agricultural adaptation to climate change the following practices are highlighted: planting trees as windbreaks, observance of crop and pasture rotation, composting organic waste instead of burning it, compliance with eco standards, use of new breeds of farm animals and plants, development of the seed sector of vegetable crops, construction of greenhouses, hothouses, growing potatoes from botanical seeds, improved irrigation methods (drop irrigation, irrigation the grooves, subsurface irrigation), the use of agro varieties that are adapted to the changing climate, preservation and dissemination of local agro-biodiversity, conservation of natural communities and natural ecosystems.

In the agricultural sector, statistics are collected on indicators related to productivity, yield, agricultural areas, etc. and do not include the human dimension.

However, as studies have shown,[83] rural women have less time for marketing activities, less access to agricultural knowledge, and fewer skills in establishing private businesses. Agricultural reforms, privatization of agricultural enterprises, and the establishment of farms occur without the adequate participation of women, because of their meager representation in local governments, women's lack of sufficient resources and skills in the business of agriculture.

[83] Gender aspects of integrated water resources management. Report on a study of representative households in the republics of: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan and Uzbekistan - Tashkent in 2005.

Number of heads of the operating (peasant) farms by the region (Number of people, as of 1.01.2012)

	Total number of people		Proportional weight in percentage	
	Women	Men	Women	Men
The Kyrgyz Republic	43 495	227 654	16.0	84.0
Batken Province	1 747	26 852	6.1	93.9
Jalal-Abad Province	10 046	61 295	14.1	85.9
Issyk-Kul Province	3 200	16 755	16.0	84.0
Naryn Province	4 440	24 421	15.4	84.6
Osh Province	10 197	49 062	17.2	82.8
Talas Province	2 001	13 305	13.1	86.9
Chui Province	11 290	34 291	24.8	75,2
	75.2	3	-	100,0
Bishkek City	-	3	-	100.0
Osh City	574	1 670	25.6	74.4

Despite the fact that women make a significant contribution to the well-being of the households and agricultural production, men conduct the sale of agricultural crops and livestock and therefore manage the generated income. Underestimation of women's work leads to the fact that women are not considered as equal participants in economic transactions, the allocation of household resources and decision-making within the wider community. [84]

1.7. Gender aspects of energy security

The use of traditional types of solid or fossil fuels to meet the domestic energy needs carries an increasingly negative impact on the health of women and children as they spend more time at home, and to a greater extent inhale noxious gases from the burning dung, and crop residues.[85]

[84] http://www.un.org/russian/esa/social/women/gender_agriculture.pdf

[85] Study of the potential influence of small and mini hydropower plants on the social and gender development of local communities in areas of the Kyrgyz Republic planned to install them. Analytical report of the Center for Gender Studies, UNDP / GEF Project "Development of small hydropower plants." - Bishkek, 2010.

Much like poverty, gender is an essential aspect of the problem of climate change and this fact should be acknowledged at the policy level. In fact, gender and poverty are interrelated and mutually reinforce the barriers to social change. Climate change is not gender-neutral:

- Women are more affected by the disrupted (unstable) and poor power supply, as it generates the inability to use household electrical appliances that could ease the house chores;
- Children and women spend more time in cold homes, compared with men, and are more likely to have health problems;
- Domestic difficulties caused by poor access to safe water, and electricity, have a more severe negative impact on the health of children and women than on men health;
- Power interruptions and its low quality create uncomfortable conditions in educational institutions, affecting the health of the students and teachers, who are predominantly women;
- Doctors and nurses spend a lot of effort to create at least minimally acceptable conditions in health facilities during the cold season. With this in mind, these time and effort could have been directed at the prevention of diseases not only in women and children, but also in men, who by virtue of the prevailing gender stereotypes rarely seek medical assistance, and turn to doctors only during the acute course of the disease
- Limited access or lack thereof of the population in surveyed villages to health care, to a large extent associated with poor quality of power supply, leads to disruption of the temperature regime. In the winter, most medical organizations, including the medical and obstetrical stations, suffer from low temperatures. As a result of this, medical workers, who are predominantly women, are often sick.

- Due to the lack of optimal conditions in medical facilities in cold seasons, the intake of the population is reduced, especially among women, who are more likely than men to seek medical assistance;
- Power shortages and blackouts, low voltage of the electric current disturbed electric power, due to worn-out equipment, lead to failure of refrigerators, and medical devices, which violates the conditions of storage of medicines, and reduces the quality of medical care;
- Failure to comply with the required storage temperatures of vaccines, due to non- refrigeration, makes them unusable. Their further use does not lead to the formation of immunity, increases the risk of infection and vaccine-preventable diseases of children, and complicates the overall epidemiological situation in the country. In some cases, the vaccine stored without proper temperature conditions may cause an allergic reaction in a child, including anaphylactic shock, impending death of a child;
- Uncomfortable conditions for the provision of medical services, and dysfunctional medical equipment, complicate timely diagnosis of diseases, registration of pregnant women and patients with chronic diseases, complicates the provision of timely medical care for the newborns, as well as for the severely ill people.
- The use of wood, which leads to the destruction of ecosystems, increases the potential risk of natural disasters, threatening more women and children.

Construction of new and rehabilitation of old small-scale and micro hydropower plants, and the use of renewable energy will provide local communities with uninterrupted quality power, will contribute to solving social and economic problems, and thereby will help solve practical gender needs of both women and men. In addition to promoting gender equality, the uninterrupted power supply will also increase the sustainability of human development via preservation of the natural habitat. Unlike large hydropower plants, the construction of which is usually accompanied by disturbance and destruction of ecological systems by flooding large areas, small-scale and micro hydropower plants on mountain rivers with natural differential levels of turnover, do not take up farmland. In extreme cases, small ponds are formed to help improve the water balance and conservation of biological diversity in their locations.

Chapter I provides a nationwide analysis of gender risks due to climate change. This section of the study can be called an "office-type study", as the study was structured according to the National Report on Climate Change: water, agriculture, health, and energy. Risks associated with climate change threaten to increase gender inequality and may even undermine the progress made in promoting gender equality. It should be understood that these risks are not only systemic and dominate the state management mechanism, but are deeply ingrained, and thus, relate to each household and its inhabitants. This notion sets a new agenda for the researchers to analyze the issues of linkage between climate change and the risks of gender inequality at the level of local communities and specific households, with particular emphasis on the situation of rural women and women heads of households, and to develop recommendations on local politics.

The study carried an applied character and had the following set of objectives: (I) To identify the level of awareness among the people and the leaders on climate change and risks associated with it;

(II) To identify practices of equality and gender inequality, gender regimes in the community and in families (women's participation in decision-making on water, land, and pasture management; in energy and agriculture issues; in time-management); (III) To identify the level of access for women and men to clean water and irrigation, sanitation and health; (IV) To identify the level of access to natural resources, pastures, fields, etc.; (V) To identify the level of awareness and the level of access of women and men to information on sanitation, renewable energy, agricultural and other environmentally friendly technologies and equipment.

CHAPTER 2. SOCIAL ANALYSIS OF GENDER INFLUENCE OF CLIMATE CHANGE ON THE BASIS OF PILOT VILLAGES IN OSH AND CHUI PROVINCES

The selection of settlements was carried out according to the following criteria:

(I) proximity to and dependence on open water sources (rivers, lakes, etc.) (II) Subjection to natural disasters (mudflows, droughts, avalanches, etc.) connected with climate change; and (III) the availability of farmland.

The study was conducted in the following villages:

- Dmitrievka village in the Issyk-Ata district of Chui Province was selected as a village located close to the open water source - Issyk-Ata river. There are also 4ponds located in the village. Irrigation is directly dependent on the water level in the Issyk -Ata river;
- Internatsionalnoe village in the Issyk-Ata district of Chui Province was selected based on the fact that the village is constantly exposed to drought;
- Mady village in Osh Province was selected as the village that regularly suffers from floods.

The study based on three villages used methods of surveying, interviews, and focus group interviews.

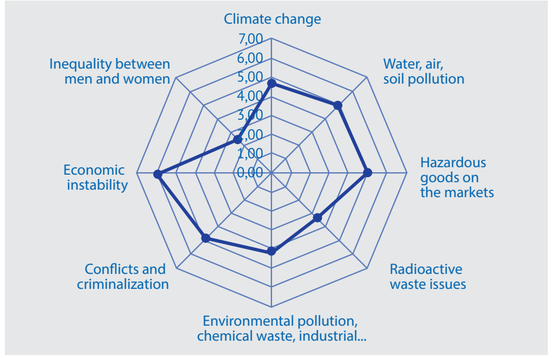
The respondents were selected according to the following methodology:

The number of respondents was calculated according to the number of households. On average, the sample contained 10-12% of the total respondents. Cluster sampling was used along with the definition of the respondents by age and sex. Random sampling method was used within the cluster. Error of the sampling design (DEFT- indicator) was 1.04%.

2.1. Public attitudes towards climate change

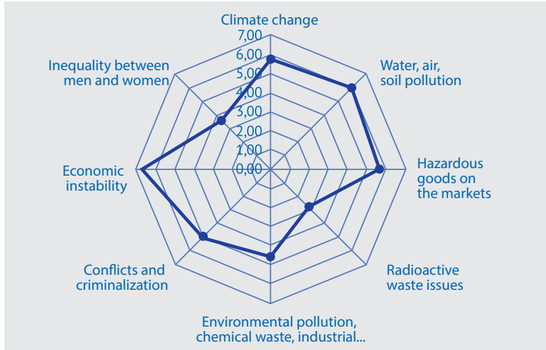
Climate change has been identified by the respondents as one of the priority issues along with economic instability and environmental pollution. Problem of dangerous goods in the markets, conflict and criminalization, chemical waste pollution, inequality between men and women is given the fourth, fifth, sixth, seventh and eighth priority respectively.

The most acute issues of the community



Female respondents voiced the issue of gender inequality more often than male respondents. Women also tend to be more worried about problem of hazardous goods on the markets and climate change.

The most acute issues of the community (male respondents)



The most acute issues of the community (female respondents)

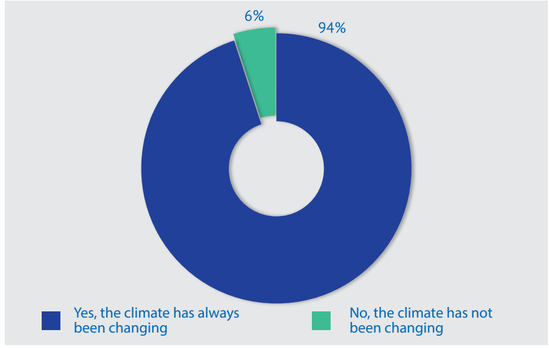
Men are more concerned with the issues of radioactive waste, conflicts and criminalization, along with the economic instability.

Over 90% of the respondents claimed that climate has always been changing; however, at the moment there are processes that are evident of climate change.

Female respondents expressed more concern about climate change and described the process as a negative phenomenon. The majority of male respondents perceive climate change as a negative process, but at the same time, a number of male respondents indicated that there are no such problems, or that climate change is a positive phenomenon.

