

Perception, Interpretation and Managing of Climate Change and Related Natural Hazards in Tajikistan

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obtain the degree of Doctor of Philosophy
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**In lovely Tajik gardens the finest flowers grow.
From springs gush crystal waters. The rivers swiftly flow.
When clouds loom over summits dark gales of winter blow
And gorges get no peace from pouring rain and snow.
The trees climb up the mountains to reach the glaciers' height
And tongues of green seem licking the snow packed hard and tight.**

(Mirzo Tursunzade)¹

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¹ Mirzo Tursunzade (1911-1977) was an important Tajik poet and a prominent politic figure.

Abstract

Risks from climate change and natural hazards are heavily menacing the people of Tajik communities in almost every corner of the country. The view on and the perception of these risks and the interpretation of subsequent disasters is strongly influenced by the Muslim culture on the one side and by the difficult economic conditions of individuals, households, communities and the society as a whole on the other side. This research aims to contribute to the understanding of Central Asian people's perception and interpretation of nature and their views and approaches to today's environmental changes and risks.

Tajikistan is highly disaster-prone; climate-induced hazards like floods, droughts, mud flows, cold waves or snow avalanches constitute a major threat to people's live, livelihood and (sustainable) development. Whereas scientific technical knowledge about climate change and resulting natural hazards and environmental degradation exists to a certain extent, the knowledge about local people's perceptions and interpretation of nature and its hazardous development is scarce. This gap has been addressed by fieldwork using ethnographic methods in selected villages in Southern Khatlon and Kuhistoni Badakhshon. A total of 230 interviews and focus group discussions were conducted between 2010 and 2013 in these two geographically and culturally different areas. The interpretation of the results explains differences of the scientific technical and local citizens' views and highlights to what extent the perception and resulting actions are influenced by factors like educational background, religious affiliation and depth of religiosity or gender. A review of today's literature of the Muslim academic community about the topic was carried out in addition to the fieldwork.

The studies in Southern Khatlon and Kuhistoni Badakhshon revealed a clear distinction between a rational, technical view and a cultural and religious interpretation of nature, climate change and related natural hazards and subsequent disasters. Whereas villagers have a bias towards the spiritual side, clerical people or schoolchildren are also using scientific-technical explanations for the occurrence of risks and disasters. This coincides with the views of the Islamic science community: Muslim scientists use in parallel a scientific-technical framework as well as a strong spiritual one. In contrary, the cultural and religious realm in the discussion of the topic is completely missing in the official Tajikistan (national and local authorities) as well as in Tajik media. Here the scientific-technical (and Western) view prevails.

The studies further revealed that risks from climate change, related natural hazards and environmental degradation are only one type of risks in a context of high economic threats and political uncertainty: health risks, economic shortfalls (including aspects of poverty and food insecurity), political stability or educational deficiencies are much higher on peoples' agenda than the environment. Almost everybody acknowledges environmental problems but considers these of lower importance than the other risks. However, households and communities in the Pamir value their environment much less a threat than those in Southern Khatlon, although disasters from natural hazards seem to be much more obvious in the Pamir. Many individuals show fatalistic attitudes towards hazards, risks and and subsequent disasters; nevertheless, there are also practical as well as spiritual risk management strategies people apply. Obviously, the higher the level of poverty the less people see the necessity to be concerned about the environment. They would opt for risk reduction and environmental protection only when they have a direct (economic) benefit from these activities.

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Transliteration of Original Linguistic Terms

A uniform transliteration method for local languages (Tajik, Pamir languages, Arabic and Russian) does not exist. Therefore, citations in the text are given in bold kyrillic, when available, and translated into English. Place names and local designations are directly provided in English. These English equivalents are given in *italic*, according to the “Table of Writing Systems” in Olson & Olson (2000: p. iv). Different spellings are possible for many local names of places, rivers or mountains, for example Khorugh or Chorugh; Pyanj or Pyandzh. In this research one option has been chosen and used throughout the research.

Note

This research uses the Qur’an translation by Sir Abdullah Yusuf Ali (published in serials between 1934 and 1937). In this research Qur’an quotations are followed by the chapter and verse numbers in parentheses.

Local and Other Terms Important for the Research

akhloq (Tajik: ахлоқ)	Moral behaviour
arshagulon (Tajik: аршагулон)	Praying for rain
avlod (Tajik: авлод)	Generation; patrilineal extended family
darki khatar (Tajik: дарки хатар)	Perception, understanding, comprehension of risk
dehqon (Tajik: деҳқон); in research: dekhan	Farmer
dehqon farm; in research: dekhan farm	A privatised farm managed by individuals, families, or collectives
donishi an’anavi (Tajik: дониши анъанавӣ)	Traditional knowledge
donishi ilmyi (Tajik: дониши илмӣ)	Scientific knowledge
donishi tekhnikiyi (Tajik: дониши техникӣ)	Technical knowledge
emom or imom (Tajik: имом)	Muslim leader or spiritual master who leads religious ceremonies and rituals in the mosque
family dehqon farm; in research: family dekhan farm	Farming on land and other property jointly controlled by the members of one family (less than 25 members)
farmon (Tajik: фармон) or farman	In the context of the research: pronouncement from Aga Khan
hashar (Tajik: ҳашар)	The traditional system of voluntary shared community labour
hima (Arabic: حمى, ҳима)	Literally: protected, prohibited. Originally: private pasture land. Today: inviolate zone for the conservation of natural capital.
hukumat (Tajik: ҳукумат)	Supremacy, executive power, government, and the administration of cities, viloyats and nohiyas
iqlim (Tajik: иқлим)	Climate
jamoat (Tajik: ҷамоат)	Third-level administrative divisions (similar to communes or municipalities). Includes several villages (there are approximately 360 Jamoats in Tajikistan)
KGB (Tajik: Комитет государственной безопасности при Совете Министров)	Committee for State Security of the Soviet Union from 1954 until its collapse in 1991
khalifa (Tajik: халифа)	Spiritual leader of a community, village
khatar (Tajik: хатар)	Hazard; also risk, danger and adventure
khatar (Tajik: хатар)	Risk; also danger and hazard

khatari ijtimoi-tabii (Tajik: хатари иҷтимоӣ-табӣ)	Socio-natural hazard (also risk, danger, adventure)
khatari ofat (Tajik: хатари офат)	Risk (hazard, danger) of calamity, disaster
khatari tekhnologiyi (Tajik: хатари технологӣ)	Technological hazard (also risk, danger, adventure)
khavfi tabii (Tajik: хавфи табӣ)	Natural hazard
kolkhoz (Tajik: колхоз)	A collective farm in the former Soviet Union (Russian term)
komsomol (Tajik: Комсомол)	Youth division of the Communist Party of the Soviet Union (CPSU) ² (Russian term)
mahalla (Tajik: маҳалла)	Neighbourhood, quarter of a city or village. A self-governing small community with a mahalla committee
Majlisi Oli (Tajik: маҷлиси оӣ)	Supreme Assembly, Tajikistan's parliament
Majlisi Milli (Tajik: маҷлиси милӣ)	National Assembly, the upper chamber
Majlisi Namoyandagon (Tajik: маҷлиси намояндагон)	Assembly of Representatives, the lower chamber
mutobiqshavi ba tagh'iryobi iqlim (Tajik: Мутобиқшавӣ ба тағйирёбии иқлим)	Adaptation on climate change; used for Climate Change adaptation (CCA)
nohiya (Tajik: ноҳия)	District, region, former rayon
oblast (Tajik: область)	Province, region, administrative division (Russian term)
ofat (Tajik: офат)	Calamity, disaster
osebpaziryi (Tajik: осебпазирӣ)	Harm, injury, damage, loss; used for vulnerability
past namudani sathi khatari ofatho (Tajik: паст намудани сатҳи хатари офатҳо)	Reduction of the level of risk of calamity / disaster
presidential land / plot	Land distributed to rural families for household farming by two presidential decrees (1995 and 1997) to improve the food security situation. Average size 0.2 hectare.
raisi mahalla (Tajik: раиси маҳалла)	Chairman from a mahalla. Elected by the members of the mahalla
rayon (Tajik: район)	Region, district (Russian term)
sayyid (Tajik: Сайид)	Here: descendent of the prophet; literal: master
shamoli sakht (Tajik: шамоли сахт)	Strong wind
State Committee for National Security (known by its Russian initials GKNB)	Successor to the Soviet-era KGB
tagh'iryobi iqlim (Tajik: тағйирёбии иқлим)	Changing, modification of the climate; used for climate change
tobovari (Tajik: тобоварӣ)	Endurance; used for resilience
viloyat (Tajik: вилоят)	Province (former oblast)
Viloyati Mukhtori Kuhistoni Badakhshon (Tajik: Вилояти Мухтори Кӯҳистони Бадахшон,)	Province of Mountainous Badakhshon (in research: Kuhistoni Badakhshon or Pamir)

² <http://en.wikipedia.org/wiki/Komsomol> (last access July 2015)

Abbreviations

ACTED	Agence d'Aide à la Coopération Technique et au Développement (Agency for Technical Cooperation and Development)
ADB	Asian Development Bank
AKDN	Aga Khan Development Network
AMEU	Assessment Monitoring and Evaluation Unit
CCA	Climate Change Adaptation
CDE	Centre for Development and Environment
CERT	Community Emergency Response Team
CoES	Committee of Emergency Situations
DRR	Disaster Risk Reduction
FAO	Food and Agriculture Organization of the United Nations
FOCUS	Focus Humanitarian Assistance
GBAO	Gorno-Badakhshan Autonomous Province
GLOF	Glacial Lake Outburst Flood
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
ITREB	Ismaili Tariqah and Religious Education Board
ITREC	The Ismaili Tariqah Religious Education Committee
IUCN	International Union for Conservation of Nature
MSDSP	Mountain Societies Development Support Programme
PHC	Primary Health Care
PRA	Participatory Rural Appraisal
SDC	Swiss Agency for Development and Cooperation
UCA	University of Central Asia
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
UNISDR	United Nations Office for Disaster Reduction
WB	World Bank
WWF	World Wide Fund for Nature
WHO	World Health Organization
WMO	World Meteorological Organization
WOCAT	World Overview of Conservation Approaches and Technologies

1 Outline of the Problem

“Policymakers need to be aware of the cognitive, behavioural, and socio-cultural barriers to action. While consistent and simple information campaigns are important, they won't guarantee that action will follow. Policymakers must be ready to address perceptions of risk, vulnerability, and capacity to adapt.”

(World Bank 2009a: p.9)

1.1 Relevance of Climate Change and Disaster Reduction

After several days of extremely hot weather a disastrous flash-flood occurred in Dasht Village, Shakhdara, Viloyati Mukhtori Kuhistoni Badakhshon³, on 7 August 2002. Two of three glacial lakes, which formed over the years, burst and the outburst flood generated a huge flash-flood of a volume of more than 1.2 million cubic metres (Zaripov 2002). The flash-flood affected large parts of the village of Dasht (Figure 1), killed 24 persons, destroyed 75 houses, a school, two bridges and other infrastructure, and made >250 families homeless (IrinNews⁴). The formation of the lakes (Figure 2) and the subsequent GLOF (Glacial Lake Outburst Flood) can be directly linked to the effects of climate change (fast melting of glaciers). Under the assumed future changes the Dasht River remains a dangerous site (Schneider, Gmeindl, and Traxler 2004).



Figure 1: Dasht village (Shakhdara)
The destroyed part of the village is covered with a thick layer of debris (Source: Zimmermann, August 2003)



Figure 2: Glacial lake at Dasht Glacier
One of the few remaining lakes following the GLOF event 2002 (Source: Zimmermann, 2003)

This dry and unemotional scientific description stays in contrast to people's view on this Dasht event. The local resident who lost almost all family members in this tragedy (see section 8.2, case history II) considers this event as “Act of God” or more precisely “a punishment of God”, because he was aware that he did something wrong at that time. After several years he came back to the site and built a

³ Viloyati Mukhtori Kuhistoni Badakhshon, from here on called Kuhistoni Badakhshon.

⁴ <http://www.irinnews.org/report/18529/tajikistan-relief-effort-to-flash-flood-victims-underway> (last access March-2015)

new house as close as possible to the original place, knowing that the location is still dangerous, but also knowing that God no longer has to punish him.

Although Tajikistan, a small, mountainous country in Central Asia (Figure 3), is one of the countries least responsible for the emissions of greenhouse gases that are said to be responsible for climate change to a large extent, its vulnerability is very high and its adaptive capacity to climate change is rather low (Fay and Patel 2008)⁵. Global climate models predict for arid Central Asia greater warming and less rain (IPCC 2014, Chapter 24). The continuing melting of glaciers and permafrost is expected (Schneider, Gmeindl, and Traxler 2004). In addition, extreme events like droughts, strong winters or destructive floods are supposed to occur more frequently, severely affecting the many poor communities of the region (Pollner et al. 2010).



Figure 3: Map of Central Asia
Tajikistan within the red circle
(Produced by U.S. Central Intelligence Agency⁶)

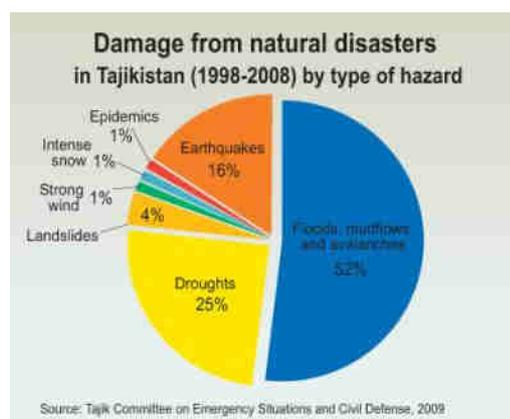


Figure 4: Damage from natural disasters in Tajikistan (1998-2008) by type of hazard (Tajik Committee on Emergency Situations and Civil Defence 2009)

In recent years Tajikistan experienced a number of devastating natural disasters (Figure 4), mainly triggered by climate factors: major droughts (2000/2001 and 2008), a glacial lake outburst flood that destroyed Dasht Village (2002), extreme winter conditions (2007/2008) or heavy rainfall that caused disastrous mudslides (May 2009, July 2015). Such events have tremendous impact on the livelihood of households, the economic situation of communities and the country as a whole.

Tajikistan is the poorest of the former Soviet republics and more than half of the population lives below the poverty line. The World Bank (2009a: p. 7) identified Tajikistan as one of the disaster hot-spot countries in the world and as the most vulnerable country to climate change in Europe and Central Asia.

Tajikistan accounts for the largest water resources in the form of glacial ice in Central Asia, and the Pamir Mountains are home to hundreds of these land-locked glaciers. Properly managed, the discharge from these glaciers can be a source of fresh water and hydro-power, supporting economic growth and improved livelihood for Tajikistan as well as other Central Asian countries. However, these glaciers and their waters also pose a direct threat to communities, infrastructure and agricultural land.

⁵ In: The World Bank (2009): *Adapting to Climate Change in Europe and Central Asia*
http://www.worldbank.org/eca/climate/ECA_CCA_Full_Report.pdf (last access August 2015)

⁶ "Courtesy of the University of Texas Libraries, The University of Texas at Austin."
http://www.lib.utexas.edu/maps/commonwealth/central_asian_common_2002.jpg (last access October 2015)

This threat, such as through the rapid melting of mountain glaciers, is further enhanced with the effects of climate change and global warming which has not only national but also regional ramifications (Focus Humanitarian Assistance 2011, unpublished project proposal).

Globally seen, risks from natural hazards like flash-floods (as described above), floods, droughts or storms, some of them exacerbated by climate change, are presently high on policy agendas: the global disaster reduction community has discussed the successor document of the Hyogo Framework for Action 2005 and adopted the new framework, the Sendai Framework for Disaster Risk Reduction⁷ 2015-2030 during the 3rd World Conference on Disaster Reduction in Sendai (March 2015). At the same time, international discussions and negotiations were ongoing for the sustainable development goals (SDGs⁸) having a close link to risks from natural hazards, disasters and disaster risk reduction. The question arises how people who live in areas with a high probability to get affected by natural disasters value these risks? Do they only see risks or do they also see chances? And are these risks and subsequent disasters considered simply as natural phenomena or do people have also other explanations?

Nowadays a third hot topic, human being is engaged with, is intensively discussed by science as well as practice and politics: climate change in general and a new climate agreement in particular⁹. Numerous international organizations are working on Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) in Tajikistan. The international organizations often have different ideologies, methodologies and approaches, normally based on Westerner's views. On the other hand, national organizations often have limited scientific and technical knowledge. Only few scientific institutions (e.g. University of Central Asia, few Tajik universities and institutes) are conducting research in these fields, particularly on the natural and physical side; socio-cultural aspects are definitely less addressed.

According to the *Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change* (The Government of the Republic of Tajikistan 2014: pp. 70, 73, 85, 103, 104) the following facts are relevant for Tajikistan: The warming trend is increasing, followed by increased range and risk of communicable diseases (including malaria, intestinal infections, and parasitic infections), increasing annual precipitation, more outbreaks of infectious and other diseases due to climate warming, longer periods of hot weather, floods and droughts, and possible economic losses due to natural hydro-meteorological events.

1.2 Views and Debates about Climate Change and Natural Hazards

In the past, participants in the scientific debate on problems in connection with climate change and related natural hazards originated in natural sciences. Only in recent decades it became the matter of social and economic sciences, too (Gaillard 2010). The discussion about people's perception of man-made or natural disaster risks is a rather young discipline in social sciences (for example: Douglas and Wildavsky 1982; Slovic 1987; Beck 1992). Although risk perception research is well established in social science, relatively little research is done on climate change and related natural hazards.

⁷ Sendai Framework for Disaster Risk Reduction (SFDRR): www.wcdrr.org (last access May 2017)

⁸ Sustainable Development Goals (SDGs): <http://www.un.org/sustainabledevelopment/sustainable-development-goals/> (last access May 2017)

⁹ See e.g. http://unfccc.int/essential_background/items/6031.php (last access August 2015)

In addition, the debate, touching a highly social and psychological issue, must also respect religious aspects. Thus, representatives of various religions are increasingly engaged in the subject. According to Polkinghorne (2007), an English theoretical physicist, theologian, writer, and Anglican priest, theology is the logical debating partner for science and both disciplines are seeking for truth about nature and natural processes, but at different levels. Polkinghorne is a leading voice in Europe in explaining the relationship between science and religion. Schipper et al. (2010) explain how religious and other beliefs are of vital importance and how awareness of both their advantages and disadvantages must be integrated into the discussions, especially in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA).

The results of technical assessments of risks in communities can be considered as more or less objective statements about prevailing risks, e.g. expressed in economic terms (see for example the *Guide to Improving Disaster Resilience of Mountain Communities* by FOCUS, 2008). In contrary to this information, the weighting of risks depends on social, cultural and religious aspects and traditions (Schipper et al. 2010) and is controlled by people's perception of risks, interpretation of disasters and, very important, the weighting of the risks posed by natural hazards against other risks the population is facing.

People's perception is dependent on personal experience (e.g. events in the recent past), overall risk environment (food security, health risks, economic risks, political stability, etc.), cultural background, local value systems and the interpretation of disasters (weather phenomena, non-adapted human behaviour, act of God, punishment by God etc.). This part in the overall risk reduction debate and in particular actions is much less developed (globally as well as in Tajikistan) than the scientific and technical description of climate, climate induced disasters or climate change.

Protection of the environment and coping with "natural" disasters from an Islamic point of view has become major issues for Muslim intellectuals in the last 10-15 years. It is said that the Qur'an and the Sunna have answers for all (coming) questions. Man had only to decrypt them. The topic is discussed on conferences, in (online) publications and institutions like the International Union for Conservation of Nature (IUCN) in Pakistan (section 4.2) or the Islamic Foundation for Ecology and Environmental Sciences (IFEES) founded in UK (section 4.2). However, the discussion lacks the consideration on how people in different Muslim societies perceive and interpret environmental and climate change or natural disasters. Only little research has been conducted concerning this topic. To understand people's perception of and awareness for the environment, its changes and the resulting risks may help to implement technical projects in a satisfying manner for the affected population as well as for experts and implementing organizations. At this point this research is an attempt to contribute to this gap of knowledge.

1.3 Research Questions and Hypotheses

The main subject of this research is to study risk perception and interpretation of climate change and related natural hazards, and to a smaller extent the managing of these risks in two areas of predominately Muslim Tajikistan. The following objectives and questions serve as a guide to the research:

Objective A:

A review of the current state of scientific knowledge in the ongoing international debate among Muslim academics on "Islam and the natural order, environment and climate change" in general.

Research Question:

On what specific religious grounds (Qur'an, Hadith and others) do Muslim academics argue to protect the environment and to cope with climate change and related natural hazards?

1. Does this debate reach the various levels of the Tajik society, including local communities?

Objective B:

To contribute to the understanding of people's perception, interpretation and ways to manage risks from climate change and related natural hazards in Tajikistan.

Research Questions:

2. What is the view of villagers on nature and their environment? Do people have traditional or local knowledge concerning risks from natural hazards and climate change? How do they perceive and interpret risks and how are they using this knowledge to manage them?
3. What are the determining factors (e.g. local traditions, religion, economy, past experience) and to what extent do they guide villagers and village leaders to consider (or not) risks from climate change and natural hazards in their daily life?

Hypotheses:

- There is a different understanding of nature, environmental risks and its management in international Muslim scientific and theological communities and in Muslim societies in Tajikistan.
- Fatalistic attitudes towards risks from natural hazards, also related to climate change, are often justified by religious beliefs in rural parts of the society where poverty is high and education poor.
- Traditional knowledge systems play an important role in the perception, interpretation and management of risks from climate change and related natural hazards.

1.4 Conceptual Framework and Structure of the Research

The first part of the research (chapter 2 to 4) is predominantly of theoretical character. After this introduction to the topic a comprehensive theoretical background (chapter 2) will sum up the current state of scientific knowledge in the relevant research topics. Chapter 3 shortly explains the used methodologies and methods. Chapter 4 highlights the available literature concerning the topic from an Islamic point of view. The Qur'an, the Hadith collections, as well as scientific papers, publications by international organizations like United Nations Environment Programme (UNEP), International Union

for Conservation of Nature (IUCN), World Wide Fund for Nature (WWF), United Nations Office for Disaster Reduction (UNISDR) and others about the subject in Muslim countries and written by Muslim and non-Muslim scholars and scientists will be discussed in this chapter. The empirical part of the research starts with an introduction to Tajikistan's environment and societies (chapter 5), followed by chapters 6 to 9, dealing with the implemented field studies in two different regions of Tajikistan. With the use of three different qualitative methods (semi-structured interviews, focus group discussions and observations) I looked at the participants in their natural setting. Chapter 6 provides the information about the implementation of the case studies whereas results are outlined for Southern Khatlon in chapter 7 and for Kuhistoni Badakhshon in chapter 8.

The discussion of the results in chapter 9 uses the Psychometric Paradigm (Slovic) and the Cultural Theory of Risk (Douglas & Wildavsky) as a main frame, whereas Pierre Bourdieu's Theory of Society and Beck's Risk Society are used where adequate to explain overall findings. Chapter 10 concludes the research. An important knowledge base for the topic is provided in Appendix 1.

2 Theoretical Background

The revolutionary idea that defines the boundary between modern times and the past is the mastery of risk: the notion that the future is more than a whim of the gods and that men and women are not passive before nature.

(Peter L. Bernstein: *Against the Gods: The Remarkable Story of Risk*.
World Bank, Disaster Risk Management series, n. 2)

The literature about social aspects of climate change and related natural hazards and risks is abundant nowadays. However, few decades back, natural hazards and risks (climate change was not yet a hot topic 20 or 30 years ago) were addressed with a purely natural science focus; the social or cultural aspects were almost missing. This is in contrast to risks from technical failures and accidents where social and psychological issues were taken into account already in the 1960s and 1970s (e.g. Sjöberg 2000).

This chapter reviews risk and risk perception research since its beginning, including the concept of Ulrich Beck's risk society, the publications by and about Pierre Bourdieu's social theory, and the literature on anthropological and religious views on nature, environment and climate change across a range of disciplines with the intention to provide a better understanding of different theoretical approaches to the topic.

2.1 Risk and Risk Perception Research

2.1.1 Early Stages

In the 1960s the development of new technologies increased and, as a result, people became scared about possible failure or disasters, especially from nuclear and similar technologies. Whereas the scientific community affirmed that the new technologies are safe, people started to fear long term dangers to the environment and / or immediate disasters. As a consequence, questions like "What is a risk?" "How do people perceive and interpret risks?" "What is an acceptable level of risk?" arouse.

General risk research started in the late 1960s and first in modern industrial societies. Social scientists started to contend that perception of threats and risks is not only a matter of technical knowledge but also of subjective personal opinions and beliefs (Sjöberg 2000).

In 1969, Chauncey Starr¹⁰ presented his research in his paper *Social Benefit Versus Technological Risk*, where he asked: How can we weigh the risks and social benefits of various technologies? Starr used a method of revealed preferences to search for risks acceptable to people. He made the distinction between the perception of voluntary and involuntary risks and argued that voluntary risks involve a choice based on individual's own set of values and built upon previous experiences. Starr stated that voluntary risks are much more accepted than involuntary risks because of this choice. To

¹⁰ Chauncey Starr (1912 – 2007) was an American electrical engineer and an expert in nuclear energy. He was interested in risk perception research and his conclusions can be considered as the basis of modern risk analysis.

prove this he examined several everyday activities and converted the social benefit of each into a dollar figure. He further calculated the cost of each activity as a function of the number of deaths associated with it. Starr discovered that people are more willing to take the risk when the activity is voluntary, even if it is measurably more dangerous.

Starr's initial work stimulated further research and in the following years (mainly during the 1980s) different approaches have been developed. Psychologists, anthropologists, and sociologists started to investigate risk perception and tried to figure out why different people make different estimates of the dangerousness of a specific risk. Over the years three main approaches have been developed: the psychological, the socio-cultural and the sociological approach. These approaches will be presented in the following sections of this literature review.

2.1.2 Psychological Approach

On the basis of Starr's revealed preferences new approaches developed in the coming years. Paul Slovic¹¹ (*Perception of Risk*, 1987; *Perception of risk: Reflections on the psychometric paradigm*, 1992), Baruch Fischhoff¹² et al. (*How Safe is Safe Enough? A Psychometric Study of Attitudes Towards Technological Risks and Benefits*, 1978) established the best-known approach, the so called expressed preferences approach, the "Psychometric Paradigm". This approach asks how much risk people are willing to accept. The approach assumes that individuals give proper reasonable answers to difficult and complex questions and that these judgments of risk and their corresponding determinantes may be measured with an adequate technique.

Slovic (1987) examined in his study of risk perception how lay persons make judgements when they are asked to characterize and evaluate hazardous activities and technologies. He calls the results of these judgments "subjective (perceived) risk". In contrary, experts rely on risk assessment and are more or less objective, analytic, and rational and their expertise is based on the "real risk". Considering this distinction, risks can be classified in objective risk and subjective (perceived) risk. The objective risk assessment is an analysis made according to scientific/professional standards and "best practices" in the field. Whereas individuals have a "lay person" view and their (perceived) risks are considered to be subjective, hypothetical, emotional and irrational.

Experts can work with the scientific / technical / economic approach or with the social science approach. With the first approach the risk is objectively quantified (quantifiable) through risk assessment. The social science approach considers risk as inherently subjective; risks may be invented to help understand / cope with dangers and uncertainties of life. Working with the social science approach we have to ask: What are the factors that determine risk perception?

One factor is the so called "individual level" (human needs and motivations) clearly represented in Maslow's hierarchical structure of needs (Figure 5). Maslow therefore suggests five interdependent levels of basic human needs. These needs have to be satisfied, starting with the lowest level, the most important level to survive.

¹¹ Paul Slovic (born 1938) is an American professor of psychology at the University of Oregon. He studies human judgment, decision making, and risk perception, and has published extensively on these topics. He is considered, with Baruch Fischhoff, a leading theorist and researcher in the risk perception field (the psychometric paradigm, the affect heuristic, and "risk as feeling").

¹² Baruch Fischhoff (born 1946) is an American Howard Heinz University Professor in the departments of Social and Decision Sciences and of Engineering and Public Policy at Carnegie Mellon University, where he heads the Decision Sciences major.

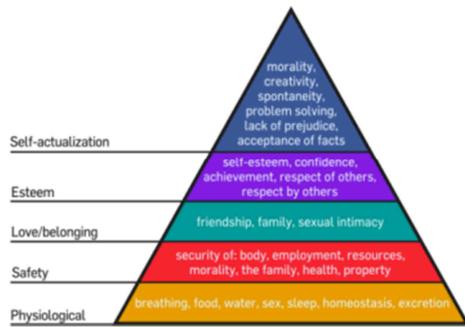


Figure 5: Maslow's hierarchy of needs. This hierarchy may explain why people engage in risk-taking behaviours (Wikipedia.org¹³)

In addition to Maslow's basic factors exist many other factors that determine risk perception, like worldviews, values, and attitudes, ethnic, cultural and socio-economic background, personal experiences (e.g. past disasters), level of education, outrage factors (aversion), level of control over the event, and who the person is and how he/she is affected.

The psychometric approach assumes that attitudes towards environmental risks are constituted on the basis of information about certain characteristics of the risk object. In a large number of studies subjective evaluations about specific risks were systematically collected and analysed for the qualitative characteristics of risks. Using standardized methods (questionnaires) Slovic asked individuals on the various aspects that might play a role in risk perception. Aspects like familiarity with or newness of the risk, perceived controllability, voluntariness of the risk, its potential for catastrophic consequences (maybe chronic-catastrophic), immediacy of the consequences or extent to which the risk is known to science respectively public. He wanted to measure people's attitudes towards the risks and benefits from various activities.

It turned out that two qualitative factors are central for lay persons concerning the perception of risk: (1) "dread risk" (perceived lack of control, catastrophic potential, fatal consequences, involuntary exposure, etc.). The less people know about a risk, the greater is its "dread factor" (people fear most what they do not understand and what they cannot see).

(2) "unknown risk" (not observable, risk unknown to those exposed, risk known or unknown to science, etc.). "Unknown" means the degree or level of familiarity to which a risk is understood.

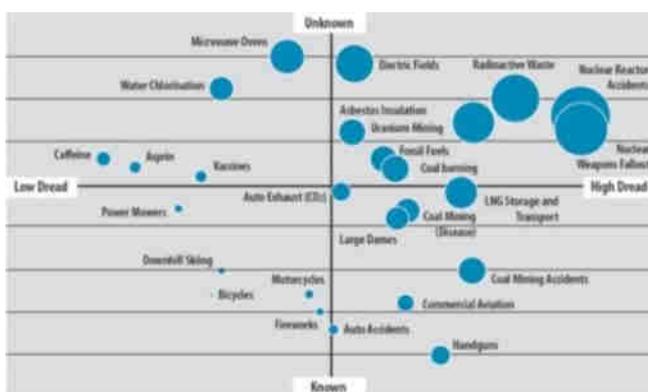


Figure 6: Selected Hazards Ranked in the Psychometric Framework (Slovic 1987)

According to Figure 6 people are much more willing to take risks based on their perceptions, which fall within the lower left hand quadrant (known and low dread). Risks in the upper right hand quadrant (unknown and high dread) are risks people do not like to take.

¹³ https://en.wikipedia.org/wiki/Abraham_Maslow last access September 2015

The research by Slovic and colleagues revealed psychological characteristics that make the different risks feel more or less frightening. Particularly important for the explanation of risk perception patterns are on the one hand the so-called "dread" risks with a high extent of damage and (global) disaster potential and on the other hand the subjective concern, the voluntary assumption of risk or the perceived controllability.

2.1.3 Socio-Cultural Approach

The cultural-theoretical approach for the explanation of risk perception goes back to the British anthropologist Mary Douglas¹⁴ and was further developed by Karl Dake. Douglas draws in her "Cultural Theory of Risk" on the sociology of Émile Durkheim¹⁵ who stated that society is the only superior moral force for individuals (see section 2.3.2). This constitutes that the society determines the value of social services and the well being of individuals, dictates hierarchies and relates individuals according to category (e.g. social layer) in this hierarchy.

In the 1980s Mary Douglas and Aaron Wildavsky¹⁶ developed the Cultural Theory of Risk in exploring cultural influences on risk behaviour. The basic assumptions are that moral values and relations within social groups play an important role for the perception of risk and the related characteristics of the subjective evaluation. According to them there are different forms of society, and each of these forms of social organization produces its own selective review of the entire "world" including the natural environment.

Douglas and Wildavsky ask "How do we choose which risks to face?" (*Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers* 1982) and they name the filter, which performs this selection (of risks), "cultural bias". Based on these "biases" a "way of life" is created which should define the management of the selected risks. Douglas argues in her paper *Risk Acceptability According to the Social Sciences*. (1985: p. 39) that a clarification on the issue of social influences must be worked out: „There cannot be a serious study of [risk] perception that does not recognize social concerns that influence selective attention“

The basis of the Cultural Theory of Risk is the so called Grid-Group-Analysis that identifies four institutionalized cultures or "ways of life" (Table 1). Grid describes the degree to which the life of an individual is determined by external rules and Group indicates the extent to which an individual's life is absorbed and carried by the group membership. Specific technology and risk settings can be assigned to the four cultures.

¹⁴ Mary Douglas (1921 – 2007) was a British anthropologist, known for her writings on human culture and symbolism, whose area of speciality was social anthropology. Douglas was considered a follower of Émile Durkheim and a proponent of structuralist analysis, with a strong interest in comparative religion.

¹⁵ David Émile Durkheim (1858 – 1917) was a French sociologist, social psychologist and philosopher. He formally established the academic discipline and, with Karl Marx and Max Weber, is commonly cited as the principal architect of modern social science and father of sociology.

¹⁶ Aaron Wildavsky (1930 – 1993) was an American political scientist known for his pioneering work in public policy, government budgeting, and risk management.

Table 1: Grid-Group-Model [Adapted from Douglas (1978), Biggs & Smith (2003) and Grams (2003)]

<i>High Grid</i>	Fatalism Low cooperation within group Lack of risk assessment	Hierarchism High cooperation within group Philosophy of risk limitation
<i>Low Grid</i>	Individualism Each persons for themselves Maxime of optimization risk	Egalitarianism High group participation in decision making Dogma of zero risk
<i>Grid-Group-Coordinates</i>	<i>Low Group</i>	<i>High Group</i>

The "group" dimension refers to the degree of integration into a social group and is thus also the degree of foreclosure of other groups or individuals outside the group. „Group means the outside boundary that people have erected between themselves and the outside world“ (Douglas and Wildavsky 1982: p. 138). The more an individual is integrated into a group, the more its general scope of action is limited by the rules of the group and this in turn leads to a stronger differentiation from other groups.

The "grid" component refers to all the other social factors that are influencing the scope of action of the individual. „Grid means all the other social distinctions and delegations of authority that they use to limit how people behave to one another“ (Douglas and Wildavsky 1982: p. 138). This refers for example to prevailing rules of conduct or any consequences arising from social affiliation. Individual characteristics like age, gender, or education are important for the shape of the "grid-grade" of a particular individual.

The social center is where power and influence are concentrated. The two cultures of the social center are the market *individualism* (low grid/low group) and the culture of *hierarchies* (high grid/high group). The individualism of the market is characterized by constant private profit maximizing behaviour and a constant optimistic attitude towards technical and ecological expectations of function. Examples for hierarchical institutions are the churches or the realms of politics and public authorities. Here, trust in technology is made possible by expert consensus.

The *fatalistic* (high grid/low group) and *egalitarian* (low grid/high group) cultures are located at the margins of society that is offside from power and influence. Fatalism is found mainly among people with little power or experience of power. Affected by technology impacts or by the transformation of the labour market for example, these people tend to show fatalistic behaviour attitudes. Within egalitarian culture members of the collective have full equality. One can find this in protest movements, emergent environmental groups and some religious sects that all state to have shared equality amongst the members of the group.

Douglas and Wildavsky express the fact that the social center trust the technology and the social border mistrust it with the words: „The Center is Complacent - The Border is Alarmed“ (1982: chapter V & chapter VI).

Douglas felt that she had to do add a fifth "way of life": the hermit. This because: "...the hermit withdrew from society for subjective reasons, which is to say that, unlike the other four ways, the hermit's way of life was not deducible from any social structure." (Pepperday 2009: p. 32). This type did not found its way into the Cultural Theory of Risk. Most researchers ignore this type.

Karl Dake (1991), a psychologist and graduate student of Wildavsky, was convinced that *worldviews* are associated with attitudes and risk perception. In his paper *Myths of Nature: Catural and Social*

Construction of Risk. Dake (1992) developed a Cultural Biases Questionnaire to measure the four orientating dispositions (*hierarchical, individualistic, egalitarian, and fatalistic worldview*) of the Cultural Theory of Risk with the help of items and to show correlations between risk perceptions and cultural biases. He wanted to measure risk attitudes and to analyse risk perceptions. Dake considers *worldviews* as disposition that can guide or influence opinions of people. Furthermore he is convinced that people can change their opinion respectively their *worldview* or that they can have more than one belief system.

Summing up the „Grid / Group Cultural Theory“:

The model has two dimensions: (1) the group describes how strongly people are bonded together and (2) the grid that describes prevailing rules and structures. The more the power of the characteristic of the particular factor of influence grows, the more increases the risk perception too. The theory assumes that with increasing civilization and social regulation man has been equipped with a culturally influenced perception.

2.2 Pierre Bourdieu - Theory of Society

Pierre Félix Bourdieu (1930-2002), a French sociologist and social philosopher, started his career as a research anthropologist in Northern Algeria. In the early sixties of the last century, he turned to sociological research and examined the French education system. His major concern was to reveal social inequalities and power mechanisms in society, science and education systems. He investigated their causes and mechanisms of action and tried to develop strategies for action. Bourdieu developed the theory of class distinction and the theory of power and practice. Over the years, he interfered in politics and initiated and supported political and social movements (Schwingel 2011).

According to Bourdieu (1985: p. 10) the forms of capital, controlled by the various agents, are trumps that define the chances of winning the stakes in the game. He calls such trumps capital and states that capital is important in defining the balance of power. Bourdieu (1992: pp.49-81) introduced three main forms of capital: (1) economic capital, (2) cultural capital and (3) social capital: (1) *Economic capital* is an accumulation of income and wealth by individuals and collectives. For Bourdieu economic capital is only one form of capital that is useful to understand the social world and is not absolutely necessary with regard to the accumulation of all other forms of capital. He even considers a purely economic view as a problem, because the accumulation of economic capital is mainly based on self-interest.

(2) *Cultural capital*, the human capital, is the total of the individually accumulated cultural resources. This may be accumulated or partly inherited (from generation to generation). Bourdieu distinguishes the cultural capital into three different forms: embodied cultural capital, objectified cultural capital and institutionalized cultural capital.

Embodied cultural capital must be acquired through learning. It is often inherited, like for example the language. Family education and school education also contribute to the embodied capital. The embodied capital becomes a part of a person itself, a *habitus* that means "...a system of lasting, transposable dispositions which, integrating past experiences, functions at every moment as a matrix of perceptions, appreciations and actions..." (Bourdieu 1977, pp. 82-83) Cultural capital in an objectified state consists of cultural goods, like writings, artworks, machines or technical instruments. One can inherit objectified cultural capital or one has to buy it, but for that the person needs economic capital. Objectified cultural capital is also in relation to the embodied cultural capital, because one has to

know, for example, how to use a machine. Institutionalized cultural capital is characterized by institutional recognition in the form of academic qualifications. Using an academic title guarantees the appreciation of acquired cultural capital. This in turn can lead to the conversion of institutionalized cultural capital into economic capital, like for example higher income.

(3) *Social capital* is based on social obligations or relationships and networking. According to Bourdieu the social capital is "...the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalised relationships of mutual acquaintance and recognition." (Bourdieu & Wacquant 1992: p. 119) Social capital may provide material or symbolic profits of great value and can be mobilised for particular purposes. Together with economic and cultural capital it can become very powerful, so that social classes can be derived.

Bourdieu (1985) names the social world in its entity the social space and designs the *social space* model. The space consists of structures in the form of distinctive social *fields* (institutions with intellectual, religious or political interests). He identifies these fields as playing fields, battle fields, power fields, and praxis fields. A *field* works like a game: it needs players (actors, owners of capital), stakes (in the form of respective type of capital and volume), game strategies (with the aim to get as much capital), and rules (field-specific rules, norms, values, and ideas). At the same time it is a competition (a struggle); it requires prizes for the winners (capital). Thus, the game or field rotates around power, prestige, authority, violence, monopoly and interests. A centre of power and powerhouse now arises about the winner (Bourdieu calls it the elite of a *field*). In a powerhouse internal and external constraints predominate. In order that an elite may arise, an elite forming force is required, this in the form of actors, goods, values, vocabulary, preferences, etc. Each faction has its own artists, craftsmen, philosophers, politicians, newspapers, etc. Who (or what) is part of the elite depends on the presence and the type of capital.

There is no equal opportunity in a field, because actors are not equipped with the same forms and volumes of capital. Each actor holds a specific position, belongs to a specific class. Bourdieu criticizes this division into classes according the Marxist class concept; nevertheless he uses the terms dominant class (bourgeoisie), middle class (petite bourgeoisie; descending, executive and rising) and working class, but he sees the concept of class in a more differentiated way and differs not only between the dominant class and the dominated classes. He differentiates within these classes into different fractions that among themselves mainly differ by divergent capital structures. The class struggle takes place in the competition and classification struggles: (1) between the dominant and the dominated classes and (2) within the classes between different class fractions (Bourdieu 1984).

Dominant class (bourgeoisie)	has set itself on the self-evident of every day's mind sets away and can act as they want
Middle class (petite bourgeoisie)	descending - compliance with the prescribed standards, executive – striving for school success and advancement new (rising) – tries to set itself apart from the conformism of this class
Working class	striving for material improvement (improvement of the living standard), preference for practicalities

The accumulation of economic, cultural and social capital determines the social affiliation of each individual. In turn, this affiliation determines the class specific *habitus* that determines the practice or actions of people. On the one hand the concept of *habitus* is a "theory of the mode of generation of practices". On the other hand it explains how people perceive society with its actions; it is at the same time a "theory of the practical knowledge of the social world" (Schwingel 2011: p. 60).

Habitus (disposition) is the product of historical adaptation (experience) of the classes; in short: "...the habitus, the product of history, produces individual and collective practices, and hence history, in accordance with the schemes engendered by history..." (Bourdieu 1977: p. 82)

The *habitus* determines class-specific ways of thought patterns (everyday theories and classification pattern, ethnic standards and taste), perception schemes (how one perceives the social world) and judgement schemes (how does one judge social actions). *Habitus* is not learned consciously. It is incorporated by everyday actions in real life, it is internalized during childhood and it remains uncomprehend and automatically. Criticism and increasing awareness are not enough to change the class-specific habitus; only crises or close contacts with members of another class can provoke this. Bourdieu speaks of "structured structures" that generate "structuring structures" (Bourdieu 1986: p. 170). Structured structures are classes that generate the *habitus* as the structuring structure. *Habitus* determines the forms of action by which the objective class relations are reproduced again. It is a cycle that is confirmed repeatedly.

2.3 Anthropological and Sociological Views on Nature, Environment and Climate Change

2.3.1 Anthropological Perspective

The topic "humans – environment" has always been part of research in social anthropology. The ecological anthropology is dealing with human-environment relationships since the early 1940s. The study and analysis of how people perceive their environment (land, climate, plant, and animal species in their vicinities), adapt to their environment and in turn transform and shape their environment are subjects of ecological anthropology (see below: Julian H. Steward). In the face of global environmental problems the topic received increased interest in the last two decades.

A concise overview of the development of the theoretical approaches of the cultural ecology is given by Keesing and Strathern's (1998) standard work of cultural anthropology and by Bohannan and Glazer's (1988) book *High Points in Anthropology*. The below outline is based on these two documents:

Julian H. Steward (1902-1972), an American anthropologist, conducted pioneering field research on the interaction of a particular human society and its natural environment in the Western United States. He worked with Shoshone, Paiute, and other Native Americans during the 1920s-30s. Later, in the 1950s-60s, he developed formally his generic theoretical and methodological framework for the cultural ecology paradigm and he introduced the idea of the *culture core* and the *socio-cultural level of integration*. With the help of these concepts Steward tries to explain that what happens in one culture may be found in others with its own distinct pattern. He defines the *culture core* as "the constellation of features which are most closely related to subsistence activities and economic arrangements" (Steward 1955: p. 37) These features include the technological strategies and material practices that local cultures develop to adapt to the ecological conditions of their home place; technology is adapted to exploit the environmental conditions in place. So cultural diversity emerges from ecological diversity as is evident in the variety of technologies and material practices of subsistence among different cultures; mountain cultures develop different strategies and techniques of subsistence when compared to low-land cultures, desert cultures, rainforest cultures, maritime cultures etc.

Roy A. Rappaport's (1926-1997) ideas and arguments had affinities with Steward and Harris (see next paragraph), but his focus was on how religious rituals and symbol systems can function in ecologically

adaptive ways. According to Rappaport, social behaviour is regulated by a system of values, in which the values are arranged hierarchically. At the bottom of the hierarchy are instrumental values and at the top are sacred / spiritual values. The highest values, that are the sacred / spiritual ones, control a better part of the behaviour and integrate the adaptive system of the culture. For Rappaport religion is part of a cybernetic system that controls the exploitation of the environment in a productive way. Intensive studies with the Tsembaga Maring tribe of Papua New Guinea convinced Rappaport that rites, belief systems, values and attitudes play an active role in the regulation of population size and conservation of the natural environment. As such, risk management is directly inbuilt.

Essentially based on Karl Marx's groundwork Marvin Harris (1927-2001), an American anthropologist, established his theory, the *cultural materialism*, in an explicit reference to his predecessor of the 19th century. Harris developed the *cultural materialism* approach as a research strategy linking ecological and sociological branches of anthropology. His theory grades the environment, the means of production and the material conditions in the determination of social sub-sectors (such as religion) at a higher value than the intellectual level of the values, goals, norms and beliefs. In simple terms: the *cultural materialism* is a theory that derives cultural and social phenomena always from practical necessity.

2.3.2 Sociological Approach to Risk and Risk Perception

Émile Durkheim (1858–1917) was a French sociologist, social psychologist and philosopher. The main topic of his sociological and anthropological research was *social solidarity*. He divided solidarity in a mechanical and organic solidarity to find out how a social unit holds its members together. Mechanical solidarity develops due to social integration of members of a society that have more or less the same common values and beliefs and therefore constitute a *collective conscience*. Organic solidarity develops due to the members of a society that have different specialisations and know that they need other members with other specialisations to survive. In today's discussions about climate change Durkheim's idea is often integrated and serves to promote *collective conscience* (Posas 2007: p. 9).

Ulrich Beck (1944-2015), a German Sociologist, influenced by the politics of the Green Movement¹⁷ and by Habermas, a German sociologist and philosopher, wrote extensively about risk and globalization since decades. During the 1980s he coined the expression *risk society*, together with Anthony Giddens¹⁸, a British sociologist. The two sociologists believed that the traditional industrial class structure of modern society is breaking apart because it creates many new dangers of risks that were unknown in previous generations. In his book *Risk Society: Towards a New Modernity* (1992) Beck argues that this new risk society has to think about solutions for these human-constructed problems and how these modern risks can be "prevented, minimised, dramatised, or channelled". He states that risks always depend on decisions and that people often fail to perceive risks until they are made visible by scientific interpretation. Therefore science has to help people to learn how to transform incalculable hazards in calculable risks.

¹⁷ Green politics is a political ideology that aims to create an ecologically sustainable society rooted in environmentalism, non-violence, social justice, and grassroots democracy. https://en.wikipedia.org/wiki/Green_politics (last access September 2015)

¹⁸ Anthony Giddens, Baron Giddens (born 1938), is a British sociologist who is known for his theory of structuration and his holistic view of modern societies. He is considered to be one of the most prominent modern sociologists.

In the course of this discussion Beck created a new periodisation of modern history that is divided into traditional society, simple modernity and reflexive modernity. The last expression was launched by the sociologists Beck, Giddens and Lash¹⁹ in the 1990s. In their book *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order* (1994) they discuss how modern society is undercutting its formations of class, stratum, occupations, sex roles, the nuclear family, and more. They state that society is in a period of rapid, fundamental and global change. Beck talks about the *World Risk Society* as one aspect of the ongoing globalization (Beck 2007). He understands globalization from an economic, ecologic, cultural, political and civil society point of view. In other words, the modern society is changing and the longer the more confronted with essential problems resulting from techno-economic development itself. Beck argues that the history of risk distribution shows that risks and wealth adhere to the class pattern, but inversely: poor classes suffer more from risks and problems than wealthy classes. He then expands this view on nations and explains that poor nations are more vulnerable to risk than rich nations, because rich nations have the possibility to purchase safety and freedom from risk.

2.4 Religious Perspective

The contribution *Religious Studies and Environmental Concern* of Bron Raymond Taylor²⁰ in the *Encyclopedia of Religion and Nature* (2005: pp. 1375-1376) is helpful for a general view on the topic. According to Taylor religious scholars of both Western and Asian religions played a significant role in the efforts to understand the environmental strengths and weaknesses of their traditions. They often had two roles, one as observer of and the other as participant in their religion. With the upcoming environmental challenges they had to rethink their traditions' responsibilities in the light of them. According to Taylor, scholars in the field face a choice between an inherited "confessional / ethical" approach that works on transitioning world religions into an ecological consciousness, and a "historical / social scientific" approach that describes a wide array of environment-related religiousness.

The basic work *Religion in Environmental and Climate Change: Suffering, Values, Lifestyles*, edited by Dieter Gerten²¹ and Sigurd Bergmann²² (2012), gathers recent research on functions of religion in the climate change discussion from anthropological, ethical, theological, philosophical, historical and earth system analytical perspectives. Most of the papers about the impact of religion in the topic of anthropogenic climate change have been presented at the "Religion in Environmental and Climate Change" symposium in Potsdam, Germany, in January 2010.

The key conclusions of this Potsdam workshop can be summarized as follows: (1) scientists from different disciplines (geography, social anthropology, religious studies, ethics, environmental history, etc.) agree that it is about time for mitigating global climate and environmental changes (2) Climate and environmental changes happen because of anthropogenic practises and attitudes, therefore the humanities are required to engage in inter- and transdisciplinary environmental and climate sciences

¹⁹ Scott Lash (born 1945, in Chicago) is a professor of sociology and cultural studies at Goldsmiths, University of London.

²⁰ Bron Raymond Taylor (born 15 April 1955) is an American scholar and conservationist. He is Professor of Religion and Nature at the University of Florida and has also been an Affiliated Scholar with the Center for Environment and Development at the University of Oslo.

²¹ Dieter Gerten is geographer and hydrologist at the Potsdam Institute for Climate Impact Research in Potsdam, Germany.

²² Sigurd Bergmann is Professor of Religious Studies at the Norwegian University of Science and Technology, Trondheim, Norway.

(3) Belief systems and religious practices are part of a majority of the world's population, therefore it is necessary to involve them in the topic's research as well (4) Researchers have to be aware that the role of religion in the topic is ambivalent and complex, progressive and regressive at the same time, therefore (5) there is a strong need for more research to identify possible alternatives and solutions. The conference and with its proceedings opened a vivid discussion about religion and climate and environmental changes and emphasized that religion adds a potentially valuable voice to the discussion of anthropogenic climate change.

Austin Leininger, a graduate at Theological Union, Berkeley, CA (2012) who reviewed these proceedings admits that the essays are well researched and of evidence. He confirms the importance of religion in the discussion of anthropogenic climate change. However he criticizes that not enough attention is paid to the diversity of religions. Furthermore, he states that it is not clear how religious leaders, theologians, and ecclesiastical spokespersons deal with the subject and how and what they pass down to people, those people whose daily decisions directly influence global climate change. This finally became an important issue in the case studies implemented in the course of this research. And it also provoked me to further understand the particular Muslim view on nature and the on-going changes (see chapter 4).

3 Methods

“If you want to know how people understand their world and their life,
why not talk with them?”

(Steinar Kvale 1996: p. 1)

3.1 A review of the recent scientific literature about Natural Order, Environment and Climate Change in Islam

A major issue in this research is the question to what extent Islam plays a role in the field of natural order, environment, climate change and related natural hazards and how contemporary representatives of Islam respond to environmental issues and crises. As already outlined in the general literature review, the role religions play in shaping human thought should not be underestimated.

A recent post (July 2015) about Muslim scholars and climate change was published by Kieran Cooke on the website “Responding to Climate Change (RTCC)”²³:

“The views of the scholars – some of the strongest yet expressed on climate from within the Muslim community – are contained in a draft declaration on climate change to be launched officially at a major Islamic symposium in Istanbul in mid-August.”

<http://www.rtcc.org/2015/07/15/muslim-scholars-name-climate-change-as-dire-threat/> (last access August 2015)

Climate change, natural disaster, environmental crisis, sustainable development, risk perception etc. are topics that are nowadays intensively discussed in the Muslim community. I started my literature review with the publication *Islam and Ecology A Bestowed Trust* (edited by Foltz et al. 2003), a collection of papers by different scholars about various aspects concerning the subject. Library searches and an intensive internet search were successful. Analysing the many contributions, an idea became apparent: Muslim scholars and scientists often use principles / concepts taken out of the Qur’an and the Sunna to explain and interpret the relevant aspects of the topic and to provide guidance how to overcome problems and obstacles. This approach is used for analysis and results are systematically listed (section 4.3, table 3), further described and discussed.

²³ Responding to Climate Change (RTCC) is a news and analysis website focused on providing the latest updates and insight into global low carbon developments. <http://www.rtcc.org/> (last access August 2015)

3.2 Empirical Studies

3.2.1 Case-Study Approach

According to Yin (2009) the case study approach can be chosen when the researcher has “How” or “Why” questions, when he has little control over events and when the focus of his research is on a contemporary phenomenon that concerns people. When these facts are given, the case-study approach is appropriate.

The case-study approach is situated in the area of empirical research, which uses various techniques, like interviews, observations, audio visual material, media, documents and reports. In the case of the here presented case studies several techniques to collect data from different sources and different methods of analysis of the collected data are used. The interviews and focus group discussions are targeted and insightful. That means they directly focus on the topic and therefore provide perceived causal inferences. Observation provides real time information and participant observation provides insight into personal behaviour and motives as well as into cultural features. It can be assumed that the research questions will not be answered completely, but will give some indications and will allow testing the hypothesis.

Govender-Van Wyk (2007) identifies in his PhD research six steps for a case study research: (1) Determination and definition of the research questions and literature review (2) Case-study selection and determination of data gathering and analysis techniques (3) Preparations to collect the data (4) Collection of data (5) Analysis (6) Conclusions and recommendations. Usually a case study ends with a case study report that can be narrative or in short question-answer formats, without narratives. The here presented case study research will follow more or less these steps.

3.2.2 Case study selection

Tajikistan is a disaster-prone country. For about 10 to 15 years disaster risk reduction and climate change adaptation is an important topic in the frame of sustainable development but also in the improvement of emergency management capacities. A number of government agencies, UN organizations and NGOs are working in this field, mainly on technical aspects; human aspects are less an issue. These conditions constituted an excellent ground for an in-depth study. Knowing the area from previous research and applied work I choose two study areas (Figure 7) for my research.

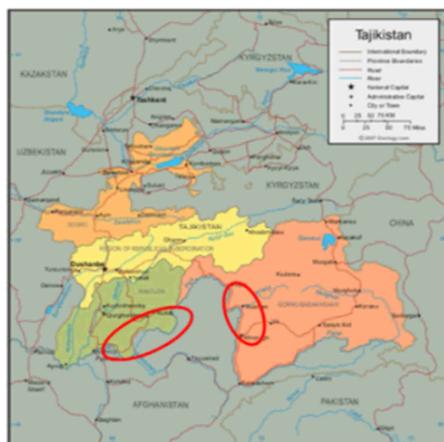


Figure 7: Study Areas in Southern Khatlon and Kuhistoni Badakhshon (Geology.com©2008²⁴)

²⁴ <http://geology.com/world/tajikistan-satellite-image.shtml> (last access October 2015)

In both areas (Southern Khatlon and Western Kuhistoni Badakhshon) I had close contacts to and collaboration with NGOs working in the field of natural resources management, climate change, natural hazards and disaster risk reduction.

ACTED²⁵ Tajikistan started its Community Participatory Flood Management Project, an ADB-funded project, in Khatlon Province in 2009. The objective of this project was to develop the capacity to anticipate, protect against, prepare for, and cope with floods and other disasters in about 130 flood-prone villages. Geographically the project covered the districts of Farkhor, Hamadoni, Pyanj and Shurobod of Khatlon province. Generously, ACTED Tajikistan provided me with the results of their Baseline Study (2009). Furthermore I could participate in a Participatory Rural Appraisal (2009) that constituted an excellent basis for my following case study research. In 2010 ACTED Tajikistan asked me to conduct a climate resilience survey in the frame of this ADB-funded project. ACTED Tajikistan further provided access to local sites in the four districts during my PhD research.

In Kuhistoni Badakhshon the Swiss Agency for Development and Cooperation (SDC²⁶) supports a disaster risk reduction project implemented by Focus Humanitarian Assistance²⁷. FOCUS also builds disaster-resilient communities through programmes funded by the Disaster Preparedness Agency of the European Commission Humanitarian Aid Office (DIPECHO). These programmes operate in vulnerable districts of Ishkoshim, Roshqala, Shugnan, Rushan, and Vanj. A main goal of the FOCUS project is the fostering of disaster resilient communities in isolated mountain areas. Through FOCUS I obtained information about local conditions, their project results, got access to villages and villagers and received overall support in and through their office in Khorugh.

Qualitative research methods were chosen for the studies in the two sites in Southern Khatlon and Western Kuhistoni Badakhshon (Figure 7). A total of 274 interviews and 12 focus group discussions were conducted during three field surveys between 2010 and 2013 in these two geographically very different areas.

²⁵ Agency for Technical Cooperation and Development (ACTED) is a privately owned, non-governmental, non-political and non-profit organization set up in 1993. The organization employs approximately 150 international staff and more than 2000 national staff. The headquarters are based in Paris, France (section 6.1.3). <http://www.ACTED.org/en> (last access August 2015)

²⁶ Swiss Agency for Development and Cooperation (SDC) is an agency in the Federal Department of Foreign Affairs with a cooperation office in Tajikistan (section 6.1.3). www.eda.admin.ch/countries/tajikistan/en/home/representations/cooperation-office.html (last access August 2015)

²⁷ Focus Humanitarian Assistance (FOCUS) is affiliated with the Aga Khan Development Network, a group of institutions working to improve opportunities and living conditions, for people of all faiths and origins, in specific regions of the developing world (section 6.1.3). <http://www.akdn.org/focus> (last access August 2015)

4 Natural Order, Environment and Climate Change in Islam



AVATAR: The Tragedy of Paradise Lost
(Ihsan Torabi on Facebook in 2010²⁸)

4.1 A Religious Approach

Judaism, Christianity and Islam are "Abrahamic religions" founded in the Middle East. These three monotheistic religions have many points of contact: written culture, science, trade and numbering systems are evidence of relations and mutual influences for centuries. In addition, they have each a script that has been written long time ago and that still serves as basis for its believers. The question remains how these books can be interpreted to fit into our contemporary life with our current problems. In the sections below, only the conditions in Islam on the basis of the Qu'ran are outlined and interpreted, although one could do similar studies in the other religions.

The relationship between man and his environment is as old as human exists. Religions may be significant catalysts for humans in coping with changes in nature. Therefore, religions need to be in conversation with the different sectors (economy, science, education, public policy) that have environmental issues, climate change and related natural hazards on their agenda (Tucker and Grim 2009). Seyyed Hossein Nasr²⁹ contributions to the discussions on religion and environment have established and broadened this debate. Already in his early work *The Encounter of Man and Nature: The Spiritual Crisis of Modern Man* (Nasr 1968) he warned from an upcoming environmental crisis with possible disastrous consequences. It is a philosophical critique of the modern concept of nature that no longer consists of a perfectly balanced order between nature, human and God, because modern science and technology have become more important and dominant. In the reprint *Man and Nature: The Spiritual Crisis in Modern Man*. (Nasr 1987) he explores the relationship between man and nature as found in Taoism, Hinduism, Buddhism, Christianity and Islam. This document is considered as the initiating idea of an Islamic eco-theology and combines nature and ecology closely with religion. Nasr describes the development and rise of modern science in his publication *Religion and the Order of Nature* (1996); at the same time he criticizes the secular and reductionist philosophies concerning nature. Nasr, who represents an Islamic traditionalism, has a theocentric world view and thinks that

²⁸ Printed out in 2010; in October 2015 it was no longer available.

²⁹ Seyyed Hossein Nasr (born 1933 in Tehran) is a Shi'ite Muslim scholar of Islam, Sufism and comparative religion. His contributions to the discussions on religion and environment have broadened this debate. He is presently University Professor of Islamic Studies at the George Washington University and President of the Foundation for Traditional Studies (Foltz 2003: p. 554).

the ecological crisis is the consequence of a spiritual crisis of human being in general and of Muslim people in particular. For him, man is in total disharmony with his environment today and therefore has to learn again that he is God's vicegerent on earth and therefore has to protect the natural order. According to Nasr, human has to rediscover and reactivate "traditional" religious cosmology, values and truths, and has to think about ethics in global debates. In his contribution *Islam, the Contemporary Islamic World, and the Environmental Crisis* (in Foltz et al. 2003) Nasr firstly examines the reasons why it was not possible to develop a strong Islamic environmentalism, although Islamic principles ask for it. He considers the environmental crisis mainly as a Western product generated by the development of modern science and technology. And because the governing classes in the Islamic world want to get Western standards as quick as possible, environmental issues were neglected. Furthermore, he regrets that the traditional scholars ('*ulamā*') who are widely accepted in the population are not enough educated about this topic. Secondly, Nasr illustrates how a possible Islamic environmentalism can be explained by the Qur'an and Islamic traditions. Thirdly, Nasr raises the question "What is to be done?" He outlines some recommendations for Muslims and sketches how an Islamic environmental movement might look like. He finishes his contribution with the words: "Ultimately, God is, as one of His Sacred Names, *al-Muḥīṭ*, tells us, literally, our "environment" (Foltz et al. 2003: p. 104). Nasr is still active in the debate. His concern for the environment is unbroken and he as a Muslim criticizes the modern West and at the same time, he strongly demands the need of Islamic environmental ethics.

In the course of my studies it became obvious that concepts or principles (some call it concepts, others principles) are important in Islamic culture, also concerning the teaching of the care for and protection of the environment, dealing with climate change and related natural hazards. Such teachings can be found in all major sources of Islamic teachings, the Qur'an, Hadith and Shari'a (Islamic law³⁰). In this research only Qur'an and to a certain extent Hadith have been examined. Important points of the Shari'a are mentioned when one of the selected authors used it (section 4.3).

According to the teachings of Islam, God is the one and only God, the absolute Creator of the universe, its components and its laws. God is the beginning and the end of all things, and this is the foundation for Islam's teachings. This fundamental Islamic principle is that of the belief in the "Unity of the Godhead", named توحيد (*tawḥīd*). In all spheres of human life God's unity must be maintained spiritually, intellectually and practically, always striving for the pleasure of God. Mawil Izzi Dien³¹, who writes about Islam and environment and who regularly contributes to the blog *A World of Green Muslims: Posting Green Messages from across the Muslim blogosphere*³², aims to connect theory and practice in this topic. He emphasizes for example the importance of the dominating concept of *tawḥīd*, adding that nowadays Muslims must try to adapt this concept to the current circumstances (Izzi Dien 2003). *Tawḥīd* and its interpretation today is an important concept as we will see in the following two sections.

Another term that leaves room for many interpretations is the word *khalīfa*. *Khalīfa* literally means "one who replaces someone else who left or died". In the context of Islam a caliph (*khalīfat rasul Allah*, Arabic: خليفة رسول الله) is a successor to the Messenger of God (Prophet Muhammad). Caliphs

³⁰ Most often translated as "Islamic law," the term Shari'a describes both Muslim practices that relate to law in Western understanding and others that do not. "Muslim Journeys | Item #226: 'Sharia' from Oxford Islamic Studies Online", October 16, 2015 <http://bridgingcultures.neh.gov/muslimjourneys/items/show/226>

³¹ Mawil Izzi Dien (born 1948) is a British citizen of Arabic origin. He is a Senior Lecturer in Islamic Studies at the University of Wales, Lampeter and runs a course on Religion and the Environment. Izzi Dien is author and co-author of a number of studies on Islam and environment and has contributed numerous articles in the Encyclopaedia of Islam.

³² <https://aworldofgreenmuslims.wordpress.com/> (last access October 2015)

were often also referred to as *Amīr al-Mu'minīn* (المؤمنين أمير) meaning "Commander of the Faithful" or *Imām* (إمام) meaning "worship leader". In his function the *khalīfa* acted as political, military and administrative leader.³³ Surat al-Baqarah 2:30 states that "Behold, thy Lord said to the angels: "I will create a vicegerent on earth." This statement is interpreted differently from its original meaning for a long time. Today "vicegerent on earth" is interpreted for example in connection with ecological and environmental problems or sustainable development, as we will see in the next two sections.

Initially there was a plan to investigate how urban religious elites in Tajikistan consider nature, natural phenomena and environmental ethics. However, in consideration of the attempts of the Tajik Government to control and constrain all religious activities it became obvious that finding people in Dushanbe who are willing to openly discuss these sensitive issues is rather difficult. Due to the same reason it was also not possible to find written contributions about this topic from Tajik (religious) scholars or scientists.

4.2 Contemporary Islamic Scientific Debate about the Topic

There is a steadily growing body of academic and scientific literature about Islamic efforts to discuss, understand and interpret nature, environment, and climate change by both Muslim and non-Muslim scholars and scientists since the mid-1980s. The here presented facts and statements focus on Muslim scholars and scientists, but rely also on papers from non-Muslim authors.

Fazlun M. Khalid (born 1932) is of Sri Lankan origin. He migrated to England in 1953. Interested in the upcoming environmental movement, he founded "The Islamic Foundation for Ecology and Environmental Sciences" (IFEES)³⁴ in 1994, a UK based organization dedicated to the maintenance of the Earth as a healthy habitat for all living beings. IFEES is motivated by Islamic principles like unity (*tawhīd*), entrustment (*amānah*), the stewardship of humankind on earth (*khalīfa*), and a system of ethics grounded in the Qur'an and in the Sunna of the Prophet Muhammad. During his time where he served as a consultant for World Wildlife Fund he edited the bibliography "*Islam and Ecology*" together with his co-editor Joanne O'Brien in 1992. The work consists of a collection of essays from different scientists with different topics like Islamic ethics and environment, natural resources or notions of conservation in Islamic texts and practices. Several essays include verses from Suras of the Qur'an and occasional a Hadith that illustrate the spiritual perspective on nature in Islam.

During a private discussion about the topic with the Deputy Manager of the International Union for Conservation of Nature (IUCN) in Islamabad, Pakistan in 2005, the publication "*Conservation and Islam*" (Akbar and Aslam, eds. 2003) was an important item. As a practicing Muslim he fully supported the main messages in this book: already the preface states that the earth is "facing the threat of environmental degradation due to unwise human activities, poverty and lack of education." (Akbar and Aslam 2003: p. 9) Furthermore the importance of NGOs working on village level is outlined. The book is mainly dedicated to religious leaders who have the contact to and the confidence of the population. Religious leaders should explain the importance of conserving natural resources by means of Islamic teachings. The chapters discuss different themes, like biodiversity, water, earth, atmosphere, etc.

³³ Holt, P.M.: Article "Khalifa" in *Encyclopaedia of Islam*, Volume 4, 1978, pp. 937 ff.

³⁴ <http://www.ifees.org.uk/about/our-story/> (last access September 2015)

Besides scientific explanations the corresponding verses of Suras are cited and explained in the context of the respective topic.

Essays from different scholars of Islam (Muslim and Non-Muslim) from various countries and background are collected in the volume *Islam and Ecology - A bestowed Trust* (2003). The essays are grouped in five chapters: (1) God, Humans, and Nature (2) The Challenge of (Re) Interpretation (3) Environment and Social Justice (4) Toward a Sustainable Society and (5) The Islamic Garden as Metaphor for Paradise. The authors discuss the Islamic tradition for environmental ethics and how it can be interpreted, reassessed, and applied to current environmental problems. They appeal for rethinking world views and ethics. The authors argue and give explanations with the help of the Qur'an, the Hadith and the Shari'a. Consistently the Islamic principles are used and discussed.



Figure 8: Collection of statements from faith-based organizations of every major religion (Lynn & Ellie Whitney 2012)

During the years 2011 and 2012 two volunteers of the "Citizens Climate Lobby", Lynn and Ellie Whitney, collected statements from faith-based organizations (Figure 8). They analysed these statements from major religions around the world regarding the science of global climate destabilisation and the moral imperatives of stewardship. The *Islamic Faith Statement* has been written by Hyder Ihsan Mahasneh who was appointed by the Muslim World League to do this important task. The statement is further discussed in section 4.3.

In 2014, specialists of Islam and other faiths, ecosystem managers, ecologists, scholars from botanic gardens, and other relevant disciplines participated in the 2nd *International Forum "Islamic Perspectives on Ecosystem Management"* in Doha, Qatar, with the objective to exchange ideas and experiences about future programmes. The forum has been organized by the Qur'anic Botanic Garden³⁵ and the Commission on Ecosystem Management (CEM)³⁶. The participants discussed Islamic principles, ethics and values. They debated how these could be used in the argument about the need of conservation of environment, ecosystems, culture and traditions. The IUCN Commission on Ecosystem Management explored relationships between faith and spirituality and the natural environment and how this relationship can be used to provide a basis for conservation. Further interests were the relationships between traditional knowledge and ecosystem conservation or the relationships between botanical gardens and ecosystems. Figure 9 presents one recommendation from the Forum.

³⁵ Qur'anic Botanic Garden is a Qatar Foundation. <http://www.qf.org.qa/explore/heritage-centers/quranic-botanic-garden/quranic-botanic-garden> (last access October 2015)

³⁶ International Union for Conservation of Nature (IUCN) with its Commission on Ecosystem Management (CEM) <https://www.iucn.org/about/union/commissions/cem/> (last access October 2015)

The urgent need to change human behavior provides an opportunity to revitalize cultural traditions and beliefs in relation to how we work with and value nature. To regain our balance with nature requires rekindling recognition of the inherent spiritual relationship that man holds with nature; that Islamic principles, and guidance provided by other religions and faiths, can change human behaviors and adoption of religious and spiritual values that have always been a fundamental aspect of nature conservation. In doing so there is need to respect all views, while ensuring transparency, focus, patience and commitment.

*Recommendation from Forum "Islamic Perspectives on Ecosystem Management"
Qur'anic Botanic Garden, Qatar and IUCN Commission on Ecosystem Management,
22-24 April 2014;*

Figure 9: CEM Flash Report March-April 2014
Piet Wit, Chair of CEM/IUCN³⁷

Looking for risk perception research in Islam one quickly comes up with the different research papers by Tom Paradise (2005, 2006, 2008) where he describes his research in Muslim communities in Agadir, Morocco, that has been devastated by two earthquakes of magnitude 5.7-5.9 in 1960. These three papers summarize the same research activities, but each with slightly other or mixed focus: architectural integrity, Islamic law, regional studies, and hazards perception for the natural hazards agencies in Morocco.

The article relevant for this research deals with people's knowledge and perception of earthquake risk and is based on the results of a survey conducted in Agadir in 2002 (Paradise 2006). Paradise conducted 243 interviews, 52 with earthquake survivors. The study revealed (Paradise 2006: p. 23):

- (1) "The less educated respondents (the social majority throughout Morocco and North Africa) were more likely to deny the significance of scientific assessment and forecasting adding that "Allah knows best" and that level of protection was above all more important and effective";
- (2) "The more educated respondents answered that more quakes were imminent (in this seismically active region), while the less educated stated that Allah protected those who were devout and were generally adverse to scientific assessment, forecasting, or new construction technologies. Such 'predictive' modeling like earthquake forecasting was akin to fortune-telling and believed to be prohibited or *haram* in the Qur'an and Hadith";
- (3) "The younger respondents were more likely to believe that new structures were safe simply because they were concrete, commonly ignorant of the necessity for new or retro-fitted iron reinforcement in concrete structures when many structures built in Agadir after the great Quake and/or commonly built today display no, limited or misplaced iron reinforcement and/or inferior mortar materials";
- (4) "Women were more likely to fear earthquakes and their damage more ardently than men, while men were less afraid and generally considered themselves more knowledgeable of seismic cause, activity, and its effects";
- (5) "Respondents who owned televisions believed that they were generally less knowledgeable and more at risk from injury or death from earthquakes (rather than non-television owners), indicating that media can expose personal and community ignorance as well as educate them..."; ...and they
- (6) "...were also truly more knowledgeable about the exact date and general statistics of the 1960 earthquake, although they still considered themselves much less knowledgeable: supporting the value of televisions as a simple, yet effective education tool in the area."

In general, the perception of risk or danger continues to fade away from the collective consciousness with growing age of those who experienced the natural disaster. This has also be observed in other cultures, like for example Switzerland (Schmid 2009:). Therefore, it is highly relevant to talk to affected people short after such an event; otherwise the information received gets more and more unreliable.

³⁷ https://cmsdata.iucn.org/downloads/flash_report_march_april_2014.pdf (last access October 2015)

4.3 Concepts in Islam Regarding Nature, Environment and Climate Change

The Islamic concepts or principles discussed in section 4.1 have induced me to review eight papers from seven authors (Table 2) that are shortly summarized at the end of this section. My intention was to seek these Islamic concepts / principles in their essays. The results are given in tables: an excerpt in Table 3 and the whole table in Appendix 2. This table contains all verses from the Suras which the authors have used to explain Islamic concepts / principles in the context of nature, environment, climate change and related natural hazards and disasters. For a number of Suras such named Islamic concepts / principles or a description as precisely as possible of what the author wanted to state has been carved out, presented in the column "Analysis" and discussed in detail further down.

Table 2: Authors and their scientific papers

2002a	Fazlun M. Khalid: <i>Sustainable Development and Environmental Collapse. An Islamic Perspective.</i>	A
2002b	Fazlun M. Khalid: <i>Islam and the Environment.</i>	B
2003	Hyder Ihsan Mahasneh (see above): <i>Islamic Faith Statement.</i>	C
2003	Ibrahim Özdemir: <i>Toward an Understanding of Environmental Ethics from a Qur'anic Perspective.</i>	D
2007	Muzammal Hussain: <i>Islam and Climate Change: Perspectives & Engagement.</i>	E
2007	Abdul Kabir Hussain Solihu: <i>Making Sense of Natural Disasters: An Islamic Hermeneutics of Malevolent Phenomena in Nature and Its Implication for Sustainable Development.</i>	F
2009	Mohsen Ghafory-Ashtiany: <i>View of Islam on earthquakes, human vitality and disaster.</i>	G
2011	Ursula Kowanda-Yassin: <i>Mensch und Naturverständnis im sunnitischen Islam. Ein Beitrag zum aktuellen Umweltdiskurs.</i> (chapter I & II)	H

Fazlun M. Khalid (born 1932) is of Sri Lankan origin. For further information see above, section 4.2.

Hyder Ihsan Mahasneh is a biologist and Islamic scholar and was the first African head of the Kenya National Parks Service. He was appointed by the Muslim World League to compile the paper *Islamic Faith Statement*.

Ibrahim Özdemir (born 1960) is an environmentalist and professor of history of philosophy, ecology and religion at Ankara University, Divinity School in Turkey. He has travelled widely in the Muslim world and the West. He has published six books and over fifty articles.

Dr Muzammal Hussain is an environmental activist and the founder of the London Islamic Network for the Environment (LINE), the UK's first local Islamic environmental group.

Abdul Kabir Hussain Solihu is an assistant professor in the Department of General Studies, Faculty of Islamic Revealed Knowledge and Human Sciences at the International Islamic University of Malaysia in Kuala Lumpur.

Mohsen Ghafory-Ashtiany (born in Tehran, Iran in 1957) is a professor of earthquake engineering and risk management at International Institute of Earthquake Engineering and seismology (IIEES, Tehran) which he founded in 1989.

Dr Ursula Kowanda-Yassin is a teacher at "Privater Studiengang für das Lehramt für Islamische Religion an Pflichtschulen"³⁸ (IRPA) Vienna and trained in adult education, founder and director of "Muslim-Info" and "Betuinsi" www.betuinsi.at (last access October 2015).

Table 3: Excerpt of the table concerning the Suras referred to in the papers with relation to nature, environment or disasters

Sura no.	Sura (Qur'an Translation by Abdullah Yusuf Ali)	Relation to nature and natural processes	
1:1	In the name of Allah, Most Gracious, Most Merciful.	one master and possessor of nature	B
1:2	Praise be to Allah, the Cherisher and Sustainer of the worlds;	Unity principle (<i>tawhīd</i>)	A C
1:5-7	Thee do we worship, and Thine aid we seek. Show us the straight way, The way of those on whom Thou hast bestowed Thy Grace, those whose (portion) is not wrath, and who go not astray.	Spiritual dependency on God	H
2:11	When it is said to them: "Make not mischief on the earth," they say: "Why, we only Want to make peace!"	Man is weak & full of mistakes No chaos & unrest	H
2:19-20	Or (another similitude) is that of a rain-laden cloud from the sky: In it are zones of darkness, and thunder and lightning: They press their fingers in their ears to keep out the stunning thunder-clap, the while they are in terror of death. But Allah is ever round the rejecters of Faith! The lightning all but snatches away their sight; every time the light (Helps) them, they walk therein, and when the darkness grows on them, they stand still. And if Allah willed, He could take away their faculty of hearing and seeing; for Allah hath power over all things.	Natural order / signs of God (<i>āyāt</i>) / some man as doubters (Maududi)	H
2:22-23	Who has made the earth your couch, and the heavens your canopy; and sent down rain from the heavens; and brought forth therewith Fruits for your sustenance; then set not up rivals unto Allah when ye know (the truth). And if ye are in doubt as to what We have revealed from time to time to Our servant, then produce a Sura like thereunto; and call your witnesses or helpers (If there are any) besides Allah, if your (doubts) are true.	Natural order / signs of God (<i>āyāt</i>)	H
2:26	Indeed, Allah is not timid to present an example - that of a mosquito or what is smaller than it. And those who have believed know that it is the truth from their Lord. But as for those who disbelieve, they say, "What did Allah intend by this as an example?" He misleads many thereby and guides many thereby. And He misleads not except the defiantly disobedient,	Man needs nature to understand the Qur'an	H
2:29	It is He Who hath created for you all things that are on earth; Moreover His design comprehended the heavens, for He gave order and perfection to the seven firmaments; and of all things He hath perfect knowledge.	Natural order Man's responsibility: master or vicegerent (<i>khalīfah</i>)?	B D
2:30	Behold, thy Lord said to the angels: "I will create a vicegerent on earth." They said: "Wilt Thou place therein one who will make mischief therein and shed blood? – whilst we do celebrate Thy praises and glorify Thy holy (name)?" He said: "I know what ye know not."	Man as God's vicegerent (<i>khalīfah</i>)	C H

³⁸ Translation: "Private course for the teaching of Islamic religion at compulsory schools."