According to data obtained from the study, only 6% of the respondents noted that they did not notice the changes in climate over the last 10 years. Male respondents, who felt that climate change is not happening, doubled the number of female respondents with the same point of view (12.2% of men and 6.4% for women).

Public opinion on climate change

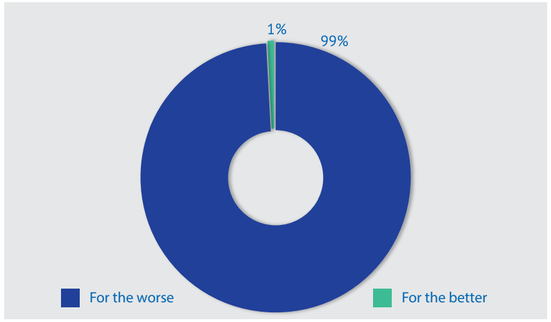


99% of the respondents indicated that the climate is changing for the worse, and only 1% of the respondents believe that climate change is a positive phenomenon. All the respondents who noted the positive nature of climate change were men.

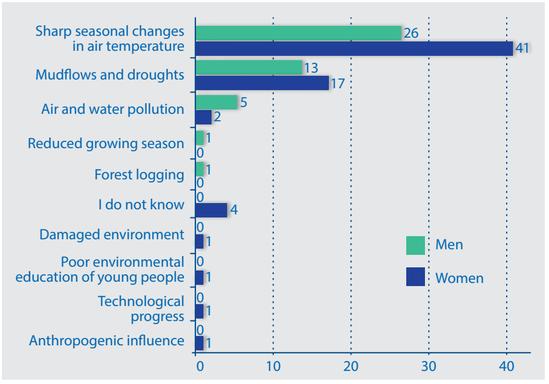
The population showed no clear vision concerning the connection between climate change and human activity. Cause and effect correlation is weakly traced. Thus, among the causes of climate change sharp seasonal changes in temperature and drought have been listed. I.e. some "natural" processes are taking place, albeit with a negative context.

Air and water pollution were also named as relatively important causes of climate change. Among other contributing factors, the following were identified: technological progress, anthropogenic influence, "poor environmental education of young people", deforestation/forest logging, damaged environment, reduced growing season. 3.5% of respondents had a hard time commenting on this issue. Men spoke more about the problem of forest logging and the reduced growing season, while women noted the sharp fluctuations in temperature. Not a single man gave the "I do not know" answer.

Public opinion on the nature of climate change



Role-based causes of climate change

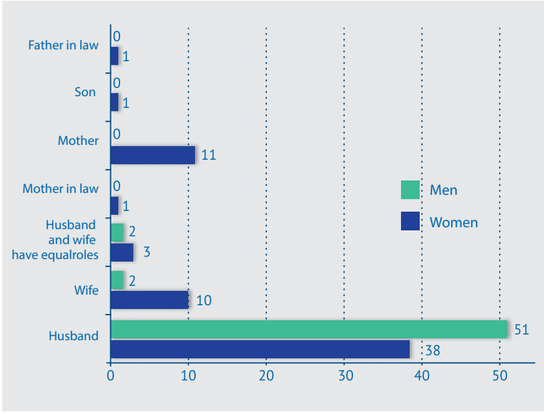


In the Internatsionalnoe village, the respondents indicated a full impact of climate change on their lives. Deterioration in health was highlighted. Headaches, variations in blood pressure, joint pain, weakness, anemia and allergic reactions are considered by the respondents to be a direct consequence of climate change. It is also noted that due to climate change, people's productivity has decreased; crop yields have reduced and mortality among animals has increased. People consider the following measures to be proper methods for counteracting the harmful effects of climate change: using the experience of their ancestors, for example, rotating the use of pastures, not buying products on the market and growing organic food, observing traditions of the ancestors and using them as tools in tillage or cultivation of livestock. The respondents in Mady village of Osh Province noted that in the past years it gets hot in the spring much faster, and air temperatures get cold earlier in the fall, sudden changes in temperature are observed throughout the seasons. Such a climate affects crop processing in the field, crop planting, and requires a construction of additional sheds for cattle.

2.2. Access to information, resource allocation and decision-making

Presence of gender roles was identified in the families of the studied households. Thus, in most cases (more than 70%) a husband was the head of the household.

Who is the head of your family?



In this case there is a difference in the perception of the primacy of the family between men and women. Men more often than women, celebrated their supremacy in the family. Men hardly celebrated female supremacy and never mentioned parents as heads of the household.

In 84.3% of cases, legal owners of farms are men, and such a pattern exists throughout the country. If there is no husband and older male child in the family, only in this case a woman is recognized as the owner of the farm. [86]

Furthermore, as studies have shown, [87] rural women have less time for marketing activities, less access to agricultural knowledge, fewer skills in running their own businesses. Agricultural reforms, such as privatization of agricultural enterprises, and the establishment of farms take place without the adequate participation of women, due to their poor representation in local governments, lack of sufficient resources and skills in the business of agriculture.

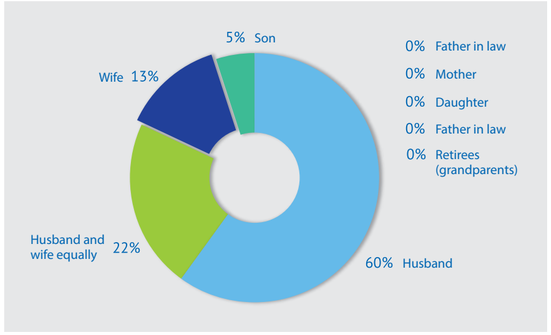
Thus, under the current trends, reduction of vital resources (water, food, productive land and pastures), will lead to further exclusion of women from the decision-making system, increase the vulnerability of the poor and increase the number of conflicts among the population.

It is curious to note the difference in mentality between the respondents in Chui and Osh Provinces. In Osh Province, in rare cases when the head of household is a woman, the respondents tend to clarify that the woman is the head of the family because her husband died and she had no other choice. Respondents in Chui Province did not specify the reasons why a woman is the head of family. Families in which men and women have equivalent roles constitute 4.2%.

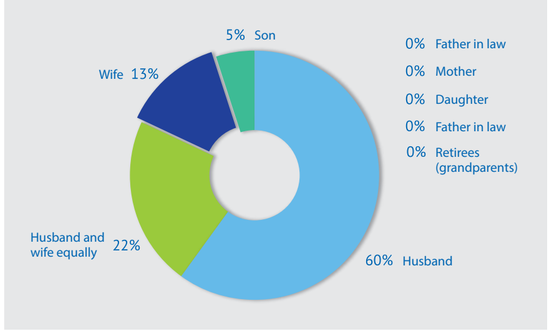
[86] Men and women in the Kyrgyz Republic. Collection of gender-disaggregated statistics. - Bishkek, 2011. p. 101.

[87] Gender aspects of integrated water resources management. Report on a study of representative households in the republics: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan and Uzbekistan. - Tashkent, 2005.

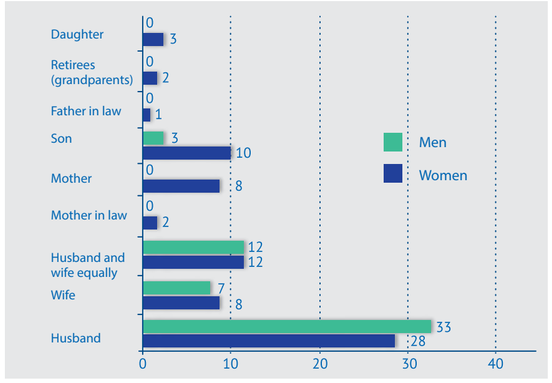
Sources of family income (male respondents)



Sources of family income (female respondents)



Who is responsible for family income?



In 47% of the cases, the man is the main provider of income in the family. In 21.3% of the cases, a woman is the main provider. In 19% of the cases both males and females carry an equal burden in ensuring family income.

Men tend to exaggerate their role in the family. According to male respondents, about 60% of the family budget is provided by the husband. According to the female respondents this number constitutes only 38%. Women also tend to underestimate their own contribution, with this in mind; female respondents indicated that their contribution to the family budget was at 11%, while male respondents estimated this number to be 13%.

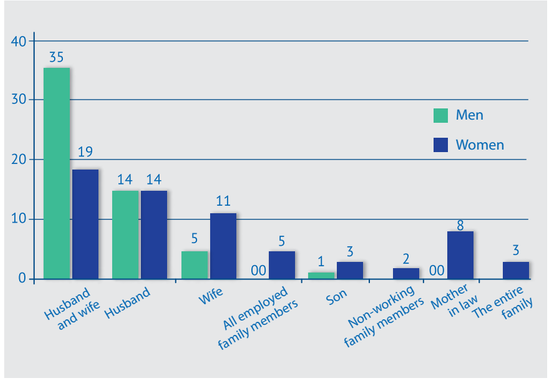
Among the respondents in Chui and Osh Provinces gender attitudes related to the fact that men are the core providers for the family, and not women were identified.

The respondents in Mady village of Osh Province noted that women and men earn almost the same income; they just have different income opportunities. Women work more in the fields than men. Men have more freedom; they have the opportunity to earn money outside of the village, as they are not responsible for taking care of the elderly and children.

In 45 % of the cases, men and women make joint decisions on the use of family budget. In 26.7 % of the cases, this role belongs only to men and in 20% of cases – only to a woman. The level of joint decision-making by all members of the family does not exceed 10%. The opinion of non-working family members is considered only in 2.5% of the cases.

Men called a much smaller range of subjects on the family decision-making agenda than women.

Roles in the decision-making process on budget planning



On the issue whether the income of women and men is at the same level, the respondents in Internatsionalnoe village did not come to an agreement. Part of the respondents claimed that men have more opportunities to earn money but this money does not "reach" home. Another group of the respondents stated that women bring more money home than men, and it does not mean that women have better income opportunities. Women often pour their entire income into the family.

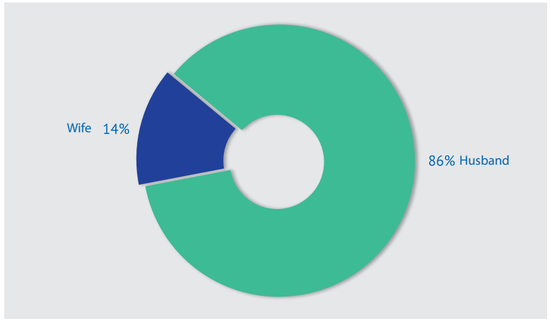
Number of pension receivers and average pensions in the Republic for the year 2011 (End of the year data, according to the Social Fund of the KR)

	Number of people receiving pensions		Average pensions size in Kyrgyz Som	
	Women	Men	Women	Men
Kyrgyz Republic	359780	186081	3368	3755
Batken Province	28627	16252	2997	4322
Jalal-Abad Province	61050	32556	3072	3359
Issyk-Kul Province	32415	20121	3138	3581
Naryn Province	28697	16207	3283	3955
Osh Province	67464	39355	3142	3428
Talas Province	14921	8313	3106	3548
	14921	8313	3106	3548
Chui Province	61600	25603	3441	3882
Bishkek city	51464	21211	4415	4958
Osh city	13542	6463	3327	4203

Women report a greater role of a wife in the distribution of the family budget than men. These data indicate a low-income of the rural population, much of which is spent on family meals.