Analysing the results of this review it became obvious that the explanation “natural order” or “order in nature”, like Özdemir calls it, is important for the authors. In more than 50 cases the cited verses of the Qur’an address more or less directly the natural order. Natural order has been mentioned 24 times together with *āya* or *āyāt* (sign, miracle or evidence) that refers to signs of God’s existence in nature in the eight papers’ context. According to Khalid’s interpretation (2002b: p. 6) the natural order in Islam is based on four principles: *tawhīd* (unity principle), *fiṭrah* (creation principle), *mizān* (balance principle) and *khalīfa* (responsibility principle); as outlined further down other authors are using additional principles (Table 4). The interpretation of these four principles does not mandatory correspond to the original meanings; rather it is an adaptation of the principles to the changed circumstances of our time and its topic of nature, environmental changes, climate change and sustainable development. Natural order and the four principles have been mentioned several times in seven out of the eight papers. An exception is Mohsen Ghafory-Ashtiany who cites the Qur’an 33 times, but never uses one of the above mentioned principles; he is a scientist (earthquake engineering) and uses purely scientific explanations. He also chose different Suras than the other authors; only eight of his chosen Suras have been cited also by other authors.

Furthermore, some Hadith (Arabic: *ḥadīth*, plural: *ahadīth*) have been mentioned in few papers as well. Hadith are distinct from the Qur’an. They are the sayings and deeds of Prophet Muhammad, his family, and his companions. It is agreed that Prophet Muhammad clearly distinguished between his own statements and God's words, the Qur’an. Each Hadith consists of two parts: the *matn*, the text of the Hadith (for instance, the words of the Prophet) and the *isnād* (from Arabic *sanad*, meaning “support”), the chain of the narrators of the Hadith (chain of authorities). There are Hadith that can be cited well in the context of environmental issues, like for example in the context of water management and conservation. Faruqi et al. (2001) write in their contribution *Islam and water management: Overview and principles* that the Prophet used just 2/3 of a litre of water to perform ablution and he spoke of not wasting water even when it was abundant: "Do not waste water even if performing ablution on the bank of a fast-flowing (large) river." (Al-Tirmidhi 427)

Table 4 provides a translation and a short description of the most mentioned concepts / principles in the analysed papers. Following the table these concepts / principles are discussed in detail.

Table 4: Original explanations of Concepts / Principles

<i>āyah; āyāt</i>	Arabic: آية, plural آيات; English: Muslims consider their holy book, the Qur'an, as a miracle or <i>āyah</i> (sign, miracle, evidence or verse).
<i>tawhīd</i>	Arabic: توحيد; English: Oneness concept (oneness of God) of monotheism in Islam.
<i>fiṭrah</i>	Arabic: فطرة; English: Primordial human nature, disposition, instinct or common sense.
<i>mizān</i>	Arabic: ميزان; English: Balance; scale.
<i>khalīfa</i>	Arabic: خليفة; English: successor, vicegerent. It is one who replaces someone else who has left or died.
<i>ribā</i>	Arabic: ربا; English: Addition, grow, or roughly translated usury. Usury is forbidden in Islamic economic jurisprudence (<i>fiqh</i>). It is even considered as one of the major sins.
<i>tawakkul</i>	Arabic: توكل; English: reliance on God, trust in God.

The concepts / principles are first described in its original meaning and different uses throughout history according to the entries in the *Encyclopaedia of Islam*. Subsequently they are discussed in the contemporary context and in relation to the topic of this research. Finally, the contemporary explanations of the discussed concepts / principles are summarized in Table 5.

In general, Muslims consider their holy book, the Qur'an, as a miracle or *āyah*. “*Āya*, (pl. *āy*, *āyāt*), a word used 373 times in the Qur’ān and found in pre-Islamic poetry, maintains the biblical sense associated with the same Hebrew root word, *ōth*, as the “sign” or “wonder” that stands as evidence by which a person comes to understand something, especially something about God. The signs of nature are a particular emphasis of the Qur’ānic usage, including rain (Q 16:65, 45:5, etc.), the cycle of the seasons (Q 45:5), day and night (Q 17:12, 45:5), the sun and the moon (Q 10:5), and the creation of the heavens and the earth (Q 29:44); an example is seen in the much disputed topic (among the pre-Islamic Arabs) of the resurrection and the afterlife, proven by the “sign” of rain, which brings life to that which appears to be dead (Q 45:5)...”³⁹

Khalid uses different verses of the Qur’an to explain the nature as signs of *Allāh*. He calls the earth “...a testing ground of the human species...” (Khalid 2002b: p. 4). The other authors as well make direct reference to many verses of the Qur’an to explain the natural order and the signs of God. Özdemir (2003: pp. 14-16) deals with “Nature as Signs of God” in one section of his contribution. Özdemir states that the pagan Muslims wanted proofs, signs or miracles for the existence of God and got them in the verses of the Qur’an. Man and nature are signs of God. They are interconnected with each other and interdependent; this fact is used by today’s environmentalists to explain the responsibility of humans towards nature. Solihu (2007: pp. 49-51) outlines that the Qur’an recognizes the physical world as signs of God. Everything in nature is created by God and God created nothing purposelessly; everything has a task in this creation. Today’s authors use the natural order and the signs of God to explain their concerns regarding nature, environment, climate change and natural disasters.

Tawhīd, “in the true sense of the term, the act of believing and affirming that God is one and unique (*wāḥid*), in a word, monotheism. For the Muslim, it is believing and affirming what is stated by the first article of the Muslim profession of faith: “there is no other god but God” (*lā ilāha illā llāh*).”⁴⁰

The doctrine of Oneness (of God) clearly states that it is only God who can be submitted and worshipped and that each individual is responsible solely to him for his actions. God knows everything and his power is all encompassing. Therefore, abusing any of his creations (living beings or natural resources) is a sin. According to Izzi Dien (2000) God’s creation is unique and is made for human to maintain it, not to destroy it. Furthermore he states that every Muslim, who believes in the concept of *tawhīd*, has to look at the world in unprejudiced manner, in the knowledge that everything in the world belongs to the same God to whom he belongs. Khalid (2002a & b), Mahasneh (2003), and Kowanda (2011) directly refer to *tawhīd* and emphasize that it is still the most important concept and simultaneously the fundament of a holistic approach in Islam. In other words, the possibility for a comprehensive, integrated, and holistic worldview is given.

Fitrah “...is a “noun of kind” (Wright, Grammar 3 i, 123d) to the infinitive *fatr* and means (an Ethiopie loan-meaning, see Schwally, in ZDMG, liii, 199 f.; Nöldeke, Neue Beiträge , 49), “a kind or way of creating or of being created”.⁴¹

In the Islamic Faith Statement Mahasneh outlines that *fitrah* is “...perhaps the most direct injunction by Allah to man to conserve the environment and not to change the balance of His creation.” (2003: p. 8). Because a lot of humans have deviated from this natural state, the community has to foster the view

³⁹ Rippin, Andrew. “*Āya*” Encyclopaedia of Islam, THREE. Edited by: Kate Fleet, Gudrun Krämer, Denis Matringe, John Nawas, Everett Rowson. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 July 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-3/aya-SIM_0335

⁴⁰ Gimaret, D. “*Tawhīd*” In Encyclopaedia of Islam, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 July 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/tawhid-SIM_7454

⁴¹ Macdonald, D.B.. “*Fitra*” In Encyclopaedia of Islam, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 July 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/fitra-SIM_2391

on this pure state of nature with its intrinsic goodness in a way that it will be reached again by all human.

Mizān "...is the nomen instrumenti from *wazana* "to weigh", which means to weigh in the ordinary sense and also to test the level of something, like the Latin *librare*..."⁴²

It is relatively new that *mizān* is used as a concept and argument in the ecological debate. It is obvious that the balance is an important concept of the Qur'an. The whole creation is in balance. All authors, except Ghafory, cite the same Sura of the Qur'an (55: 1-13) where the creation with all its beautifulness and balance is described. Today, *mizān*, the sensitive ecological balance, is used for argumentation when it comes to disturbing phenomena in nature, like the greenhouse effect. Muslim scientists appeal for working with and not against the environment to ensure its sustainability.

Khalīfa in political theory "...It is asserted by Muslim historians that the term *khalīfa* was first used as the title of the successor of Muḥammad by Abū Bakr, but it is doubtful whether he ever assumed it as a title (Caetani, *Annali dell' Islam*, 11 A.H., para. 63 n. 1)...

...The title *khalīfat rasūl Allāh* implied the assumption by Muḥammad's successor of Muḥammad's functions as judge and temporal leader of the community. Muḥammad's prophetic function, on the other hand, was held to have ceased with him and it was believed that the spiritual guidance of the community had been inherited by the community as a whole. The *khalīfa*, thus, had no authority to give new interpretations to religious matters: his function was merely to maintain old doctrines..."⁴³

This concept has also changed its meaning with the centuries. Contemporary scholars and scientists like to use the concept of *khalīfa* in the sense that human is the steward or vicegerent of God on earth and therefore has to take care for it. Although the Qur'an states that human has a privileged position among God's creations, humans are not allowed to strain or abuse this position. Mahasneh (2003: p. 5-6) speaks of the importance of this concept with the role and the responsibilities of human beings in the natural order. He documents his statements with Sura 2: 30-34 and Sura 6: 165. In his section "Man's Responsibility: Master or Vicegerent?" Özdemir (2003: pp. 18-20) states that although man is at the top of the great chain of being, how he calls it, man is not the owner of nature. Nature has been entrusted to humans and therefore humans have responsibilities towards all other beings on earth. Kowanda (2011) and Solihu (2007) argue in the same manner.

Concerning the topic of this research two other principles have been important for few authors as well: *ribā* and *tawakkul*.

Ribā "...lit. increase, as a technical term, usury and interest, and in general any unjustified increase of capital for which no compensation is given. Derivatives from the same root are used in other Semitic languages to describe interest..."⁴⁴

Khalid (2002b: p. 5) and Hussain (2007: pp. 24-30) discuss *ribā* in connection with the topic of the research. Khalid points out that the Qur'an prohibits usury or the taking of interest and makes the link to environmental issues. Hussain discusses *ribā* in the context of *Economics in an Era of Climate Change*. He thinks that the intense economic activity with its profit motive has to be reduced or stopped, so that the exploitation of resources can be prevented.

⁴² Wiedemann, E.; Burton-Page, J. "*al-Mizān*" In *Encyclopaedia of Islam*, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 July 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/al-mizan-COM_0758

⁴³ Sourdel, D.; Lambton, A.K.S.; Jong, F. de; Holt, P.M.. "*Khalīfa*" *Encyclopaedia of Islam*, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 October 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/khalifa-COM_0486

⁴⁴ Schacht, J.. "*Ribā*" *Encyclopaedia of Islam*, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 October 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/riba-COM_0918

Tawakkul, "...verbal noun or maṣdar of Form V of wakala "to entrust [to someone], have confidence [in someone]", a concept in Islamic religious terminology, and especially that of Sūfism, with the sense of dependence upon God..."⁴⁵

Kowanda (2011: p. 52) highlights that *tawakkul* is of importance for the Islamic community and that every Muslim has to show trust in his creator in the form of *tawakkul*. The Qur'an says that God will take care of human's maintenance. Kowanda considers an unconditionally trust as dangerous and warns of a misreading of *tawakkul*. As an example of misreading she mentions that birth control can be hindered with such an attitude.

To accomplish this section the eight papers are summarized and it is shown how the respective author has used these Islamic concepts / principles:

A - In 2002 the "World Summit on Sustainable Development" took place in Johannesburg, South Africa. It was convened by the United Nations to discuss sustainable development⁴⁶. The summit ended with the adoption of a political declaration by EU leaders (*The Johannesburg Declaration on Sustainable Development*) and a 65-page Johannesburg Action Plan (*Plan of Implementation*). Fazlun Khalid (2002a) was one of the international speakers. In his statement he outlined that the world has become a global village and therefore has to solve the current problems with global response. He regretted that the rapid progress (mainly in Western countries) occurs at the cost of the environment, because the world is seen as economic resource. He then turned to an Islamic recipe and asked: "Are Muslims a part of the problem or a part of the solution? Sad to say much points to the former option." (Khalid 2002a: p. 4). He argued that Islam and other traditions have been reduced to religion and that this attitude must change. Khalid believes that protecting the environment is a form of worship, and that humans have a basic right to the benefits of a healthy planet. He is convinced that Qur'anic teachings can successfully motivate local people to change their attitude and behaviour concerning a healthy and sustainable environment. He further outlined the importance of the natural order and *fiṭrah* and the place of Muslim people in this system. For him *fiṭrah* describes the primordial nature of creation itself where human is located in it. Furthermore he strengthened the importance of reviewing the Shari'a regarding trade and environmental protection and gave an example of an instrument, called *hima* (action for protecting natural capital), that was used to save an endangered marine zone in Africa. For Khalid it is possible to adapt Shari'a institutions within secular administrative systems and to work together towards a sustainable environment.

B - In his second contribution *Islam and the Environment* Fazlun Khalid (2002b) starts with the explanation that Islam is not only the religion, but a whole way of life. He then explains the basics of Islam as religion in short and the roots of Islamic environmental practice that one can find in the Qur'an and the Sunna (guidance) of Prophet Muhammad. Concerning the ethical dimensions in Islam he writes about the Shari'a, the Islamic legal system, and makes the link to environmental themes, like exploitation or waste that are also part of the Shari'a. The following chapter deals with the natural order and he cites several verses of the Qur'an to show that the universe human live in is a sign of God's creation. It is written in the Qur'an that everything on earth was created for humankind, but that human has to live in a way that pleases God. In the next chapter Khalid works out what the

⁴⁵ Lewisohn, L. "Tawakkul" In Encyclopaedia of Islam, Second Edition. Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Brill Online, 2015. Reference. Universitaetsbibliothek Bern. 16 July 2015 http://referenceworks.brillonline.com/entries/encyclopaedia-of-islam-2/tawakkul-SIM_7447

⁴⁶ Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." From the World Commission on Environment and Development's (the Brundtland Commission) report *Our Common Future* (Oxford: Oxford University Press, 1987). <http://www.worldbank.org/depweb/english/sd.html> (last access October 2015)

“Enlightenment” period provoked in Europe. According to Khalid (2002b: p. 5) “One result of the Enlightenment was science, including the scientific capacity for rendering intelligible certain aspects of the material world and for making mankind (in Descartes’s own words) “Master and possessor of Nature.” Khalid emphasizes that this view is not the view Islam teaches the Muslims, because in Islam only one master and possessor of nature exists, namely God. Islamic teachings set limits to human behaviour. For Khalid this happens with the help of the four principles *tawhīd* (unity principle), *fiṭrah* (creation principle), *mizān* (balance principle) and *khalīfa* (responsibility principle). For each principle he gives a short explanation, citing corresponding verses of the Qur’an.

C - Hyder Ihsan Mahasneh (2003) discusses in the first part of his *Islamic Faith statement* the relationship between human and environment. He states that man has to adjust if he wants to survive. Then he argues that the industrial revolution that has taken place in Europe in the 18th and 19th centuries has had negative consequences for the social and environmental well-being. He lists for example loss of biodiversity, species extinction, global warming or exploitation of the earth’s resources. In the second part of the statement he discusses man’s relation to God, the principle of divine ownership, man’s capacity to reason and to balance (justice), man’s duty to use and not to abuse, and the four Islamic principles *tawhīd*, *khalīfa*, *mizān* and *fiṭrah*. Mahasneh states that all these points are important for the Islamic view on conservation and emphasizes his arguments with citations of verses of Suras of the Qur’an. He concludes his statement with the following words: “If biologists believe that humans are the greatest agents of ecological change on the surface of the earth, is it not humans who, drawn from the brink, will—for their own good—abandon Mammon and listen to the prescriptions of God on the conservation of their environment and the environment of all the creatures on earth? The Islamic answer to this question is decisively in the affirmative.” (Mahasneh 2003: p. 9)

D - İbrahim Özdemir (2003) emphasizes in the introduction of his paper *Toward an Understanding of Environmental Ethics from a Qur’anic Perspective* that the Qur’an is the primary source for guidance for Muslims in all areas. Muslims believe that the Qur’an is the direct word of God and plays an important role for the ethical lifestyle of Muslims. According to Özdemir (2003: p. 1) the Qur’an provides “a comprehensive, integrated, and holistic worldview based on the unity of reality (*tawhīd*).” He gives a short overview about the history of the relationship religion – environmentalism and concludes that every religion has its own ethics that can provide “the metaphysical foundation necessary for an environmental ethic.” (Özdemir 2003: p. 3). Then he looks at nature from the Qur’anic perspective. He points out that man’s possession of free will is on the one hand a high privilege because it puts him on the top of the great chain. On the other hand this capacity is a burden for man, because he has to take the leadership and the responsibility over all other beings and everything on earth; in other words: he is God’s vicegerent (*khalīfa*) on Earth. For Özdemir the natural order is important too, and he states that nature has been created in order and balance; men are only one part of it. Balance (*mizān*) is a key term for him and he considers justice and balance to be a universal law of God to which men must hold. In a short paragraph he explains that the Qur’an and the Sunna assign a number of obligations and responsibilities to human concerning the use of water (no pollution, no waste, etc.). Furthermore he sees “Nature as Muslim” and “Nature as Signs (*āyaat*) of God”. He documents these statements using various quotes of the Qur’an and referring to Muhammad Hamidullah (an Indian Islamic scholar of the 20th century), Muhammad al-Ghazali (a Persian Muslim theologian, jurist, philosopher, and Sufi of 10th century), Jalal al-Din al-Rumi (a Persian poet, jurist, Islamic scholar, theologian, and Sufi mystic of the 13th-century), Said Nursi (a Kurdish Sunni Muslim theologian of the 20th century), Fazlur Rahman (an Indian scholar of Islam of the 20th century), and Seyyed Hossein Nasr (a contemporary Islamic philosopher, see section 5.1). Furthermore, Özdemir describes the duty of men to protect animals that constitute a community (*umma*) like men do. He

finishes his paper with the words of Yunus Emri, a Sufi poet of the 13th century: “We love all creation for the sake of its Creator.” (Özdemir 2003: p.29)

E - In his paper *Islam and Climate Change: Perspectives & Engagement* (that is a refined version of his final dissertation) Muzammal Hussain (2007) expresses his understanding of Islamic environmental ethics in relation to climate change. First he explains the main influences (natural and anthropogenic) on the earth’s climate from a scientific point of view. Then he outlines the resultant current and potentially impacts of climate change. In his second section his focus is on Islamic environmental ethics that are, according to Hussain, influenced by Islamic teachings, prophetic traditions and history. After an explanation of the basics of Islam where he stresses the importance of the two fundamental sources of Islamic law, the Qur’an and the Sunna, he discusses a number of relevant themes, like for example mounting wealth and the religion of self-interest, nature and the Qur’an, guardian or vicegerent (*khalifa*), the concept of one God (*tawhīd*), unnatural disasters, future generations or population control in Islam. With the help of Islamic teachings and basic principles of an Islamic environmental ethic, he looks at the problems of climate change. In the next section Hussain discusses the relationship between economy and climate change and presents some basic principles of the Islamic approach to economics. Finally, Hussain describes possible forms of an Islamic response to climate change. He gives particular attention to how Muslims living in the UK might engage with the climate issue. Hussain aims to bring together societies, so that they collectively engage with this global and pressing problem of climate change.

F - In the introduction of his paper *Making Sense of Natural Disasters: An Islamic Hermeneutics of Malevolent Phenomena in Nature and Its Implication for Sustainable Development* Abdul Kabir Hussain Solihu (2007) states that magnitude and frequency of natural disasters are increasing today and gives some numbers. After this short section he first describes the *technocratic* view of some scholars, like for example Thomas H. Huxley⁴⁷ or John Stuart Mill⁴⁸ who say that nature is evil and man is its victim. Solihu states that thanks to the growing knowledge of how the earth functions, humans are better informed or prepared today, but that this knowledge does not help always. Secondly, Solihu discusses the *spiritual* interpretation of humans who think that the disaster was a punishment, like for example after the 2004 Indian Ocean tsunami. And thirdly, he records that some views want to bridge the gap between the technocratic (1) and the spiritual (2) framework, saying that there is interconnectedness between human and all other living things. After this introduction Solihu turns to the Islamic perspective of natural phenomena. He explains the Islamic attitude towards nature with the help of many verses of the Qur’an and works out different Islamic principles like God’s vicegerent (*khalifa*), autonomous communities (*ummas*), signs (*āyat*) of God, and balance (*mizān*). He further states that “...the term natural disaster is normally translated into Arabic as *al-kawarith al-tabi`iyah* or simply as *al-jawa’ir...*” (Solihu 2007: p. 50) and adds that there is no root for natural disaster in the Qur’an or the Hadith. The Qur’an mentions disasters always by their name: *rajfah* or *zalzāl* (earthquake), *ṭufān* (flood), *ḥasiba* (violent tornado) and *ṣayḥah* (mighty blast). The section “The Macroscopic Perspective” begins with the comment that natural disturbances, as Solihu calls them, are not necessarily disastrous. Only from the anthropogenic perspective they may be disastrous, because they may destroy human assets. Normally, nature has a resilient mechanism to recover, but because “humans stubbornly stand in their way” (Solihu 2007: p. 51), this resilience is disturbed. Then Solihu

⁴⁷ Thomas H. Huxley (1825-1895) was an English biologist who supported Charles Darwin's theory of evolution.

⁴⁸ John Stuart Mill (1806–1873) was a British philosopher, political economist and civil servant. He contributed to social theory, political theory and political economy.

provides some scientific information and numbers about the death toll from natural hazards, the rate of natural population change and the birth rate for the world in general and Indonesia in particular. He states that the Qur'an emphasizes that death is unavoidable for every living creature. Solihu admits that the death of a family member, for example, is a catastrophe, but not for the world as a whole. The next section deals with the many violations of the Divine Law and the fact that humans are mainly responsible for disasters. Solihu divides the divine law in the physical law (the law of nature) and the moral law. He gives several examples of catastrophic punishments in the Qur'an. He also cites a Hadith from Umm Salmah (6:304) who heard the Prophet saying: "...When sin becomes rampant among my ummah, they will be subject to an inclusive punishment from Almighty Allah..." (Solihu 2007: p. 61) and then makes the link to today's violations of nature and resulting disasters, like for example the human induced flood by China's Yangtze River in 1998. Solihu wonders why God allows such disasters and searches the answer in the fact that humans violate the moral law and disturb the balance. In his last section Solihu outlines the necessity of a commitment towards sustainable development. He promotes the competition in doing good deeds (*khayrāt*) and forbidding the spread of mischief (*fasād*).

G - Mohsen Ghafory-Ashtiany (2009) is an expert in earthquake engineering. With his paper *View of Islam on earthquakes, human vitality and disaster* he intends to foster the interest and participation of the public in Disaster Risk Reduction (DRR), especially in developing countries. He starts with a short overview on the history of risk perception and interpretation of natural disasters, giving examples from the Maya people, Greek, Roman and Egyptian civilizations. He explains that human has great knowledge about the earth today, but anyway cannot prevent every event. And when a disastrous event, like Hurricane Katrina in 2005, happens, people blame the experts or still explain the event with God's will or his wrath. He further describes the key elements of earthquake disaster risk reduction. He states that earthquakes are unavoidable events and the disasters they release depend on the magnitude, but also on the vulnerability situation of the population. Based on these explanations Ghafory defines the following guiding principle of a successful earthquake risk reduction: (1) Belief in nature and the existence of seismic hazards, (2) Comprehensive approach to earthquakes, (3) Expert leadership and good governance, (4) Towards a sustainable development, and (5) Long-term actions based on consistent policies. The subsequent section is dedicated to the key concepts in Islamic belief. According to Ghafory Muslim people have with the key concepts of Islamic teaching the best conditions to support the guiding principles of earthquake risk reduction. He lists these principles and explain them based on the Qur'an: (1) Islam means submission to the will and guidance of God, (2) Submission is based on faith and cognition, (3) The Qur'an is comprehensive, multi-functional and different interpretable, (4) The principles are based on experience, cognition, wisdom and revelation, (5) Leadership of elite and experts, (6) Group work, social activities and responsibilities, (7) Humans are born innocent and can develop in a good way, (8) God's will is based on human deeds and behaviour, (9) Human has free will, (10) Human do not have the right to hurt themselves or others, (11) Humans' rights have to be respected, (12) Humans have to respect the laws, (13) Concept of "Command the good and forbid the evil" (*amr bil ma'ruf wa nahy an al munkar*), and (14) Sins are violating God's guidance. Furthermore he lists the direct references to earthquakes and the two complementary concepts of "belief" and "doing good deeds" in the Qur'an. He is convinced that with a correct interpretation of all these verses a good disaster risk reduction and management is possible, like for example earthquake proof construction of houses and infrastructure. Ghafory also gives a few Hadith (statements) from the Prophet Muhammad that fit above discussed topic too. For example he writes that Prophet Muhammad has never said that "earthquakes or other disasters are expressions of the wrath of God or the result of disobedience or infidelity."

(Ghafory 2009: p. 219). And in a separate section he gives several examples of statements of Prophet Muhammad and one of Imam Ali that can be related to the need of doing good deeds and avoid bad ones and to issues related to earthquakes (Ghafory 2009: pp. 227-228). In his next section he stresses again the importance of the principle "doing good deeds" and "avoiding bad deeds". In a diagram he outlines what means "good deeds" and "bad deeds" concerning construction, community and environment (Figure 10). Based on the example of the story of Noah's ark, he outlines how one can be safe in a disaster.



Figure 10: The relationship between our acts and protection against disaster (Ghafory 2009: p. 229)

To conclude, Ghafory asks in his paper why Islamic countries face such frequent disasters. He explains this fact by regretting that today's Muslims do not completely follow Islam and Islamic teaching. Furthermore, he blames corrupt rulers and bad management that hinder the development process.

H - Ursula Kowanda-Yassin (2011) wrote a comprehensive publication about *Mensch und Naturverständnis im sunnitischen Islam. Ein Beitrag zum aktuellen Umweltdiskurs*.⁴⁹, based on her PhD thesis. The book consists of three main chapters, but for my research only two have been examined: the first chapter is a discourse about religion and environment from an anthropocentric perspective and with the question: "Who is responsible for the current environmental problems?" Kowanda explains the definition of nature based on the historical development. The monotheistic religions put human in the center of world affairs. Critics see anthropocentrism as cause of the exploitation of nature. According to Kowanda, nature does not exist as a discrete power in Islam, because it is only a part of the great creation. She gives an insight in the development of this definition of nature, quoting Ibn Arabi (an Andalusian Scholar of Islam, Sufi mystic, poet, and philosopher; died in 1240) and Hossein Nasr (section 4.1). When she looks for the causes of the environmental problems, she refers to Fazlun M. Khalid and Nawal H. Ammar who find the causes in the social injustice. Furthermore, she states that Islam looks at the nature of human in its entirety and explains it based on the term *fitrah* that she considers being "die ursprüngliche Form der Dinge"⁵⁰ (Kowanda 2011: p. 53). She underlines her findings with verses from the Qur'an. Kowanda also gives an overview about the five pillars of Islam. Finally, she comes to the conclusion that anthropocentrism is compatible (or even required) with a responsible attitude to nature. In the second chapter of the book Kowanda examines the religious environmental ethics and states that religion is important for this topic. She first explains the different types of ecology, like eco-feminism, Deep Ecology, eco-activism, and Earth First! In the section about Islamic environmental ethics Kowanda cites numerous verses of the Qur'an and few Hadith that point to the miracle of creation and the responsibility of human beings to protect the environment. The principles of Islam insist on thrift, frugality and a careful use of resources. She further explains different Shari'a instructions, like *ḥarīm* (forbidden, sacrosanct) and *ḥimā* (protected, prohibited) that are useful for the protection of nature and *ḥisba*

⁴⁹ Translation: "Understanding of man and nature in Sunni Islam: A contribution to the current environmental discourse."

⁵⁰ "The original form of things"

(accountability) that is useful for the compliance with regulations. Kowanda finishes the chapter with the statement that Islam has numerous environmentally ethically sensible suggestions.

As outlined above contemporary Islamic scholars and scientists refer to the relationship between humans and the environment as an ethical one. There is a great theoretical and practical activity to formulate a response to today's environmental problems. Many concepts and principles in the Qur'an carry substantive implications for the environment and they are used accordingly to today's environmental problems (Table 5).

Table 5: Explanation of concepts related to climate change, environment and natural hazards

Arabic	Arabic	Today's explanation related to the research topic
<i>āyah; āyāt</i>	آية, آيات pl.	Scientists explain that everything in nature is a sign of God and they express their concerns regarding nature, environment, climate change and natural disasters with selected verses.
<i>tawhīd</i>	توحيد	Each individual is responsible solely to God for his actions. Therefore, abusing any of God's creations (living beings or natural resources) is a sin.
<i>fiṭrah</i>	فطرة	The key concept of <i>fiṭrah</i> underlies Muslims' responsibility to the environment. No change should be in the creation of God, but human's behaviour is disrupting the balance of earth's nature. Humans disobey God's will and therefore violate <i>fiṭrah</i> .
<i>mizān</i>	ميزان	Scientists use for the sensitive ecological balance the term <i>mizān</i> and argue with it when it comes to disturbing phenomena in nature, like the greenhouse effect.
<i>khalīfa</i>	خليفة	Contemporary commentators define the word <i>khalīfa</i> as "God's vicegerent" on earth. God has entrusted humans with its safekeeping.
<i>ribā</i>	ربا	Some scientists think that the intense economic activities with its profit motive have to be reduced or stopped, so that the exploitation of resources can be prevented.
<i>tawakkul</i>	تَوَكَّلْ	The Qur'an says that God will take care of human's maintenance, but unconditionally trust or a misreading of this <i>tawakkul</i> can also be unreasonable and can lead to harm.

To summarize it can be said that the discussion about nature, environment, climate change and natural disasters are well represented in the Muslim world; however, the scientific discussion is relatively young but intensive. Compared to Western conditions, where only the scientific-technic view exists, there are clearly two views in the Islamic understanding concerning the topic: beside a scientific-technic framework there is a strong spiritual one.

Chapter 4 started with a landscape picture from planet Pandora and ends with a picture from a *Na'vi* (Figure 11), both pictures from the movie "Avatar"⁵¹. Ihsan Torabi integrated pictures from this movie in a detailed statement he made on Facebook in 2010. The movie is primarily an action-adventure journey of self-discovery, in the context of imperialism and deep ecology.



Figure 11: Neytiri, a Na'vi
(Source: www.avatar-forums.com last access August 2015)

Like the scientists in the different sections of this chapter Torabi argues that the Creator gave human beings a paradise, yet in their madness they destroyed it and Torabi then tries to show a way out of this misery. He compares human with the *Na'vi* (an indigenous species that live on Pandora) and states that the *Na'vi* know that the natural world serves them because they live according the divine will and maintain a unity-based consciousness. To close his comment Torabi cites the Qur'an (14:48): "One day the earth will be changed to a different earth, and so will be the heavens, and (men) will be marshalled forth, before Allah, the One, the Irresistible;..."

⁵¹ Avatar (marketed as James Cameron's Avatar) is a 2009 American epic science fantasy movie.

5 Tajikistan Country Profile

Tajikistan proclaimed its independence on September 9, 1991, but it was slow to alter its flag!



The new design from November 24, 1992 incorporates the same 4 colours as the 1953 flag. Green is now said to stand for agricultural production, while red is a "symbol of state sovereignty." White has the same meaning as previously, referring to the cotton crop. The crown in the centre of the white stripe is capped with an arc of seven gold stars: these are said to represent unity among the different social classes of the country, including workers, peasants, and intellectuals. (Source: Encyclopaedia Britannica)

5.1 Geography

According to the *Country Profiles*⁵² is Tajikistan the smallest country of Central Asia with an area of 143,100 square kilometres. Its maximum east-to-west extent is 700 kilometres, and its maximum north-to-south extent is 350 kilometres.

The country has a highly irregular border, including 430 kilometres along the Chinese border to the east and 1,030 kilometres along the border with Afghanistan to the south (Figure 12). Most of the southern border with Afghanistan is set by the Amu Darya (*darya* is the Persian word for river) and its tributary the Pyanj River (Darya-ye Pyanj), which has headwaters in Afghanistan and Tajikistan. The other neighbours are the former Soviet republics of Uzbekistan, to the west and the north and Kyrgyzstan, to the north.



Figure 12: Map of Tajikistan⁵³
(Produced by U.S. Central Intelligence Agency)

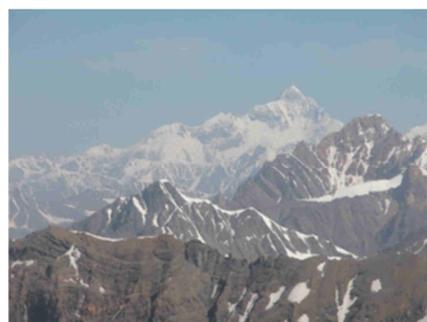


Figure 13: Ismoil Somoni Peak in Pamir 7,495 m a.s.l.
(Source: Zimmermann, 2005)

More than half of Tajikistan lies above 3,000 meters a.s.l., and several of the country's mountain ranges contain glaciers and peaks exceeding 7,000 meters a.s.l. (Figure 13). Almost 93 percent of

⁵² The Federal Research Division (<http://www.loc.gov/rr/frd>) provides customized research and analytical services on domestic and international subjects to agencies of the United States Government, the District of Columbia, and authorized Federal contractors on a cost-recovery basis. The series of profiles of foreign nations is part of the Country Studies Programme, formerly the Army Area Handbook Programme.

⁵³ "Courtesy of the University of Texas Libraries, The University of Texas at Austin."
http://www.lib.utexas.edu/maps/cia15/tajikistan_sm_2015.gif (last access October 2015)

Tajikistan's surface area is mountainous. The Pamir and the Alay are the two principal ranges. These ranges are cut by hundreds of valleys, canyons and gorges and drained by numerous streams which flow into few large river valleys. In these valleys and the few flood plains lives and works the majority of the country's population.

Tajikistan has the biggest water resources in Central Asia. The country can be divided into four major river basins: The Syr Darya (Tajik: Сирдарё) Basin, the Amu Darya (Tajik: Амударё) Basin, the Zeravshan (Tajik: Дарёи Зарафшон) Basin and the basin draining to China. The northwest of Tajikistan forms part of the Syr Darya basin. Only 3 percent of the total flow of the Syr Darya River is generated within Tajikistan by the shallow rivers Khodzhabakirgan, Isfara, and Isfana (FAO 2012: p. 212). The Amu Darya is the largest river in Central Asia, with a catchment area of 309,000 km² and a length of 2,540 km. Most of the Amu Darya flow originates on the territory of Tajikistan (72.8 percent) by the junction of the Vakhsh and Pyanj Rivers. The Zeravshan River, once the largest tributary of the Amu Darya, is today almost fully used for irrigation (FAO 2012: pp. 210-211).

5.2 Climate, Climate Change and Natural Hazards

According to Kimsanov (2011) climate in Tajikistan covers a wide range of air temperature, humidity conditions, precipitation and intensity of solar radiation. Climate is sharply continental and changes with altitude (Figure 14).

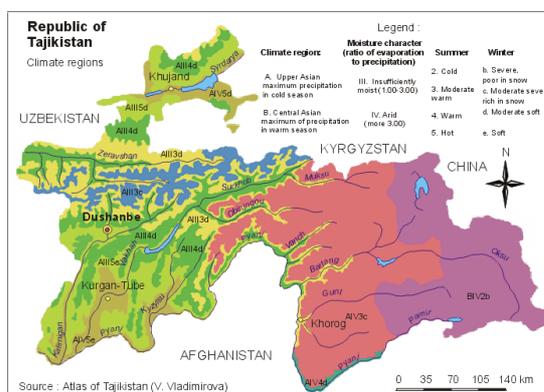


Figure 14: Climate regions of Tajikistan (Tajikistan 2002: Vital maps and graphics on climate change)⁵⁴

Tajikistan's subtropical south-western corner experiences some of the highest temperatures in the country, on average 35°C to 42°C in the summer. At Tajikistan's lower elevations, the average temperature range is between 25°C to 30°C in July and -1 °C to 3°C in January. Although rainfall can be sporadic, as the drought of 1999-2001 and the drought of 2008 have shown, most precipitation occurs in winter and spring (Figure 15) (ADRC 2006). Spring floods and landslides are rather common, particularly when rainfall coincides with strong snowmelt.

Climate models predict for Central Asia greater warming and less rain (IPCC 2014). In addition, extreme events like droughts and floods are supposed to occur more frequently as outlined in the 3^d

⁵⁴ Electronic version: Tajik Met Service, Dushanbe 2002. <http://enrin.qrda.no/htmls/tadjik/vitalgraphics/eng/html/c10add.htm> (last access October 2015)

National Report by Tajik Government to the Intergovernmental Panel on Climate Change (IPCC)⁵⁵. The omnipresent environmental degradation, deforestation and desertification aggravate these trends. Agriculture needs too much water what results in high water tables, erosion and salination. Tajikistan's poor often pollute water resources, cut already scarce forest resources for firewood, and practise an excessive cattle pasture that exceed the carrying capacity of the land (UNITED NATIONS 2004 and 2012, Kust 2014).

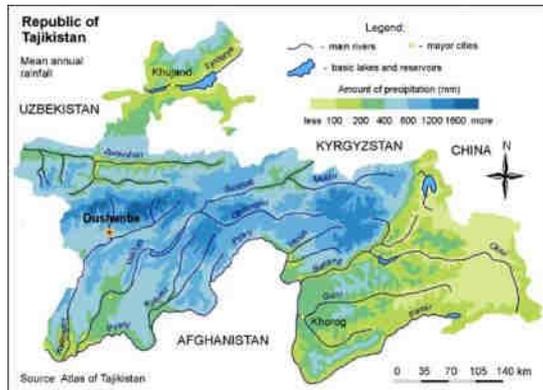


Figure 15: Mean annual rainfall in Tajikistan (Tajikistan 2002: Vital maps and graphics on climate change)⁵⁶

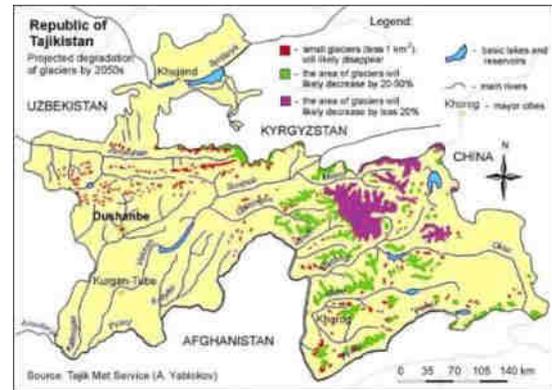


Figure 16: Projected degradation of glaciers (Tajikistan 2002: Vital maps and graphics on climate change)⁵⁷

Tajikistan is considered to be the most climate vulnerable country in Central Asia (Fay and Patel 2008). Tajikistan is highly susceptible to natural disasters, and is regularly affected by floods, landslides, and droughts. In recent years, the glaciers are fast melting (Figure 16) what results in increased water inflow into the major rivers, causing floods and flows. However, in the longer-term the water inflow from glaciers will drastically decrease with vanishing glaciers. This coming water-shortage will also increase the already existing tensions between the water-stressed countries in the wider region (Izquierdo et al. 2010).

Not climate related, but also common in Tajikistan are earthquakes⁵⁸. The territory of Tajikistan is located in a zone of high tectonic interaction of three large mountain structures: Pamirs, Hindukush and Southern Tien Shan.

⁵⁵ Intergovernmental Panel on Climate Change (IPCC) is the leading scientific research authority on global climate change. The IPCC regularly reviews scientific research around the world and compiles assessment reports (AR) of the state of knowledge on climate change. The IPCC also produces Special Reports like the one on Extreme Events (2012).

⁵⁶ Electronic version: Tajik Met Service, Dushanbe 2002 <http://enrin.grida.no/htmls/tajik/vitalgraphics/eng/html/c20.htm> (last access October 2015)

⁵⁷ Electronic version: Tajik Met Service, Dushanbe 2002 <http://enrin.grida.no/htmls/tajik/vitalgraphics/eng/html/u10.htm> (last access October 2015)

⁵⁸ The website Earthquake Track <http://earthquaketrack.com/p/tajikistan/recent> (last access August 2015) shows the many earthquakes occurring in or near Tajikistan.

5.3 History

The region has a rich history. Tajiks are direct descendants of the Iranian people whose continuous presence in Central Asia and northern Afghanistan is attested from the middle of the first millennium BC. The ancestors of the Tajiks constituted the core of the ancient population of Khwārezm and Bactria, which formed part of Transoxania (Sogdiana). For centuries the region of today's Tajikistan has been subdued, conquered and ruled by foreign intruders. The time since independence (1991) has been characterized by violence (civil war in mid 1990s), poverty, autocratic leadership, and geostrategic vulnerability.

The below timeline shows this rich history of today's Tajikistan. It is a compilation of data and information from different sources⁵⁹:

6th to 4th centuries BC - Large parts of present-day Tajikistan were part of ancient Persia's Achaemenid Empire.

4th century BC - Alexander the Great subdued the region and it became part of the Greco-Bactrian kingdom, one of the successor states to Alexander's empire. The northern part of present-day Tajikistan was part of Sogdiana.

2nd century BC - A net of interconnected trade routes, later called the Silk Road, linked China with Western Asia and Europe. The routes crossed Central Asia and there were also two routes through the Pamir, one from Kashgar via Irkestam into the Ferghana valley (Uzbekistan) and one from Yarkand through Tashkurgan across the Wakhan into present-day Chitral valley (Pakistan).

7th / 8th century AD - Arab invaders began to conquest the region, including present-day Tajikistan, and introduced Islam.

9th / 10th century AD - The Persian Samanids were a Muslim dynasty with considerable political and cultural influence. They gained control over the region and ruled Transoxiana and Khorasan from 819 to 1005. The Samanid period is considered to be the beginning of the Tajikistan nation-state (which was a part of Greater Iran). Today Tajik people consider Ismail, the most famous Samanid ruler, as their national hero and "Father of the Nation".

13th century AD - Ghengis Khan invaded the region and the main cultural areas of Central Asia thus became possessions of his second son Chagati.

14th century A.D. - Most of present-day Tajikistan became part of Timur's (Tamerlain's) Empire. Timur managed to create a great power with Samarkand as capital.

1860-1900 - Present-day Tajikistan was divided: the north came under Tsarist Russian rule and the south was annexed by the Emirate of Bukhara (an autonomous protectorate of Russia) and was under its control until 1924.

1917-1918 – While Russia was occupied with the upheaval after the Bolshevik revolution; armed Central Asian groups tried to initiate an insurrection, but failed.

Early 1920s - 1991 - The Soviet Union began to establish Soviet rule in Central Asia. In late 1924 Tajikistan was removed from the political map, so to speak. Officially, this was done using ethno-

⁵⁹ Sources: www.historyatlas.com / BBC News / Encyclopaedia Britannica: <http://www.britannica.com> / Bullard, W. (2011): *All against All: The Tajik Civil War (1991-1997)* / Jonson, Lena (2006): *Tajikistan in the new Central Asia: geopolitics, great power rivalry and radical Islam*. (London, UK: I.B. Tauris) / Zimmermann, B. (2006): *A Society in Transition: Ismailis in the Tajik Pamirs*. Master Thesis, University of Bern, Switzerland.

linguistic and economic criteria. In 1929 the Tajik Soviet Socialist Republic was formed in the structure of the USSR. Finally, in September 1991 Tajikistan gained independence from the Soviet Union.

1992-1997 - The end of the Soviet patronage in late 1991 created a power vacuum and rumours began. Armed clashes between pro-government forces and pro-democracy and Islamist groups broke out in Dushanbe and ended in a civil war. Regional power struggles exacerbated the political crisis in the capital as regions such as Badakhshan declared sovereignty and other regions refused to accept the Kulobi dominated government elected in 1994. The civil war came to an end with the help of the United Nations, Russia, and Iran in 1997. The Rakhmonov government signed a peace agreement with the United Tajik Opposition (UTO), a coalition of Islamic leaders and secular politicians.

1997 - Government re-established control, oppressed political opposition, and imposed strict media controls.

2001 - After the terrorist attack on 11 September, U.S. troops were stationed in Khorugh and Dushanbe and French soldiers in Dushanbe. Nevertheless, Russia still played the role of an important order of power in the region with its troop presence. Border security to Afghanistan took place by Russian troops until summer 2005.

2003 - Tajiks voted on changes to their constitution that would allow President Emomali Rahmon (born as Imomali Sharipovich Rakhmonov) to potentially stay in power for another 17 years. An overwhelming majority of voters approved the constitutional change.

2005 - Tajik voters cast their ballots in parliamentary elections. President Emomali Rahmon's National Democratic Party won the election overwhelmingly with nearly 75 percent of the vote. The opposition earned only two of 63 seats in Parliament. The EU said "significant breaches" were reported during the vote, including proxy voting, obstruction of election observers and irregularities in vote counting.

2006 - Tajikistan's President Emomali Rakhmon won re-election to a new, seven-year term according to preliminary results that gave him nearly 80 percent of the vote. Foreign observers said the vote was flawed.

2012 July - Rebel leader Tolib Ayombekov, a former warlord, allegedly killed the head of provincial security in Gorno-Badakhshan province on July 21. This was believed to be the result of a dispute over who would control how much of the drug smuggling from Afghanistan. On 24 July 42 gunmen and government soldiers were killed in subsequent clashes with the armed group led by Tolib Ayombekov. Dozens of civilian casualties were also suspected. A few days later, in early August, Tajik government troops opened fire on a crowd protesting the unexplained killing of an influential local leader in the autonomous province Kuhistoni-Badakhshan. Hundreds had gathered in front of Khorugh regional headquarters to demand an explanation for the overnight death of Imumnazar Imumnazarov, a former warlord during the country's civil war in the 1990s.

5.4 Government and Administrative Structure

Government and Administrative Structure

According to the Constitution (available on the President's official website⁶⁰), the Republic of Tajikistan is a sovereign, democratic, legal, secular and unitary state. Tajikistan is a presidential republic with a legislative, executive and judiciary branch, dominated by the executive branch. The current constitution was adopted in 1994 and amended significantly in 1999 and 2003.

Baizoyev and Hayward (2004: 229-230) explain that the territory of Tajikistan is divided in a descending hierarchy into provinces (Tajik: viloyats or Russian: oblasts), districts (Tajik: nohiyas or Russian: rayons), and towns, settlements, and villages. Dushanbe is the capital of Tajikistan and is located in the west of Tajikistan.



Figure 17: Four territorial regions of Tajikistan (Geoscience News and Information, Geology.com⁶¹)

Tajikistan is administratively divided into four territorial regions⁶², i.e. a group of *nohiyas* and three *viloyats* (Figure 17):

- **Sughd Province** (Вилояти Суғд): Sughd Province is located in the northwest of the country with Khujand as its centre. Sughd covers the Zerafshan valley and the western part of the Ferghana valley. Its territory is 25,400 square kilometres, and has a population of 2,233,500 (2010), mainly Tajiks, with strong Uzbek community of around 30 percent. The province includes 14 *nohiyas*, 8 towns of provincial significance and 20 settlements.
- **Districts of Republican Subordination** (Ноҳияҳои тобеи ҷумҳурӣ): Situated in the central part of the country with Dushanbe as its centre and including the Qarategin valley, the Kofarnihon area and the Hisar valley. The area stretches over 28,600 square kilometres. The total population is 1,722,900 (2010), including the capital Dushanbe with a population of 724,800 (2010). It has 13 *nohiyas* (districts), 4 towns of republican significance, 8 settlements and 91 rural *jamoats* (village centres).
- **Khatlon Province** (Вилояти Хатлон): This south-western province is the most populated part of Tajikistan with a population of 2,677,300 (2010). Its territory is 24,800 square kilometres. The province was formed at the end of 1992 after the merging of Kulob and Qurghonteppa viloyats.

⁶⁰ <http://www.prezident.tj/en> (last access October 2015)

⁶¹ <http://geology.com/world/tajikistan-satellite-image.shtml> (last access October 2015)

⁶² https://en.wikipedia.org/wiki/Regions_of_Tajikistan (last access October 2015)

- Kuhistoni Badakhshon Autonomous Province (Вилояти Мухтори Кӯҳистони Бадахшон): Former Gorno Badakhshan Autonomous Oblast. This *viloyat* is geographically isolated in the east of Tajikistan. It covers a territory of 64,200 square kilometres and accounts for 44.5 percent of Tajikistan's territory but only three percent of its population 206,000 (2010). The centre is the city of Khorugh; the province consists of 5 *nohiyas*, one city and 42 rural *jamoats*.

The president's administration directly nominates the heads of the local districts and provinces (regional level). The local representative authorities in regions, towns, and districts are the assemblies (*majlis*) of people's deputies, which is chaired by the chairperson. In Tajikistan the chairperson of the province, district, and town is a key element of the local government, and president's main client. The province, town and *nohiya* have a local branch of the *hukumat* (government) which is the central administration. Executive and representative powers in all these locations are vested in the chairperson of *hukumat*. According to the constitution, chairperson heads both (!) executive (as a head of *hukumat*) and representative (as a chairperson of *majlis*) authority. As high administrator, the president has exclusive authority to appoint heads (chairpersons) of provinces (*viloyats*), districts (*nohiyas*), and towns (Novovic 2011).

Land Tenure and Land Reform

In Tajikistan one can find people who are living in rural areas with or without state-runned *Sovkhoz* or *Kolkhoz* (collective farmlands), who are renting land, have kitchen gardens that play a significant role in family survival, have fruit and nut trees, and people who have undergone land reform. Therefore, land ownership or land tenureship plays an important role in people's daily life; this became very evident during the interviews.

During the Soviet period, the agricultural land of Tajikistan was organized into *sovkhoses* (state farms) and *kolkhoses* (collective farms). Both, *sovkhoses* and *kolkhoses* were large farms with typically more than 1,000 hectares. The state had the close supervision and set production plans and received monthly reports on the operations of the farms. A presidential decree of October 1995 initiated a process of conversion of *kolkhoses* into share-based farms operating on leased land, agricultural production cooperatives, and *dekhan* (peasant or worker) farms. One-third of the 30,000 peasant farms in Tajikistan are organized as collective *dekhan* farms and not family farms. People often call *dekhan* farms *kolkhoses*, but they have a different organizational structure. There are only few "original" *kolkhoses* and *sovkhoses* in Tajikistan today. These state controlled *kolkhoses* or *sovkhoses* are responsible for seed production, livestock breeding, and research (Porteous 2003).

In a next step these collective *dekhan* farms were divided in family *dekhan* farms with 25 or fewer members. Legally the land does not belong to the farmers, but they have long-term, inheritable rights on it. To get land for family *dekhan* farms, farmers had to actively apply for, but a lot of farmers were either not aware of this requirement or they lack knowledge of specific laws; many of them have only some general knowledge of their land use rights (World Bank 2012).

Household plots and kitchen gardens are considered as household assets that play an important role in communities' and households' subsistence and food security and therefore have an economic importance (Rowe 2009). People produce some foodcrops, including vegetables and fruits, for self consumption.

The USAID-supported Land Tenure and Resource Management (LTRM) Office established the project "Tajikistan Land Reform and Farm Restructuring Project" (LRFPR) in 2013 with a duration of four

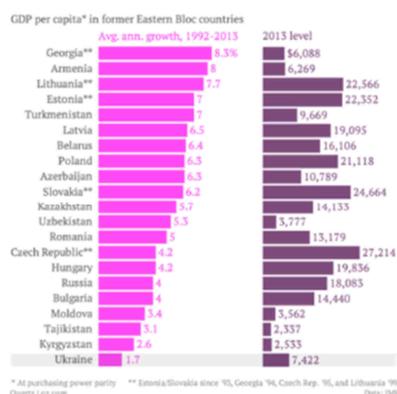
years: “The purpose of the Tajikistan Land Reform and Farm Restructuring Project (LRFPR) is to support the continuing progress of dehkan farm restructuring and recognition of property rights leading to a market in land use rights. The LRFPR will focus on policy and legal development, expanding awareness of land-use rights among rural government and citizen stakeholders, facilitating acquisition of land-use certificates, and building government capacity to effectively develop, monitor and implement the land reform process.”⁶³

The implementation of the land reform varies widely (Hierman 2015: pp. 1-2). In some districts the process of decollectivization is almost completed, in other districts collective farms are still the predominant form of agricultural organization. Hierman argues that the land reform has been decentralized and therefore, local authorities have a significant influence in the implementation, not always to the favour of the farmers.

5.5 Economy

Tajikistan has one of the lowest per capita GDPs among the 15 former Soviet republics and is considered as the poorest country of Central Asia (Figure 18).

The agriculture sector is a significant part of the national economy, contributing more than 20 percent of gross domestic product (GDP) and employing two thirds of the population. Less than 7 percent of the land area is arable and is utilized for the cultivation of crops. Another one percent supports permanent crops such as fruit- and nut-bearing trees. Cotton is the most important crop, but the sector is burdened with debt and obsolete infrastructure (Table 6).



Product	1991	2001	2005	2006	2007	2008	2009	2010
Grain	304.3	494.2	934.9	912.3	931.2	942.9	1,294.5	1,261.0
Raw cotton	819.6	452.7	447.9	437.9	419.8	353.1	296.0	310.5
Potatoes	180.9	308.2	555.1	573.7	662.1	679.8	690.9	760.1
Vegetables	627.8	396.8	718.5	759.7	835.1	908.2	1,046.9	1,142.6
Melons	175.0	96.9	170.2	218.2	254.2	285.2	424.6	482.4
Fruits	176.8	143.6	148.3	208.8	157.2	262.4	213.9	225.3
Grapes	120.9	109.7	90.6	107.1	116.9	117.9	138.7	124.2
Tobacco	11.1	4.1	1.6	1.3	0.5	0.2	0.2	0.5
Livestock and poultry (live weight)	150.7	60.0	107.4	112.3	119.0	129.8	134.3	143.2
Milk	587.2	382.6	533.0	544.7	583.6	601.0	629.7	660.8

Figure 18: GDP per capita in former Soviet republics (Quartz 2014)⁶⁴

Table 6: Agriculture production in all categories of farms in TJ from 1991 to 2010 in thousand metric tons (Statistical Bulletin 2011)⁶⁵

Furthermore the production is closely monitored, and in many cases controlled, by the government. Regarding the two case study areas, the mountainous area of Kuhistoni Badakhshon is the largest according to the territory, but has the smallest population and the lowest level of agricultural activity,

⁶³ <http://usaidlandtenure.net/project/tajikistan-land-reform-and-farm-restructuring-project> and <http://usaidlandtenure.net/content/project-brief-land-reform-and-farm-restructuring-project-lrfrp> (last access August 2015)

⁶⁴ Quartz is a digitally native news outlet, born in 2012, for business people in the new global economy. <http://qz.com/180511/ukraine-unrest-stems-from-two-decades-of-squandered-post-soviet-independence/> (last access September 2015)

⁶⁵ Main agriculture indicators of the Republic of Tajikistan - 20th anniversary of independence, Statistical bulletin, Dushanbe, 2011, pp.48-88

whereas the Khatlon province is the largest with regard to population (2.6 million) and agricultural activity in Tajikistan.

Mineral resources include silver, gold, uranium, and tungsten. Industry consists only of a large aluminium plant, hydropower facilities, and small out-dated factories mostly in light industry and food processing.

The civil war (1992-97) severely damaged the already weak economic infrastructure and caused a sharp decline in industrial and agricultural production. Today the Tajik population has three main sources to generate income: subsistence economy, remittances (from work migrants abroad) and subsidies.

Tajikistan in general and Khatlon in particular are still in transition from a centrally planned agricultural system to a more market-oriented arrangement with production on recently privatized farmland. Statehood always preferred the low-lands of Tajikistan and so it is not surprising that also today elites (often regime insiders) control large-scale cotton farms and take possession of villagers' land in Khatlon and therefore leave farmers little opportunities to develop well-functioning small scale individual farming with the possibility of some extra income.

It is of utmost importance to show the relevance of remittances as most important contribution of local economy. In 2008 the remittances were estimated to be about 49% of GDP (National Bank).⁶⁶ Unfortunately, due to the economic crisis in Russia, many labour migrants have to return to Tajikistan and remittances are alarmingly decreasing:

“DUSHANBE, September 11, 2015, Asia-Plus

In the first half-year of 2015, remittance flows from Russia to Tajikistan have reportedly declined by 58.6 percent compared to same period last year.”

<http://www.asiaplus.tj/en/news/remittance-flows-russia-tajikistan-reportedly-decline-586-percent>

(last access September 2015)

Most of the labour migrants are men and work in construction industry or in other low-skilled, often seasonal jobs, like for example agriculture, gardening, housework, restaurants, transportation etc. It turned out that Tajik labour migrants in Russia face several problems: Especially young people are no longer able to speak and understand the Russian language properly. The labour rights are regularly violated, often because Tajiks are not aware of their rights. Tajiks are often discriminated by the police. They are treated badly, insulted and humiliated, go unpaid, are beaten and even killed. They become victims of attacks, especially when they try to bring their monthly salaries to a Western Union counter to send money home. Tajiks often cannot adapt to the Russian climate and become sick, for example they fall ill with tuberculosis. Or they spread sexually transmitted diseases when they come home. According to different interlocutors higher skilled Tajiks hardly find adequate jobs abroad.

The problems that this labour migration creates at home in Tajikistan are not to be underestimated: Women are increasingly challenged to deal with natural resource management and agricultural issues which represents a further burden in addition to the household and child-rearing. Hence, women have to manage every-day tasks, also the duties normally the husband handles. A lot of children grow up without father. These children often do not obey the mother, because traditionally the father is the respectful person. Another problem is that some men start a new family in Russia. First they still send modest means home to their Tajik families, but reduce it with the time and one day apply for divorce and break contact with their wives and children in Tajikistan. These men do not come back to

⁶⁶ From the ILO report (2010): *Migrant Remittances to Tajikistan*. http://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-moscow/documents/publication/wcms_308938.pdf (last access October 2015)

Tajikistan, they abandon their Tajik families, sometimes simply by a telephone call. These abandoned women often do not have a state-registered marriage, but one performed according to the religious ceremony of *nikoh*. Such women have no rights to income or land. Furthermore, they have neither legal rights, nor social protection for themselves and their children and often their in-laws ask them to leave. These women are exposed to extreme poverty, depressions, suicide, disease, abuse, etc. They are often forced to work under difficult conditions on the state-owned farms or cotton fields. Only few women marry for a second time. As a rule, they become second wives and have no legal status and are considered to be single mothers. The psychological impact on these women and their children is significant and needs a social readjustment in this male-dominated society. Another problem may develop when a husband returns home and wants to continue with his traditional view on gender roles, but his wife has changed and has more self-confidence and does not want to “step back”.

Looking at the present situation (2015), new problems have emerged over the years:

- 1) Since January 1st, 2015 Tajik citizens are only allowed to enter Russia with a valid passport.
- 2) “Negative developments in the Russian economy, Western sanctions, the fall in oil prices and the weakening of the ruble have led to a reduction in the number of labour migrants in Russia and to a wave of return migration in Tajikistan.” (Olimova 2015) This fact results in an increasingly reduction of the volume of remittances to Tajikistan.

The crisis has contributed to the growth of shadow employment. This fact fosters the vulnerability of Tajik migrants to various kinds of abuse.

5.6 Population, Ethnicity and Language

Population

According to the CIA World Fact Book⁶⁷ Tajikistan’s population was 8,051,512 in 2014. The estimated growth rate is 1.75 percent per year (2014). Some 26.5 percent of the total population (2011) is classified as urban. The population is concentrated in the western, south-western, and north-western regions.

According to the World Bank’s⁶⁸ newest update the poverty headcount rate has fallen from 80 percent to 32 percent during the period 1999-2014. Nevertheless, almost 50 percent of the population has to be considered as poor, especially in the Khatlon region, where an estimated 78 percent of the population lives under the national poverty line (International Fund for Agricultural Development (IFAD) and the World Bank⁶⁹).

In 2012, Olimova⁷⁰ and Olimov stated that an estimated 1.2 million, mostly young and middle aged men work abroad, mainly in Russia and Kazakhstan. The remittances these working migrants send back amount to an estimated 50 percent of the country’s GDP. This labour migration creates a significant male-female imbalance in the adult population of Tajikistan. With the absence of particular family members, workloads and responsibilities change.

⁶⁷ CIA World Fact Book, <https://www.cia.gov/library/publications/the-world-factbook> (last access September 2015)

⁶⁸ <http://www.worldbank.org/en/country/tajikistan/overview> (last access October 2015)

⁶⁹ <http://www.ruralpovertyportal.org/country/home/tags/tajikistan> (last access September 2015)

⁷⁰ Saodat Olimova is an associate in the al-Farabi Carnegie Programme on Central Asia and head of the public opinion department at the SHARQ (ORIENS) Research Center in Dushanbe, Tajikistan.

The official literacy rate of adult population is almost 100 percent (2010 est.); however the enrolment for education is decreasing (89.7 percent in 2010) and the quality of education is decreasing since independence in 1991 as well. This has several reasons, like poor conditions of school buildings, low salaries for teachers (and therefore missing of teachers), curricula that have not been updated for over a decade, increasing unequal access for males and females to the different stages of education (especially in rural areas), etc.

Ethnicity

According to the World Factbook⁷¹ (2000 census) Tajik people are of ethnic Persian descent and constitute the largest indigenous group in the country (79.9 percent of the population). Other ethnic groups include Uzbeks (15.3 percent), Russian (1.1 percent), Kyrgyz (1.1 percent), and others (Figure 19). Figure 20 to Figure 22 show different ethnicities.

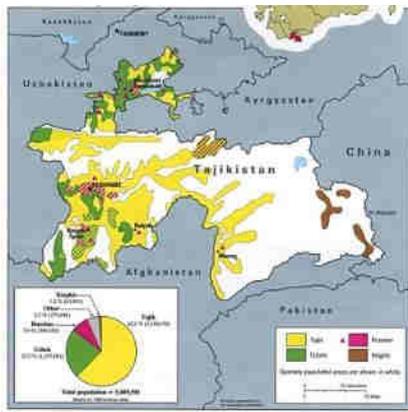


Figure 19: Major Ethnic Groups in Tajikistan 1989 (images.nationmaster.com)⁷²



Figure 20: Old Tajik men in Southern Khatlon (Source: Zimmermann, 2012)



Figure 21: Man with Kyrgyz roots Khojibakirgan (Source: Zimmermann, 2013)



Figure 22: Two boys, one with Tajik and one with Russian roots (Source: Zimmermann, 2010)

⁷¹ <https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html> (last access September 2015)

⁷² http://images.nationmaster.com/images/motw/commonwealth/tajikistan_ethnic_92.jpg (last access September 2015)

Language

According to the Encyclopaedia Britannica⁷³ the Tajik language belongs to the sub-group of Indo-Iranian branch of the Indo-European language family.

Article 2 of the current Constitution (Basic Law) of the Republic of Tajikistan⁷⁴ states that:

The state language of Tajikistan shall be Tajik.

Russian shall be the language of international communication.

All nationalities and people living on the territory of the republic shall have the right to use their mother tongue.

According to Rzehak (2001: p. 23) people of different local Pamiri languages communicate in Tajik when they meet each other. Otherwise they speak Shughni, Bajuwi, Rushani, Bartangi, Roshorvi, Khufi, Sarikoli (more widely presented in China), Yazghulami, Wakhi, and Ishkashimi. Genetically, Pamir languages belong to the north-eastern subgroup of the east-Iranian language, which is different from Tajik (Akiner 1983: 377). Kyrgyz is a Turkish language belonging to the Altaic group (Kreutzmann 2003: 218). Because Russian was the official language during the Soviet period, both Tajik and Pamiri languages have been influenced by the Russian language.

Tajiki is currently written in the Cyrillic alphabet developed during the former Soviet period, although it has been written in both the Latin alphabet and the Persian alphabet in certain parts of its history.

5.7 Community and Family Structures

Tajik communities are not organized according to tribal affiliation. The core of the traditional social structure of the Tajiks (and other sedentary people in Central Asia) is usually the *avlod*, the ascent patriarchal extended family. Normally such an extended family comprises of one adult couple, their unmarried daughters and their married sons with their wives and children. A woman does not become member of her husband's *avlod* with the marriage, but their children will belong to it. Sometimes an extended family can be developed into a clan based on patrilineage. An *avlod* normally has the common ownership of the family farmstead, the land, plants and animals. For generations, this *avlod* system provided survival, autonomy, and adaptability to its members, serving traditionalism and sustainability of the society. Today conditions are changing, but the influence of the *avlod* can still be felt in Tajik society (Wiegmann 2009; Nourzhanov and Bleuer 2013).

The Tajik society has, historically seen, a well-developed civil network on local level. Tajik communities in rural and urban areas are traditionally organized in neighbourhood communities with own organs of self-administration (*mahalla* committees) that are formed by people of influence (local elders, spiritual leaders, wealthy people). In rural areas *mahalla* communities are subject to the jurisdiction of *jamoats*, in the cities they are respectively subordinated to urban authorities. *Mahallas* are important social institutions with different duties, like collection of taxes, organization of ceremonial affairs, public discussions of the community's problems, solving conflicts or raising funds. *Mahallas* are allowed to work with national government entities and international organizations.

⁷³ <http://www.britannica.com/topic/Iranian-languages> (last access September 2015)

⁷⁴ <http://www.president.tj/en/taxonomy/term/5/28> (last access September-2015)

Tajik people give their loyalty rather to region-based groupings, than to local rulers and / or monarchs (Nourzhanov and Bleuer 2013: section 4).

In general the situation of women in Tajikistan is difficult. During the Soviet system women enjoyed rights and took part in the civil society. Traditional practices such as polygamy, payment of a bride price and marriage without consent were banned. Today patriarchal attitudes become stronger again and women face several problems: although they play an important role in home subsistence farming, they lack control over resources in the household, their participation in public life and decision making is limited, they often experience domestic violence and are exploited (Bassuoni 2011). On the other hand men carry the burden that they are sent abroad for work by their family in order to send remittances home.

5.8 Religion

About 98 percent of the Tajik citizens are Muslims. The majority of them are Sunni (official state religion) and adheres to the Hanafi school of Sunni Islam. Approximately three percent of Muslims belong to the Ismaili Shia. These Nizari Ismailis mainly reside in eastern Viloyati Mukhtori Kuhistoni Badakhshon (former GBAO), in some districts of Khatlon and in Dushanbe (UNHCR 2010). Russian Orthodox, Jewish, and Zoroastrian citizens make up the remaining two percent. The Zoroastrian religion still influences traditions and people's superstition. People, especially women, still believe in supernatural forces and amulets (Bliss 2006: pp. 237-238).

Islam is on the rise in Tajikistan. After the time of officially atheist Soviet Union, Tajikistan's Islamic Revival Party tried to fill the gap once occupied by communism's ideology. Tajikistan's cultural heritage with its traditions and values served to unify people during the process of post-Soviet nation building: "Islamic values and everyday practices that had survived the Soviet era became integrated as state-approved cultural heritage into the national narrative of the new nation-state." (Schmitz 2015: p. 6). Even the Muslim population of Dushanbe city started to show a greater emphasis on religious identification. Educated elites demand a greater involvement of Islam in the moral education of youth and ethics teachers state that it would be better to explain the secular moral content "with religion" and to identify systematic religious knowledge as "religious education method" (Stephan 2009).

With the time the government feared that the religion will become too powerful and it tried to reach control over the development. In 2009 a new "religion law" has been established that required registration for religious groups, criminalised unregistered religious activity and private religious education and proselytism. Furthermore, it set strict limits on the number and size of mosques, required official permission for religious organizations to provide religious instruction and to communicate with foreign co-religionists, imposed state controls on the content, publication and import of religious materials, and so on. (United States Commission on Religious Freedom 2015: pp. 120-125). According to the Human Rights Watch Report (2015)⁷⁵ the human rights record deteriorated again in Tajikistan. Already in 2012 Tajik authorities tightened restrictions on religious freedoms, and pursuant to newly adopted legislation, the government extended far reaching controls over religious education and worship and also closed unregistered mosques. In August 2012 President Rahmon signed the "Parental Responsibility Law". The law stipulate that parents must prevent their children from participating in religious activity, except for state-sanctioned religious education, until they reach

⁷⁵ https://www.hrw.org/sites/default/files/wr2015_web.pdf (last access October 2015)

18-years-old. The government started to observe mosques and their attendees regarding religious extremism and statements critical of the government. Furthermore, it started to control the age and the numbers of *hajj* (religious pilgrimage) participants. Since 2014 the Ministry of Finance and the State Committee on Religious Affairs (SCRA) pay the salaries of the imams of Friday mosques and control the selection of the *imams* (United States Commission on Religious Freedom 2015: pp. 120-125).

5.9 General Discussion about Environmental Issues, Climate Change and Related Natural Hazards in Tajikistan

To complement the field studies an extended internet search on how Tajikistan deals with the topic has been conducted and provides additional information about the issues of nature, climate change and related natural hazards. Government, scientific community and national and international organizations have been examined. The results provide an overview on how Tajikistan deals with the consequences of climate change and related natural hazards:

Government

The Government of Tajikistan is aware of Tajikistan's environmental problems and the climate change issues. It has developed a number of legislative, legal and regulatory documents, programmes and concepts regarding environmental protection and sustainable use of natural resources. In 1998 Tajikistan joined the UN Framework Convention on Climate Change. During the years 2001 and 2002 the *National Action Plan for Climate Change Mitigation of the Republic of Tajikistan*⁷⁶ was elaborated and released in 2003. Up to 150 specialists were involved in the preparatory process, including over 100 highly qualified experts, PhDs and MAs from ministries and state departments of the Republic of Tajikistan, academic institutions and universities, NGOs and international organizations. This National Action Plan identifies the priorities and measures to be undertaken by the Republic of Tajikistan regarding the manifold and complex problems of climate change. In 2008 Tajikistan ratified the Kyoto Protocol (see Appendix 1).

Tajikistan's national authorities consist of ministries, a number of committees and agencies. Those few relevant for this research are briefly described here:

Ministry of Agriculture of the Republic of Tajikistan

The Ministry elaborates and implements the common national agricultural policy, including the area of crop growing, livestock breeding and other sectors of agricultural production. It develops programmes and forecasts of production to ensure effective use of the national agricultural capacities; organizes monitoring of production and profitability of the agricultural sector and identifies development trends. It renders support to agricultural producers; prepares recommendations for the improvement of agricultural production and farming operation effectiveness; provides necessary information for public and local authorities, institutions, enterprises and civil society; etc.

The website should be available in Tajik, Russian and English. The Russian version has some gaps and the English version seems to be still under construction. <http://moa.tj> (last access September 2015).

⁷⁶ <http://unfccc.int/resource/docs/nap/tainap01e.pdf> (last access October 2015)

Ministry of Energy and Water Resources of the Republic of Tajikistan

This ministry is responsible for the elaboration of strategies for fuel-energy industry development and for management, use and protection of water resources in the Republic of Tajikistan and their implementation through national and sectoral programmes; undertaking measures for implementation of the national energy and water policy in context of international cooperation and foreign economic relations. In regard to water resources the ministry is responsible for keeping track of the use and protection of water resources, the established quotas and limits of water uses, irrespective of ownership forms, and consolidation of information on water resources; approval and licensing of construction of hydraulic structures and bank-protection activities; etc.

The new website should be available in Tajik, Russian and English, whereas the English site seems to be still under construction. <http://www.mewr.tj/> (last access September 2015)

Committee for Environmental Conservation at the Government of the Republic of Tajikistan

The Committee's key tasks are to follow the single public ecological policy in the area of conservation of environment, rational use of natural resources, including protection of natural heritage, prevention of extremes that negatively affect environment and biodiversity and of persistent organic pollutants. It has to ensure state control over protection and rational use of flora and fauna, fish stock, hunting reserves, nature conservation areas, touristic passages, forests, water resources, atmosphere, land and their wealth, and minerals. Furthermore, it has to control application of chemicals and mineral fertilizers, waste disposal, observance of ecological and biological safety standards. The committee has to arrange and conduct environmental monitoring (weather, glaciers, lakes and reservoirs), analyse phenomena and processes of natural disasters and effects of climate change.

The website should be available in Tajik, Russian and English, but is not properly updated in all languages. www.hifztabiat.tj/ru (last access September 2015)

State Agency for Hydrometeorology of the Republic of Tajikistan (Tajikhydromet)

The agency takes part in implementing the common national policy in the area of hydrometeorology and environmental pollution monitoring; produces state statistical reporting in the area of hydrometeorology and provides the data to upper authorities; coordinates establishment and maintenance of the system of integrated environmental monitoring; etc.

The website that was available in 2014 is no longer working

National Committee of Emergency Situations and Civil Defense (CoES) under the Government of Tajikistan

In Tajikistan disaster response and recovery is based on expectation that disaster impacts will be liquidated as quickly as possible, with a return to pre-disaster conditions which incorporates disaster risk reduction to reduce the future impacts of disasters. Recovery takes place under the National Committee of Emergency Situations and Civil Defense, which encompasses all elements of the Government. The National Commission sets the overall policy and implementation responsibilities for recovery.

The website should be available in Tajik and Russian, but Russian is not properly established. The website in general is not regularly updated. The website can be found under www.khf.tj (last access September 2015).

Committee for Land Management, Geodesy and Cartography of the Republic of Tajikistan

This institution has to develop and implement the unified state police in the field of land tenure, land cadastre, land utilization, land relations, topography, geodesy and aerospace works. Furthermore, it is responsible for land management and registration of land use rights and has to define and rehabilitate administrative borders of oblasts, regions, cities and villages.

Overall, the information available about how the government is dealing with environment, climate change and related natural hazards are extremely meager. Almost no information can be retrieved from the official websites. However, few official publications (e.g. national communication, see section 1.1) show that these topics are an issue for government entities as well, but they are definitely not at the forefront.

Scientific Community

Tajikistan has an Academy of Sciences (Academy of Sciences of the Republic of Tajikistan) that consists of 18 research institutes and three territorial groupings. The Academy aims to develop fundamental and applied research in the natural, technical, medical, and social disciplines as well as in the humanities. Scientists in Tajikistan are concerned about experiencing environmental impacts on ecosystems by the effects of climate change, like melting glaciers, floods or droughts, but also by man-made causes like deforestation, land erosion or waste management. Furthermore, scientists are concerned that they often do not have the possibility to work on a scientific basis because they have only weak contacts with governmental stakeholders responsible for environmental issues (Kust 2014) and they lack appropriate equipment and means. Nevertheless, Tajik scientists are worried about the growing problems of the topic as these few statements prove:

Kurbonbek Rustambekov (2007)⁷⁷, a hydro meteorologist of Kuhistoni Badakhshon:

“Climate change is bringing various challenges to the life of the local population. In the last five years we have observed a rise in local temperatures of up to three degrees centigrade here.”

Dr S.P. Aliev (2012)⁷⁸, Head of State Sanitary Epidemiological Surveillance Service (SSESS):

“Our population is not sufficiently aware of climate change and its impact on health. The mass media are the main channel to the population and it is crucially important that people receive correct, clear, transparent and necessary information. If people are made aware of the problems, and how to protect their health, this will support the development and strengthening of the country’s health system.”

Mr. Saroj Kumar Jha (2014)⁷⁹, World Bank Regional Director for Central Asia, notes in Tajik News:

“...that economic losses from weather-related disasters vary from 0.4 to 1.3 percent of GDP per annum for Tajikistan.”

⁷⁷ <http://www.irinnews.org/report/72916/tajikistan-melting-glaciers-pose-growing-threat-in-the-pamirs> (last access October 2015)

⁷⁸ <http://www.euro.who.int/en/countries/tajikistan/news/news/2012/01/tajik-journalists-role-feted-in-climate-change-discussions> (last access October 2015)

⁷⁹ <http://tadj.news.tj/en/news/losses-weather-related-disasters-stand-13-gdp-annum-tajikistan> (last access October 2015)

According to Ilhomjon Rajabov (2009)⁸⁰ from the Climate Change and Ozone Centre in the State Organization of State administration for Hydrometeorology about 50 percent of the country's 8,492 glaciers are in retreat or are likely to disappear by 2050. He is sure that the melting of the glaciers is due to climate change and will create great problems for the water regime not only of Tajikistan but of whole Central Asia.

Anvar Homidov, a leading specialist from the State Organization on Hydrometeorology Tajikistan, clearly stated in his presentation on the "Third International Conference on Climate Services" in 2013 that his organization has not enough trained specialists, no methodological and scientific basis, not enough funds to rehabilitate sites of observation and that they do not have experience to solve or mitigate the problems arising from climate change. His aim is to strengthen the capacity of national institutions.⁸¹

Professor Abdulhamid Kaumov (2009: p. 4), a national consultant, outlined in his foreword of his report *Effectiveness analyses of State Programme on Environmental Education and Learning*.

“As far as more than 70% of people are living in rural area, their prosperity mostly depends on nature resources. Realizing a key role of efficient nature resources management in the context of sustainable development for the last ten years Government of the Republic of Tajikistan undertook concrete steps on improving regulatory and legal documents on nature resources and environment protection management.

Particularly “State programme on environmental education and learning of population of the Republic of Tajikistan in perspective up to 2010” was adopted. “

In 2009 the two ethnologists Citt Williams and Ivan Golovnev started a project called *Pamiri women and the melting glaciers of Tajikistan – A visual knowledge exchange for improved environmental governance*. They investigated Pamiri womens' understanding and adaptation to climate change from the point of view that the glaciers of the Pamir Mountains which provide over 50 percent of Central Asia's water resources are rapidly melting. Three generations of Pamiri women share their perception and knowledge about the impacts of the melting of the glaciers and the decreasing water levels. The result of the case study can be read as article in the book *A Political Ecology of Women, Water and Global Environmental Change* (edited by Buechler and Hanson 2015). With the help of the United Nations University (UNU) and the Christensen Fund and in association with the Tajikistan Academy of Sciences, Institute of Zoology and Parasitological Williams and Golovnev produced a video that can be watched on youtube: *Pamiri women and the melting glaciers of Tajikistan* <https://www.youtube.com/watch?v=rKaecMDew60> (last access September 2015).

Environmental changes are obviously a topic for a number of scientists in Tajikistan. However, there are no wide-ranging programmes or projects about the subject as can be found in other countries.