In the surveyed villages, female member of the local councils made up 13.6%. Out of 11 council members in the Internatsionalnoe village, only 1 was a female.

Local council members



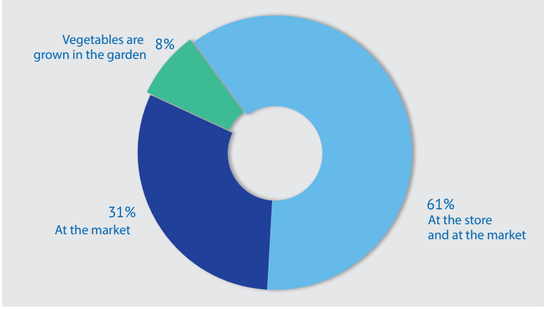
2.3. Access to land, pastures and irrigation

The vast majority of land owners are male. 64.17 % of the respondents do not give land shares to their daughter if she gets married. 11.67 % - give. 2.5 % said that if the daughter wants to, they would allocate het a share of family land. 1.67 % said that land owners rarely allocate property in favor of the daughter. 20% of respondents did not know the answer to this question.

Thus, gender inequality in access to land is fixed in the existing practice of allocating land plots. At the same time, according to the respondents, women in Osh Province spend more time working on land than men.

Due to the projected decline in precipitation and irrigation water after 2025, the area of sown fields may reduce, which will cause a decrease in crop yields. This will inevitably have an impact on food security, particularly in the most vulnerable areas. Reduction of food can lead to malnutrition and hunger, which will have a long-term effect on health, particularly among children.

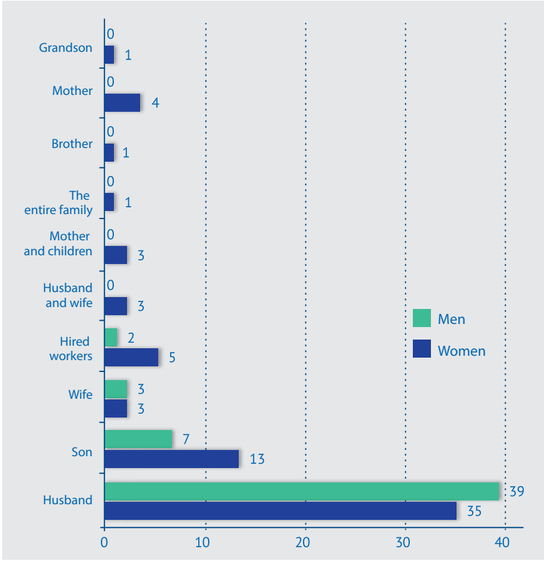
Where do you get your products from?



An overwhelming number of the respondents buy food at the markets and in the stores. 31% of the respondents exclusively shop at the markets. 8% grow vegetables in the garden. Generally, the function of purchasing groceries is performed by women (61.3 % of cases). In 14.4% of the cases, the responsibility for purchasing groceries is carried out by the husband. In 15.9% of the cases, the spouses jointly buy groceries.

After the dissolution of "Kalinin" collective farm in Dmitrievka village, agricultural land was distributed to the collective farmers and residents - 0.9 hectares to each, employees and their families received 0.36 hectares, and the rest of the residents - 0.18 hectares each. There are currently 350 registered farms. According to the Ail Okmotu, around 60% of land owners are men. Due to migration, during the sale, land shares are being registered in the name of one person, not in the name of the family. Most often this person is a man.

Role-based irrigation responsibility



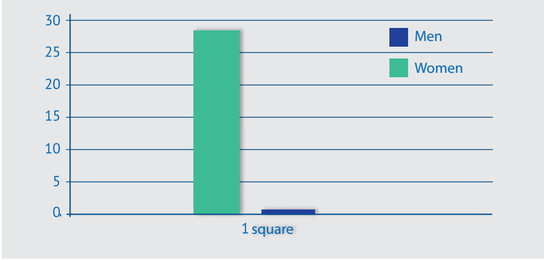
The main sources of income in villages are: livestock (48%), agriculture (40%), and service sector (12%).

In Internatsionalnoe village, more than 80% of land owners are men: in 396 of 495 households.

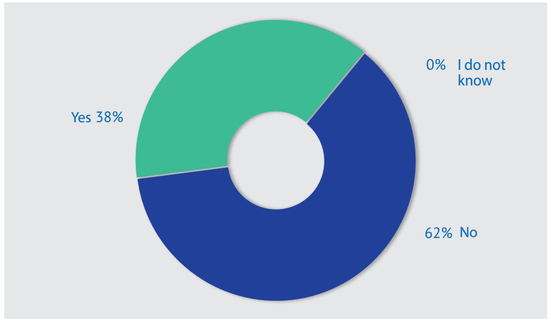
Access to irrigation water shifts along with the access to land.

Over 60% of the respondents said that the responsibility for irrigation of land lies on the husband, and the second most common response was the responsibility of the son. Women highlight more family members who are involved in the irrigation process, compared to men, but the overall picture remains the same. Traditional gender roles stipulate that men are responsible for irrigation of the agricultural land, while weeding, crop processing, and harvesting is performed mainly by women and children.

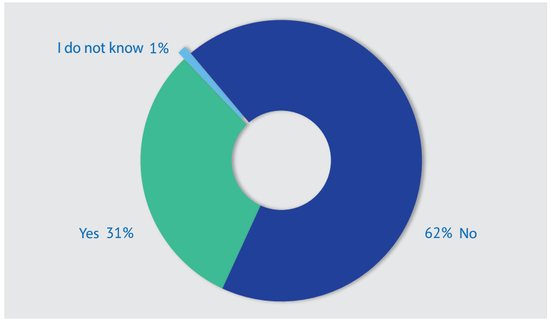
27.5% of the respondents were members in the WUA or RPAWU (Rural Public Association of Drinking Water Users), of whom less than 50% were women. 40.83% of the respondents are not members of such structures and another 31.7% are not aware whether they are members or not. Women constituted 50% more of the respondents who did not know the answer to this question, which indicates low awareness and participation of women in the decision-making process on the use of water. As a rule, the WUA, RPAWU, and Jayit Committees (executive body of farm land users) consist of landowners.



Do you partticipate in the decision-making process in regards to irrigations water? (male respondents)



Do you partticipate in the decision-making process in regards to irrigations water? (female respondents)



In each of the studied villages an established Water Users Association existed. Its main function is the distribution of irrigation water, as well as fundraising for water. In large towns such as Mady, WUA includes 10 people, smaller settlements (Dmitrievka and Internatsionalnoe villages) - up to 5 people. In the study, we used data on the composition and abundance of AVP not only from Mady village, but the other three villages were included in the AO. Among the employees (38 people) of Water Users Associations (WUAs) in the studied communities, only one was a woman - an accountant in the Dmitrievka village WUA.

In assessing the involvement of different groups in the decision-making process regarding the distribution of irrigation water, 65% of respondents said that they were not involved in decisions about water and 1% did not know whether their household is involved in decision-making or not. Among the respondents who do not participate in decision-making about water and do not know the answer to this question, women were the majority. 34% responded positively, (positive responses among men prevailed).

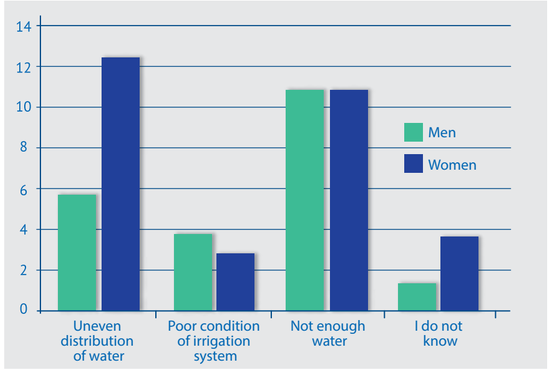
During clarification of responses, almost all women said they do not participate in decisions about water, but know it from their husbands.

75% of the respondents indicated that they are experiencing problems with irrigation; problems with uneven distribution of water and noncompliance with taking turns in water use, poor condition of the irrigation system, and interruptions in the supply of water from the canal.

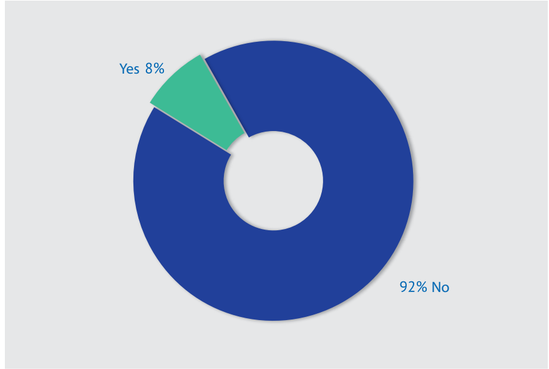
Women express greater discontent with water distribution, while men are more concerned about the condition of the irrigation system. The general issue of water scarcity is of equal concern for women and men. Women expressed lower awareness of these issues.

19.9% of the respondents do not have any problems with irrigation. 5.2% did not know if there are problems or not, as they are watering only the garden, and had sold the land share. Thus, in Dmitrievka village, only 52 % of the population has access to irrigation water.The majority of the respondents are not members of pasture committees.

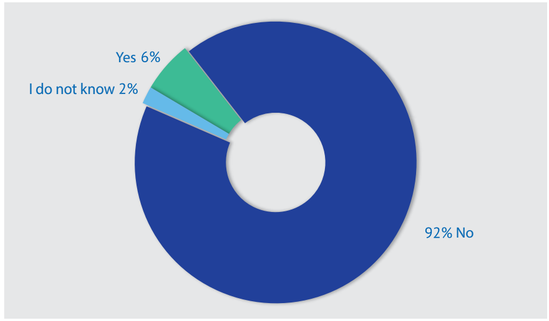
Problems with the distribution of water



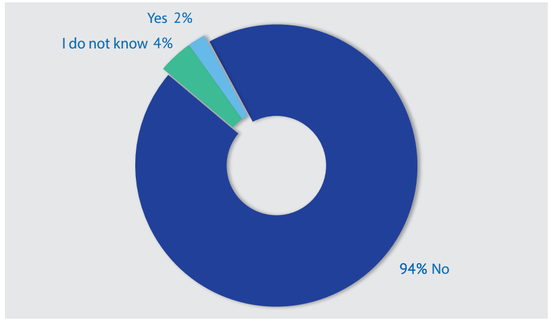
Membership in the Jayit Committee (male respondents)



Membership in the Jayit Committee



Membership in the Jayit Committee (female respondents)



Men, however, showed greater awareness about this issue and could accurately answer the question about the pastoral committees. A high percentage of women did not know whether anyone in the family was a member of Jayit Committees. Among the respondents, not a single woman was a member of Jayit Committees.

Among the analyzed Jayit Committees only one had a female member (Internatsionalnoe village), she served as an accountant. The respondents reported that members of Jayit Committees are often cattle breeders.

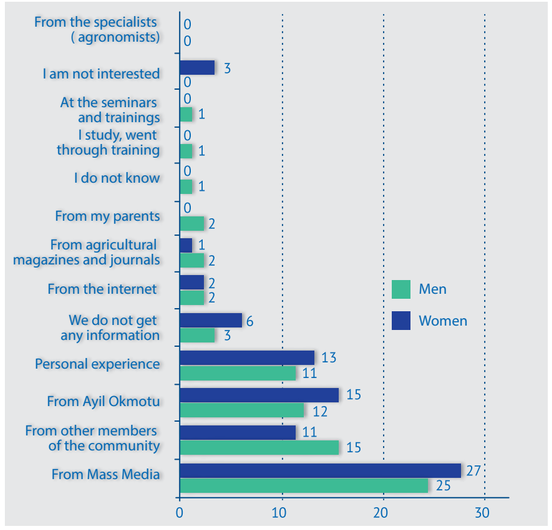
Only 6% of the respondents are members of Jayit Committees. Typically, a member of the Jayit Committees is head of the household, who is also the land or home owner. 89.2% of the respondents did not participate in decisions on the use of pastures.

If we compare the answers of the respondents according to gender, we can see that the majority of women get their information from television, friends and acquaintances as well as the print media, rather than from their husbands. Seminars and special training courses are sources of information in 7.5% of the cases. However, the proportion of women receiving information through participation in such outreach activities is lower than that of men. All women admitted that they always share the received information, while among men the proportion of those who only occasionally share information with others is 14.3%, and 3% of them never share information with others.

In Mady village of Osh Province, the information provided by AO and information received through interaction with other members of the community is of high importance for both men and women; whereas in Internatsionalnoe and Dmitrievka villages a more significant source of information was media.

43.33 % of the respondents said that the decision about what to plant and how to grow cattle is made by the husband; in 27.5% of cases both husband and wife made these decisions together; in 15% of cases such decisions are made by a woman alone. In other cases, the decision is also made by men.

Where do you get your information on agricultural issues?



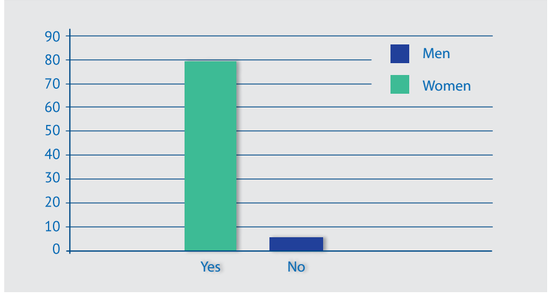
Girls and young women in the Dmitrievka and Internatsionalnoe villages are more informed about innovation than older women, because they have access to the Internet, and they are sent to various training courses in the city. There are also agricultural journals in the village. Ail Okmotu updates the information on innovations (there is a responsible employee, head of AO is also active in this respect, information about innovations and updates are always posted for all to see on the information board). Girls in Mady village, on the contrary, are less knowledgeable on these issues than women.

In the context of climate change and the abrupt transformation of temperature amplitudes, the increase of conflicts over natural resources is predicted (for example, between pasture owners, local communities, and mining companies). It is important to increase the participation of local communities, including women and youth, in the process of managing and controlling natural resources.

2.4. Access to Energy and Technology

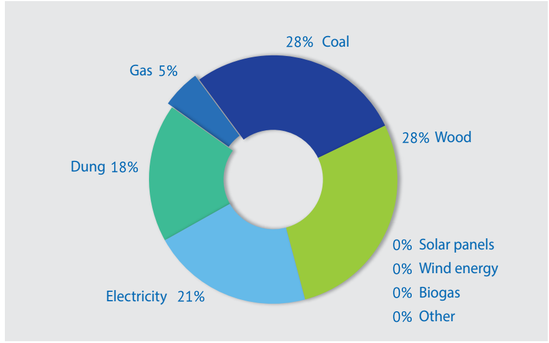
Energy and transport are two spheres dominated by men; decisions in these sectors tend to move in the direction of addressing the needs of men. However, it is necessary to focus on the basic needs of households and consumption patterns to ensure energy security.

Have you insulated your house in the last 10 years?



86.6% of the respondents insulated their homes due to climate change. Greater awareness on this issue was expressed by women.

What type of fuel do you use?

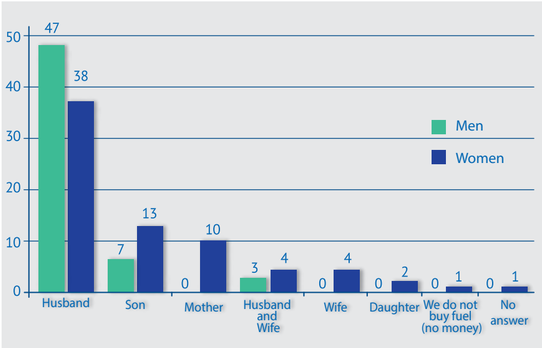


The majority of the respondents use charcoal and firewood. Fuels, such as biogas and wind energy are not used at all. Solar panels were used in one case out of all cases studied. The respondents did not name any types of alternative fuel that was not mentioned in the questionnaire.

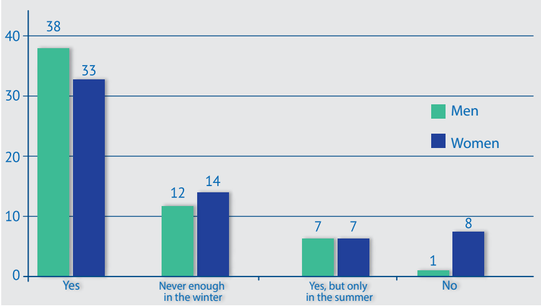
At the household level the load on the implementation of reproductive functions are also distributed unevenly. The most significant types of activities in terms of greenhouse gas emissions are house heating, cooking, and transportation.

In over 80% of the cases the responsibility for purchasing and delivering fuel lies on the men. In 5.38% of the cases, both husband and wife have equal responsibility. Only in every 25th case, or in 4% of all cases, women are responsible for purchasing and delivering fuel.

Role-based responsibility for purchasing fuel



Do you have enough electricity?



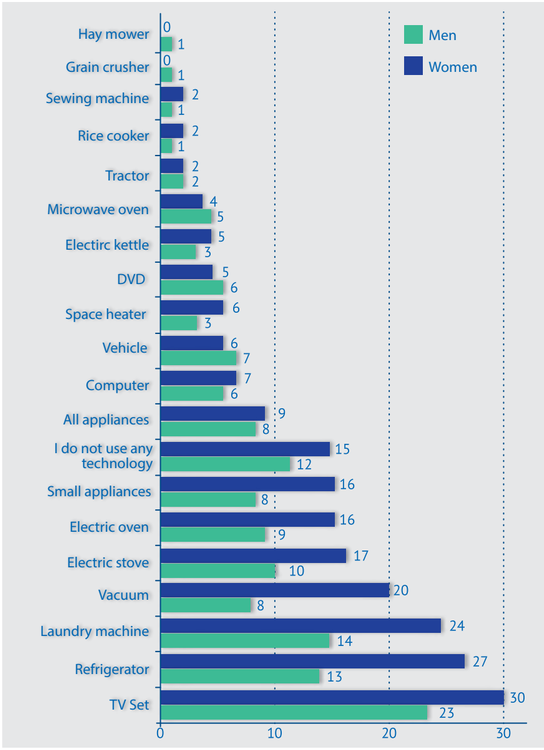
The respondents said that in general, most of them lack electricity, and electricity shortages are most associated with seasonal consumption. In this case there is a difference in the responses of men and women - women are more unsatisfied with energy security than men.

Women and children spend more time at home, and are more sensitive to temperature and microclimate inside of the house; they are under greater risk of inefficient heating appliances and furnaces.

33.3% of the respondents indicated that they cannot use any alternative forms of energy. 23.3% said that they did not know whether they can use alternative energy or not. 30.8% of the respondents consider electricity generators to be an alternative source of energy. 1.7% reported that biogas can be an alternative to electricity. 8.3% of the respondents favored the use of solar panels, and 2.5% mentioned natural gas.

Low access to effective domestic technologies - energy efficient furnaces, and safe cooking stoves, on the one hand result in the increased greenhouse gas emissions and inefficient waste of natural resources, and on the other lead to health problems and spread of poverty. For example, the use of inefficient stoves and furnaces in rural areas in Kyrgyzstan leads to excessive fuel consumption, logging of the nearby forests and shrubs, which reduces the capacity of the ecosystems to regulate climate and water retention.

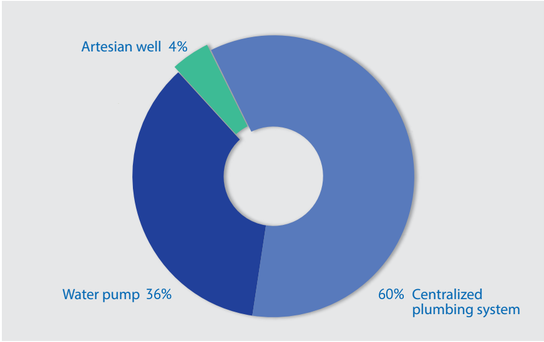
What technology do you use?



63.4% of the respondents believe that listed technology is energy-efficient, 36.6% do not know whether or not it is energy efficient.

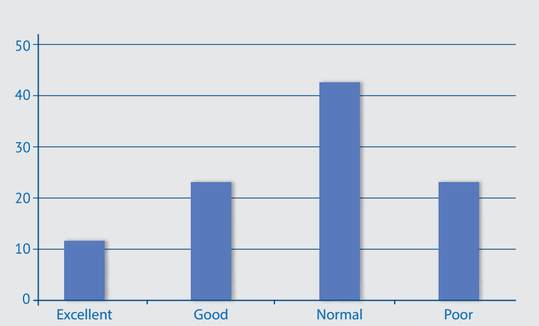
Water sources

In most cases, the population receives water from water supply systems, 36% of the respondents get their water from the wells outside or within the courtyard. In 4% of the cases, there are artesian wells in the yard (in Chui Province). These wells exist as alternative sources of water.

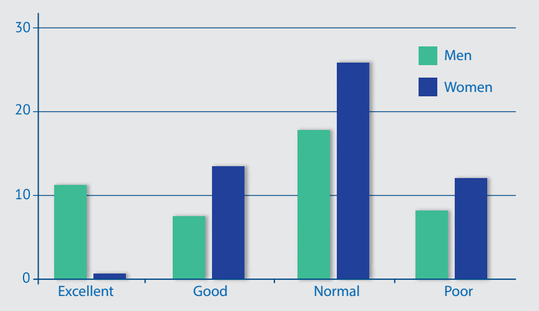


The sex of the household head is significant in regards to access to safe drinking water: access to clean drinking water is higher in the “female-controlled” households than in the “male-controlled” households.

Water quality assesment



Water quality assesment



The majority of the respondents assess the quality of water as normal. 22.5% of the respondents consider water to be of good quality and the same number defines it as bad quality. 11.7% of the respondents rated the quality of water as great. In all pilot communities men gave higher ranks to the overall water quality than women. This is explained by the fact that in almost 99% of the households, the function of water purification, food preparation, and laundry is the responsibility of a woman.