National and International Organizations

Yuri Skochilov (2010), the executive director of Youth Ecological Centers, <http://www.ecocentre.tj/> (last access August 2015), a Tajik non-governmental organization whose mission is “Improving environmental condition by more sustainable use of natural resources and creating alternative

⁸⁰ <http://www.climate-services.org/sites/default/files/wysiwyg/PPCR%20ICCS3%20-%20Tajikistan%20-%20Final.pdf> (last access May 2014; access in October 2015 no longer available)

⁸¹ <http://www.climate-services.org/sites/default/files/wysiwyg/PPCR%20ICCS3%20-%20Tajikistan%20-%20Final.pdf> (last access 19-June-2014; access in October 2015 no longer available)

livelihoods for local communities”, said on the occasion of the publication of Oxfam International’s report *Reaching the Tipping Point? Climate Change and Poverty in Tajikistan*:

“I think the climate situation is now the most important problem for Tajikistan. The bottom line must be the real needs of people, and people must come up with adaptation measures by themselves, i.e. village development plans.”

<http://www.eurasianet.org/departments/civilsociety/articles/eav022210.shtml> (last access September 2015)

Nowadays several organizations have the topic Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) on their agenda and work in the field of sustainable development, natural resource management, climate change and related natural hazards / disasters in Tajikistan. They are implementing programmes in various geographical areas. A selection of organizations is given below. The information is taken from the website *Tajikistan Research Resources*⁸² and from the respective websites.

ACTED (French: Agence d’Aide à la Coopération Technique et au Développement) is a French non-governmental, non-political and non-profit organization set up in 1993.

ACTED Tajikistan is strongly promoting holistic disaster risk management, inclusive local governance, and sustainable rural economic development. Improving local governance is at the core of each ACTED Tajikistan’s interventions.

The author of the here presented research assisted to develop a manual for community-based organizations (CBOs) who work in a variety of different fields, such as education, health, disaster risk reduction, the rights of the disabled, gender issues, etc. (Figure 23).



Tajik:
дастурамал барои баланд бардоштани
ташабускорию мақомотҳои худидоракунӣ дар
сатҳи деҳа

English:
Instructions for increasing self-government
bodies at the village level

Figure 23: Local Governance Initiative Handbook
<http://www.ACTED.org/en/tajikistan> (last access
September 2015)

Translated by the author

CAMP Kuhiston is a non-profit and non-governmental organization founded in 2006. The organization promotes sustainable development in the mountain regions of Tajikistan. CAMP Kuhiston is active in the fields of integrated local risk management, natural resource management and energy saving programmes.

<http://camp.tj/index.php?language=eng> (last access September 2015)

⁸² <http://tajikistanresearch.org/ngos/> (last access September 2015)

Caritas Switzerland implements a development programme in Khatlon since 2000. The main focus is on natural resource management including the reduction of risks from natural hazards. Since 2011 Caritas is promoting watershed management in Muminabad District (Kulob). The reduction of floods, flows and landslides is addressed through the improvement of the overused watersheds: on the one hand the project contributes to improve livelihoods; on the other hand it reduces the risks from these hazards.

<https://www.caritas.ch/en/what-we-do/worldwide/country-programme-of-tajikistan/> (last access September 2015)

Focus Humanitarian Assistance (FOCUS) is an international disaster management and emergency response agency providing relief and support services during and following natural and man-made disasters. It is an affiliate of the Aga Khan Development Network (AKDN). FOCUS Tajikistan is fostering community-based disaster resilience. Various projects aim at strengthening the ability of local communities and institutions to cope with disasters. Information management, capacity building, community-based risk reduction and scientific knowledge generation are top on their agenda.

http://www.akdn.org/tajikistan_disaster.asp (last access September 2015)

The German Research Centre for Geosciences GFZ⁸³ implements the project "Regional Research Network CAWa (Central Asian Water)". The CAWa project intends to contribute to a sound scientific and a reliable regional data base for the development of sustainable water management strategies in Central Asia. This is important for the Pamir region that is rich in water, but also faces related problems, especially due to melting glaciers (including also glacier lake outburst floods).

<http://www.gfz-potsdam.de/en/section/climate-dynamics-and-landscape-evolution/projects/regional-research-network-cawa/> (last access September 2015)

Mission East is a Danish relief and development organization. In Tajikistan the focus of Mission East is on improving livelihoods for vulnerable households and communities. One project addresses villages that are extremely vulnerable to natural disasters and where mainly women live, because men are working abroad. Women get trained on how to act in case of a natural disaster.

<http://www.miseast.org/en/tajikistan/home> (last access September 2015)

Mountain Societies Development Support Programme (MSDSP) is a project of the Aga Khan Foundation Tajikistan (AKF TJK) dedicated to improving the quality of life of the people of the mountainous regions of Tajikistan. The cornerstone of MSDSP's project implementation is its institutional platform that covers 1,623 Village Organizations (VOs). Amongst other issues MSDSP fosters a sustainable management of the natural resources that constitute the main sources of livelihoods in rural Tajikistan, such as land, water, forests, and pastures. MSDSP is aware of the increasing importance of climate change and related natural hazards. Therefore, the organization implements a number of programmes concerning strengthening community resilience to climate change.

http://www.akdn.org/rural_development/tajikistan.asp (last access September 2015)

⁸³ The Helmholtz-Centre Potsdam – the GFZ German Research Centre for Geosciences is the national research centre for Earth sciences in Germany.

Oxfam International, founded in Britain in 1942, is an international confederation of 17 organizations working in approximately 94 countries worldwide. In Tajikistan the organization has three main topics: safe drinking water and sanitation; economic development; and improving the capacity of villagers and state institutions to adequately respond to disasters.

<https://www.oxfam.org/> (last access September 2015)

The Swiss Agency for Development and Cooperation (SDC) is active in the field of Disaster Risk Reduction (DRR) in Central Asia since 2003 as one of the main donors. Today DRR is an integral part of the regional water management programme and focuses on improved watershed management and adaptation to changing climate factors. The capacities of communities living along rivers to prevent, prepare for and react to natural disasters are strengthened through a number of implementing partners. As a result, their safety and livelihoods are improved and natural resources are managed in a more sustainable way.

www.eda.admin.ch/countries/tajikistan/en/home/international-cooperation.html (last access September 2015)

Since 2003, the United Nations Development Programme's (UNDP) "Disaster Risk Management Programme" has been supporting the Government of Tajikistan in reducing the impact of natural disasters on vulnerable communities by strengthening national capacity to reduce risks, prevent, coordinate, respond and recover from disasters.

<http://www.tj.undp.org/content/tajikistan/en/home/ourwork/crisispreventionandrecovery/overview.html> (last access September 2015).

From the mid-1990s until today, NGOs address a wide range of issues, like health, education, human rights, gender, microeconomic development, environmental protection, sustainable development and DRR. While the state-run welfare system disintegrated slowly, the NGOs became stronger and started to take over functions that are normally carried out by the government. Today the NGO sector impacts the legal framework of the state and aims at building a system of political responsibility and stability.

6 Case Studies

A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

(Yin 2009: p. 18)

In accordance with Yin (2009) a clear focus was given during the investigations in Khatlon and Pamir on interviews, focus group discussions and direct or participant observation. Documentation, archival records and physical artefacts were used too, but only to a limited extent.

Semi-structured interviews have been chosen because on the one side they consist of several key questions that help to define the areas to be explored and on the other side these interviews allow to ask questions where the interview partners can answer in more detail or can narrate his or her story (Kvale 1996). These narratives serve as a kind of umbrella that catches personal and human dimensions of experience over time, and considers the relationship between individual experience and cultural context (Clandinin and Connelly 2000).

For the focus group discussions a questionnaire has been developed as well. In this way the thematic is clearly given and the interviewer serves as moderator. In general, participants do not come equally to word. Depending on the situation mutual disruptions and sometimes heated discussions can come up during the discussion. Focus group discussions can reveal relationship networks, different opinions or negotiation processes (Flick 2007: pp. 248-268).

The social anthropological method of observation aims to get insights in daily life of the respondents, the structures and the correlations in the family or the village. The observation is an act of taking note of a phenomenon and the securing of impressions and knowledge. This acknowledgment can be done on the basis of all human senses (sight, hearing, smell, touch, and taste), but also by means of technical aids such as photography, audio and video recordings (Flick 2007: pp. 279-357). I used photographs only in limited cases to document the interviews (mainly groups); however, due to privacy and security reasons I did not make any audio or video recordings.

6.1 Data Gathering Approach

“If you want to know how people understand their world and their life, why not talk with them?” (Kvale 1996: p. 1) I found this statement striking. Because I like to get to know people and talk with them, I chose the qualitative method of personal interviewing rather than just anonymously analysing questionnaires.

Qualitative data gathering methods (Kvale 1996) were used for all studies in both study areas, as this way of information gathering is known to provide a “deeper” understanding of social phenomena than using quantitative methods with standardized questionnaires. A total of 274 (202 with the help of mobilisers from ACTED Tajikistan) semi-structured interviews with individuals, 12 focus group discussions and many observations provided information necessary and useful to explore the views, experiences, beliefs and / or motivations of individuals on the topic of the research.

The interview partners were Tajik citizens of different origin, with different level of education, different sex and age, and different professions.

6.1.1 Questionnaires

The three field studies (climate resilience survey and the two case studies) were implemented in Southern Khatlon and Kuhistoni Badakhshon (see section 3.2.2).

In 2010 a Climate Resilience Survey has been conducted in four districts in Southern Khatlon (Farkhor, Hamadoni, Pyanj, and Shurobod) in the frame of a project by the Asian Development Bank, implemented by the NGO ACTED Tajikistan.

For the survey I developed for each interviewee category (local government officials, religious leaders, villagers with leading positions, villagers, and schoolchildren) individual questionnaires and one questionnaire for the following in depth study with focus group discussions later in the same year. The Climate Resilience Survey complements the interviews in the three districts Farkhor, Pyanj, and Shurobod conducted in 2012. Questionnaires have been developed for the Climate Resilience Survey, my case study in Khatlon in 2012, as well as in Kuhistoni Badakhshon in 2013. The respective forms were developed together with local interlocutors as some of the questions required to be adapted to local conditions. The final versions of the questionnaires are given in Appendices 3, 5 and 6. In the first part of the questionnaires, respondents were informed about the study details and they were given assurance about anonymity and confidentiality. They could agree to be named by their village, their first name and their occupation. Everybody agreed and some of them even asked me to publish a photo of them in my research. In this way the interviewees got an idea what they could expect from the interview and they could decide to participate or not. The next two parts of the questionnaires addressed the geographic information (province, district, jamoat and village) and the information about the individual interview partner (gender, level of education, occupation, and household head), respectively. The thematic questions in the main part of the questionnaire are either semi-structured or open ended. Some questions are phrased in order that only a limited range of responses can be given - i.e. "How much confidence do you have in ..." – no, little, pretty much, complete confidence or cannot choose" Other questions gave the opportunity to narrate as much as the interviewee knows or likes to share with the interviewer. Simultaneously, the interviewer observed the particular situation and took notes and pictures where allowed. At the end of the interviews the interviewer thanked the participants for their time. Knowing from my former visits that it is usually appropriate to give a small present when you visit someone's house, each respondent got a small present from Switzerland (a Toblerone chocolate bar). Often a further discussion took place over a cup of tea and some sweets.

6.1.2 Ethical considerations

The following ethical considerations were put into place for this research, according to a proposal outlined by Kvale (1996, pp. 109-123):

- Informed Consent: To ensure active and willing consent participants were provided with sufficient information about the researcher and the nature and purpose of the research, about their role and about the use of their information in the research. Furthermore, they were told that they have the right to withdraw at any time when they feel uncomfortable. Indeed, among the 275 interviews (202 for the climate resilience survey and 73 for the two other surveys) this case arrived only three times. Twice women felt themselves uneducated and therefore were ashamed. The third case was an old

man who suddenly argued that he has no longer the time to discuss with me. All other participants agreed to be involved in my research.

- Confidentiality and Anonymity: Although all participants agreed with the publication of their answers, I tried to provide the highest possible anonymity, respectively safety. Therefore, participants of the studies are not named in the research and should not be identifiable by a reader. "Should" not be identifiable; however, when e.g. in Khorugh the discussion was with a well-known person of the community like the *khalifa* a full anonymity cannot be guaranteed. Statements from *raisi mahalla* or *jamoat*, directors of schools or deputy directors of schools refer only to the district and not to the village so that their anonymity is more or less safeguarded.
- Safety Issues: This was only a matter in Khatlon. Foreigners were not allowed to visit some villages because of recent tensions in the region. This has been, of course, respected.
- Prevention of Harm or Suffering: From former experiences in Kuhistoni Badakhshon (Zimmermann 2006), where Ismaili people liked very much to talk about religious issues, some explicit questions about religion were given in the questionnaire for the surveys in Khatlon (2012) and Kuhistoni Badakhshon (2013). However, the interlocutor in Khatlon was very much concerned when reading these questions. She, together with a staff member from ACTED Tajikistan, explained that members of the State Committee for Religious Affairs (people still call them KGB) are going around in the whole country and especially in Khatlon to listen if someone talks about religion too much. The government has increased the power of the State Committee for Religious Affairs to enforce the country's restrictive religion law and impose large administrative fines without due process. Authorities also maintain tight controls on those seeking to receive religious education abroad. The interlocutor told that law-enforcement bodies have uncovered and shut down illegal religious schools in Khatlon province during June and July 2011.⁸⁴ Further information about developments on this topic is given in section 5.8. Considering these sensitive issues we decided to omit questions directly related to religious matters in the questionnaire and to address and discuss them only verbally, taking into account the particular situation. Question 10 (asking about *akhloqs*) has not been asked in Pyanj District for above mentioned reasons. After the interviews in Pyanj District it seemed not to be too sensitive to discuss such issues. It turned out that people describe books of geography or biology as *akhlaqs* as well, because they also refer to moral behaviour. Therefore, question 10 was re-integrated in the questionnaire.

6.1.3 Transcribed Interviews and Notes

My understanding of the Tajik language is fairly well, but my speaking is not sufficient to conduct interviews without translator. Therefore, I always had translators with me; on the one hand to translate and explain the broader cultural context when I was confused about an answer because I did not understand the real meaning of the statement and on the other hand to serve as an assistant and guide. During interviews I recorded the answers of the interviewees by writing (I did not use a voice recorder because of confidentiality and possible confiscation) and at the end of the day I went through my notes, discussed open questions with the translator, wrote a clean copy, and added my reflections and comments.

⁸⁴ Information has been checked: <http://news.tj/en/news/47-illegal-religious-schools-reportedly-shut-down-khatlon> (last access September 2015)

The questionnaires have been translated into Tajik and Russian. The Russian version was useful because elderly and middle aged persons, who grew up with the Soviet system, often better understand the essence of questions when they are in Russian. On the contrary, young people no longer know the Russian language well. In 2009 Tajikistan dropped Russian as state language; today all official documents are in Tajik and education in the country is (should be) conducted in Tajik language only (see section 5.6).

6.2 Field Work in the Khatlon Province 2010/2012



Figure 24: District map of Khatlon Province. The surveyed districts are under the red circle. (Tajikistan Water Supply and Sanitation Network)⁸⁵



Figure 25: Hamadoni in Khatlon Province (Source: Zimmermann, 2009)

Khatlon province consists of 24 districts, 14 in Western Khatlon and 10 in Eastern Khatlon. Each of them has four to nine jamoats, being the smallest political entity.

The project area of the ADB flood reduction project (red circle in Figure 24) consisted of the four Southern Khatlon districts Hamadoni, Farkhor, Pyanj and Shurobod. This community-based project provided excellent access to individuals, households and particular groups. The four districts have the following characteristics:

- Rural area (bordering Afghanistan)
- Climate conditions with continental climate (hot dry summers) and occasionally extreme weather events)
- Mainly lowland, situated on the river Pyanj (Figure 25)
- Area of cotton cultivation and livestock breeding (cattle, sheep, and goats)
- The majority are Sunni people

⁸⁵ <http://tajwss.tj/site/en/tajwss-data-base2/itemlist/category/2-regions-of-tajikistan.html> (last access July 2014; access October 2015 no longer available)

6.2.1 Interviews and Focus Group Discussions in Khatlon in 2010

The request by ACTED Tajikistan to conduct a Climate Resilience Survey in their project area in 2010 (outlined in section 1.3) was an excellent chance for me to work with interviews to get knowledge about people’s perception and interpretation of climate change and related natural hazards. ACTED Tajikistan allowed me to use the gained information for my own research.

The aim of this survey was to assess the present level of climate resilience in selected communities of Khatlon Province covered by the Community Participatory Flood Management Project (ADB Project). The survey incorporated questions on how the community knows about and interprets hazards, vulnerabilities and risks, and how it traditionally manages these risks. The results served as basis for better integrating climate risk reduction and climate change adaptation measures in communities' development planning. The survey took place during summer and autumn 2010 (Table 7).

Table 7: Procedures and Final Schedule

Secondary information analysis: results from previous Participatory Rural Assessment in 130 villages in the project area covered by the Community Participatory Flood Management Project (ADB Project)
Development of research tools and action plan
Design of five different questionnaires for the five selected stakeholder groups (local government officials, religious leaders; respected villagers; villagers and schoolchildren), and translation into Tajik
Early July 2010: Test run and training of interviewers
Adjustment of the questionnaires
August 2010: interviews with the five stakeholder groups
September/October 2010: Data processing and analysis
October 2010: Focus group discussions and analysis during November 2010
Development of analytical report

The survey started with two types of interviews: 55 structured interviews with local government officials (*jamoat*, CoES, Health Centre) and schoolchildren (grade 6 to 11) and 147 semi-structured interviews with religious leaders; villagers with a leading position, respected villagers and villagers. Specific questions and answers (yes or no, figure, single statement) were supplemented with open-ended story-telling answers.

The July / August series of interviews had the objective to get knowledge about peoples’ view on nature and their environment, their perception and management of risks related to climate and climate change. A questionnaire has been prepared for each stakeholder group. The final versions of the respective questionnaires are given in Appendix 3.

After a three day test run it turned out that the questionnaires had to be slightly adapted. For instance, the question about interviewee’s religiousness was not appreciated. People sometimes said: “You ask me about my religiousness and me, I am praying every day for 20 years.” They felt a little bit offended by this question. Another fact turned out to be relevant during the test run: people in villages gathered quickly in the location where the interview took place. Answering delicate questions in front of a whole group could be embarrassing for the interviewee. So I decided to look for a quiet place without bystanders in each village.

Interviews have been conducted in fourteen villages in four districts of Khatlon (Table 8).

Table 8: Selected Villages

District/Rayon	Jamoat	Village
Hamadoni	Chubek	Chubek
	Dashtigul	Faizobod
	Qahramon	Daginamak
Farkhor	Galaba	Surhob
	Zafar	Somonchi
	Dehoti Darqad	Darqad
Pyanj	Namuna	Tojiksoy
	Nuri Vahdat	Shakardasht
	Mehvar	Urtabuloq
	K. Sayfiddinov	Lohuti
Shurobod	Shurobod	Quhdoman
	Dashtijum	Shogun
	Sarichasma	Sarichasma
	Doghiston	Darai Imom

Table 9: 202 Interviews with 234 Interview partners

Interviewees	Male	Female	Age	Profession
a) Local government officials	28	7	Mainly 50+	<i>Jamoat official</i> , workers for CoES and at Health Centre
b) Religious leaders	15	1	Mainly 50+ 2 nd 31-49	Most are responsible for one village (500-1000 people)
c) Village Leaders (respected villagers)	24	3	Mainly 50+ 2 nd 31-49	Chairman of <i>mahalla</i> , teacher, head of <i>dekhqon</i> farm, school director, doctor, elderly person etc.
d) Villagers	44	60	Mainly 31-49 2 nd 50+	Farmer, housewife, government servant, unemployed etc.
e) Small groups of schoolchildren	20		Grade 6-11	

202 interviews with different interview partners (

Table 9) have been conducted with the help of a few assistants (called mobilizers) of the NGO ACTED Tajikistan.

a) Local Government Officials

Structured interviews were conducted with:

Director of regulating department	5
Chairman of <i>Jamoat</i>	1
Deputy of chairman	3
Head of military office	1
<i>Jamoat</i> military office	1
<i>Jamoat</i> statistic economist	1
Tax inspection under <i>Jamoat</i>	1
Land organizer	3
<i>Jamoat</i> secretary	3
<i>Jamoat's</i> worker	3
Not specified	13
Total interviews	35

This questionnaire was designed to get information about six main topics:

1. Extent to which disaster risk reduction, related to climate change and natural hazards, has been a priority, in particular at the local level.
2. Progress made by local-level government in monitoring risks and providing information to local communities.
3. How effectively local-level government has used knowledge and education to ensure key stakeholders are well informed to build a culture of safety and resilience.
4. Overall progress towards changing social, economic, environmental conditions and land use at the local level to reduce disaster risks.
5. Progress towards strengthening disaster preparedness for effective response (capacity and resources) of local authorities, communities and individuals.
6. Overall progress in addressing important cross-cutting issues that have an impact on overall disaster risk reduction strategies.

b) Religious Leaders

Interviews were conducted with 16 religious leaders (15 male and 1 female, more than 55 percent were elder than 50 years and have been living in the village for more than 30 years). The mosque is almost everywhere in the religious leaders' responsibility. Most religious leaders interviewed are responsible for the whole village (having 500 to 1,000 inhabitants).

c) Villagers with leading positions (respected villagers)

Interviews were conducted with 27 persons (24 male and 3 female, more than 65 percent were elder than 50 years and have been living in the village for more than 30 years). About 20 percent were elderly people (*rishsafed* for man and *müysafed* for woman), 40 percent teachers, and the rest held different positions, like doctor, chairman of *mahalla*, school director or head of a private farm.

d) Villagers

Interviews were conducted with 104 persons (44 male and 60 female; most of them were between 31-49 years old). Almost 40 percent had secondary education/technical and 10 percent a higher education. 36 percent had no full secondary education. Among the different occupations mentioned were: farmer (45.5 percent), housewife (19.5 percent), government servant (12 percent) and unemployed (9 percent). About 49 percent of the respondents were the head of the household.

e) Schoolchildren

Twenty interviews were conducted with groups of 3 to 4 schoolchildren or sometimes with only one student. 36 male and 16 female from grade 6 to 11 took part.

Based on the answers from the above described survey, an in-depth study on this subject was proposed as a follow-up, because it turned out that the July / August interviews had sometimes too general answers. The aim was to get a deeper insight into the topic under study: to receive more in-depth knowledge about how people perceive and interact with their (changing) environment, about the level of indigenous knowledge and how this knowledge is used to cope with imminent environmental change resulting from climate change. Focus group discussions have been conducted in six villages of three districts (Table 10).

Table 10: Selected villages for the focus group discussions

District/Rayon	Jamoat	Village
Hamadoni	Kalinin	Anjirkon
	Kalinin	Kodara
Farkhor	Gayrat	25 Solagi
	Darqad	Bunafsha
Pyanj	Nuri Vahdat	Tugul
	Mehvar	Navobod

In each village two focus group discussions have been taken place: one with men and one with women in the age groups 40-60 years or above 60 years.

Table 11: Sex and Age Distribution

Age	Group of Men	Group of Women
40-60 years old	2	3
Above 60 years old	3	3
Mixed	1	
Total	6	6

The average group size was about 10 participants. Specific questions concerning climate change, adaptation measures, indigenous knowledge, and gender issues have been discussed. The duration of the focus group discussions lasted from 40 minutes to one and a half hour. Each group had to discuss eight questions. These main questions were asked. Where we realised that respondents did not understand properly, the questions could be deepened with sub-questions and explanations. The sub-questions were a kind of guide for the interviewer and could be formulated in own words and be adapted to the particular situation.

The eight main questions were:

1. How do women and men interact with their natural environment?
 - What unique knowledge about the environment, species (plants and animals), and natural resources (e.g. water, pasture land, wood) do women and men gain from these interactions? Here interaction is seen as preserving, using, maybe over-using the natural environment.
 - Do women have a different interaction with their environment? Are women maybe more preserving the environment than men?
 - How can this knowledge be made available (retrieved) for sustainable development? (that is: to use the environment and not to over-use it)
 - How can this knowledge be made available (retrieved) for future generations?
2. What are the local beliefs concerning the environment?
 - Should people take care of the environment from an ethical, traditional or religious point of view?
 - Are there particular features (forest, pasture land, etc.) which have high ethical, traditional or religious value?
 - Do any species (plant and animal) have a cultural value (religious value, mythical connotation, etc.)?
3. What do people know about changes in their environment?
 - How would they describe these changes and differences?
 - Did people recognize that particular species (plants, animals) disappeared or increased in the past years, decades? If so: are overall numbers changing? Or are particular species disappearing or increasing in number? Which ones? How fast? How do people know whether the numbers of a species are changing?
 - What do people know about the degradation of the environment? Can they name causes for such changes? Examples: over exploitation of grass land and forest, disease, habitat degradation and destruction, displacement by non-native species, soil erosion, water pollution.
 - Do they see change as a continuum or do they differentiate specific stages?
4. What do people know about changes in the climate?
 - Can they predict changes in the weather?
 - Can they predict for example a coming flood?
 - Do they observe changes in weather, weather patterns? (e.g. earlier spring season, more rain during rainy season, more frequent drought periods etc.)
5. How do people control the use of their environment (e.g. agriculture, hunting, collecting etc.)?
 - What is different in the use of the environment (water, grassland, and forest) now and many years back?
 - Are there (were there) any mechanisms to control or regulate this interaction (e.g., beliefs, taboos, community rules, etc.)?
 - If any: Who was / is responsible for such control?
 - Were there/ are there special regulations for livestock care and production (grazing)?
 - How was livestock management (grazing) in the past (maybe even before Soviet times)?

6. What do people do if they notice changes in their environment?
 - What measures do they take to safeguard or conserve the environment or individual species? Did their forefathers have special adaptation measures/practices to do so?
 - What factors have led to the breakdown of the traditional management systems, if any? What did their forefathers do in such cases?

7. Are there people in the community who are by nature experimenters and adapters of technology? Who are they? Do they experiment alone or in groups?
 - How are practices selected for adaptation?
 - How are experimentation and adaptation undertaken? (In a systematic manner or spontaneously)
 - Do people record results of adaptation and experimentation? What are the recording techniques (orally or written)?
 - Do people hand on their knowledge to the younger people as the forefathers did?
 - How are results of experimentation and adaptation passed to or shared with other farmers or even communities?
 - What traditional activities facilitate information sharing?

8. How do people find out about environmental and climatic changes and related hazards? And where do people go to for information or advice if they have questions concerning these issues?
 - Who is the most knowledgeable person in the village about these issues?
 - Who makes decisions concerning these issues?
 - Which outsiders visit the village? What types of information do they bring with them?
 - Do local people think this information is useful (reliable, applicable locally)?

6.2.2 Access to Study Area Khatlon

The area of Khatlon is affected on a very regular basis by different types of disasters. Earthquakes, mudslides, flooding, heavy rains and heavy winds have a devastating effect on the livelihoods of people. Strong winter snowfall and consequent snowmelt have a dangerous impact upon numerous locations in the districts. According to ACTED Tajikistan⁸⁶, Khatlon's vulnerability to floods stems in large part from its geography. The province contains most of the low-lying flat land in Tajikistan. The population density of the province is high and predominantly rural and is employed mainly in the agricultural sector – these facts increase the area's vulnerability to flooding and the degree to which it is affected. The area is under constant threat of flooding by the Pyanj River, as flood protection facilities have degraded over the years and decades because of continued under-funding of operation and maintenance expenditure. In addition, floods from the upper mountains are worsening.

The 2010 interviews and focus group discussions were intended to be implemented in the four districts Farkhor, Hamadoni, Pyanj, and Shurobod, simultaneously with the climate resilience survey and build a part of the case study in Khatlon. Finally, the interviews 2012 could take place in three out of the four districts, namely Farkhor, Pyanj, and Shurobod. ACTED Tajikistan was kind enough to provide me with one of its staff member in each district. This staff member chose the village and, together with my translator, was responsible to find interview partners according to my desires. A driver with his car was hired to get around.

⁸⁶ Internal project document (2009) from ACTED Tajikistan's Assessment Monitoring and Evaluation Unit (AMEU)

6.2.3 Interviews in Southern Khatlon 2012

The second field stay (Table 12) took place in Southern Khatlon (Figure 26 and Figure 27) during March and April 2012. Based on the knowledge already gained with the climate resilience survey, one questionnaire had been designed. A staff from ACTED Tajikistan and the translator were worried about the questions concerning religion and religiousness and asked to omit or change them (see section 6.1.2). As a consequence one question was changed from "God gave human beings the task ..." to "As human beings we have the task ...", and one delicate question with sub-questions was rephrased and shortened and the sub-questions, if possible, only asked and remembered orally and in the evening written down in German. The questionnaire is given in Appendix 4.

Table 12: Procedures and Final Schedule

Jan-March 2012: Secondary information analysis: results from previous Climate Resilience Survey in the project area covered by the Community Participatory Flood Management Project (ADB Project)
Development of research tools and action plan
Design of one questionnaire for all stakeholders and translation into Tajik and Russian
Early March 2012: Test run and adjustment of the questionnaire
March and April 2012: interviews in Pyanj, Farkhor and Shurobod
June / July 2012: Data processing and analysis



Figure 26: Invitation for lunch in Farkhor District
(Source: Zimmermann, 2012)



Figure 27: Mirzo Ashur Village, Shurobod District
(Source: Zimmermann, 2012)

Table 13: Sex and Age Distribution

	Age 18 - 30	Age 31 – 49	Age 50+
Female	3	7	9
Male	1	7	11

I had the intention to conduct 39 interviews (Table 13) in 13 villages (Table 14). During one interview the young female interviewee began to feel uncomfortable and asked to stop the interview which had the effect that only 38 interviews could be evaluated.

Table 14: Selected Villages

District/Rayon	Jamoat	Village
Pyanj	Kabud Saifiddin	Lohuti
	Kabud Saifiddin	Farhona
	Nuri Vahdat	Shakardasht
	Nuri Vahdat	Vakhyo
	Mehvar	Urtabuloq
	Mehvar	Kuldiman
Farkhor	Gulshan	Bobosafol
	Komsomol	Murodbakhsh
	Komsomol	Ghalaba (Figure 26)
	Ghalaba	5 Solagi Tojikiston
Shurobod	Doghiston	Doghiston Village
	Yol	Anjirob
	Sarichashma	Mirzo Ashur (Figure 27)

The time frame of this field survey was chosen in late spring considering that in early spring farmers are busy with ploughing, sowing, planting etc. Unfortunately spring was very late in this year and so it was sometimes difficult to reach people who had time enough to sit down and discuss. This had the effect that mainly elder villagers had the time to answer the questions.

6.3 Field Work in Kuhistoni Badakhshon 2013



Figure 28: District map of Kuhistoni Badakhshon. The survey area is in the red circle (AKF Report about Activities in TJ, 2002)



Figure 29: On the road to Khorugh (Source: Zimmermann, 2015)

Kuhistoni Badakhshon is administratively divided into eight districts. Each of them consists of six to nine *jamoats*. So-called Village Organizations (VOs) exist at village level. VOs have unofficial basic-democratic structures. They have been established by the Mountain Society Development and Support Programme (MSDSP) of the Aga Khan Foundation (AKF).

The three Kuhistoni Badakhshon study districts Roshtqala, Shugnan and Rushan (Figure 28) have the following characteristics:

- The majority are Shia people
- One of the most mountainous part in the country (Figure 29) with mountain rivers, deep valleys and gorges, settlements mainly on alluvial fans
- Mountain areas are especially vulnerable to climate change
- Parts of Western Kuhistoni Badakhshon are extremely peripheral (bordering Afghanistan) with sometimes difficult access
- Climate conditions: average annual temperature is around 8° C, annual precipitation is about 250 mm, and in wet years up to 300 mm (Bliss 2006: p. 27), relatively mild winters, but sometimes a lot of snow
- Subsistence farming and international aid, some tourism

The collaboration with Focus Humanitarian Assistance provided excellent access to villages and households.

6.3.1 Access to Kuhistoni Badakhshon

Kuhistoni Badakhshon is the largest administrative unit of Tajikistan, occupying 44 percent of the territory. The 250,000 residents of Kuhistoni Badakhshon, however, make only three percent of the country's population, according to a report by Focus Humanitarian Assistance (internal project document 2011). Due to its rough terrain the region is extremely vulnerable to mountainous hazards (flash floods, rock fall, snow avalanches, glacial lake outburst floods etc.) and earthquakes. The region has scarce natural resources, being thus dependent on the external markets. Kuhistoni Badakhshon has almost no land safe from natural hazards to accommodate its population; adaptation to disaster risks is thus every day's reality. FOCUS Tajikistan was the main implementer of a project called *"Remote Geo-Hazards Capacity Building and Monitoring."*

FOCUS offered assistance, knowing me and my partner from former research and collaboration in projects. A staff member prepared a useful list with sites to be visited. With the assistance from FOCUS I could find an experienced Pamiri woman as translator who has worked before in Afghan Badakhshan. FOCUS also provided a car with driver.

6.3.2 Interviews in Western Kuhistoni Badakhshon 2013

The third field stay took place in Kuhistoni Badakhshon during April and May 2013. The schedule is given in Table 15. The same questionnaire as in Khatlon was used except for question 3 where one more issue ("Health system") and one sub question ("Why do you have / have not confidence in your religious leaders?") have been inserted. As already mentioned it is no problem to talk about religion with Pamirians. They trust the support they get from His Highness Karim Aga Khan IV and they like to talk about religious matter.

The interviews were conducted with individuals; however, in some cases the couple answered together. In other cases a part or the whole family wanted to follow the interview. It was obvious that most women expressed their own opinion and that they are usually esteemed within the family. The interviews in Kuhistoni Badakhshon normally lasted longer than in Khatlon, because Pamiri like to narrate. Almost everybody wanted to offer a meal or at least a cup of tea with some appetizers to the interviewer and her translator after the interview. Sometimes this second part of the interview lasted quite long, but revealed excellent insights in family life and community. Thirty-four interviews in 19 selected villages (Table 16) have been conducted. No interview had to be interrupted.

Table 15: Procedures and Final Schedule

Development of research tools and action plan
Design of one questionnaire for all interview partners and translation into Tajik
Early April 2013: Test run
Adjustment of the questionnaire
April and Mai 2013: interviews
July / August 2013 Data processing and analysis

Table 16: Selected Villages

District/Rayon	Jamoat	Village
Roshtqala	Sezhd	Durum
	Sezhd	Sezhd
	Mirsaid Mirshakar	Baroj
	Mirsaid Mirshakar	Langar
	Bomirshakar	Dasht
	Gadoliev Kurbonshoh	Shikush

District/Rayon	Jamoat	Village
	Tavdem	Andarv
	Tavdem	Shod
	Tusion	Tusion
Shugnan	Khorugh	Khorugh
	Sokhcharv	Zevardasht
	Sokhcharv	Choshtkandez
	Sokhcharv	Buni
	Sokhcharv	Yomj
	Shirinjonov Mirzojon	Sokhcharv
	Porshinev	Khosa
	Porshinev	Khushk
Rushan	Rushan	Baghu
	Rushan	Yemtz
	Rushan	New Riddeh

Table 17: Sex and age distribution of the respondents:

	Age 18 - 30	Age 31 – 49	Age 50+
Female	1	7	7
Male	1	3	2
Family (Head of Family)	1	4	8

It was obvious that young people, a part of the working class, were almost missing (Table 17). Young people often study in Dushanbe or abroad, or they are for work in Russia.

6.4 Data Analysis and Interpretation Methods

There is not “the” method available for the analysis and interpretation of qualitative interviews and focus group discussions in a social research, but a variety of possible methods and mixes of methods. Different schools and directions have their specific approaches. Each researcher has to look what method or mix of methods will fit best for his / her research.

After the review of the documents of the exercise *Analyse ethnographischer Interviews* (analysis of ethnographic interviews) of the Institute of Social Anthropology of the University of Bern in 2005, reading the corresponding chapters of Kvale's *InterViews. An Introduction to Qualitative Research Interviewing* (1996: pp. 187-209) and Flick's *Qualitative Sozialforschung. Eine Einführung* (2007: pp. 369-483) and an intensive internet research the list of evaluation steps by Freiling and Gottwald (2008: p. 38) has been selected for the analysis, as this compilation of steps matches well the author's idea about how to analyse and interpret the interviews.

Evaluation Steps by Freiling and Gottwald (2008: p. 38):

- (1) Transcription of the interview texts
- (2) Analysis of each interview: interpretation of the contents and case histories
- (3) Creating an evaluation grid: development of a system of structural codes (i.e., type of field activity or respondent category) and thematic codes. Thematic codes can be deductive, like theoretical constructs from research literature or inductive, based on the major themes that emerge from the study data themselves, e.g. problem of natural disasters or insufficient health system.
- (4) Segmenting and coding: segmentation of the interview contents and assignment of the corresponding codes
- (5) Thematic comparison of the interviews: search for same and different interpretations of the discussed segments of the themes, grouping of these, selection of specific themes and elaboration of cross-cutting issues
- (6) Generalisation of statements and topics (regarding the two sites or different interview groups).

7 Case Study in Khatlon Province

"I think weather has become warmer in the last four or five years and that is affecting our crops. The sickness of our crops is increasing, but the pesticides are expensive and we are losing almost 30 percent of our crops: onion, tomato and cucumber."

(Farmer in Khatlon District 2012)

7.1 Introduction

Farkhor District, situated between Surhob (Kyzylsu) River and Pyanj River, is prone to flooding from these two rivers particularly because the level of Pyanj River is higher than most of the territory of Farkhor district. Disastrous floods occurred in the district in 1998, 2000 and 2005. Other natural hazards like landslides and mud flows are observed in mountainous Doghiston, Yol and Shurobod Jamoats and across a number of Jamoats of Hamadoni and Farkhor districts (ACTED Tajikistan 2010).

The data presentations consist of four case histories, the interviews in Hamadoni, Farkhor, Pyanj and Shurobod Districts in summer 2010, the focus group discussions in Hamadoni, Farkhor and Pyanj Districts in autumn 2010 and the interviews in Shurobod, Farkhor and Pyanj Districts in 2012. Interpretation and discussion will follow in chapter 9 where selected results will be taken up, discussed and interpreted in terms of content and methodology.

7.2 Case Histories

In this section a selection of four case histories are presented to illustrate the issues of concern. Case History 1 is a summary of two focus group discussions, one with men and one with women in a village in Pyanj District. Case Histories 2-4 derive from interviews in villages in Pyanj, Farkhor and Shurobod District.

The presented case histories should show how different the interviewees were: from various regions, higher education or basic education, different level of prosperity, different destinies. The four examples are narrated summaries of these focus group discussions and interviews. Case history 1 discusses the eight questions of the focus group discussions from 2010.

Case histories 2 to 4 are subdivided into five thematic sections:

- The three main problems for Tajikistan
- Trust in different governmental institutions
- Religious matters
- Environment, climate change and related natural hazards
- Last disaster in the village

They are narrated summaries of the individual interviews from 2012. As a conclusion, key points relevant to the issues under investigation are carved out for further discussion.

Case History 1:

<u>Province:</u>	Khatlon	<u>District:</u>	Pyanj
<u>Jamoat:</u>	Nuri Vahdat	<u>Village:</u>	Tugul
<u>Men >55 years old:</u>	10	<u>Women >55 years old:</u>	11



Figure 30: Satellite image of Tugul Village
Pyanj River in the west and bare hills in the east
(Google earth, access October 2014)



Figure 31: Men focus group discussion in Pyanj District
(Source: Zimmermann, 2010)

The area is identified as “Wheat and Livestock Zone”. The zone is interspersed with “Cotton, Vegetables and Wheat Zone”⁸⁷. Agriculture (wheat, fruits and vegetables) and, to a lesser degree, animal husbandry are the dominant livelihood activities in this relatively fertile zone. Most households are part of the *dehkan* land tenure system where cotton is still the main crop.