Male respondents more frequently ranked water quality as excellent, while women highlighted disadvantages and problems associated with the quality of drinking water.

The vast majority of the respondents do not purify their water. 26.5% of the respondents purify water from time to time, when the water is visually contaminated. 24.8% boil their water, 5.8% skim it, and 3.3% of the respondents purify their water through special filters. Women turned out to be better "experts" in this matter, as they could identify the methods of cleaning water, as well as when and how they do it.

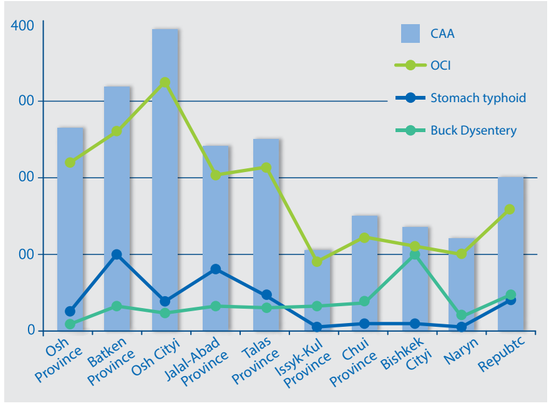
In all the studied villages Countryside Drinking Water User Unions (CDWUU) have been established and are operating. Leadership positions in three villages are occupied by men. Accountants and controllers are mostly women, and in Mady village 100% of CDWUU members are male. Workers are also men.

Water scarcity, and, consequently, low access to clean water, especially in rural areas, is directly correlated with the increasing evidence of diarrhea. Statistics show an increase in household spending on fuel consumption (up from 14.7% in 2006, to 15.2% in 2010). In the meantime, spending on clothing has decreased (from 57.7% to 42.8%) and from personal care products (from 12.9% to 10.2%).[88]

Due to shortage of water, a family often neglects hygienic measures for the sake of more "important" water needs, such as drinking and cooking. The negative impact of unsafe drinking water and reduction of sanitary levels will affect women and children.

[88] Report "Epidemiological analysis of morbidity due to water factor" chief specialist SES, Otorbaeva D.S., Bishkek, 2011.

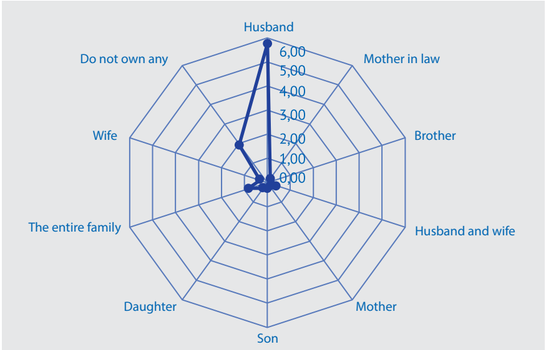
Water-related diseases in the Kyrgyz Republic disaggregated by regions (average annual values between the years of 2000 and 2010 for 100 thousand people)



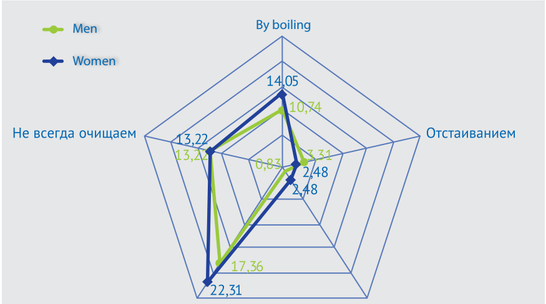
Frequent illnesses of family members, particularly children, (intestinal diseases due to lack of water for hand washing in schools; colds, due to inconvenient location of toilets far away from the school buildings, etc.) are the reason that women are forced to spend more time on childcare.

Mortality from some parasitic and infectious diseases remains traditionally high among both female and male population. Moreover, male mortality is clearly predominant. This notion once again demonstrates the need to develop an adaptation strategy based on gender-sensitive indicators.

Who is the land owner in your family? (female respondents)



How do you purify your water?



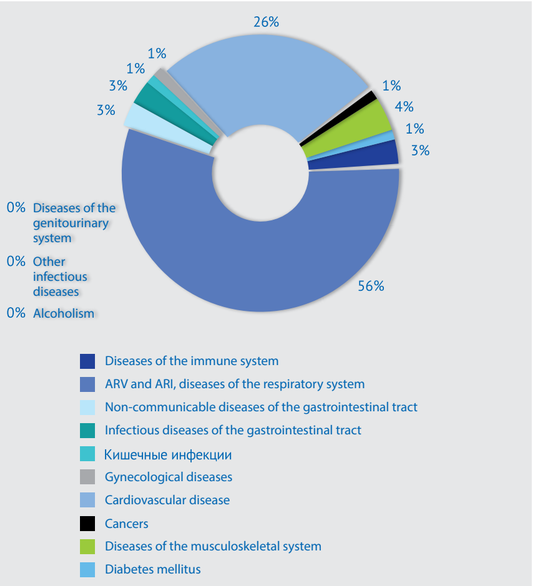
Villagers often have water supply in their yards and also use water from the fenced and unfenced springs not far from home. Rainwater collected in the tanks, and water from plastic canisters is equally used by village and town dwellers. Village dwellers mention the lack of water for permanent use nearly three times more often.

These gender-disaggregated statistics [89] show that women spend most of their time to care for the sick and elderly family members in comparison with men. Deterioration of water quality and increased incidence of diseases related to water will intensify the pressure on women, which will reduce the opportunities for women in the labor market and, consequently, decrease their income, leading to poverty.

Access to clean drinking water is one of the most pressing problems in the Dmitrievka village. By the time the CDWUU "Jeek-Suu" was created, deterioration of the pipes was at 60-65%. In 2008, within the ARIS project, some of the pipes were replaced, asbestos cement pipes were laid, and, according to the residents, now sprout roots of trees grow into and through these pipes, and water gets polluted, and does not pass through the pipes. Residents get their water from public drinking water sources, according to the respondents, an outbreak of intestinal infection took place in the village in the summer (according to the MOS, in 2012 19 people got sick with hepatitis, and 43 people with intestinal infections). Many people dig out artesian wells. It costs from 200 to 400 dollars. Thus, the poor are most vulnerable to this problem.

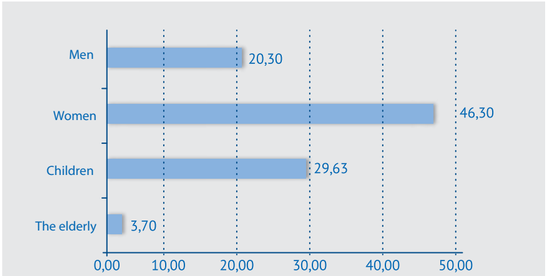
2.5. The impact of climate change on health

Most common illnesses



[89] Women and Men in the Kyrgyz Republic. - Bishkek, 2012.

Who goes to the doctor most often?



Most often the respondents suffer from colds and diseases of the cardiovascular system. The share of infectious diseases of the gastrointestinal tract is 3%, the share of intestinal infections - 1%.

Most often, doctors treat women and children, men and old people go to the doctor 4 times less. 42% of the respondents go to the doctor for illness, 3% - out of necessity of mandatory scheduled checkup. 54.6% of the respondents do not seek medical assistance from the doctor whatsoever, but clarify that this does not mean that they do not get sick. Resentment of medical treatment is caused by distrust in the quality of medical services and the cost of such services.

As the interviews have shown, the respondents mainly seek medical help in the MOS, clinics, and in rare cases, in the regional hospitals. Men often noted that MOS do not provide the entire spectrum of medical care, for example, there are no specialized doctors. Some respondents in Mady village indicated that in the event of health problems they turn for help to traditional healers. Most women seek traditional methods of treatment.

Explaining the strategy of skilled care avoidance, more women than men complained about the expensive drugs and medical services, distance to the hospital, and the poor quality of services.

With this in mind, men are twice as likely to appeal to urban and national health care, where more qualified help could be provided. This is due to higher male mobility and low mobility of women, especially pregnant women and young mothers, who are in the most need of skilled care.

2.6. Maternal and Child Health

The number of pediatricians and gynecologists has reduced since 2005. Thus, the number of pediatricians for every 10,000 children aged 0 to 14 years has decreased since 2005 from 6.2 to 4.3, the number of obstetrician- gynecologists from 4 to 3.7.[90] Economic conditions, as well as unwillingness to lose income from work, lead to the fact that women essentially do not take maternity leave. Without the status of formal employment, pregnant woman carry heavy workloads all the way until they give birth. Most women continue to bear the burden of housework and care for family members, combining it with the income-generating activities in the informal sector.

Labor migrants from Russia and Kazakhstan often come very late for registration of pregnancy. (Mady v.)

Employed women are working until the last moment and come in to the UCM with a bunch of neglected diseases. (Internatsionalnoe v.)

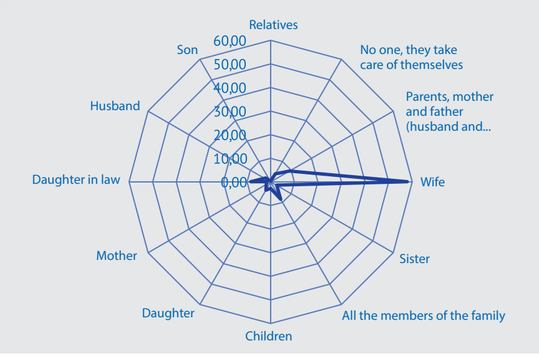
Young women and daughter in law often do not have their own money to pay for the tests that need to take place each month. It costs about 100 som, moreover, they would need to spend money on travel, money that they do not have. (Mady v.)

[90] Analysis of public expenditure on the social sector in the Kyrgyz Republic for 2007-2010.

The overall incidence of child morbidity is growing. Most common cases are infectious and parasitic diseases. One of the most pressing problems is the health of school children. None of the schools in the surveyed villages have sewer systems. While only 70.4% of the republic's 2,191 schools have sewer systems, the number of health workers in schools is less than 40%.

Studies have shown that parents do not know the symptoms of disease and are often late to seek medical assistance.

Who takes care of the sick in the family?



In households the function of nursing the sick and the elderly is assigned to a woman by gender, the man performs this function only when its fulfillment by a woman is impossible. In most cases, women take care of the sick in the family. Men take care of the sick only in every 20th case. In 15% of the cases, nursing is carried out jointly by men and women.

People in the village do not take leave to care for the sick, thus, there is an extra load of unpaid labor that falls on women's shoulders.

MOS operate in the surveyed villages, and have 4-6 paramedics. In all the villages 100% of the MOS staff are women.

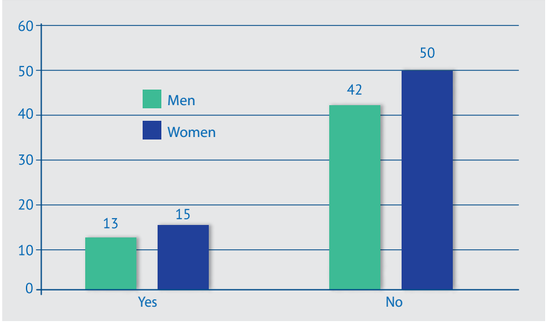
Thus, we can say that there is a steady flow of migration within the country, aimed at areas of the capital and Chui Province. Thus, in 2010 the population of Chui Province increased by 2,809 people only due to the internal migration, in Bishkek this number grew by 5,424. We can predict a surge of problems related to sanitation and access to clean drinking water (as well as the emergence of social conflicts related to these issues) in Chui Province and in Bishkek, where the existing infrastructure cannot cope with the growing demands.

Intensification of sanitation and hygiene issues will be observed in the studied areas where there is an outflow of workable, economically active population, and lack of financial and human resources is tangible (educated people, doctors, teachers) and can become a major force in addressing these problems.

2.7. Vulnerability to emergency situations and ecological risks

23.3% of the respondents mentioned that their family members have suffered from natural disasters, and 76.7% answered that there were no casualties. In general, people suffered from mud-slides and droughts. Damages are a result of mud-slides that destroy homes and agricultural crops, in some cases, the respondents had limb injuries of varying severity, also drought destroys crops and pastures.

Have your family members suffered from natural disasters?

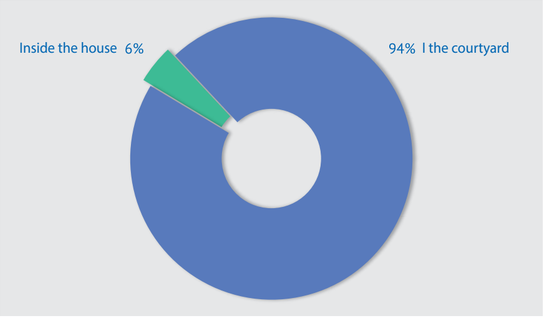


Women in Mady village mentioned that despite the mudslides, residents of two villages were not given a tax break. For instance, in 2012 mudslides occurred 4 times, thus, farmers needed more seeds than in previous years, in order to grow crops. Residents hoped that local authorities would offer them a tax break (land tax and water tax), but this did not happen.

The environment is getting worse. Harvest yields have decreased, and health conditions of people living in dangerous zones, with the threat of emergency situations, have worsened.

> Women are laughing that children are over-trained for emergencies; if they hear anything strange during the day or at night, they run out of the house and run towards the hills. They have learned to protect themselves, but living in constant fear is not good either.

Toilet location

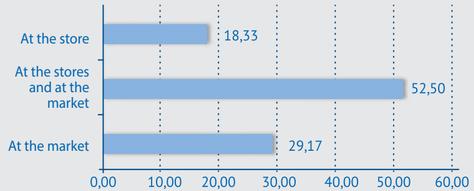


In the majority of the cases, the toilet is located outside of the house; only in 6% of the cases is the toilet located inside the house. All the respondents who have indoor toilets also have one outdoors. Women noted that lack of a comfortable, warm toilet and water inside of the house causes inconveniences and health problems.

When purchasing goods for their children, the majority of the respondents look for quality (77.9%), low price is on the second place (19.8%), and 2.3% of the respondents do not have an idea what criteria is used by their wives when purchasing goods for their children.

Thus, the field-study confirmed the basic conclusions regarding gender-specific effects of climate change in workload distribution, power, and access to resources. The main areas are dependent on access to natural resources (water, land, pastures) and health status. The existence of gender-specific norms in the society, as well as

Where do you purchase goods for children?



reforms that take place without gender mainstreaming, make women more vulnerable to the economic and environmental challenges. Given the dynamics of the environment shown in the First and Second National Communication on Climate Change, it is necessary to take adaptation measures and reduce the risk for the population in the context of future changes. Strategies and adaptation measures will differ for regions, settlements, and for the social groups. In the given context, the gender component is most significant, as inadequate consideration and involvement of women in decision-making process is about the future, may lead to the reproduction of poverty, increased vulnerability to climate change risks and poor performance of adaptation strategies in general.

CONCLUSIONS

- The Kyrgyz Republic recognizes problems associated with climate change, which is confirmed by meteorological observations. There is major international interest on the issue. However, the policy of adaptation to climate change is in the formation stage and is reactive rather than proactive in nature, which results in the absence of long-term, socially-oriented measures aimed at adaptation to climate change;
- There is a substantial institutional gap between the climate and gender discourses, which is reflected in the virtual absence of gender mainstreaming in climate programs. Lack of gender analysis of climate change effects and other aspects of the ecological crisis leads to a lack of a clear picture of the distribution of risks for different social groups. As a result, programs developed without these data will not be effective. Performance indicators of public policies are gender and environmentally blind and ultimately lead to an asymmetry in the concentration of wealth (or material well-being) and increasing inequality, including gender inequality;
- Women and children are more vulnerable to the adverse effects of climate change due to poor access to resources, information, and decision-making process, etc.
- At the level of local government structures (local councils, village administration, WUA [91] Village Associations of Drinking Water Users (VADWU), "Jayit" committees, etc.) a significant gender misbalance is evident in favor of men. The exclusion of women from the decision-making system on access to natural resources such as water, land, etc. is observed;
- In the context of climate change and the abrupt transformation of temperature amplitudes, decline of vital resources can cause an increase in conflict situations, which will lead to further exclusion of women from the decision-making system, and increase the vulnerability of the poorest; According to the Second National Communication on Climate Change, the rise of social tensions will take place in the period from 2050 to 2100, when the predicted peak of water decline will take place in the region.
- Increasing trends of respiratory, cardiovascular and infectious diseases are highlighted as health issues with a direct correlation to climate change. The level of overall child morbidity is increasing with prevalence of infectious and parasitic diseases. A relevant issue is the health of school-age children. A large percentage of rural schools are not supplied with sewage systems and lack the appropriate conditions for promotion of personal hygiene habits;
- Deterioration of drinking water quality and an increase in the incidence of water-related illnesses increases the burden on women, and also reduces the opportunities for women in the labor market; consequently this leads to a decrease in revenues and further instills female poverty;
- Very few studies of the effect of climate change on the structure and dynamics of the disease in terms of the gender component are being conducted, which serves as barrier for adapting preventive measures for gender-sensitive adaptation of the population and health systems to climate change;
- The shortage of professional capacity of doctors has been on the rise since 2005, the number of pediatricians and obstetricians is in decline. The number of pediatricians for each 10,000 children aged 0 to 14 years has decreased from 6.2 to 4.3 in 2005, and the number of obstetrician-gynecologists fell from 4 to 3.7. [92]

[91] Among the employees of Water Users Associations in the studied communities of 38 people there was only one woman.

[92] Analysis of state expenditure on the social sector in the Kyrgyz Republic for 2007-2010.

This fact will inevitably have an effect on the condition of medical services for women and children, who according to climate change predictions will be in greater need of these services.

- Health care institutions are facing new challenges arising from climate change and are not ready for the upcoming changes with the existing trends, such as: the outflow of professionals, residual value financing, and lack of long-term strategies;
- There is a growing gap in living conditions between urban and rural areas, and there are persistent trends in the decaying infrastructure in the regions. A further increase in social inequality will lead to the unequal distribution of risks associated with climate change and environmental crisis, and an increase of the burden on the most vulnerable social groups, including women;
- Low-quality housing, even urban, (apartment blocks) will increase the impact of climate change on humans, as extreme heat increases the discomfort of living in buildings with inefficient ventilation, and frequent precipitation causes leaks and mold. The situation is often complicated by the dilapidated state of the utilities and their poor management, especially in the field of water supply and sanitation;
- Climate change leads to drought, reduced crop yields, poor quality of food and food shortages. Exacerbated security problems of production, storage and marketing of food, prevention of waterborne food poisoning and infections, the launch of social mechanisms of redistribution of resources at the level of local communities and families gets activated. Femininity norms are being restores, and are associated with low food intake "slenderness, fragility, etc.", which leads to poor and unbalanced nutrition among women and girls, and as a consequence causes poor health conditions and lowers the body's immune system;
- Household responsibilities of women, their role of stewards of natural resources in the community gives them all the advantages in the development of strategies to adapt to the realities of environmental change, but at the same time, the environmental degradation has a negative impact on women and children. In order to mitigate the effects of climate change, women must be seen as important actors in the distribution of resources and conflict reduction. Women have the experience and knowledge for establishment of sustainability of their communities to the growing natural hazards.
- It is necessary to increase the role and participation of women, without it, the strategy for reduction of climate change risks for the whole community cannot be developed. Projects, policies and programs for climate change reduction will find meaning and will be successful only if interests of the entire community are taken into account, including children and women.
- In the next twenty years the country's capacity to adapt to climate change will be determined by complex socio-economic factors and inherited issues, namely: the environmental degradation (as a consequence of a decrease in access to natural resources) and the unsatisfactory state of life-supporting infrastructure.

At the community and household level

- The impact of climate change is perceived by the public as one of the priority issues along with economic problems;
- The problem of inequality between men and women is more active in women's discourse. Women, more often than men, are alarmed with problems of hazardous goods on the market, criminalization, chemical waste pollution, inequality, the negative impact of climate change in connection with a possible decrease in income and an increase of diseases;
- Women and children more often turn for help to doctors; men and elderly people seek medical help 4 times less often. 42% of the respondents go to the doctor when ill, 3% - out of necessity of scheduled inspection. 54.6% of the respondents did not seek medical attention even in the presence of disease. Resentment of seeking medical treatment is associated with distrust to the quality of medical services and the need for financial costs in the case of treatment;
- As the interviews revealed, the respondents mainly turn for treatment to medical and obstetrical stations, clinics, and in rare case – to regional hospitals. Men often noted that medical and obstetrical stations do not provide the necessary medical care, for example, there are no highly specialized doctors. Men are twice more likely than women to turn to urban and national health care institutions that provide more qualified help. This is due to the higher mobility of men and low mobility of women, especially pregnant women and young mothers, who are in a dire need of skilled care;
- Institutional mechanisms for knowledge spreading and security provision in local communities (medical and obstetrical stations, hospitals, schools) are funded on a residual basis and are not ready for the challenges imposed by climate change. Systematic power outages and poor quality of power supply cause uncomfortable conditions in educational and medical institutions, and as a result impair patients' access to health services, and negatively affect people's health, negatively affect the nurses, teachers and students, who are predominantly female. In the winter health workers are making a lot of effort to create appropriate conditions in health facilities, when they could use this time for disease prevention not only among women and children, but also men who, due to the prevailing gender stereotypes, seek medical help extremely rarely, and only during the acute course of the disease;
- Due to climate change, the issue of access to safe drinking water prevails. The vast majority of the respondents do not purify the water. 26.5% of the respondents purify water from time to time, when the water is visually contaminated. 24.8% boil water, 5.8% - skim water, and only 3.3% purify water through special filters. Women turned out to be better "experts" in this matter, as they could identify the methods of cleaning water, as well as when and how they do it. Women are more aware of the problems related to water quality, while men tend to focus on infrastructure issues. In the households where women are the "head", access to clean drinking water is higher than in the households with "male control";
- Men tend to exaggerate their role in the family. According to male respondents, about 60% of the family budget is provided by the husband. According to female respondents this number constitutes only 38%. Women tend to underestimate their own contribution, and with this in mind; female respondents indicated that their contribution to the family budget was at 11%, while male respondents estimated this number to be 13%, the rest of the contribution was attributed to the participation of other family members (parents of the wife/husband, children, etc.). Economic conditions, as well as the unwillingness to lose income from work lead to the fact that women do not use maternity leave. Pregnant women who do not have the status of formal employment bear heavy workloads all the way to birth giving. Most of them continue their housekeeping chores and care for family members, combining these deeds with the income-generating activities in the informal sector.
- At the household level, the load on the implementation of reproductive functions is distributed unevenly. Women spend more of their time on care for the sick and elderly family members than men.
- Children and women spend longer time periods in poorly heated rooms than men, and thus, are more likely to have health prob-

lems. For example: Power outages and poor quality of power supply in educational institutions reduces the health of students and teachers, who are predominantly females. Domestic difficulties caused by the low availability of clean water, and electricity have a negative impact on the health of children and women, more so than in men. At the same time, in over 80% of the cases, the responsibility for the purchasing and delivering fuel to the households lies on men;