Tugul Village (Figure 30) was built in 1950 as a resettlement for people from the Rasht valley that lost everything in an earthquake in 1949.

The two focus group discussions in Tugul Village, one with men (Figure 31), the other with women, took place in the house of the *rais*.

How do women and men interact with their natural environment?

Men stated that they try to save the natural balance (*mīzān*) by looking after flora; planting some new, young trees in place of died or hewed trees. They considered that women take care of the environment in a better and noble way: “When you look how women are working in and with nature, you can see that it really comes from their hearts.” In return, old men still keep notes and drawings from their forefathers, hand over their knowledge to younger generations: where to build a house safe from flooding or avalanche; where to walk that a stone will not fall on their head. The old people of the village are those who survived the terrible earthquake in 1949, where their native village Hoit⁸⁸ (in Rasht District) was entirely destroyed by a landslide which occurred as a consequence of the earthquake: “We are originally Gharm people that were relocated after the earthquake in 1949, because our village Hoit completely disappeared from the earth's surface.” Here in Tugul they are worried about

⁸⁷ USAID, WFP and Famine Early warning Systems Network: *Livelihood Zoning „Plus“ Activity in Tajikistan*. This product has been carried out using a rapid livelihoods assessment approach that aims to identify and describe trends and patterns in livelihoods that can be used as a starting point for early warning analysis.
<http://www.fews.net/sites/default/files/TJ%20Livelihood%20Zone%20Descriptions%20English.pdf> (last access September 2015)

⁸⁸ Earthquake in Hoit in 1949; 9-10 on Richter scale. This earthquake wiped out a great number of villages and killed more than 28,000 people (Yablokov 2001)

mudflow and about a possible outburst of Lake Sarez⁸⁹: "Such an event can wash off our whole district." The men said that they explain all these facts and what to do in case of a disaster to the young generation.

Several women stated that they are illiterate and just do what is their job, what is demanded from a woman. They thought that everything around them is environment: water is used for drinking and irrigation, trees for fire-wood, etc. Women said that old people teach young people how to interact with environment, take care, protect from pests, illnesses, etc. All women agreed that they are harder working than men, even in the agricultural sector: "We are working and working and working the whole day and have no time to think about what we are doing, we just do it. Men love to sit together, drink a cup of tea and discuss about God and the world."

What are the local beliefs concerning the environment?

Regarding religion men explained that they wash themselves and keep clean before praying, and they think that religion never teaches bad things. Men stated to esteem and respect flora and fauna, except the wild pigs which live on the border with Afghanistan. However, they complained that there are some unscrupulous people, who throw dust in the water channels: "We have a lot of diseases because of this fact. We must tell our small children not to drink water from the channels." Men regretted that there are no longer forests and pasture lands in the area.

Women said that their housework never finishes: work on private plots, on presidential land and in cotton fields. They could not remember to have special local beliefs. They stated that they plant seedlings and saplings according to the seasons: "Some crops, like potato, onion or carrot we plant twice a year; most important is the optimal time for planting."

What do people know about changes in their environment?

Men thought that there are mainly human factors that cause the dying of trees, the decrease of fruit trees, vegetables, etc.: "People use too many pesticides. Unclean drainages have led to the rise of groundwater to the subsoil in a way that salty water is coming up and makes our vegetables to shrink."

Women stated that flora and fauna directly depend on climate conditions: "Today we can observe invasions of pests that cause huge damage to agriculture crop." They added that the productivity of peach trees, grape and pomegranate trees have decreased: "These trees do no longer give as many fruits as in former time. The fruits are of poor quality and often they are damaged. Even persimmon fruits were damaged last year." Women told that a new type of bee has appeared. Women called them mutants from the small yellow ones: "The new bees destroy everything and the useful small yellow ones are dying out." They also told from locusts that came last year and ate every green thing on their way. One woman explained that during Soviet times the cotton fields were sprayed against pests by plane and this treatment also covered kitchen gardens: "Today we do not have money for such treatments." Women agreed that the level of diseases, like hepatitis A, typhoid fever or brucellosis has increased.

What do people know about changes in the climate?

A 75 year old man said that he can observe changes in the climate: "In summer the temperature is 10°C above the usual. Winter time has changed too; beginning of winter is now in January." All men agreed that these changes are disturbing their agricultural life. Men stated that their forefathers could guess when to sow land, just by looking to the ploughed ground. One man added that when his ear is itching, it will soon rain. He said that his ear is more often itching in the last years: "Dangerous downpours have

⁸⁹ Lake Sarez is a 16 km³ water volume lake formed in 1911 as a result of an earthquake with a potential to outbreak. A major landslide dammed the valley and a lake developed behind. The population is afraid that this natural dam will break one day and that the lake will discharge.

become frequent, like in China, Pakistan etc.” Men said that people expect mudflows from mountains, when it is plentiful and continuous raining: “People fear mudflows, especially at the present time, because drainages are not or only a bit cleaned and mudflows may leave the river bed.” One man explained that the meteorological station is located in the area of the airport of Pyanj District. Other men added that anyway all information about upcoming weather they receive from TV.

Women said that the weather is changing from year to year. They observe that heavy rainfall has become more frequent: “Such heavy rainfall can provoke mudflows.” Women agreed that they can forecast rain only by clouds. One woman added: “There are few old villagers who are able to predict how winter and summer will be.”

How do people control the use of their environment (e.g. agriculture, hunting, collecting fire-wood etc.)?

Men explained that the control mechanism of district administration only concerns cotton fields and mulberry: “The rest lies in the hands of each individual. In Soviet times everything was under control, even each person who was unemployed.” One man added that even private and state owned livestock was under control: “Pastures of private and state owned livestock had been regulated too. In our times it is chaos! It is very hard for simple farmers.”

Women mentioned that the village has its own, limited pasture lands⁹⁰, but not all women go there: “Mainly men are engaged in livestock management. We pay 10 Somoni a month for each animal to the shepherd who looks after our animals.” During Soviet times there was a control on pasture lands, but presently the land gets more and more divided and people sow wheat.⁹¹ One woman stated that the population tries to solve upcoming problems by itself: “For example, we inherited the *ketmen* from our forefathers (Figure 32). This is an agricultural tool by which we plough the land by hand. Tractors are too expensive.”



Figure 32: Ketmen.
A *ketmen* is a hoe to dig the soil by hand.
(ACTED Tajikistan, 2010)

What do people do if they notice changes in their environment?

Men state that they try to preserve the flora. Cleaning drainages for reduction of high underground water level and saving root system of trees. They try to adopt old rules of planting, growing and crop rotation. To preserve the environment women plant trees and look after them. Young persons are working under the supervision of seniors. Their fathers, mothers and people with experience hand their knowledge to them. In return they give them their new skills. Women try to preserve long-term flora and plantings. In place of hewed tree (particularly short-lived fruit trees) they plant new types. Lemons, persimmons, oranges, mandarins etc. appeared in the region in the last 20-30 years; this is nowadays possible, maybe as a consequence of climate change.

⁹⁰ Pastures are owned by the Tajik state. Pastures are usually managed as common property (e.g. a village) and used as communal grazing land (WOCAT 2007: pp. 193-196).

⁹¹ Further information about land reform and farmland restructuring in section 4.2.2

Are their people in the community who are by nature experimenters and adapters of technology? Who are they? Do they experiment alone or in groups?

There are 1-2 persons in the village who introduced new ideas into the agricultural sphere. They disseminate their ideas, and they are known for this in neighbouring villages.

The young generation aspires to learn more about new technologies and is supported by the elders.

Women state that the young generation is more competent; all count on them.

How do people find out about environmental and climatic change and related hazards? And where do people go for information or advice if they have questions concerning these issues?

Men stated that they know about CC from two geography teachers and from TV. They added that they discuss in the mosque, exchange information and opinion: “The chairman of the *mahalla* committee and the chairman of CoES (Committee of Emergency Situations)⁹² sometimes conduct discussions about natural disasters. And ACTED once conducted a seminar and trained the population.”

Women said that they get information mainly from TV: “We see and hear in TV about how to keep clean houses, plantings, water and territories. Seminars and trainings on such topics are usually conducted with men, not with women.” Some women stated that they refer to God, because only he knows what will be in the future, how will be the weather and what type of diseases will appear. Few women hoped that NGOs come to the village to encourage and push people for a better handling of the environment.

Key points:

- Changing of the climate is recognized, including changes in occurrence of hazardous events like strong rain
- There is rather high awareness about hazards, about environmental problems and about changes of the environment
- Would prefer to have more forests, better grazing land
- People themselves are considered to be responsible for changes (there is no control as it was during SU)
- Climate change has influence on livelihood
- There seem to exist some traditions which are passed to the younger generation

⁹² In villages that face high risks of emergencies emergency committees exist, formed by community members (8-10 persons).

Case History 2:

Province: Khatlon

Jamoat: Mehvar

Family size: 6 → grandmother, son with his wife and three children

District: Pyanj

Village: Urtabuloq

Income earners: 2 (man is in Russia, his wife works as a teacher in Urtabuloq School)



Figure 33: Satellite image of Urtabuloq
The village is situated on the river Pyanj along the border with Afghanistan
(Google Earth, last access 27-09-2014)



Figure 34: Nowruz at Urtabuloq School
The girl, representing Nowruz, carries a flat dish with young wheat, called Sabzeh, which symbolizes the new growth of the new year
(Source: Zimmermann, 2012)

The village is situated on the river Pyanj along the border with Afghanistan (Figure 33). The area is identified as "Cotton, Vegetable and Wheat Zone", interspersed with "Rainfed Wheat and Livestock zone" (Famine Early Warning Systems Network 2011). In addition to cotton, households also produce vegetables, mostly onions, potatoes, carrots, cabbage, and fruits. Irrigation infrastructure still exists, but since Soviet time the maintenance of some of these systems has largely fallen into disrepair.

The director of the school received us and proposed to participate in the *Nowruz*⁹³ festivities after the interview. The interview with a female Tajik language teacher took place in a classroom of Urtabuloq School. During the interview a woman entered the room and brought a plate with the traditional *Nowruz* meal *Sumanak*, a sweet porridge made from sprouted wheat. The atmosphere in the school was warm and the children presented a very nice performance with poems and songs about *Nowruz* (Figure 34).

Notes:

The interviewee stated that she considers health care, education, and crime and security as the most important issues for Tajikistan. She was concerned about the significant rising of the groundwater level in the area that leads to salinization and she thought that this water could not be healthy for the agriculture. Another problem seemed to be the lack of drinking water. She told that children sometimes drink water from the irrigation canals and then get sick.

Regarding the education system she was concerned about the increasing lack of good and responsible teachers. She feared that all young teachers will leave the region: "With our meagre salaries it is difficult to feed a whole family and yet we are often better off than most of the villagers." Furthermore, she regretted that the school is not well staffed, be it with a modern curriculum, books or tables and chairs.

⁹³ *Nowruz*, in Tajik, means "New Day" and is usually celebrated on March 21, the first day of spring which is also the beginning of the Persian New Year. Tajiks consider Nowruz as their biggest celebration of the year.

The woman hopes that one day the government will install electricity in such a way that they have power for more than only one hour per day: “Teaching in the darkness of the winter it is not convenient. Sometimes we have to close the school for one day or more. The government several times promised to improve, but until today nothing happened.”

The woman was concerned about drug smuggling: “Our village is located on the river Pyanj that builds the border with Afghanistan. The smugglers only have to cross the river.” She thought that the lack of good jobs in the region is the reason for young people to get involved in drug trafficking with all its concomitants, like drug use and addiction and crime. The woman mentioned mines and other unexploded devices as another problem of the region. She narrated from a deadly incident that happened in Mehvar *jamoat* in 2011 when three children found a metallic object in a no longer used canal and played with it. She said that it would be appreciated to have regular information updates for local residents and schoolchildren about that matter.

The respondent stated to have no confidence in government institutions. She would consider it as normal when government and citizens try to solve Tajikistan’s problems together: “But in fact the government institutions betray us. *Hukumat* always promises us something, like electricity or safety from river Pyanj, but then nothing happens. Last year the village needed stones to strengthen the riverbank. Government sold us stones for an exorbitant price!”

She had confidence in business because she knows that farmers or housewives can sell their products on the market.

Regarding courts and legal system she had only little confidence. She was not sure whether the legal system would be of help in case of need.

As mentioned above the woman found many problems regarding the education system: “For example, when we have a problem with the school building we have to solve it in our community. For example, last year a storm damaged the roof of the school building and it fell down. Few rich farmers donated money and we teachers repaired it by ourselves.”

She stated to have pretty much confidence in mosques and religious leaders. However the religious leaders cannot help because they lack money. The woman explained that the school has a special teacher who gives lessons in ethics.

Asked about environmental changes, climate change and natural disasters the woman said that she can see changes in the climate in the last years. Either they have no rain and accordingly heat with the strong Afghan wind (*shamoli Afghani*) and maybe even drought or they have flood because of too much rain or water coming down the river Pyanj: “I think that more water will flow down the river Pyanj in future and that we will have more flooding in our village. The level of the river Pyanj will rise when the glaciers in the mountains melt. Already today when the snow in the Pamir begins to melt, the river in our village often overflows its bank.” She added that due to all these changes they also have more and more problems with pests that destroy their crops, vegetables and fruit trees: “A new type of bee appeared. We think these really big bees are mutants of the small yellow ones. They destroy the fruits on our fruit trees. There are people who say that the Chinese would have sent the bees to Khatlon to get the control over us.” The interviewee knew quite a lot about the topic because ACTED Tajikistan provides occasionally awareness raising and training in the field of disaster prevention and emergency response. Furthermore, she stated to have a TV and that she sometimes talks to the teacher of geography who knows a lot about the topic. She thought that climate change is natural, but added that she has learnt that also humans are at fault because they burn too many fossil fuels, cut too many trees or pollute the environment. She was sure that modern science and technology can help to solve the problems.

The woman remembered that the last disaster happened in February 2012: “We had a lot of snow and then a storm arrived. A lot of houses were damaged. The house walls collapsed.” According to her, it was an act of God.

Key points: The lady

- is fully aware of environmental problems; she understands a wider system of the environment
- recognises changing of the climate but not to its full extent
- has confidence in religious leaders but absolutely not in government
- believes business opportunities for people's well-being
- considers disasters as an act of God

Case History 3:

<u>Province:</u>	Khatlon	<u>District:</u>	Farkhor
<u>Jamoat:</u>	Komsomol	<u>Village:</u>	Murodbakhsh
<u>Family size:</u>	7 → grandfather & grandmother, son with his wife & three children	<u>Income earners:</u>	2 (farmer, government servant)



Figure 35: Satellite image of Murodbakhsh Village (Google Earth, last access 27-09-2014)



Figure 36: Bridge at Surkhob River
One of the two relevant bridges for the village at Surkhob River (Source: Zimmermann, 2012)

The area (Figure 35) is a fertile zone, where rainfall averages 150–250 mm per annum. The basic income of the population is production of agricultural crops, cattle breeding and poultry. Irrigation infrastructure is found throughout the zone, but often in disrepair (Famine Early Warning Systems Network 2011). Most households in this zone are part of *dekhan* land tenure system and still grow cotton. In addition to cotton, households also produce wheat, fruits (lemon, grapes, apricots, peaches and pomegranates) and vegetables (onions, potatoes, carrots, cabbage). Better-off households cultivate larger areas of land and hire agricultural labourers. Because of the poor economic standard in the village a lot of men are labour migrants. This in turn has the effect that women have to work harder and are often additionally working in the cotton fields.

The interview took place in the guest room of the family's house. The respondent who was 60 years old and still worked as a farmer ordered his daughter-in-law to bring tea and sweets. The man first expressed his pleasure about my interest in their problems. Then he explained that the village is situated between two rivers and that the villagers are concerned about the condition of the two bridges that connect them with other villages (Figure 36).

Notes:

According to his view health care, climate change and resulting hazards and poverty are the most important problems Tajikistan is presently facing. He added that the village is in a good position regarding health care because it is situated in a *jamoat* with a good functioning health station. Regarding poverty he mentioned the many low educated, poor families in the village: “I think it would be easier to survive for families when they would have fewer children. These families often have five, six or more children, simply too many.”

The farmer stated to have pretty much confidence in government institutions and added that his son is working for the government and, therefore, the family's budget is dependent on the government. In his opinion the government should be in charge of solving Tajikistan's problems: “We cannot do

everything by ourselves. Here in the village we have to help each other, but generally seen, the government has to solve the major problems of Tajikistan.”

The man had little trust in local business and industry: “I think only rich families can do real business. For the rest of the population it is an additional financial support, but not more.”

He considered the legal system to be quite adequate and said that he can rely on it when in need.

Education is important for him and he had complete confidence in the education system: “I tried to give my children the best education possible. When you are educated, your life will be better. I cannot support the upcoming tendency to take girls out of school at the age of 12, only to marry them.”

He answered that he has pretty much confidence in religious leaders. Once they needed stones for repairing a house; the *mulloh* came to work with them when asked. Furthermore, the man thought that local religious leaders can act as mediators in conflicts or as bearer of information due to their personal relations with state elites and national religious elites. According to him mosques and religious leaders play an important role in the hierarchical structure of a *mahalla* and religious practices and ceremonies are essential for the community: “It is important that our religious leaders conduct the Friday prayer, wedding, funeral and holiday. This helps to hold the community together.”

The man is very much concerned about environmental changes, climate change and natural disasters: “Of course I am worried. Our village is situated between two rivers. Our village will be flooded and our bridges will be destroyed in case of heavy rainfall or when the natural dam at Lake Sarez will collapse. .” He added that they always have problems with water, be it too much or too little or polluted. The soil in and around the village has become salty and contaminated during the last years and people have problems to grow vegetables in their kitchen gardens: “They use a lot of chemicals in the cotton-fields and against locusts. These chemicals contaminate our soil and our water. We have more and more diseases in the region. People are often sick.” He complained that villagers often have shortage of water for their households during summer time due to over-irrigation of the state-owned cotton fields.

He said that he knows quite a lot about environmental problems of the village and its environment, but specified: “I know a lot about the causes and the solutions of the topic, but our village has no means.” The man considered climate change as to be natural and thought that modern science and technology can solve the related problems. He stated to live in a responsible manner not exploiting nature. Furthermore, he admitted to be interested in the topic and to get information from TV, internet, newspapers and books.

The man said that the last really destructive disaster happened in 2003: “There was a very strong wind that destroyed everything. It came like a wall. People did not know where they should flee.” For him the disaster happened because people did not fulfil the demands of nature’s law: “As long as people cut all trees, build houses in dangerous places, do not clean the canals etc. they are vulnerable.”

Key points:

- Science-based understanding of naturally-induced problems "they did not fulfil the demands of nature's law"
- Overall positive view on life; confidence in government, legal system and religious leaders but no confidence in private business
- To be educated is important, is required to solve problems, but means are even more important
- Without means nothing is possible; an excuse to do nothing?

Case History 4:

<u>Province:</u>	Khatlon	<u>District:</u>	Shurobod
<u>Jamoat:</u>	Yol	<u>Village:</u>	Anjirob
<u>Family size:</u>	14 → grandfather, son with his wife & two daughters (both divorced and back in the family) & three sons, one daughter-in-law, and five children	<u>Income earners:</u>	3 (two sons are working in Russia, one in Dushanbe)



Figure 37: Satellite image of Anjirob Village (Google Earth, access October 2014)



Figure 38: Anjirob Village
The village is situated at the border with Afghanistan (hills and mountains in the background).
(Source: Zimmermann, 2012)

The area (Figure 37) is identified as Khatlon Mountain Agro-Pastoral Zone (Famine Early Warning Systems Network 2011). The main crops are wheat, legumes (lentils, peas, beans) and fruits (apple, grapes, pears, apricots). Households have an average of 2 – 10 hectares of land available. The main source of fodder for livestock is pastures and crop residues. Livestock sales represent an important source of income. The region is difficult to reach; the roads are in a bad shape and often interrupted.

The interview took place on the veranda of the house where the woman and one daughter were cutting cloth to sew dresses. The woman welcomed us with the words: “Welcome at the end of the world!” (Figure 38) The daughter said to her mother that it would be better to get mother’s husband that he could participate in the interview, but the mother ignored her and agreed to answer the questions. She added that her husband is anyway drunk and cannot answer the questions properly. The daughter repeated her suggestion during the interview once again. The mother "solved" the issue by sending her to prepare the evening meal.

Notes:

Asking for the most important problems Tajikistan is presently facing, the woman listed health care, environmental changes and poverty. She explained that a lot of children of the village are ill because of polluted drinking water. People have to get water from the river Pyanj with their donkeys; this takes them every day two to three hours. In addition women fear to fetch water because the river forms the border with Afghanistan. Women are not allowed to go alone; they always have to be in a group or with a man.

The woman also stated that when somebody gets seriously ill, there is no possibility to bring this person to the district hospital: “We do not have public transport and only one or two families in the village have a car. Furthermore the roads are often blocked by rock fall or landslides.” Regarding poverty she meant

that almost every family has sons working in Dushanbe or Russia. She was proud that her youngest son just got the diploma as a scientist. According to her, the son prefers to stay in Dushanbe; she thought that he can earn a lot of money now. Unfortunately it seemed that he is unwilling to send money home. One of the two sons, he works in Russia, was just sick and was in a hospital in Moscow. She was concerned because she knows that Tajiks in Russia are treated badly. Then she asked me to take her two daughters with me, either to get work in Dushanbe or better to take to Europe. This wish she repeated several times during the interview. My translator went angry and rebuked the woman. I asked her for patience and understanding.⁹⁴ The woman thought that all citizens of Tajikistan and the government have to solve Tajikistan's problems together.

The woman had pretty much confidence in the local government. She argued that government helped her daughter with her two children when she was abandoned by her husband and later divorced. Regarding business she could not choose an answer because she did not know how the situation is in Tajikistan. She could only state that they are self-sustaining farmers and get some money from their sons and with her sewing. How the situation is outside her village she could not say: "I never go outside my village, we do not have TV or radio. Sometimes I hear something from neighbours. I cannot join in this topic." The same she stated for the legal system: "Until now I have never had anything to do with them." She had complete confidence in schools and the education system. The school building has been rehabilitated some time ago. According to her, teachers are engaged and take responsibility for the children and the school building with its garden: "Every year all teachers plant fruit trees in the school garden and they let build even two toilets, one for girls and the other for boys." Furthermore she appreciated that children receive a meal every day.⁹⁵ (During a school visit later this day all these mentioned facts could be confirmed and it turned out that teachers have had training about how to teach ecological issues.)

Regarding mosques and religious leaders she said that the mosque of the village is very small and poor and that she does not see a benefit. She told that she is praying sometimes, but that religion does not play a major role in her life: "Our problem is poverty and here the religion cannot help." Regarding the question about the existence of *akhloqs* she stated that these things are discussed in the school books of geography and biology.

The woman was concerned about the environmental changes and increasing disasters. She thought that severe floods have increased due to more rain; she referred to the disastrous spring floods in Kulyob in 2010⁹⁶ that killed more than 30 people. Furthermore she considered earthquakes as a possible threat. She was afraid that when a disaster would hit her village, nobody would come and help: "The help from our government in Dushanbe is very poor. They do not want to help us. I would say that they neglect us. Maybe it is because we are at the end of the world. Only foreigners and NGOs come and look how they can help." The woman mentioned a project where village people could participate in training and learnt a lot of interesting things, like for example: "We should not cut down trees for firewood." She explained that the deforestation is not good: "It is important to save our rich nature with all its plants and animals. This is better for our cereals and vegetable-growing or even our bee-keeping." In the course of this

⁹⁴ On our way back the translator, originating from the city of Kurganteppa, confessed that she did not know about the poverty in the countryside and that she has been a little bit overwhelmed with the situation.

⁹⁵ World Food Programme: *Schools on the Afghan Border*. WFP delivers oil, pulses and flour. The parents contribute fresh vegetables and a school assistant prepares a soup and bread for the children. <https://www.wfp.org/node/3596/4743/20635> (last access September 2015)

⁹⁶ Central Asia-Caucasus Institute: Severe Flooding in Tajikistan, 2010. <http://old.cacianalyst.org/?q=node/5337> (last access September-2015)

project she also learnt that people have to live in a responsible manner and should not exploit nature. Climate change is natural according to her.

The last disaster just happened two days ago: “After heavy rainfall a mud flow came down from the mountain behind the village and hit the village and the road to the village.” She considered it as an act of God.

Key points:

- Confidence in the governmental systems, except for national government
- Changes of the environment are acknowledged, people have do something to protect the environment
- Little confidence in religious leaders
- Disasters are an act of God

7.3 Interviews 2010 – Results

Investigations about public knowledge and perception of and response to natural hazards become necessary with growing concern about climate change and increasing frequency and magnitude of extreme weather events and other natural hazards. The aim of this particular survey was to assess climate resilience in selected communities in Southern Khatlon by conducting interviews and focus group discussions (a total of 202 persons and 12 groups in several villages). The study incorporated questions on how the community knows about and interprets hazards, vulnerabilities and risks, and how it traditionally manages these risks. The result of this study was an increased understanding of people's present level of climate resilience.

55 structured interviews with local government officials (jamoat, CoES, Health Centre) and schoolchildren (grade 6 to 11) and 147 semi-structured interviews with religious leaders; villagers with a leading position, respected villagers and villagers.

The analysis of these questionnaires followed the six main themes presented already in section 6.2.1. Summarized in short they addressed the following issues for the local level:

1. Extent to which disaster risk reduction, related to climate change and natural hazards, has been a priority
2. Progress made by local-level government in monitoring risks and providing information
3. Progress towards changing social, economic, environmental conditions and land use to reduce disaster risks
4. Progress towards strengthening disaster preparedness for effective response of local authorities, communities and individuals
5. Progress in addressing important cross-cutting issues that have an impact on overall disaster risk reduction

a) Local Government Officials

A total of 35 local government officials were interviewed.

1. Extent to which disaster risk reduction, related to climate change and natural hazards, has been a priority, in particular at the local level

Answers pointed out that there are institutional capacities for dealing with the effects of climate change and related natural hazards at local level and that, with limited emphasis, Disaster Risk Reduction (DRR) is incorporated into overall planning in key sectors at local level. Furthermore, government is said to provide DRR training for local officials and community leaders. Only concerning the available budget most of them (80 percent) indicated that this is not sufficient.

2. Progress made by local-level government in monitoring risks and providing information to local communities

Local government officials stated that hazard and risk assessments take place regularly with the participation of representatives of all sectors of local communities, however, in some places with limited interest. Almost the same result showed the question about the existence of an effective early warning system. Only the question about the existence of functioning risk management systems to monitor risks and hazards regularly was negatively (62.9 percent) answered.

3. How local-level government has effectively used knowledge and education to ensure key stakeholders are well informed to build a culture of safety and resilience

Concerning information for key stakeholders on changes in the average weather conditions and disaster risks and how to be ready and manage it, the answers were mainly positive (45.7 percent) or positive to a certain degree (28.6 percent). There is some material for key stakeholders and schools, but concerning trainings the answers' trend is no or with limited extent.

4. Overall progress towards changing social, economic, environmental conditions and land use at the local level to reduce disaster risks

The question concerning adequate social protection for vulnerable people was answered controversially: yes (35.3 percent), yes, but with limited extent (32.4 percent) and no (32.4 percent). The results concerning the support of local-level governments to help communities to adapt to climate change were mainly yes (51.4 percent) or yes, but with limited extent (37.1 percent). Most public facilities (schools and hospitals) in high risk areas have been re-built or strengthened to a limited extent (51.5 percent).

5. Progress towards strengthening disaster preparedness for effective response (capacity and resources) of local authorities, communities and individuals

Positive answers (over 80 percent) for strengthening disaster preparedness and response capacities were given. Yes, but with limited extent (50 percent) for regular drills and evacuation rehearsals and clearly no (80 percent) for financial reserves and / or contingency funds that can be made available quickly to support rapid response to disasters.

6. Overall progress in addressing important cross-cutting issues that have an impact on overall disaster risk reduction strategies

Concerning the question if villager's rights to participate in disaster response and prevention measures are effectively promoted in policies and law the answers were mainly positive: yes (40 percent), yes, but with limited extent (51.4 percent). The questions concerning the chances and the equality of the society concerning all the disaster risk reduction strategies were mostly positive or yes, with limited extent. It was stated that women at local level may have specific public roles in decision-making and implementation of DRR activities (yes 60 percent and yes, but with limited extent 31.4 percent). The question concerning the presence of indigenous and traditional knowledge was answered controversially: yes (34.3 percent), yes, but with limited extent (34.3 percent) and no (31.4 percent).

b) Religious Leaders

Flood and strong wind were considered to be the major threats, occurring very often and causing damage to homes and business and to agricultural land. Half of the religious leaders thought that disasters occur as an act of God or a divine punishment.

Almost all of them (15 of 16) knew about climate change. Most of these 15 religious leaders have their knowledge from TV.

Over 50 percent felt quite well informed about climate change and related natural hazards or disasters. Asked for possible reasons of climate change and related natural hazards or disasters, four referred to the will of God and eight listed climatic factors like melting of glaciers, heat waves, heavy rain fall etc.

More than 80 percent of the religious leaders stated that they observe an increase in the average temperature and the amount of rain over the last 10-30 years. 75 percent observed changes in the vegetation cover, 12.5 percent are not sure about this. Among the changes were mentioned: extinction of plants and herbs, growing kitchen gardens and vineyards, some new grasses. A lot of them explained that today harvest is decreasing because of too much (abundant) rain.

Asked about traditional and local knowledge that can help to solve the problems of climate change and related natural hazards or disasters, half of them said that they have a certain traditional and local knowledge. Only one person answered that people have to pray to God, one proposed to give alms, and one mentioned *Arshigulon*, the spring ritual of singing to the skies to ask for rain. Some others gave advice how to strengthen river banks, cleaning the river from wooden debris, planting trees as protection etc.

Almost all religious leaders are concerned about the topic. 87.5 percent felt responsible for their community; people come to them and they try to help them, either with moral or material aid, with advices, proposing an evacuation, giving educational lessons or explanations.

The topic is occasionally discussed in the religious leaders' community where they get some additional help from national, *hukumat* or *jamoat* institutions. This help consists of education, early warning, and evacuation to safe places, disaster prevention, and channel cleaning. Only one person mentioned financial help.

Asked about problems in their daily life, all religious leaders said that they have problems of various kinds. The most serious ones mentioned were unemployment, food shortage and lack of money.

The help for the most vulnerable people seemed to function well. Help goes from organizing the evacuation to a safe place to supporting with food or other materials. However, several religious leaders mentioned that the village has some problems with thieves and plunderers during disasters.

c) Villagers with leading positions (respected villagers)

Flood, strong wind and mudflow were considered to be the major threats, occurring very often and causing damage to homes and businesses and agricultural land.

Almost all of them (25 of 27) stated that they have heard about climate change. Most of them (55 percent) had their knowledge from TV, the rest mentioned radio, newspapers and others.

Being with strong or medium religious beliefs, 63 percent thought that everything happens because of God's will and that they cannot do anything. 30 percent thought that they are the vicegerent (*khalifa*) and servant of God on earth and therefore have to take care of the planet.

Almost everybody felt quite well informed about climate change and related natural hazards or disasters. Asked for possible reasons of climate change and related natural hazards and disasters, six referred to the will of God, the others listed climatic or human induced factors like melting of glaciers, increase in global temperature, construction of hydro powers, pollution, deforestation, destruction of ecological system, heavy rain fall etc.

More than 70 percent of the villagers with leading positions and respected villagers observed an increase in the average temperature and more than 80 percent an increase in the amount of rain over the last 10-30 years. 67 percent observed changes in the vegetation cover, 12.5 percent are not sure. Among the changes were mentioned: rise of groundwater level what results in degradation of trees,

many new plants are growing, some plants are disappearing. Several explained that today harvest is decreasing because of too much (abundant) rain or long lasting drought.

Almost everybody was concerned about natural hazards and related disasters. 44 percent thought that the causes for natural disasters are purely natural causes, 37 percent thought that human induced factors are the reason and 11 percent saw it as an act of God or a divine punishment.

Asked about traditional and local knowledge that can help solving the problems of climate change and related natural hazards and disasters, 55.5 percent answered with yes. One person answered that there is a need to sacrifice and asking for blessings, two recommended giving alms, some mentioned *Arshigulon*, the rain prayer. Some others gave advice like how to strengthen river banks, cleaning the irrigation channels and the drainages, planting more trees like the ancestors did, looking for a safe place during disaster etc.

93 percent felt responsible for their community; people come to them and they try to help them. For example some try to show people alternative methods and products for agriculture, one gives financial help, one helps with transportation in case of disasters because he has a car, one helps with medical care and some said that they have to do their utmost to serve people. An old tradition is the community mobilization. Several *mahalla* chairmen stated that they organize communal labour work, called *hashar*. For example, villagers maintain and repair water channels, strengthen river banks (Figure 39) or help a family in need by repairing the roof of their house.



Figure 39: Example of *hashar* in Pyanj District
(Source: Zimmermann, 2012)



Figure 40: Damaged road in Pyanj District
(Source: Zimmermann, 2012)

Asked about problems in their community's daily life, everybody said that there are problems. Getting a job and lack of money are serious problems. Getting food and being prepared for a strong winter are also considered as problems. The most serious problem for the community, including climate change and natural hazards, depends on where the village is located. In Farkhor most mentioned flooding of Pyanj River, strong wind and drought. In Shurobod mudflows, landslide, damaged roads (Figure 40) and bridges are the main problems. In Pyanj people from one village feared the collapsing of the hill situated nearby, because it contains water. Other problems are river bank erosion, flooding of the Pyanj, and mud flows. Only two persons said that for their community the lack of job opportunities is the most serious problem.

Most respondents considered people with disabilities and seniors as the most vulnerable members of the community.

d) Villagers

Being with strong or medium religious beliefs, two thirds thought that everything happens because of God's will and that they can do nothing. 31 percent thought that they are the vicegerent (*khalīfā*) and servant of God on earth and therefore have to take care of it.

Approximately 60 percent live within a radius of 5 km from a river. Flood, strong wind, mudflow and earthquake were considered to be the major threats, occurring very often and causing damage to agricultural land and homes as well as businesses.

Almost all of them (over 90 percent) have already heard about climate change. Most of them had their knowledge from TV or radio, only few from newspapers (5 percent).

More than 70 percent of the respondents stated an increase in the average temperature and approximately 90 percent an increase in the amount of rain over the last 10-30 years. Approximately 70 percent observed changes in the vegetation cover and over 50 percent made adjustments in their farming because of this. Among the listed adjustments were change of crop variety (36.5 percent), planting of trees for shading (26 percent) and lease agricultural land (20.5 percent). Build a water-harvesting scheme (6.5 percent) and either reduce livestock (5.5 percent) or change from crop to livestock (5 percent) were mentioned too, depending on where the community was located. Insurances were not a topic, only one person mentioned it. Respondents making no adjustments listed the following reasons: lack of money (59 percent), lack of information (22 percent) and shortage of labour (18 percent).

Asked if specific traditional and local knowledge is available to solve problems of climate change and related natural hazards and disasters one half answered with yes, the other half said no or I don't know. However, it turned out that the main local tradition is *arshigulon* (the rain prayer) followed by *sadaqa* (alms to prevent disasters). In Tojiksoy Village, Pyanj District, some villagers mentioned that in the case of drought someone has to sit backwards on a donkey by night. Then he has to go to the neighbouring houses and make their empty buckets filled with water. Two elderly women explained that they sprinkle their children with water to ask for rain. In Kuhdoman Village, Shurobod District one woman said that they use *arshigulon* to ask for rain and in the case of too much rain they burn a blue rag and the sun will come out. Furthermore, especially women believe in supernatural forces. Concerning the sharing of knowledge several respondents mentioned that they orally pass their knowledge from one generation to the other; however, it remained unclear what this particular knowledge is.

78 percent stated that they feel to be informed or informed to a certain degree about climate change and related natural hazards and disasters. Asked for possible reasons of climate change and related natural hazards and disasters, over 50 percent answered that the reasons are purely natural causes. 31 percent referred to the will of God, 13 percent thought that it is a combination of natural and man-made causes and only 3.5 percent regarded it as man-made. Almost all want to be better informed about the topic.

Almost everybody was concerned and felt to be at risk from climate change and related natural hazards and disasters. The most important mentioned assets at risk were houses, human life, agricultural land and livestock.

Almost 80 percent thought that they are prepared or prepared to a certain extent for natural hazards and disasters. The majority will take their family and move to a safe place (only one respondent told that he does not know where to go). Several families have a bag with necessary items ready and their documents in a safe place. One respondent supposed that it would be better to take preventive

measures so that the disaster does even not occur. From those that thought that they are not prepared approximately 60 percent expect support from the National Government, hukumat or jamoat. 27 percent expect support from International Organizations and NGOs. Only two respondents expect support from God. Asked about the actions they expect from government or NGOs, they mentioned providing medical care, obtaining money, rebuilding houses and procuring and distributing food, and shelter.

For three quarters of the respondents nobody is responsible for natural disasters. From the rest of the respondents 61.5 percent thought that there are only purely natural causes, 25 percent saw the reason in man-made causes and 13.5 percent considered it as an act of God or a divine punishment.

"Do you feel somehow responsible for the disasters that happen?" This question was interpreted as "Do you feel to have a responsibility in case of a disaster?" Over 90 percent of respondents felt a responsibility in case of a disaster. Most of them saw their responsibility in being a member of the community. The assistance for neighbours and other community members is of high importance, beside the assistance for the own family.

Asked about problems of their family's daily life, respondents listed as their biggest problems: unemployment (31 percent), food shortage (17.5 percent), being prepared for a strong winter (16 percent) and getting necessary financial help (14 percent).

The most serious problems for the families are natural hazards like flooding, mud flows and droughts, and lack of money; they also mention climate change as a threat. The most serious problem for the communities are natural hazards like flooding and mud flows, strong wind and strong winters. Beside some other serious problems were mentioned, like unreliable electricity supply, socio economic changes (growing migration), and health diseases.

Most respondents mentioned people with disabilities and seniors as the most vulnerable people in the community.

Over 60 percent did not think that someone can benefit from problems other people have or from the effects of climate change and natural disasters. Those who thought that very probably someone can benefit, most listed thieves and officials who are involved in the distribution of humanitarian aid.

e) Small groups of schoolchildren

The most mentioned natural hazards they knew is strong wind (21 percent), mud flow (21 percent), earthquake (16 percent) and flood (14.5 percent).

Almost everybody remembered the last natural disaster that happened in the village. For the majority it was a mud flow and they stayed at home at this moment. After the event most of them discussed the event with their families and also during their lessons at school. 54 percent of the schoolchildren had already heard about climate change. Everybody stated that they like to learn more about climate change, all these natural hazards and disasters and that they would explain and discuss it with their families.

84.5 percent said that they know why a flood happens. Asked about who is responsible for natural disasters, 77 percent answered that this is nature and only 11.5 percent thought it is God. One student stated that the government is responsible and five could not give an answer.

Concerning measures to take in case of an emergency they were not so aware, but they could list a lot of items their families have at home and which are necessary in such a case.

7.4 Focus Group Discussions 2010 – Results

The focus group discussions were held in six villages: Anjirkon Village (Kalinin *Jamoat* in Hamadoni District), Kodara Village (Kalinin *Jamoat* in Hamadoni District), 25 Solagi Village (Gayrat *Jamoat* in Farkhor District), Bunafsha Village (Darqad *Jamoat* in Farkhor District), Tugul Village (Nuri Vahdat *Jamoat* in Pyanj District) and Navobod Village (Mehvar *Jamoat* in Pyanj District). In each village two focus group discussions have been taken place: one with men and one with women in the age groups 40-60 years or above 60 years.