- Women and children are increasingly suffering from inadequate power supply, as this limits the use of household appliances, and requires more effort in housekeeping. The respondents showed low capacity in adaptation to climate change: 33.3% of them indicated that they could not use alternative forms of energy, 23.3% said that they did not know whether they can use alternative energy or not. 30.8% of the respondents consider electric generators to be an alternative form of energy. 1.7% reported that biogas can be an alternative to electricity. 8.3% of the respondents favored the use of solar panels, and 2.5% indicated natural gas as an alternative energy source;
- The representatives of groups of older people emphasize the importance of energy efficiency of residential premises, due to its correlation with lower heating costs and the possibility of saving, along with the improvement of the quality of life. The respondents predominantly use charcoal and firewood. Fuels, such as biogas and wind energy are not used at all. Solar panels are used in a few cases. The respondents did not name any types of alternative fuel that was not mentioned in the questionnaire. Village dwellers heard almost nothing about energy-saving stoves, or other energy-efficient appliances. Low access to effective domestic technologies, such as energy efficient heaters, and safe cooking stoves, causes an increase in greenhouse gas emissions and inefficient waste of natural resources, along with the deterioration of health and increase of poverty;
- The vast majority of land owners are male. 64.17 % of the respondents do not give land shares to their daughter if she gets married. 11.7% - do. 2.5% said that if the daughter wants to, they would allocate a share of family land for her. 1.67% said that land owners rarely allocate property in favor of the daughter. 20% of respondents did not know the answer to this question. Thus, gender inequality in access to land is fixed in the existing practice of allocating land plots. At the same time, according to the respondents, women in Osh Province spend more time working on land than men;
- Gender roles form a different response to climate change between men and women engaged in farming activities. As the dominant landowners, men consider themselves to be farmers and are less likely to use new strategies to ensure livelihood and search for new technologies of farming. Both men and women report greater stress due to changes in weather conditions over the past 10-20 years; but while women talk about an increase in the amount of household work, men noted the growing need to take credit money.
- Impacts of climate change worsen the situation of exclusion of women from agriculture, due to their lack of access to fertile land. Women need special support so that they not only have access to natural resources, but could also make decisions on the cultivation of trees, for example, multiple use of some of the species.
- Local communities have certain survival strategies, however, with the current situation they will be soon be insufficient. There is a need for more support from the government, civil society, and others, to protect rural communities from climate change.
- Female farmers and local residents are losing their plots, resources and livelihood due to land capturing. The government exercises unfair distribution of land, and establishment of large-scale production. These activities lead to an increase in poverty and decreases food security. Women are among the main victims of this trend, as they are denied access to resources that are essential for their livelihoods and livelihoods of the communities. Efforts of public institutions should be directed at termination of these practices, at strengthening the rights of local communities and at their protection. Adaptation plans that lead to the improved living standards of rural communities, including women, should be developed in consultation with women's groups on climate change;
- Women in rural areas have less time for marketing activities, less access to agricultural knowledge, fewer skills in running their own businesses. Agricultural reforms, such as privatization of agricultural enterprises, and the establishment of farms take place without the adequate participation of women, due to their poor representation in local governments, women's lack of sufficient resources and skills in the business of agriculture. Women tend to share the information obtained in the course of training, while among men the proportion of those who occasionally share information with other is 14.3%, and 3% of them never share any information with others. This suggests a need for the development of special educational programs for women on adaptation to climate change;
- Women often represent the key component of communities, families and local economy. They are the main providers for the household. As a result, it is women who directly feel the devastating effects of climate change, and to a large extent, women determine the community's ability to adapt. At the same time, men and women have different starting conditions in access to resources, the decision-making process, and allocation of time budget at the household and community levels. 43.3% of the respondents said that the decision on what to plant and how to grow cattle is made by the husband; in 27.5% of the cases the husband and wife make these decisions together; in 15% of the cases, such decisions are made by a woman alone. In other cases the decision is also made by men.
- Women more often than men note that they or their family members have been affected by emergency situation, but did not have the opportunity to learn the methods of response in emergency situations. 23.3% of the respondents mentioned that their family members have suffered from natural disasters, and 76.7% answered that there were no casualties. In general, people suffered from mudslides and droughts. The hazard is caused by the fact that mudslides destroy households and crops, in some cases the respondents had injuries of various degrees. Droughts destroy crops and pastures;
- The average salary of women is 78.4% of the average male wage, the biggest gap in traced in Jalal-Abad Province (69.8 %) and Bishkek (76.5 %); the slightest gap was in Naryn Province - (95.9%).[93]
- Women note that a wife plays a more important role in the distribution of the family budget than her husband. In the assessment of family budget contributions, and participation in the decision-making process, men call a much tighter list of family members than women do.

[93] Women and men in the Kyrgyz Republic. Compendium of gender-disaggregated statistics. - Bishkek, 2012. - p. 17.

RECOMMENDATIONS

To state authorities:

- Ecology experts, and commissions on development and coordination of the national gender policy should be include in the National Council for Women, Family and Gender Development and other structures;
- Gender-sensitive indicators should be included in the departmental and state programs on prevention of emergency situations and adaptation to climate change.
- State programs and projects on water, health and sanitation, prevention of social conflicts, gender dimension of climate change trends should be introduced and implemented;
- A system of ongoing monitoring and analysis of gender-disaggregated statistics on environment and climate change should be developed;
- State and local government institutions responsible for adaptation to the changing environmental conditions, climate change and other consequences of the environmental of the crisis should be appointed;
- A methodology for gender mainstreaming, mitigation and adaptation to climate and environmental change should be developed and implemented in the process of development and implementation of government programs, policies and other policy documents relevant to the respective government authorities;
- Increase capacity and functional literacy of women and men given the necessity for adaptation to climate change through improved access to information and education technology and consulting resources, especially in rural areas;
- Increase women's access to services and technologies required for water supply, agriculture, care for the family, household keeping and enterprises;
- Strengthening the capacity of women's organizations, self-help groups, entrepreneurs and networks, so that they can negotiate with the terms of their engagement in the issues of sustainable development and adaptation to climate change;
- Develop and implement a set of measures aimed at ensuring the equal participation of all stakeholders, especially women, recipients of services and risks carriers in the process of decision-making on matters of environmental significance; efforts to respond to emergency situations can create the possibility for participation of women in the decision-making process on community development. This is the best way to reduce the risk of climate change and disaster risk.
- For the development of gender-based adaptation strategies to climate change, the following components are needed:
  - Scientific research (with its inclusion in the plans of the NAS of the KR, the Ministry of Education and Science of the KR, etc.), based on gender-disaggregated statistics of morbidity and mortality in all entities that are exposed to climatic conditions, with regional (taking into account the effect of highlands), age, income, and occupation divisions;
  - Gender-disaggregated data analysis in seeking medical care, including due to emergencies caused by weather conditions;
  - Inclusion of adaptation issues into the state educational standards of schools, vocational and higher education;
  - Distribution of information on climate change and adaptation measures among the population, health professionals, and decision makers. Environmental education can make environmental issues solving a part of everyday life and survival.
  - Promotion of women's entrepreneurship and support of women in taking responsibility for their initiatives to promote alternative sources of income.
  - To conduct national and regional information campaigns on sanitation, hygiene and sustainable use of water resources, and ensure access of residents of towns and villages to information about the quality of drinking water, the conditions of decentralized sources of drinking water, and water recreational areas used for bathing.

For local governments and civil society organizations:

- Develop plans for emergency situation response (ESR) at the local, regional and national levels, taking into account the specific needs of different target groups, providing primary place an effective warning system through various channels that are available for different population groups. Conduct separate trainings for young mothers, families in which there are persons with disabilities. Actively involve different target groups in the process of creating plans emergency response;
- There is a need to add an item on the standards to protect women and girls in emergency situations.
- Develop a methodology and carry out trainings for employees of local governments and local councils on socially-oriented planning of local budgets, and the creation of local development programs with long-term climate change and inequality in the distribution of risks for different social groups. When women receive support and become active participants in the process of preparedness and response, their role in the family and community is successfully utilized.
- Vulnerability to climate change can be reduced by increasing the area of green spaces and working with crops of small agricultural producers. This approach also reduces greenhouse gas emissions through greenery planting.
- Gender inequality has a negative impact on land management, pasture management, and agro-forestry. An explanation of women's rights to land and property rights must be provided at the local and national levels.
- Actively involve women in various water management, land and pasture resources management bodies (water user associations (WUAs), Jayit Committees, VADWU, local councils, local authorities);
- Involve women in the management of irrigation systems, which will allow a more fair and efficient (creating water reserves, runoff control, preservation of riparian forests) use of water resources.
- Introduce new environmental sanitation technology, including "eco-toilets" and improved ventilated toilets on the territory of social facilities (schools, medical and obstetrical stations, etc.)
- Work with the youth, as they are activists in reducing the risk of natural disasters and climate change.

To international development agencies:

- Incorporate gender experts into climate change projects to determine the impact of gender and make recommendations for achieving gender balance at all levels;
- In the implementation of gender projects include a dimension related to climate change and incorporate these forecasts in the activities.
- Combine environmental protection with income generation for women in ongoing projects, to provide them with sustainable livelihoods. Support civil participation of women in adaptation to climate change, which must be combined with targeted income generating activities (such as programs for saving public funds or paid labor with the gender factor) that help them gain confidence in their abilities.
- Support projects aimed at families, where women and men need to work together for the purpose of adaptation to climate change. As well as projects aimed at reducing the vulnerability of women by increasing their capacity, knowledge and skills to control environmental risk (access to information and resource management capacity building will have a significant impact on the ability and willingness of women to reduce the impact of emergencies and respond to any disasters, which may occur in the future).
- Encourage a continued research of gender-sensitive approaches to climate change, legislation and legal measures to adapt to climate change, promote gender equality as a fundamental contribution to sustainable development.

ANNEX. FOCUS GROUP RESULTS

Internatsionalnoe village, Issyk-Ata district of Chui Province

The vast number of female respondents claimed that they engaged in home and family activities, along with raising and feeding livestock. Men provide transportation services, and are involved in buying cattle for feeding and subsequent sale.

In general, the population grows barley, wheat, and clover. Corn, beets and sunflowers are rarely cultivated.

These crops are grown because fewer resources are required for seeding, they require less water, and are used on the farm as feed for livestock. Cereals are a liquid commodity that is easy to sell.

Clover grows well, despite the lack of water, its market price is high, it is a good source of income, and it does not consume much time and space.

Livestock rearing is based on sheep and cows, a few community members have horses. Poultry is essentially grown only for personal consumption.

All the respondents expressed complaints regarding crop yields. Last year, they harvested 800 kg to 1200 kg of grain from 1 hectare. Low yields are due to drought, lack of irrigation water, lack of fertilizers and soil erosion, poor condition of the ditches, people do not have enough money to dig out proper ditches, due to lack of agricultural machinery field work is not performed on time.

Residents of the Internatsionalnoe village associate environmental degradation with the presence of several gas stations and car traffic of freight transport on the roads. The difference in the perception of the causes of environmental degradation between men and women is not traced.

Residents view biogas and solar panels as alternative energy sources, but they are not using them. Girls are more informed about the alternative sources of energy than older women, since they have access to the Internet and are constantly using it.

The population considers generators, solar panels, induction stoves and energy-saving light bulbs as alternative energy sources.

Residents of the Internatsionalnoe village do not know whether they can get energy from renewable energy sources and how much it would cost.

At the same time, the respondents note the full impact of climate change on their lives. Deterioration in health has been mentioned. Headaches, variations in blood pressure, joint pain, weakness, anemia and allergic reactions are considered to be a direct consequence of climate change. It is also noted that due to climate change, people's productivity has decreases; crop yields have reduced and mortality among animals has increased.

The population sees the following adaptation measures as methods necessary to counter the harmful effects of climate change:

- Using the experience of ancestors, for example, rotating the use of pasture lands, not buying products on the market, and growing organic food;
- Observing practices of the ancestors and using them in the process of working the land or cattle breeding.

In order to increase agricultural productivity, organic and inorganic fertilizers and pesticides are used. Pesticides are used because there are not enough workers for weeding. Insecticides against the Colorado potato beetle and aphids are also used.

The respondents in Internatsionalnoe village did not come to an agreement on the issue whether the income of women and men is at the same level. Part of the respondents claimed that men have more opportunities to earn money but this money does not "reach" home. Another group of the respondents stated that women bring more money home than men, and it does not mean that women have better

income opportunities. Women often pour their entire income into the family.

On the issue of water purification, the respondents said that those who have access to piped water do not purify it. If the water is visually contaminated, they boil or skim it.

Residents agreed that they use technology for daily life and agriculture. The most common machines are: crushers, grinders, welding machines, hand plows and harrows.

In order to increase income, village residents tend to sow the fields in late autumn, they take out the manure on the fields, purchase expensive seeds, exchange the seeds, and also exchange male species in herds and flocks in order to avoid degeneration.

The respondents believe that they are quite heavily dependent on ecosystem goods. In 2000, the village had a large apple orchard, which has been completely cut down for firewood within 2 years. Nobody planted new trees, and this place turned into pasture land. People cut down trees for firewood anywhere, nobody plants new trees. Attempts to restore the trees are undertaken only by students, but the plants die due to the lack of water.

Climate change affects migration processes. If corn heading numbered 800-900 grains in the past, now it is several times smaller. For several years the Chinese have been growing corn in the village, harvesting 7-12 tons per hectare, while the local population harvests an average of 2-3 tons per hectare. Young people do not linger in the village, they express no interest in finding out how the Chinese were able to get such a harvest, and migrate to the city in search of a better income.

Answers regarding greenhouses and dry toilets:

- Greenhouses are used only for personal purposes, in very few cases;
- Dry toilets are freezing toilets, they can be placed directly on the floor inside of the house, the microbes die at low temperatures, and these toilets are comfortable.
- Focus group results:
- Without even realizing it, people are constantly adapting to the changing conditions.
- If in the past it was not fashionable to use the built-in fireplace, nowadays they are renovated and used at full capacity.

Dmitrievka village, Issyk-Ata district, Chui Province

Women in Dmitrievka village mainly work in municipal service, are engaged in farming, or at home with their kids.

Generally, the population keeps cattle, processes own and leased allotments. Agriculture is a good source of income, and a sufficient amount of food remains for personal consumption. At the same time, the population of the village considers this situation to be abnormal, and farming to be a necessary measure, since wages are low and there are not enough jobs.

Village dwellers complain about crop yields, because lately, due to climate, spring comes later, hence the growing season starts later. Because of the dry spring and early summer the fields get replanted, which causes soil erosion, a decrease in crop yields.

Kant Cement and Slate Plant is a source of pollution, from which the cement dust and contaminates spread to the fields. The factory furnace, which emits fumes into the atmosphere, is working around the clock.

Residents believe that in order to solve the problems of energy supply, it is necessary to use resources responsibly, to insulate the house, and to use energy-saving lamps.

The respondents believe that all modern appliances are made with regard to the need to consume less energy, so one needs to replace old appliances with new ones, at home and at work.

The residents do not know whether they can receive energy from alternative sources, but if they are offered such sources, they are likely to be able to pay.

All the respondents noted the negative impact of climate change on health. When the temperature changes, people's health deteriorates and livestock deaths increase.

In order to avoid negative consequences, less harm to nature and improvement of the environment are a must. How and who will do it is unknown, as people are not ready to take the responsibility for these processes themselves.

The residents rarely use fertilizers, often only in small doses and in the garden, as they (fertilizers) are expensive.

The respondents believe that men have more opportunities to earn money, and that they must feed the family, not women.

The residents do not purify water, because the water is "good". Water for children is boiled or skimmed.

The population is well equipped with appliances; in fact, almost every house has all that is available to the population of Kyrgyzstan. At work everybody has office equipment.

In order to increase income, the population is looking for extra paid work. Women use appliances, which allow optimization of house chores and enhances the effectiveness.

Respondents found it difficult to answer the question whether they depend on ecosystem products. Residents indicated that they have enough fuel and energy sources.

Answers regarding greenhouses and dry toilets:

1. Greenhouses are used for personal needs in the garden.

2. One of the female respondents had seen such a toilet with her relatives. It must be sprinkled with ash after use. It has two divisions, one for feces and one for urine, and then "all this" is poured into the garden. The respondents are skeptical that such toilets are a possibility in Dmitrievka, as it is "shameful" and "disgusting" to eat foods fertilized in this way. Although some people in the village fertilize their gardens and orchards with human excrements, and their fruits and vegetables are better and tastier than others. But still, few people will eat such produce.

Note: Girls are more aware of the innovations than women, because they have access to the Internet, and they are sent to various training courses in the city. There are also agricultural journals in the village, updating the information on innovation engaged is a duty of Ail Okmotu (there is a responsible employee, head of AO is also active in this respect, information about innovations and updates are always posted for all to see on the information board).

Mady village, Osh Province

Residents of the village are mainly engaged in animal ranching, growing corn, potatoes, carrots, wheat, tomatoes and cucumbers. They grow these cultures, because they are easy to sell. Women said despite mudslides, residents of the two villages were not exempt from taxes. For instance, this year mudslides occurred 4 times, thus, farmers needed more seeds that in the previous years, in order to grow crops. Residents hoped that local authorities would offer them a tax break (social fund, land tax and water tax), but this did not happen.

Crop yields have declined. After each mudslide they have to replant the seeds, it requires additional expenses. But this is not the most important issue. The main issue is lack of agronomists in the Ail Okmotu. Baatyrbek (local leader) said that this year he bought an elite variety of corn, called "Pioneer", a kilo of this variety costs 420 soms. He planted the seeds, and then he was told that before the end of the season it is necessary to water it 7 times, and do the cultivation 5 times. He believes that if you care for conventional varieties in the same way the yields will rise. But he did not expect such costs, especially in the village with a great shortage of irrigation water. Yield depends on the weather, there is little rain lately, but mudslides are constant. No matter what, if you take good care, yields will be high.

The environment deteriorates. First of all, crop yields have decreased, and secondly health of people living in hazardous areas that are threatened by disaster is deteriorating. Our village is located in a hazardous area, lately we are afraid to leave children and the elderly in the house, especially in the spring and autumn. Women are laughing that children are over-trained for emergencies; if they hear

anything strange during the day or at night, they run out of the house and run towards the hills. They have learned to protect themselves, but living in constant fear is not good either. We mainly use electricity in the winter, and heat the stove with coal. We prepare firewood and dung in the winter.

There are generators made in China, but they are dangerous, noisy, so they are placed near the barn. Also, they are expensive, in one day they need 4 or 5 liters of gasoline, which is an equivalent of about 400 - 500 soms.

We heard that in other countries they use solar panels. We think that scientists there are working at the appropriate level. We do not understand why members of the Science Academy receive awards, when people do not get the benefit of their work. We just do not know what machines that can produce energy exist, how much such a machine costs, how much time it will take to recoup, etc.

Lately it gets hot very quickly in the season and cold as well. Such a climate has a significant influence on processing of fields, planting crops, and construction of additional sheds for cattle.

It would be nice to have a well-developed plan for emergency response. It is necessary to eliminate the Ministry of Agriculture, as not a single farmer has received any benefit from it. On the contrary, it is necessary to increase opportunities of the Ail Okmotu; it is necessary to develop a position for a lawyer and an agronomist. There is a need for legal consultations on human rights violations. The agronomist could give advice on growing crops. It is necessary to carry out the rehabilitation of bridges and canals. Nearly 30 people have died from car accidents in our village this year because of the narrowness of the road. There is a need for life, equipment and car insurance.

Buy fertilizers from the market in Osh, they are mainly Uzbek. We do not want to use fertilizers, but otherwise the yield will be low.

Women and men earn almost the same; there is just a different in possibilities. Women are working in the field more than men. During the mudflows women are responsible for children, and the elderly. Men have more freedom; they have the opportunity to earn income outside of the village.

We do not cleanse the plumbing, but house water is purified via boiling. The used to give us bleach to purify water pipes, but now no one gives it to us, we do not even know who is responsible for clean water. The water is always dirty.

The houses have refrigerators, televisions, some have semi-automatic washing machines. Electric kettles are also used.

To improve profitability they work in the field year-round, crops must be watered on time; there is a need for timely planning the sale of products, of course, at a high price. We do not use anything to ease the house chores. We want to have home appliances, but they are expensive.

Crop yields depend on irrigation water, and on the number of conflicts.

Village dwellers have not heard anything about the installation of energy-saving stoves, or other energy-saving devices.

Every resident of the village makes greenhouses for personal use, and grows tomatoes, cucumbers, peppers, cabbage and greens from seeds.

They had no idea about the "dry toilets".

Note: Girls are less knowledgeable on these issues than women. There is a philosophy in the village: "she will learn everything once she is married".

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