The focus group discussion from Tugul Village is summarized in the case history 1 in section 7.2.

1. How do women and men interact with their natural environment?

In Anjirkon men considered women to know more about climate and environment than men. One man argued that women are more sensitive to cold and heat. Men said that they are closer to their environment because they mainly work outside. They narrated that they are immigrants from Shurobod. When they came in 1951 forests and riparian forests covered the area, but men mastered the land. Today there is no more forest, only cotton fields and farming land.

In Kodara men thought that they are closer to the nature than women, because women spend most of their time inside the family's compound. One man argued: "Women's world is limited by their house, courtyard and garden." Women felt themselves close to their environment. They stated that they need men when hard work like ploughing or harvesting is to do. Therefore, they feel themselves always staying in the shade of their men.

In Bunafsha men and women argued that they are both working close to nature: men more around the village and for the safety of the village; women in their houses and kitchen gardens and during harvest in the cotton fields. One man said: "First men plant the trees and then women foster them." One woman explained: "Sometimes I plant a tree that my grandchildren can use the fruits later."

In Navobod men thought that villagers are quite well informed about their environment. One man said: "We have certain knowledge about weather, environment, flora and fauna. And as women always interact with nature, in their kitchen-garden, in the river by washing clothes during clear weather etc., they are closer to the nature and its resources than we men." Men agreed that it is necessary to plant green vegetation as much as possible. One man explained: "As much plants as much oxygen one will have and the temperature of air will be normal." Another man added that alternating of agricultural crops is necessary. Men mentioned the lack of drinking water and complained that children are drinking from the dirty irrigation channels and therefore, new types of diseases or very rare ones come up. Men also mentioned that not everybody is informed about environment: "We have a lot of poor not well educated people in the village." Women said that they are responsible for their large families. One woman explained: "We take care about our environment, our yard with the kitchen garden and the livestock we keep there." Another woman stated that they plant young trees when they cut an old one: "Otherwise nothing will be left for the future generations."

2. What are the local beliefs and the local knowledge concerning the environment?

In Anjirkon men and women stated that they have no local beliefs and explained it by being immigrants from Shurobod. Women said that everything is in God's hands and depend on him.

In Kodara men stated that they are immigrants from Shurobod and therefore have no local knowledge or beliefs. In Shurobod they had indigenous knowledge, mainly about medical plants. One man said: "In Shurobod a lot of medical herbs grow, here in Hamadoni we can only collect mint and chamomille." Men

complained that the population has doubled its size, that they do not have enough land, in short, they only have problems. One man finished with the words: “Therefore, we believe in God and hope.” Women could not give an answer to this question.

In Bunafsha men agreed that there are no specific beliefs in the village. Women confirmed this but added that some people in the village know exactly when to sow or plant. Women said that in former times people went to the local religious leader to ask for advice and help. Several women mentioned that people have to plant two trees when they cut one, according to religious rules.

In Navobod men and women stated that they do not have local beliefs. Women added that they give their knowledge to their children, but it remained unclear what knowledge this is.

3. What do people know about changes in their environment?

In Anjirkon men and women perceived that their environment is changing and they consider themselves as responsible to take care. Men told that wealthy people occupy their pasture lands. Because there are only cotton fields around the village and no pastures, they have to reduce their livestock. Women explained that water channels are dirty and filled with debris, and nobody will clean them. They also stated that they feel helpless because some wealthy people, local or coming from outside, take possession of land as pasture and do not care whether this land belongs to villagers for their own grazing. Therefore, villagers can no longer have livestock; only one or two cows can be kept in the kitchen garden. Women feared that nothing is left for them in future.

In Kodara men and women mainly associated environment with pasture land. This land has become less, because wealthy people occupy land as pasture or for cotton production and do not care what is happening with the villagers. One woman said: “We poor people lose agricultural and pasture land and have to keep our cattle in the village.”

In Bunafsha villagers stated that they are immigrants and explained that this region was covered with forests before they came to this place in the 1950-1960th. Later all trees were cut and taken for fire wood and the land was transformed into large cotton fields. For the future men and women made dire predictions like this man: “Today we have only our houses with the kitchen gardens left, because the pastures have been taken away by some wealthy people. So we had to eat or sell our cattle. Today families can keep one cow or two goats in their garden in the best case.”

In Navobod men thought that they are quite well aware about changes in their environment. One man said: “The rise of water level in Pyanj River washed off a big piece of coastal land in Urtabulok village. Now we have no longer direct access to our pasture land and therefore we keep our cattle in the livestock pen near our houses.” Another man added that villagers can let graze the cattle on the fields for some days after harvesting wheat and corn. Men complained about the upcoming marshes behind the cotton fields from where children are catching diseases. Women mentioned that wild pigs are increasingly destroying their wheat and mung beans plantations.

4. What do people know about changes in the climate?

In Anjirkon villagers noticed that climate is changing: more hot summers, more rain (men were upset that since the flood in 2005 where an important bridge was washed away, they do not have a replacement), colder winters, etc. Men said that the production of crops (wheat, corn, rice) has decreased; the same with fruits like mulberries, grapes, apples, pomegranates. They stated that a new type of bee has appeared that multiplies very fast and destroys the fruits: “Either there is too much rain or we have drought. Both are not good for the agriculture.” Furthermore, they said that the weather is

no longer predictable: “Today weather is no longer reliable. Suddenly we have abundant rain or a heat wave.” Men noticed that due to changing climate new types of fruits like lemons, mandarins or persimmons now grow in the region. One woman said: “Climate is sharply changing and this not to the better.” Women explained that because of the hot temperature in summer the wheat remains in the milk stage (very young stage of maturity), because the heat and dehydration hinders the wheat to ripen. “And after too much rain and strong winds the fields are destroyed.” Furthermore, women complained about boll worms, spider mites, apple worms, small hoppers, whiteflies and locusts are destroying fruit trees and vegetables in the kitchen gardens; and due to lack of money they cannot buy the necessary pesticides.

In Kodara men explained that climate is changing. One man said: “The chemical factories are to blame. They pollute the environment and increase the temperature.” Another man added: “Fifty years ago we had an average temperature of +25° C. Today temperature can rise up to +45° C.” Several men said that thunder and lightning happen now in autumn; years ago they were only in spring. Men also noticed that swallows fly earlier than years ago. Women could not answer this question.

In Bunafsha men said that 15 to 20 years ago snow cover was about 1m during winter, so that all vermin and pests died. One man explained: “Today summers are so hot that the pasture lands are quickly brown and withered. Furthermore, different kinds of pests are spreading and the quality of crop and fruits are decreasing.” Women stated that they notice the changing climate. One woman complained: “Pomegranate trees are disappearing because of pests, even melons have worms. Persimmon trees quickly spread, but people do not process the fruits, because they are not used to these fruits. Finally, we have too many of these trees.” Women also said that today winters are shorter but colder and that they do not have coal for heating. Several women remembered that they had been delivered with coal for free during Soviet times: “Today we have to collect stalks of cotton for heating.”

In Navobod villagers agreed that nobody can foresee the weather, only God knows. Men stated that they can see that the climate is changing, that rains and torrents have become frequent and that winter are getting to be colder and summers hotter. One man said: “This year most vineyards are mildewed and will give no yield.” Women stated that temperature is increasing and so do diseases like the flu they suffered in early autumn.

5. How do people control the use of their environment (e.g. agriculture, hunting, collecting etc.)?

In Anjirkon villagers said that there is no control from the governmental side and therefore they can't do anything that wealthy people occupy their land. “Poor people have only their garden plot where they can have maybe one cow that only gives 3-4 l of milk per day. The land is really out of order.”

In Kodara Village men and women stated that there are no authorities that could control the environment. One man said: “Everybody keeps his own trees, grows his own vegetables, and looks only for his family. Everybody looks for his own, small world.” Women said that nobody cares about them and how they have to live.

In Bunafsha men stated that nobody has the control over the use of the environment today. In former times the district administration had the control. One man complained: “Today water channels are dirty and nobody cleans them. The channel coming from the Pyanj River has broken and nobody cares about it, but all are afraid of further damage.” Women agreed that the head of the village tries to have a certain control over the environment.

In Navobod men said that control was executed by Hukumat and other authorities during the Soviet times: “They kept under control the period of planting, harvesting and preservation. Today there is no control.”

Furthermore, men agreed that mulberry trees no longer have a lot of fruits and nobody tries to find out why and then try to stop it. One man complained that nobody controls where livestock is grazing: “During Soviet times there was a control when and where it was allowed to let livestock to graze. Today everything depends on the administration of the district, but we do not get any help from them. So the village have clogged irrigation channels, the livestock is grazing uncontrolled everywhere, there is a lack of irrigation water, in the kitchen gardens carrot, turnip, radish etc. perishes. It is getting to the worst.” Women agreed that the village needs a head who can organize and lead all necessary works.

6. What do people do if they notice changes in their environment?

Men in Anjirkon thought that it is wrong that everybody is only looking for his family and that it would be better or even necessary to do some work together. One man argued: “The water channels have not been cleaned for twenty years. We should clean them together.” Another man explained that one year they tried to fight the pests together, but only for one year, because money lacked for a second year. Some old men remembered the Soviet time where everything was organized. Women almost stated the same like men.

In Kodara men and women complained about the desolate condition of everything: not enough pasture land, pomegranates, peaches and apricots that are disappearing because of diseases, bad quality of vegetables, new types of fruits, like lemon and persimmons, crop fields that are going to be destroyed because of lack of maintenance of the channels, widespread web spinning spider mites and a new type of bees, pest, etc. Nobody proposed measures to change something.

In Bunafsha villagers stated that during Soviet times everything was well organized and people knew what they had to do. They were even paid for their work. Today people have to take care of their environment by themselves, but not everybody does. One man planted 280 fruit trees. Now he is afraid that pests and locusts may destroy his investment of USD 1,800.

Men in Navobod mentioned that they plant saplings near their home in spring. Furthermore, they agreed that they know where to build houses, namely in safe area. Women could not answer the question.

7. Are their people in the community who are by nature experimenters and adapters of technology? Who are they? Do they experiment alone or in groups?

In Anjirkon men stated that people are not willing to hand their knowledge to the young generation and that they are afraid that this knowledge is lost one day: “With time, all this knowledge will be forgotten.” Furthermore, they said that nobody wants to teach important issues, and if they will, they will do it only for money. One man said: “Anyway young people are not interested in learning old fashioned methods.” One man told of a farmer with a pomegranate garden who covered each fruit with clay during the period of ripening to save them from pests, and he was successful.

Men in Kodara stated that nobody in the village has ideas how to better deal with the environment: “We do not have such people in our village.” Women explained that they try to give their knowledge about housework to the young girls.

One man of Bunafsha Village said: “Necessity is the mother of invention.” Then he explained that one villager invented a self-made combine harvester for threshing wheat. He constructed it without any recording, totally independently. Neighbours now can use his services. One man added: “But he does not explain to others, how to construct such a machine. It is his secret.” Another villager reported that he also invented a machine, a mini-harvester, and he too does not make his secret available. One man added:

“People have ideas, but no proper tools to realise them. Workshops where it is possible to realize such inventions would be appreciated.” Women thought that clever people have to teach young generations.

In Navobod men and women said there are no experimenters and adapters of technology in the village.

8. How do people find out about environmental and climatic changes and related hazards? And where do people go to for information or advice if they have questions concerning these issues?

Villagers of Anjirkon knew about climate change from TV. They would appreciate further explanations about climate change and climate change adaptation. A man said: “Nobody supports us and we feel left alone with our problems.”

In Kodara villagers stated that nobody has come to inform them about climate change. They said that only ACTED is assisting the village; they would like to be more informed and educated about environmental issues.

In Bunafsha villagers mainly know about climate change from TV. Men explained that ACTED is the only organisation assisting them. One man added: “Once we could participate in a seminar concerning the prevention of natural disasters.” Women stated that they like to get help concerning the problem with the pests.

In Navobod men and women know about climate change from TV. Moreover, men learned about changes or upcoming natural disasters from the chairman of village’s CoES, Mirzoyev. One man added: “Our teacher of history Idrisov K. has big knowledge about the topic. ACTED trains the population in prevention of disasters, conducts seminars, conversations and distributes “Visual Information Materials”. At the moment there is a plan to conduct a training concerning emergency situations.” Women excused their scarce knowledge and mentioned that they are quite illiterate and cannot contribute to this issue.

7.5 Interviews 2012

Compared to the interviews and focus group discussions in 2010, the 2012 interviews had a wider context: they contained not only questions related to climate change and increasing extreme weather events and other natural hazards, but addressed various problems people may face in their daily life as well.

7.5.1 Respondents’ Characteristics

For the semi-structured open-ended interviews a questionnaire was used to record people's answers to particular questions and issues. For a number of questions, pre-set answers could just be ticked, whereas for other questions a numerical key was used for the answers. As the number of interviews was limited a full-fledged statistical analysis was not conducted; the data from the questionnaires were directly entered into MS Excel; this programme served as tool for data analysis and presentation (Table 18). Answers with a green colour background indicate to further narration. This information has been written down separately in a note book and is integrated directly in the interview texts.

Table 18: A section of the table to analyse the questionnaires

Interview No.	Origin			sex		level of education							What is your occupation?							If working as a farmer: For how many years do you work as a farmer?			1. What do you think is the most important issue (the second and the third important issue) for TJ today?											
	Rayon	Jamoat	Village	Age class	f	m	No school education	Not full secondary	9 grades	Secondary education/technical	Vocational education	Higher education	No answer	Farmer	Government servant (incl. teacher)	Health care worker	Housewife	Unemployed	Others	Kitchengarden	Between 5 and 10 years	Between 10 and 20 years	More than 20 years of experience	Most important	Second important	third important								
1	Panj	Kabud Saifiddin	Lohuti	2		x			x					x																				
2	Panj	Kabud Saifiddin	Lohuti	2		x			x					x							x													
3	Panj	Kabud Saifiddin	Farhoma	3					x					x																				
4	Panj	Kabud Saifiddin	Farhoma	2	x										x																			
5	Panj	Nuri Wahdat	Shakar-dasht	3		x									x																			
6	Panj	Nuri Wahdat	Shakar-dasht	3	x				x						x																			
7	Panj	Nuri Wahdat	Vakhyo	3		x				x																								
8	Panj	Nuri Wahdat	Vakhyo	3	x					x																								

As already outlined in section 6.2.3 the age of the respondents was arranged in three classes: (1) 18-30, (2) 31-49 and (3) above 50. The missing of young people was obvious: out of the 38 interviews only four were with people younger than 30 years. This is clearly the result of the high labour migration of young people. Almost every family has at least one young family member working in Russia to send remittances home. Fourteen interviews were conducted with people in the class "31 – 49 years" and 20 interviews with people "older than 50 years". Figure 41 shows the age distribution in percentage.

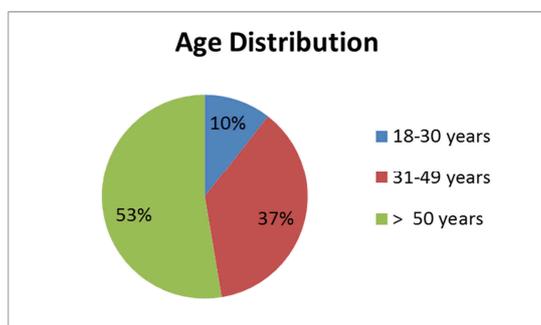


Figure 41: Age Distribution in percentage

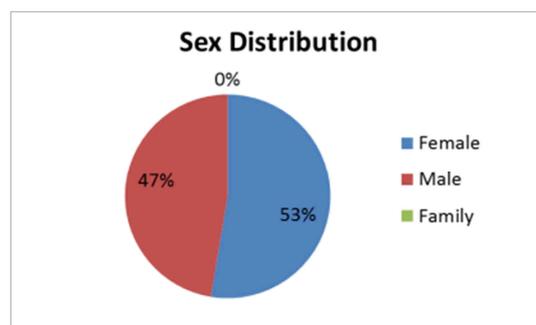


Figure 42: Sex Distribution in percentage

In Figure 42 the sex distribution in percentage is given, corresponding to 20 female and 18 male interviewees. In Khatlon no interview with a family could be conducted; the separation of men and women in everyday life is quite evident here.

The majority of the interviewees had a full secondary education (section 4.6) or even a higher education. Four male respondents only finished 9 grades. Four respondents (all women) had a vocational education (three years). One woman has been taken out of school before finishing her secondary education; one man did not finish the secondary education as well. Figure 43 shows the level of education in percentage.

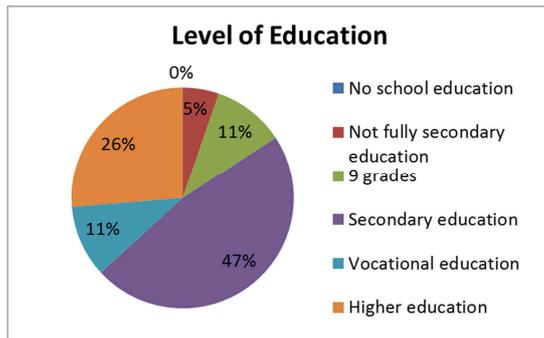


Figure 43: Level of Education in percentage

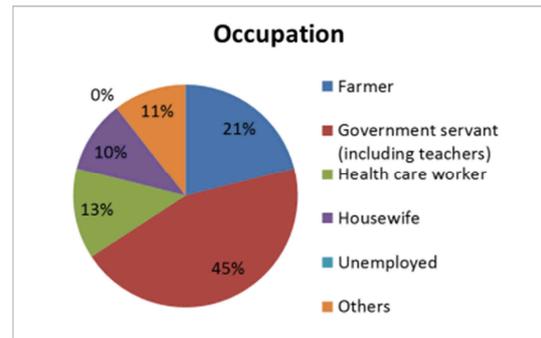


Figure 44: Occupation in percentage

The analysis of the occupation of the respondents revealed that a bigger part worked for the government, namely 17. Among these 17 were *raisi mahalla* (4), *raisi jamoat* (1), chemist (1), logistician (1), and teachers (10, of which 2 were directors of a school). Five respondents were working in the health sector: one doctor and four health point worker. Four women considered themselves as housewives, bringing up children or taking care of grandchildren (while parents were working in Dushanbe or Russia). Eight respondents were farmers, five of them on their own land. One of them had less than five years of experience in farming, one between five and ten years, four between ten and 20 years and two more than 20 years. Among the respondents that indicated other occupations than the already discussed were one tractor driver and one engineer in a factory, a woman that took care of the school library and one tailor. Nobody stated to be unemployed. Figure 44 shows the different occupations in percentage.

It turned out that everybody had a kitchen garden. Often people talked about it without being asked, because they narrated from their manifold difficulties with their kitchen gardens. This fact implicated to integrate such question about the kitchen garden in the interviews in Kuhistoni Badakhshon.

7.5.2 Results of the Questions

Question 1: "What do you think is the most, the second and the third important issue for Tajikistan today?"

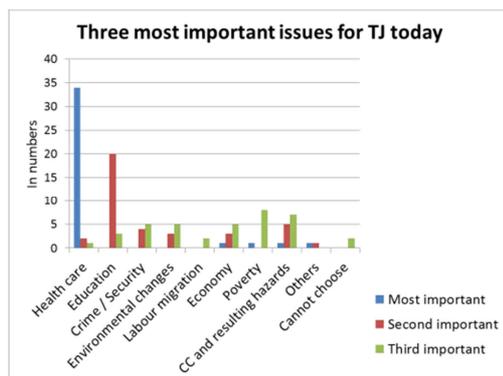


Figure 45: Three most important issues for Tajikistan today in numbers

Health care was by far the most frequently mentioned primary concern, followed by education. All the other issues seemed to be of minor importance (Figure 45).

Health care: 34 respondents spontaneously mentioned health care as the most important issue, for two others it was the second and for one the third important issue for Tajikistan. Although

interviewees classified health care as an important issue, there were only few statements underlining this importance:

“We have the urgent problem of increasing HIV-infected persons. Drug addicts and returning migrant workers are to blame.”

“I am a nurse and I think it is important to take care of pregnant women and small children. The conditions in many homes are still catastrophic. People need to be informed and instructed regarding health care, sanitation hygiene and cleanliness.”

“I know that our greatest problem is the overpopulation. After three children I thought I better do some contraception and I went to the hospital. Now I have an intrauterine device.”

“I am a medical doctor and I am very concerned about the health situation in our region. People have only limited access to basic health services. Diseases like typhoid, malaria, hepatitis begin to spread.”

“We have not enough doctors, nurses and health posts. To go to a doctor is awkward, time consuming and costly.”

Although most interviewees classified health care as a very important issue, there were little comments.

Education: Nobody considered education as the most important issue for Tajikistan today. Twenty respondents stated it to be the second important issue and three to be the third important issue. Interviewees answered shortly and the comments were concise:

“Everybody has the right to get an education.”

“Knowledge improves your life.”

“Girls do not need a full education. They better learn how to manage a household and raise children.”

“We have to strengthen the education system with modern curriculum, well-staffed schools, and well paid teachers. Otherwise we will take a step backwards.”

“If you do not have enough money, you cannot send your children to university.”

“Girls education is not so important. It is better to take a good marriage.”

Crime and Security: Nobody ranked this topic as the number one issue for Tajikistan. Four considered it as second and five as the third important issue to solve. Only one woman commented her choice: “I just want to live in my house in freedom.”

Environmental Changes: Environmental changes are not a top priority. Only three respondents looked at it as second important and five as third important issue for Tajikistan to solve.

One interviewee mentioned that he can observe an increase of snow in the last years. Another man from Pyanj District added that because of this fact, planting season starts later in the year. A woman from Ghalaba Village explained that in her village that is situated near Pyanj River, they have to fight against river bank erosion: “Every year we lose some farming land because of this erosion. Over the years we will no longer be able to plant enough to feed the whole population of our village.” And finally, one respondent said: “Our environment is changing. We have more and more problems. We must take care of our environment.”

Labour migration: Only two mentioned labour migration as a problem and this only as third important problem.

One interviewee stated: “Nobody should have to go away from his family. This is not good.” In Mirzo Ashur Village only interviews with women were possible; none of these women considered labour migration as a problem. One woman welcomed me and said: “Welcome to our village of women! We only have few old men in the village; all our husbands and adult sons are working in Dushanbe or Russia.”

Economy: Nine respondents mentioned that the Tajik economy is a problem; one person considered it as the most important problem, three as second and five as third important problem.

A *raisi mahalla* added: “For a better life.” One farmer thought that the economy of Tajikistan must develop. A senior doctor from Shurobod District stated: “When we have a good economy, our life will be better.”

Poverty: Surprisingly, one interviewee only considered poverty as the most important issue for Tajikistan to be addressed and eight ranked it as third important issue.

The woman who works in a school library in Pyanj District specified: “With a monthly salary of 190 Somoni you cannot survive with a whole family.” A teacher from Farkhor District told: “I know what poverty means. When I was seriously ill, my husband left us. I never heard from him again and I had to raise our six children alone.” And a woman said that especially women and children are exploited as workers in the cotton fields: “The south of Khatlon is very poor; in particular female-headed households are suffering. These women, often together with their children, are working in the cotton fields during harvest. They have to work for hours for a ridiculous wage.”

Climate change and resulting hazards: Thirteen respondents stated that this topic gets more and more a problem. One interviewee considered it the most important, five the second and seven the third important problem of Tajikistan to be solved. Answers were commented as follows:

“Winters are colder and last longer. Last winter we had no more fire wood for our houses and no more fodder for the animals. Every winter animals die.” (Shakardasht Village, Pyanj District)

“We are farmers. We need a good climate.” (Kuldiman Village, Pyanj District)

“In these days it sometimes happens that we have no more fodder during winter and we have to butcher some of our animals.” (Murodbakhsh Village, Farkhor District)

“With changing climate we have more disasters. Our village is endangered from two sides and people have no way to escape.” (Ghalaba Village, Farkhor District)

“We often have an alarm because of too much water in Surhob River. We are prepared. Every family has an emergency kit and knows the emergency exit.” (25 Solagi Tojikiston Village, Farkhor District)

Others: A 63 years old pensioner from Farkhor District said: “My only wish for Tajikistan is its prosperity and peace.” And the head of the agriculture sector in Shurobod District stated that Tajikistan’s biggest problem is the lack of clean drinking water.

Question 2: “Please indicate which statement below comes closest to your opinion”: “The government has the duty to solve Tajikistan’s pressing problems” or “The citizens of TJ have to solve Tajikistan’s pressing problems.” or “The government and all citizens of TJ together have to solve Tajikistan’s pressing problems.”

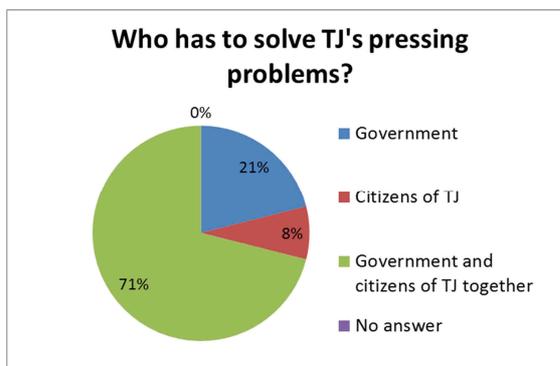


Figure 46: Who has to solve TJ’s pressing problems?

The majority of 27 respondents considered it as the duty of government and citizens together to solve Tajikistan’s pressing problems. Eight interviewees thought that this is the duty of the government alone and three interviewees said that it is the duty of each citizen (Figure 46).

A farmer from Lohuti Village emphasized that Tajik people have to help each other and this in turn together with the government: “And sometimes we need the help from foreign countries.” The director of a school in Pyanj District stated that government and population must work together and specified: “A consensus must prevail within governmental institutions and they have to work together and not against each other.” A housewife from Pyanj District added: “We cannot demand that government is doing everything alone. We are obliged to help.” A *raisi mahalla* from Farkhor District thought that it is not favourable when everybody works with his own agenda: “This will create a lot of problems. Better is to work together.” Another *raisi mahalla* from Farkhor District had the opinion that problems first have to be solved in the family: “We always try to solve our problems within our family and only when this is no longer possible we ask *hukumat* for help. *Hukumat* is not responsible for every problem.” A senior doctor from Shurobod District said that in principle *hukumat* is responsible, but that everybody has to take responsibility. And one man from Shurobod District thought that in fact *hukumat* has a lot of money, but that this money disappears in private pockets and does not arrive at the level of the population. Some respondents expressed their gratitude towards ACTED Tajikistan for their continuous assistance.

Question 3: “How much confidence do you have in ...”

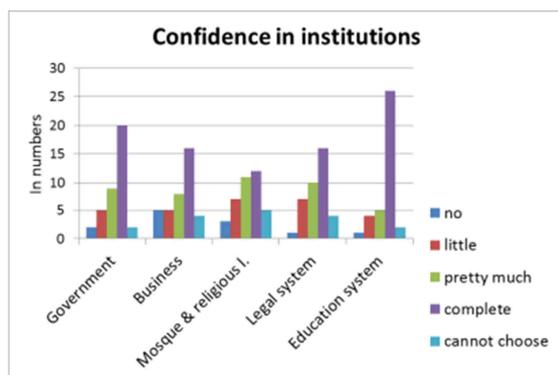


Figure 47: Confidence in institutions in numbers

The evaluation shows that Khatlon people have quite high confidence in their institutions (Figure 47):

Government: A farmer from Kuldimon Village said as several other respondents did: “We must have confidence and should not ask questions. We have no other choice!” A government server from Farkhor District meaningfully meant: “I get my salary from *hukumat*, so we must have confidence in it. Do you understand?” A *raisi mahalla* from Farkhor District commented that government is doing a lot for the country: “You know it is powerful!” And a health worker from Farkhor District who stated to have pretty much confidence in government controversially said: “Sometimes government offers health courses, but otherwise government does not do much! We have mainly to look for ourselves.” Many interviewees made statements in this sense.

Business: Although many respondents stated to have pretty much or complete confidence in business, only few commented their choice like for example a farmer from Pyanj District: “We can go to the market and sell our vegetables and fruits.” Few interviewees stated that doing business in the bigger cities may be good and important, but doing business in the village is not worth mentioning. And the woman who works in the library of a school in Pyanj District explained: “I am a widow with a small salary and we have only a small piece of land to work with the family on it. The yield is just enough for the family. There is nothing left to sell.” And a tractor driver from Pyanj District who works on a cotton farm stated to have only trust in the cotton production. A *raisi mahalla* from Farkhor District mentioned that trade with goods is useful, but he added: “In former time we got goods from Russia. These goods were of really good quality. Today we can only buy Chinese goods and the quality is very poor.” Few respondents remarked that without money one cannot start a business. Sometimes even to sell vegetables on the market is costly, because one has to pay for the transport and the place on the market. A woman from Farkhor District complained that today’s cotton yield has decreased and that the cotton is no longer of high quality: “I do not know why, but it may be because we use cotton seeds of low quality.” And she added: “When we try to improve our cotton cultivation again, our living standard will increase too.”

Mosque & religious leaders: In most villages the respondents explained that the mosque is their gathering location when they have to discuss problems of the community or of individual families. They stated that normally the *mulloh* acts as mediator, be it between villagers and *mahalla* institutions or between villagers. The *mulloh* informs and explains news from the local or regional *hukumat* or from NGOs. Villagers call him for ceremonies, holidays or special prayers, like for example when farmers need rain. Several interviewees said that the mosque itself does not have enough money to help financially, but that *mullohs* sometimes help with man power when there is a house, a wall or a roof to be repaired. Some added explanatory statements:

“Last winter we had a lot of snow. Our *mulloh* helped us shoveling snow from the roofs.”

“I am a widow and later I also lost one of my sons. Therefore our *mulloh* and his staff help me a lot.”

“*Hukumat* closed our mosque in Bobosafoli Poyon, because it has no proper documentation, they said. We think that it is because the government in Dushanbe fears that extreme Islamic groups will indoctrinate the population.”

“We have no mosque, *hukumat* closed it. They told us it is because there is no construction permit for the mosque. But we still have a *mulloh* in our village. He helps us when we have problems. Once he organized stones to build a health post.”

“Our *mulloh* informs us about everything that happens. He has also news from elites, like for example government in Dushanbe, *hukumat*, *raisi mahalla* or notables of the village.”

“I go to the mosque for praying.”

“We discuss problems of the village in the mosque. This year a young man wanted to go to Moscow for work, but he had no money. We collected money for him and then he could leave for Russia.”

Legal system: Although most respondents stated to have pretty much or complete confidence in the legal system, only few commented their answer. One woman from Pyanj District said that they did not help her when she came from another district and needed an official permanent residency. And another woman stated: “You should know your rights. Then it is fine.” One respondent added that you must have money and then lawyers will help.

Education system: The majority of the interviewees stated to have confidence in the education system, although some mentioned the budget deficit of the Khatlon Education Department as a problem. A teacher from Pyanj District explained that teachers sometimes rest unpaid for months: “It is no wonder that many teachers move away from Khatlon.” Several respondents complained about the poor school infrastructure. A farmer from Pyanj District said that the school building of the village has to be replaced: “*Hukumat* promised to give money for this, but till today nothing happened.”

Question 4: “Generally spoken how concerned are you about environmental changes, climate change and natural disasters?”

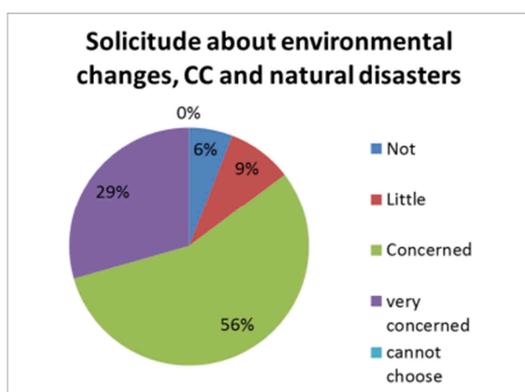


Figure 48: Solicitude about environmental changes, CC and natural disasters



Figure 49: Destroyed infrastructure. Floods that destroy infrastructure, agricultural land and houses become more frequent Shurobod (Source: Zimmermann, 2012)

The majority of the interviewed persons were concerned about environmental changes, climate change and natural disasters (Figure 48). People realise that natural hazards are becoming more frequent (Figure 49).

The farmer from Pyanj District, who stated to be not concerned, explained: “Everything that happens on earth and in heaven is in God’s hands.” Several interviewees from Pyanj District emphasized their concern

about increased threats from river Pyanj and from mudflows coming from the mountains. A widow from Pyanj District told that she lost one of her sons in a mudflow nine years ago, when he helped in Lohuti Village. Four respondents from Urtabuloq and Kuldimon Villages were concerned because of river Pyanj. One of them said: “I think that winters will be stronger with more snow in the mountains in future and therefore, more water will be in river Pyanj than usual and this will cause problems for our village.” And a woman from the village disaster preparedness team of Kuldimon Village felt responsible with her team to inform and instruct villagers what to do in time of disaster. A man from Bobosafoli Poyon Village was little concerned at the moment: “In times where we do not have disasters, I am not concerned.” In Murodbakhsh Village interviewees were concerned because on the one hand their village is situated between the two rivers Pyanj and Surhob and on the other hand the strong wind from Afghanistan becomes stronger and stronger and often destroys houses and fields. In Ghalaba Village where all respondents stated to be very concerned a young woman said: “Our president declared that all citizens of Tajikistan have to be concerned about climate change. Frankly, I think that our village is not ready for these changes. For example, winter tends to be longer and harder. Villagers are not able to have enough fodder for their animals for the whole winter. They have to buy additional fodder that is very expensive. I heard from a truckload of fodder, costing 1.000 USD.” Several respondents stated that people have to be ready for disasters and to know the evacuation route.

Question 5: “Here is a list of environmental problems. Which problem, if any, do you think affects your family and your village the most?”

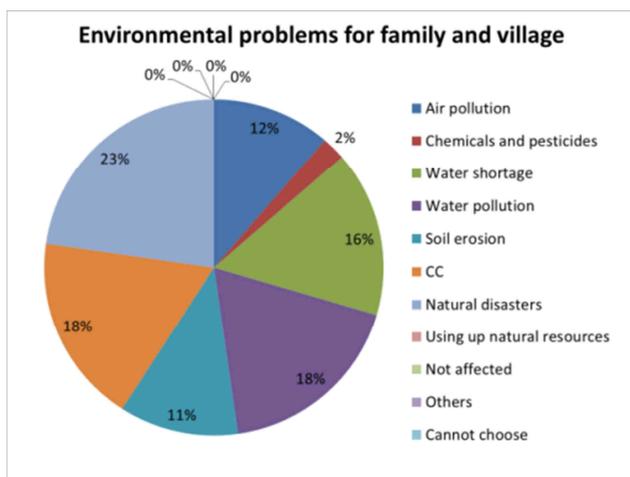


Figure 50: Perception of nvironmental problems



Figure 51: Locusts
Locust raids often cause extensive damage in lower Pyanj and Farkhor Districts (Photo: FAO)

Ten respondents chose natural disasters, eight each climate change or water pollution, but nobody chose "using up natural resources". Only one person considered chemicals and pesticides as a problem. Five out of the 38 interviewees wanted to opt for two environmental problems (Figure 50).

Air pollution: Three respondents from Pyanj District and two from Farkhor District complained about the strong wind coming from Afghanistan, called *shamoli sakht* or *Afghani*. A man from Murodbakhsh Village explained: “During summer we often have the strong Afghan wind; sometimes we even have heavy dust storms, mainly in autumn. The dust penetrates everything. It pollutes our water and makes people ill. Especially children suffer from respiratory problems and inflamed eyes.” And a man from Farhona Village added: “We have this strong wind coming from Afghanistan during six to seven months every year.” A woman from Shakardasht village described the situation by saying: “Look, in the morning we have sunshine and

everybody is happy. During the morning the strong wind starts and suddenly our world is gray and we can no longer see the sun.”

Chemicals and pesticides: A respondent from Murodbakhsh Village who chose this problem as the most important for the village explained that the region suffers from locust raids for five years: “I think the locusts come in millions from the Afghan side and destroy huge swathes of arable land in only a few hours. The chemicals and pesticides we use to fight them are dangerous and pollute our soil and water. And this is definitely not good for every living being.” (Figure 51)

Water shortage and water pollution: This is one of the major problems in Southern Khatlon. Interviewees from Bobosafoli Poyon Village said that the village suffers from water shortage and or water pollution: “People often take polluted water without thinking. Finally they are ill, especially their children.” Another man from the village explained that they learnt from ACTED Tajikistan to store snow in a tank to get water during winter and to store rain water in the tank during spring and summer. Respondents from other villages often complained about lack of clean water as well. A man from 25 Solagi Tojikiston Village said: “We cannot take water from our river, because it is polluted by animals. We have to go with our donkey quite far away to fetch clean water.” And a woman from Doghiston Village stated: “Today we can take the water, but some years ago our water was polluted by the animals and we had typhoid in our village. Today we take care and look that our animals do not pollute the water.”

Soil erosion: Only one respondent from Murodbakhsh village commented his choice: “People cut trees and bushes for fire wood and do not care that the soil will be naked like this and therefore the wind can blow the soil away. I think *hukumat* has to prohibit the cutting of trees.”

Climate change: A woman from Shakardasht Village explained that climate is changing for the worse: “The summers are getting hotter. Sometimes I have the impression that our region slowly becomes desert like. Furthermore, the Afghan wind brings us a lot of dust and pollutes our water and covers our fields.” In turn a man from Doghiston Village complained that winter is getting colder and longer and hinders the farmers to cultivate their fields in time. A man from Ghalaba Village observed that the river is bringing more water than some years ago: “Because of lot of snow in the high mountains the river brings too much water and we have to fear that our village will be flooded.” A woman from the same village said: “Thirty years ago we could plant pepper in this region. Today it is impossible, because climate has changed.”

Natural disasters: In Mirzo Ashur Village all four respondents chose natural disasters, but did not comment why. The same result was found in three other villages: 25 Solagi Tojikiston (Farkhor District), Doghiston and Anjirob (Shurobod District).

Question 6a and 6b: a) “How much do you feel you know about the causes of environmental problems mentioned under question 5?”

b) “And how much do you feel you know about solutions for environmental problems mentioned under question 5?”

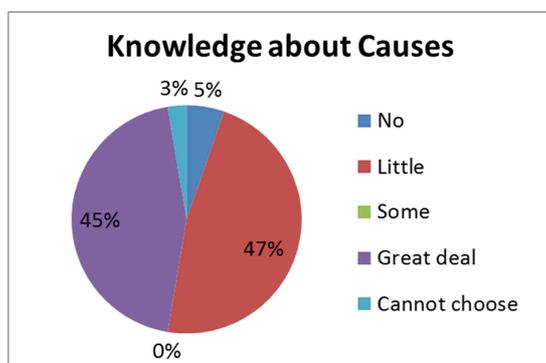


Figure 52: Knowledge about causes of environmental problems

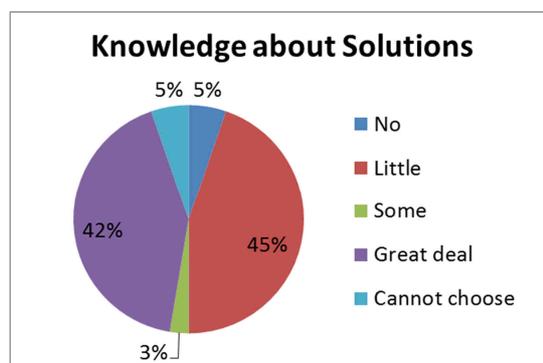


Figure 53: Knowledge about solutions for environmental problems

Knowledge about causes: Eighteen respondents stated that they have little knowledge about the causes of the environmental problems mentioned under question 5 whereas 16 believe that they know a great deal (Figure 52).

Respondents who said to have only little knowledge about the causes of environmental problems rarely commented their choice. Those who stated to know a great deal were aware of what is going on in their village. Only few had a wider horizon. Some explained that they know something because NGOs sometimes conduct seminars about the topic. Here some statements:

“I am new here, just came from Dushanbe. I know nothing about the topic.”

“We can manage our problems.”

“I only know that we always have water shortages.”

“I do not have the time to take care of such problems.”

“I know a lot about environmental problems, but we do not have the financial and technical resources to solve them.”

“Everything depends on people’s behaviour.”

“People pollute the irrigation channels. They dispose their waste in the channels.”

“I know quite a lot about the topic, because I read the news, check it in internet and watch TV.”

“I know a lot about the problems, because I attend every information day or training from ACTED Tajikistan.”

Knowledge about solutions: The evaluation revealed approximately the same distribution as for question 6a (Figure 53).

A farmer from Lohuti Village stated that everybody has to help to solve the problems and that working together is fruitful. The same view had a *raisi mahalla* from Bobosafoli Poyon Village: “It is urgent that people learn to work together to fight all our problems. We can no longer wait and think that someone else will handle it.” And a man from Kuldimon Village who is member of the village’s disaster preparedness team said: “I have to know a lot, it is my job.” Several interviewees explained that they know about solutions from TV and from ACTED Tajikistan’s trainings and information days regarding this topic. A woman from Murodbakhsh Village proposed to no longer cut trees, on the contrary to plant young trees and bushes. And a woman from Galaba Village explained that they have the problem of salty soil, but that villagers have found out that some potato varieties like slightly salty soil. A man from Murodbakhsh Village mentioned the problem of the salty soil too and said: “I think it is also a problem of

our irrigation management. We need too much water. Some farmers really flood their fields.” There were also few respondents who clearly regretted that they do not get enough information about the topic.

Question 7: “Please indicate which statement below comes closest to your opinion.”

- Climate change is caused mostly by human activity such as burning fossil fuels.
- Climate change is natural.
- Climate change does not exist.
- Do not know.

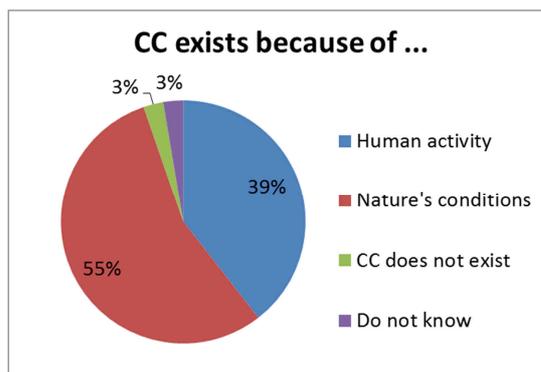


Figure 54: Assumed reasons for climate change
CC exists because of...

The majority of 21 respondents assume that climate change is natural. Another 15 stated that climate change is caused by human activity (Figure 54).

Only few respondents commented their choice. A farmer from a village in Farkhor District stated that in general human behaviour has turned to worse: “People no longer know how to live in a responsible and humble way.” Another man from the same village thought that the reason is the increased poor education of young people: “They do no longer know how to live and interact with our environment. And how they can think about what to do, when they even do not understand the problem?” Nobody who opted for “climate change is natural” made a comment about his/her choice, except one man from Shurobod District: “I think climate change is natural but at the same time directed by God.” During the field inspection in Doghiston Village some women came and started to discuss. They expressed their concern about the changing climate, especially about the longer lasting and stronger winters.

Question 8: "Please indicate which statement below comes closest to your opinion."

- Modern science and technology will solve our environmental problems with little change to our way of life.
- We trust too much in science and not enough in our religious faith.
- There is no solution concerning environmental problems and climate change.
- Do not know.

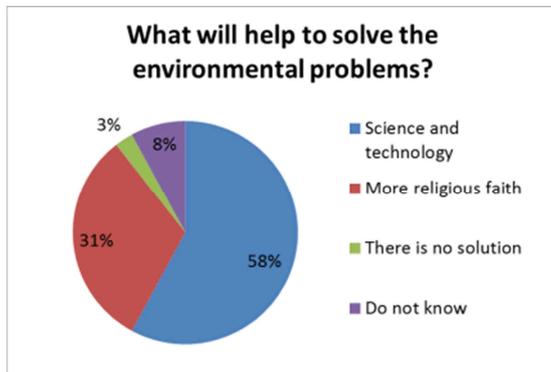


Figure 55: Assumed solutions for environmental problems



Figure 56: Tractor donated by the EU, Pyanj District (Source: Zimmermann, 2012)

Twenty-two respondents believed that modern science and technology will solve their environmental problems whereas 12 interviewees opted for more trust in religious faith than in science and technology (Figure 55).

A farmer from Lohuti Village, who stated to believe in science and technology, was proud to be the caretaker of a tractor sponsored by the EU: "Everybody wants to rent the tractor." (Figure 56) Several respondents said that today we have the twenty-first century and that this is the century of science, technology and progress. And a man from Vakhyo Village expanded this statement in looking at me intensely and saying: "It is up to you. All technology comes from your Western countries. So you can help us."

Question 9: "Please indicate which statement below comes closest to your opinion."

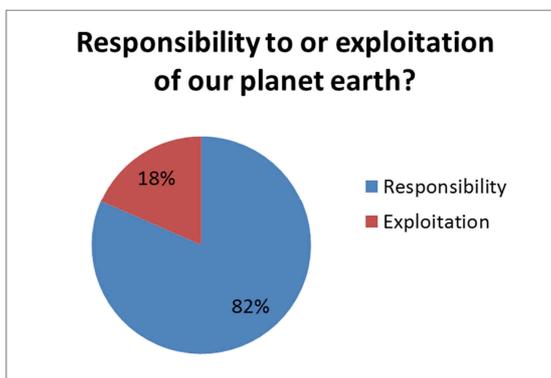


Figure 57: Responsibility to or exploitation of our planet earth?



Figure 58: Cutting wood for cooking and heating (Source: Zimmermann, 2004)

Thirty respondents clearly stated that human being has to live in a responsible manner with animals, plants, and the resources of the planet. Eight interviewees said that human being has the right to take

everything from the planet (Figure 57). Two out of these eight commented their answer: A woman from a village in Shurobod District said: “We plant fruit trees, cultivate vegetables and have livestock. It is logical that we should need all this for us.” And a second woman from the same village explained: “As we have our own vegetables, wheat and livestock, we have the right to use it. But all things that do not belong to us, we do not have the right to use it without permission.”

Some respondents that proposed to live in a responsible manner with our planet said in a short way “of course”, as they wanted to say “what a strange question”. Here are some other statements:

“One hundred percent of our life consists of nature and we build our and our children’s future on it. If we do not take care of our planet, we will not survive long.”

“We must not only take care of everything on earth, we have also to manage it. When you choose the second answer, there will come the time where life will no longer be possible. Everything will die.”

“Everybody is responsible for the well-being of everything on earth. We also have to take care that other people live in a responsible manner too. And we have also to take care of animals. For example, when a dog is injured, we have to take care of him.”

“NGOs are telling us that we have to live in a responsible manner towards our environment. For example they told us not to cut trees to get fire wood.” (Figure 58)

Question 10: “Are environmental issues, climate change and natural disasters addressed in your works of ethics (*akhloqs*)?”

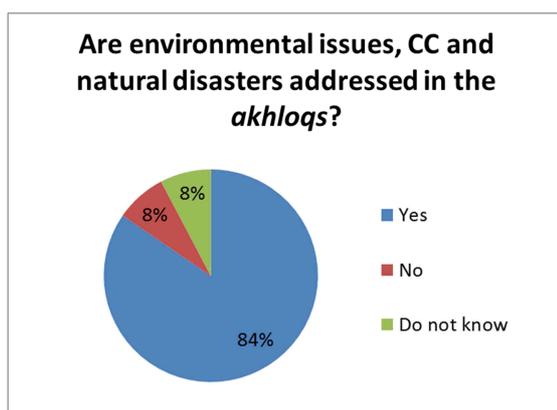


Figure 59: Representation of environment, CC and natural disasters in the *akhloqs*

This question was not asked in Pyanj District because it was considered to be too sensitive. Twenty-two respondents from Farkhor and Shurobod stated to know or read *akhloqs*, two said “no” and two did not know (Figure 59).

Most of the respondents said that children have *akhloq* lessons at school where they learn ethics and morality. An older man from Bobosafoli Poyon Village explained: “Children learn about good manners and behaviour and how they should interact in a respectful way with their family, friends, old women and men, etc. They also learn to take care of and be responsible for animals, nature and our environment. I think today’s children are better informed than the adults.” And the *raisi mahalla* of this village said that he does not read *akhloqs*, but: “I read newspapers, like *Jumhuriyat* or *Khatlon news*, to be informed on what is going on in our world.” And because he knows that most villagers do not have the money to buy a newspaper, he passes it down to someone else who in turn passes it further.

Several respondents stated that they do not read *akhloqs*, but they get informed about the topic by radio and TV, to a certain extent internet and newspapers. A man from Murodbakhsh Village regretted that they can no longer get *akhloqs* for adults: “If *akhloqs* were sold, I would buy and read them.” And several interviewees confessed that they like to read the school books of their children or grandchildren: “With these books one can learn a lot about geography, ecology, biology, human nature, etc.”

Question 11a: “Please, remember the last natural disaster you had in your village. What was it and when did it occur?”

Table 19: Selected Villages

District	Village	Last Disaster	Year
Pyanj	Lohuti	Snow, rain and later flood	2012
	Farhona	Flood	1957
	Shakardasht	Flood	1995
	Vakhyo	Flood	September 2011
	Urtabuloq	Winter storm	February 2012
	Kuldiman	Heavy snowfall	March 2012
Farkhor	Bobosafoli Poyon	Snow, later flood	January/February 2012
	Murodbakhsh	Strong wind & dust storm	2003
	Galaba	Heavy rainfall, later strong wind	2011
	25 Solagi Tojikiston	Strong wind & dust storm	2012
Shurobod	Doghiston	Heavy snowfall, later strong wind	2012
	Anjirob	Heavy rainfall, later mud flow	2012
	Mirzo Ashur	Rock fall	2012

* Slide / flow can be landslide, debris flow or mud flow. It was not always clear what it really was. This might be because of missing corresponding Tajik words.

It is obvious that the Southern Khatlon region suffers from frequent strong winds, floods, mudflows, droughts and other natural disasters.

Question 11b: Question 11b: "Why did the disaster occur?"

- Geography and nature of the area
- It was because people failed to fulfil the demands of the laws of nature. For example, building their house in a dangerous place
- Administrative negligence of the authorities who have to protect us
- It was an act of God

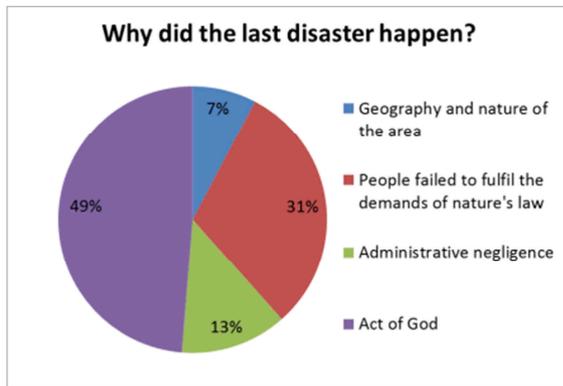


Figure 60: Why did the last disaster occur?



Figure 61: Warning of debris flow
(Source: Zimmermann, 2015)

Almost half of the respondents (19) stated that the disaster was an "act of God". Twelve interviewees saw the responsibility with people who did not fulfil nature's law (Figure 60). One person considered two reasons together: "an act of God" and "people failed to fulfil the demands of nature's laws")

Respondents rarely commented their choice. Some interviewees stated that it was an "act of God" and yet added: "The disaster happened because it rained too much. That is nature." A man from Farkhor District said that everything lies in the hand of God. A woman from Farkhor District compared the strong wind and the dust storms in Khatlon with the tsunami in Japan in 2011: "Every disaster happens because God wants so." From the five respondents who said that the disaster occurred because of administrative negligence three were from Anjirob Village, and two from Murodbakhsh Village. The village Anjirob just suffered from a mud flow few days before the interview. Several respondents complained about people who build their houses wherever they want without taking care, if the place is defined to be safe or not (Figure 61). A woman from Ghalaba Village reminded that it is not good to cut all trees: "Hukumat has to forbid it; otherwise people do not stop cutting trees."

Question 11c: “Do you think that villagers can actively contribute to prevent disasters from occurring?”

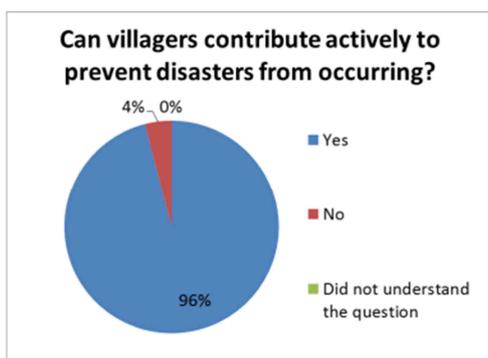


Figure 62: Villagers' contribution to prevent disasters. Can villagers contribute actively to prevent disasters from occurring?



Figure 63: Exhibition for awareness building Activities to raise public awareness on natural disasters, disaster risk reduction and emergency preparedness (Source: Zimmermann, 2006)

This question has not been asked in Pyanj District, because this question was later integrated. Twenty-four respondents said that villagers can contribute actively to prevent further disasters (Figure 62).

One woman from Mirzo Ashur Village explained that she cannot do anything to prevent a disaster. All the other interviewees had explanations and ideas what to do to prevent or mitigate a disaster. Respondents living near a river mainly explained that it is dangerous to build a house near the river. Several interviewees also mentioned the seminars, workshops and trainings ACTED Tajikistan offers (Figure 63). Here some statements:

“I wanted to build a house on the river side, but government forbid it.” (Bobosafoli Poyon Village, Farkhor District)

“It would be good when government helps people to build houses in a safe place and of good quality. Government should give us maps and the material.” (Bobosafoli Poyon Village, Farkhor District)

“I think that we should not build houses under a slope where rocks may fall down.” (Murodbakhsh Village, Farkhor District)

“When you live in a mountainous area you have to take care where you build a house. I heard a story from the earthquake in Khowaling. A boy went to the mountains to look after the animals of the family. When he came home, all people of the village were dead.” (Murodbakhsh Village, Farkhor District)

“We had lessons in the mosque about what to do in case of an earthquake. The emergency staff also told us about other disasters.” (25 Solagi Tojikiston Village, Farkhor District)

“Here in Doghiston, we know that when a flood will come, we must redirect the water. We dig a channel in the direction away from the village.” (Doghiston Village, Shurobod District)

“We must plant a lot of trees.” (Mirzo Ashur Village, Shurobod District)

“Sometimes, I think that people are really stupid. In 2010 we could hear a mudflow coming and people remained in their houses and did not escape. When the mud had covered everything I had to go and help people to leave their houses.” (Mirzo Ashur Village, Shurobod District)

8 Case Study in Kuhistoni Badakhshon



Village in the Pamir
(Source: Zimmermann, 2015)

When God created the world, he asked all the people to form a line so that he could distribute the lands of the earth to them. Now everyone knows that the Pamiri is not big, he is very polite and does not use his elbows. So the Pamiri representative found himself at the end of the line. When it was his turn, God looked surprised: "It seems I miscalculated," he said. "I don't have any land left for you." The Pamiri began to cry – and everyone knows that when a Pamiri cries, even God cries too. God put his arm around the Pamiri.

"It was my fault," he said. "Actually, I do have one little piece of land left that I was going to keep for myself as my garden. But since I made such a foolish mistake I will give it to you. It is called Badakhshon." (Popular legend of the Pamirs⁹⁷, also reported to me twice in Pamiri households)

8.1 Introduction

Kuhistoni Badakhshon is a high mountain area, consisting of several mountain ranges with altitudes up to 7,000 m a.s.l. and long valleys where the villages are mainly located on alluvial fans and river terraces. Tectonic movements are active in Kuhistoni Badakhshon, which leads to an intense seismic activity in the region. Fluvial erosion and sedimentation is responsible for an enormous amount of mass transport that provokes for example damming of the valleys by debris fans. Due to natural hazards like debris flows, avalanches or flooding, settlements, agricultural land, pastures and human infrastructure are at risk (Zaripov et al. 2002). According to Famine Early Warning Systems Network (2011), the area of western Pamir is identified as "Western Pamir Valley Migratory Work Zone". Agricultural land is scarce; most households reside in the valley bottoms, only few in the upper zone. Precipitation comes mostly in the form of snow from October through May. Growing of wheat, potatoes, tomatoes, cucumbers and fruits (Figure 64) and limited livestock husbandry (sheep and goats and some poultry) are the main income of the population. Irrigation is highly necessary.

The data presentations consist of five case histories and the interviews in Roshtqala, Shugnan and Rushan Districts in 2013. Interpretation and discussion will follow in chapter 9 where selected results will be taken up, discussed and interpreted in terms of content and methodology.

⁹⁷ Retold by Robert Middleton <http://www.pamirs.org/Legends%20of%20the%20Pamirs.pdf> (last access October 2015)

8.2 Case Histories

In this section a selection of five interviews, out of the 34 interviews, are presented as case histories to illustrate the issues of concern. I could visit Rushan, Shugnan and Roshtqala District.



Figure 64: Rich apple harvest in Khorugh
(Source: Zimmermann, 2015)



Figure 65: Great hospitality in the Pamir
(Source: Zimmermann, 2015)

The presented case histories emphasize the difference of the interview settings: from different valleys, higher education or basic education, different level of prosperity, different destinies. The five examples are narrated summaries of these interviews.

Each case history is subdivided into five thematic sections:

- The three main problems for Tajikistan
- Trust in different governmental institutions
- Religious matters
- Environment, climate change and related natural hazards
- Last disaster in the village

As a conclusion, key points relevant to the issues under investigation are carved out for further discussion.

Figure 65 is intended as thank for the overwhelming hospitality that has been given to me.

Case History I:

Province: Kuhistoni Badakhshon

District: Roshtqala

Jamoat: Sezhd

Village: Upper Sezhd (approx. 3'000m a.s.l.)

Family size:

8 adults and three children → grandfather, first son (pensioner), second son (commercial accountant) with wife and their two sons (one is teacher and the other regularly works in Russia) with their wives, and 3 boys

Income earners:

4 (including the pensioner's small pension)



Figure 66: Satellite image of Sezhd village (Google Earth, August 2015)



Figure 67: Family's house in Upper Sezhd (Source: Zimmermann, 2013)

The house of the family, situated in an orchard, is rather large (Figure 66 and Figure 67). The interview took place in the warm kitchen where the pensioner was preparing Palav⁹⁸. Two brothers, one with his wife; two young sons and their wives; and the youngest child were present.

Notes:

Asking for the most important problems they are presently facing, the family listed poverty, climate change and labour migration. The pensioner explained that they live in a remote area and the road to their village is in very poor condition. They do not have enough arable land and their kitchen garden is not so fertile because winters are getting harsher and longer lasting. The teacher stated that the changing of the climate is a very serious problem; and he pointed outside where it was snowing (end of April): “Today snow and rain are coming in the wrong time.” The pensioner explained that people polluted the rivers with fertilizer and chemicals during Soviet times. Today they have problems with water too. The accountant is responsible for two springs. He does not know if the water is clean. The son who just came back from Russia remarked that for him the main problem is that families cannot survive without sending sons to Russia. The mother agreed that people cannot survive without such remittances from their sons; and the father added that this is true but additionally they cannot survive without the support from AKF (Aga Khan Foundation). He said: “Without the help of AKF Pamiri people would eat each other.” Asked about tourism as financial source, they replied that they tried to be involved, but foreigners are often afraid and think the Pamir is a dangerous place because of

⁹⁸ Palav or osh, generically known as plov (pilaf), is a rice dish made with shredded yellow turnip or carrot, and pieces of meat, all fried together in vegetable oil or mutton fat in a special qazan (a wok-shaped cauldron) over an open flame. The meat is cubed, the carrots are chopped finely into long strips, and the rice is coloured yellow or orange by the frying carrots and the oil. The dish is eaten communally from a single large plate placed at the centre of the table, often in with one's hands in the traditional way. http://en.wikipedia.org/wiki/Tajik_cuisine (last access October 2015)

neighbouring Afghanistan; there remains only a small individual trekking tourism. The accountant was annoyed that people in Murghab, situated in the same altitude like Sezhd, are privileged and do not pay certain taxes people of Sezhd have to pay.

The family thought that the government has the responsibility to help them because they live in such a remote and barren place. The pensioner pointed to me and said: "You are coming from Switzerland because you are interested in our problems and how to solve them. In contrast our government does not care a straw". He further explained that Dushanbe neglects the Pamirians and even tries to skimp them. "Although we need job perspectives and therefore like to get to know about the governmental plans for a new mining project and respective working places in the region, but the government does not inform us".

One of the young women stated that the governmental education system is of poor quality and they do not trust it. The teacher explained that the Soviet education system was very good. He said: "Today when a student wants to go to the university, you have to pay a lot of money, on the one hand for the university and on the other hand for the professors. You can even buy a diploma for your child." The wife of the teacher said that thanks to His Highness (the Aga Khan) there are at least two kindergardens in the valley. Her husband added that His Highness supported the construction of a governmental school with five classes; their two boys now go to this school.

The public health centres are similarly supported: His Highness supports the construction, provides medicine, dressing material, vaccinations, etc., but the government has to pay the salaries for the staff. For this reason they considered the health system as sufficient. The pensioner objected, however, that the doctors' behaviour is changing: "When you do not have money, the treatment will be bad. Giving the doctor enough money, you will get a good treatment, but you will get dizzy from the bill." The family has no trust in the legal system. Although the regulations and laws are in principle good, in practice nobody follows them. They considered the system as corrupt.

The family had different opinions concerning the trust they have in religious leaders. Women go to the *khalifa* or *mulloh*, when they have a health problem or personal wish. These religious leaders prepare for them *tasdofs* and *tumors* (written charms against illness or for the fulfilling of wishes)⁹⁹. Because women believe in these, the charms help. The two young men, however, considered the *tasdofs* and *tumors* to be useless. The pensioner added that today to be *mulloh* is some kind of business. He meant that the old religious leaders were and still are good, but the young ones are only keen on money. One of the young women said that a good *mulloh* can even search for water. Or when a rock fall threatens the village, a good *tumor* can stop the rocks to fall. The pensioner answered that he does not believe this, and the teacher added that in such case it is better to construct a protective dam. The pensioner who is in the village's Emergency Response Team, argued that it is even better to sign out the dangerous places in the village and to prohibit building houses in those places. However, his final statement was: "We are used to live in these dangerous mountains. I do not care too much about." The family agreed that *khalifas* and *mullohs* are important in bringing and explaining the *farmons*¹⁰⁰ coming from His Highness. The teacher's wife pointed out that their children take *akhloq* (ethic) lessons¹⁰¹. The teachers are paid separately by His Highness for providing these lessons. She explained that the lessons are free of charge for the children and added that they would hardly survive without the help of His Highness. The family explained that the *akhloq* lessons address

⁹⁹ Zimmermann, B. (2006, p. 72): *A Society in Transition: Ismailis in the Tajik Pamirs*. Diploma research, University of Bern, Switzerland

¹⁰⁰ Orders or guidelines coming from *Mawlana*

¹⁰¹ Zimmermann, B. (2006, pp. 61-64): *A Society in Transition: Ismailis in the Tajik Pamirs*. Diploma research, University of Bern, Switzerland.

different topics and that one is explicitly about environment, natural hazards and climate change. There are *akhloq* books for children and corresponding guides for parents. Sometimes children even have trainings, e.g. earthquake exercise. The family agreed that human beings have to take care of nature and animals in a responsible manner.

The discussion about environmental changes, climate change and natural disasters revealed that the family is aware of the problems. The pensioner's wife said that due to heavy and severe climate conditions ("today we have at least seven months winter.") young people are leaving the Pamir or even the country. Her younger son added that normally they shear their goats and sheep in February or March and the pensioner continued: "... and now look, we have snow again. Our livestock is suffering from this weather." He said that the hills are the pasture grounds of their animals and therefore, they need rain and snow during winter time. Nowadays winter can last till May, animals cannot find enough fodder outside and the farmers go out of hay stock.

Concerning the last natural disaster they faced, the family told that a big rock fall hit one house in 2012. Fortunately nobody died. The pensioner told that there was a landslide in 2011. Even the grandfather could not remember to have experienced such a big landslide in his life. Snow avalanches are a problem almost every year in April and May. The family stated that such events are natural. They agreed that government and population have to try to prevent such events together. The pensioner was convinced that he knows quite a lot about the causes of environmental problems and how to solve them.

Key points:

- Changing of the climate is considered to be a serious problem
- Economic issues are considered to be important; the communities depend on remittances as well as on the assistance from His Highness
- The government institutions are considered to be weak and negligent.

Case History II:

Province: Kuhistoni Badakhshon

District: Roshtqala

Jamoat: Bomirshakar

Village: Dasht

Family size:

2 adults → husband (electrician at the power station) with his second wife

Income earners:

1

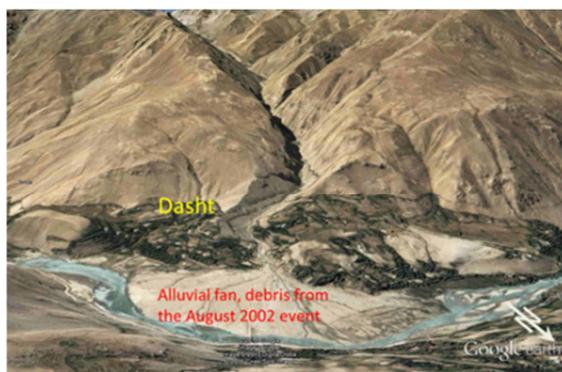


Figure 68: Satellite image of Dasht
The 2002 debris flow affected large parts of the previous village on the alluvial fan
(Source: Google Earth, August 2015)



Figure 69: Glacial lake outburst flood (GLOF) at Dasht
Part of Dasht village was destroyed in August 2002.
(Source: Zimmermann, 2003)

In 2002, large parts of the village of Dasht were destroyed by a glacial lake outburst flood (GLOF). It was reported that the flood wave arrived in Dasht in three waves, leaving dozens of residents of the village dead and hundreds homeless.

The interview took place in their newly built home in Dasht. The man lost his first wife, two sons and one daughter in the “Dasht event” (Figure 68 and Figure 69), which occurred in the tributary headwaters of the Shakh dara Valley on 7 August 2002. This devastating debris flow was triggered by a glacial lake outburst. The man was working in Khatlon at that time. Following the disaster, the man lived in Khatlon for one year, where he met his second wife (she has two adult daughters). Later the couple could stay in the house of an uncle in Shakh dara Valley and finally, they were allowed to construct a new house in Dasht. *Hukumat* provided them with land and the house could be built with the support of FOCUS.

Notes:

The man stated that life is normal and that they do not have particular problems. His wife hesitated to say anything and kept quiet for the rest of the interview. Sometimes she nodded affirmatively, sometimes I had the impression that she wanted to say something, but hesitated. The man explained how he lost his first wife and his children during that night. As a consequence of this disaster 72 households from the village were moved to the villages Firuza-1 (27 households) and Firuza-2 (45 households) in the Nosir Hisrav district of Khatlon Province, a hot lowland district with limited job opportunities. He did not have any choice and had to leave his ancestral place since his house was completely destroyed and he had no financial means to move to another place. After one year in Khatlon he wanted to return to Dasht, but *hukumat* and *jamoat* told him that he is no longer a citizen from here, because he received a house in Khatlon. He defended himself against this decision and finally, *hukumat* turned in. Basically, he was of the opinion that citizens and government have to solve Tajikistan’s problems together.

Asking about the confidence he has in government, health system, business, legal system and educational system he answered briefly and concisely. His opinion was that they have no choice as to trust the governmental institutions. He stated that the medicine one gets does not help. Business is fine, one can get everything, but the prices are high. He told that he has a salary of 380 somoni per month and that this is just enough for food and other daily needs.

The man originates from a *Sayyid (Pir)*¹⁰² family, his mother's father was *khalifa*; his second wife comes from a *Sayyid* family too. They are Ismailis that pray every day and pay their *dasond* (tax)¹⁰³. The couple considered *tumors* as useful and he narrated that during the 2002 event his uncle started to cite Suras from the Qur'an and the debris flow stopped. He added that a *khalifa* or *mulloh* can also recite religious poetry called *maddah*¹⁰⁴. These poems are sung in Persian. The man thought that *tumors* put on the top of a hill may prevent a landslide from occurring and when the landslide yet occurs it would be probably because of people's misbehaviour: "Everything that happens is an act of God and has its reason." He heard that school children have *akhloq* lessons, but because his children are dead and he does not have children with his second wife, he never read one. He stated that according to his faith people have to take care of animals and the environment and that people have to live in a responsible manner.

Regarding the questions about environmental changes, climate change and natural disasters he stated that he is concerned, because they experienced recently this big flood in the Dasht torrent. Nevertheless, he originally wanted to build his new house in the location where his family is still buried under the accumulation of the debris flow, but *hukumat* gave him another plot. For him the causes of environmental problems root in the misbehaviour of human beings and he considered them as a kind of punishment. He regarded climate change as natural: "We cannot blame God or the government, climate change is natural." According to him nothing can be done to solve the problems, because everything that happens has to happen. He stated: "Coming from a *Pir* family, I know that we cannot do anything." He told that they get trainings about planting trees, build dams etc. but he thinks that this does not help: "When the debris flow will come, it comes." He remembered that before the disaster there were a lot of trees in the village, but the debris flow destroyed everything.

He said that the last disaster was the devastating debris flow of August 2002. It happened during night, it was impossible to react. Parts of the village were completely destroyed, 25 people died. "It was an act of God. Perhaps we did something wrong and had to get punished." Then he added: "I did something wrong. This I know. My behaviour at that time was bad."

Key points:

- Man lost his family, seems to be more or less fatalistic and to a certain degree resigned, at the same time he is satisfied with his life
- Thinks that they have to trust the governmental institutions
- Disasters can be a punishment by God for misbehaviour of people

¹⁰² Former local religious leader (appointed by Imam, descendants of the Prophet Muhammad)

¹⁰³ Every believing Ismaili is supposed to pay *dasond* (12½ % of his gross income) to His Highness. People, who cannot pay so much, are obliged to pay so much as is possible for them.

¹⁰⁴ *Maddah* is a music-prayer-meditation practice; mainly used for healing (Koen 2003)

Case History III:

Province: Kuhistoni Badakhshon

District: Khorugh town

Jamoat: Khorugh town

Village: Khorugh

Family size:

2 adults and two children → man (philologist at the University of Central Asia) and his wife (journalist, artistically talented), together they have the cultural organization "*Merosi Ajam*"; one daughter and one son

Income earners:

2



Figure 70: Satellite image of Khorugh City at the confluence of Pyanj and Gund River. Pyanj River forms the border with Afghanistan. (Google Earth, August 2015)



Figure 71: Khorugh City (28,000 inh.) The family lives on the hill side (Source: Zimmermann, 2013)

The interview took place in the family's home in Khorugh (Figure 70 and Figure 71) and was by far the longest in the series of interviews. After the interview Umed Mamadsherozdshoev showed me his impressive private library. His favourites are the studies of the history of Badakhshon. Up to the Soviet period the manuscripts are written in Arabic and Farsi script, therefore he first had to learn these scripts. He wrote 16 books on different topics to date, for example, a comprehensive document about Badakhshon's history. He also writes books about nature or the traditions of Badakhshon. He is a very welcomed participant in international conferences (Tokyo, London, Istanbul, India, Russia etc.). In turn his wife Sabohat Donayorova worked as a journalist for a long time. Over the years she realised that she was increasingly hindered to write what she wanted and she looked for alternatives. For that reason, the couple established their little NGO "*Merosi Ajam*"¹⁰⁵ (Мероси Ачам) in Khorugh. The woman, who is an excellent painter, illustrates brochures for NGOs (Figure 72), organizes exhibitions and for some time she assisted in trainings about natural hazards, preparedness, prevention etc. for teachers and youth. This couple communicates its opinion openly compared to many other respondents.

¹⁰⁵ *Merosi* (from Persian, is translated as heritage) and together with *ajam* (non-arabs - persian nations) it means "Great Heritage"



Шинондани дарахтҳо дар минтақаҳои хавфнок, гузоштани нишонаҳои огоҳкунанда, донишони роҳ ба ҷойи бехатар, омода намудани доруворӣ ва гизо – яке аз корҳои муҳимест, ки онҳоро бояд иҷро кард. Системаи огоҳкунӣ ва хабардоркуниро донишман лозим аст.

Figure 72: Drawing in a handbook about natural hazards Sabohat was drawing the pictures for a handbook about natural hazards and how to deal with it¹⁰⁶ (2014)

Notes:

The couple considers health, education and economy as the most important issues for Tajikistan today. They stated that health service worsens; new health professionals have poor knowledge and they do not trust them. During the Soviet period the medical education was very strict. Only the best could become a doctor, but today students with rich parents can enter the faculty: “That is very dangerous for our society. Good treatment is at risk. Today you can even buy the diploma.” They narrated from a young woman whose father bought a dentist diploma and set up a dental surgery for her in Khorugh, but nobody wants to get a treatment from her. They also stated that the infrastructure of hospitals, health points or private surgeries is old and insufficient. Even the drugs are outdated and it is dangerous to use them. With pharmaceutical products made in Tajikistan one never knows whether it is according to the standard: “Sometimes when I talk to the pharmacist, he says that he does not trust them as well.” During the Soviet period when someone was ill, the family took him to the doctor. The treatment was free of charge and it was good. Nowadays people have to pay lots of money for a good treatment, starting with the guardian that one has to pay to get announced. The man stated: “Since 1991 you can see doctors drink alcohol, like the military.” He further said that today there are a lot of children with prenatal diseases. He assumed that this happens because people live in bad conditions: health, economic, sanitation, food etc. and because the number of good educated specialists is insufficient. His wife added that water and fruits are not polluted in Badakhshon: “That keeps us alive.” Regarding education they narrated similarly. During Soviet time the education system was very good and serious. Not everybody could enter the university. And without a master degree one could not work at a university. Salaries for the professors were high enough. The woman told that during this time there were a lot of libraries and book shops. Moscow sent books to Kuhistoni Badakhshon and every village had his book shop. There was a unit that tried to convince people that reading books is informative and fun. Today elder people still keep these books at home. After the collapse all has been destroyed and the education system became weak. The economic situation worsened and a lot of specialists left the country. Publishing books was stopped, book shops closed. The woman tried to open a book shop in Khorugh, but the government was not interested and did not give her space. She narrated that her daughter likes to study. She knew that there are free places and tried to get one for

¹⁰⁶ Translation of the Tajik text: "Planting trees on vulnerable sites, putting warning signs, knowing about the routes to safe havens and use of drugs and nutrients are one of the essential tasks that should be implemented. It is necessary to know about warning and awareness systems."

her daughter: “However, we received many denials, because I did refuse to pay for the study place. Now we try to get a free place for students with excellent performance. According to the good marks and the recently received award of my daughter she should get a place!” Her husband added that when he worked at the Tajik university he was often offered money from students or parents to provide a place at the university, good marks or even a diploma. He always refused, but with this attitude he made enemies, and finally he left the university.

Both considered Tajikistan’s economic as very weak. The man stated that Tajikistan has almost no industry and everything has to be imported; in addition, work places are rare. Furthermore, he remarked that Pamiri people are not used to do business and when they try, it remains unprofessional. His wife added that one is obliged to be on the market with some carrots and enervated she said: “For the stand at the market you have to pay money, so people take a loan to pay it. Now imagine you cannot sell your carrots and so your debts grow. It is a vicious circle.” She thought that people have to increase farming. She had the idea to collect herbs, maybe in Tusion which is famous for its herbs, and sell them, or even export them. “Or one can make its own juice from the fruits of the thousands of fruit trees of Badakhshon, instead of buying Chinese or Iranian juice.” A friend of her had the idea to make a business with nuts, but she needed a donor and technology. “Or maybe it is possible to sell the good and clear water to Saudi Arabia, but the taxes and custom affairs cost a lot of money.” The couple, especially the woman, had many ideas for small-scale business, but they both thought that technology does not come to Badakhshon; the rest of Tajikistan is definitely privileged because there is more arable land and people are not physically separated from the rest of the country like the Pamir. Furthermore, they complained about the omnipresent corruption in Tajikistan. The man stated: “Although Tajikistan has an anti-corruption department, nothing improves, because people of this department are the worst relating to corruption.” However, they wished to receive more help from the Tajik government to solve the manifold problems.

Both stated that they have no confidence in religious leaders. The man told that he started to work for the Ismaili Tariqah and Religious Education Committee (ITREC)¹⁰⁷ in their research department in 1995 and stayed there for five years. He had to control and look after religious activities. At the beginning he liked the work, because it was the time where the Pamirians had connection with their Imam for the first time. People were interested in their religion. Gradually politics interfered. People from the Ismaili Centre have been appointed to ITREC and conflicts started. For example: “Nasir Khusraw¹⁰⁸ has always been very important for Pamiri people, his ideology is our guidance. But the staff from the Ismaili centre told us that we are no longer in need of Nasir Khusraw.” His wife added: “Soviets thought that the Ismaili ideology is no danger for them”. She blamed that today’s *khalifas* do not understand Islam. And because they do not know anything, young people do not listen to them. She said that sometimes she debates with *khalifas*, but they can never convince her.

In the spirit of Nasir Khusraw (nature is God's gift) the couple explained its philosophy: “Whatever in nature is, we have to take care of it. The better we treat nature, the longer we have a benefit of it.” According to the couple the old *akhloqs* are a kind of philosophy and the new *akhloqs* are part of the *Ta’lim Curriculum* (an international programme in religious and cultural education). These books have been developed in the Institute of Ismaili Studies for children and parents. For the woman it is very important that each human being has to leave something behind, when he or she dies. She explained it with her own situation: “When I left my job as journalist at the *hukumat*, colleagues asked me why I am

¹⁰⁷ ITREC has been changed to ITREB (Ismaili Tariqah and Religious Education Board) in 2012

¹⁰⁸ Nasir Khusraw (1004-1060) a Persian poet, traveller and philosopher. He spent his last fifteen years in a remote place in the mountains of Badakhshon.

leaving. I said: When I am working in my kitchen garden, I am sure that something will remain in future, for instance a fruit tree I planted or flowers. When I stay with the *hukumat*, nothing remains in the future.”

The couple was aware of the problems related to environmental changes, climate change and natural disasters. They observe that today there is more, particularly heavy rain than in the 1970s and 1980s. Heavy rains destroy the irrigation channels; and they are afraid of possible landslides. At the same time they often have water shortages. The woman got upset that people burn their garbage and therefore pollute the air or throw their garbage in the irrigation canals. She said: “There were also rumours that the dead bodies of the riots last autumn had been thrown in the water reservoir.” She told that already their grandfathers said that people should not pollute the water and should not have a bad behaviour towards nature: “If you behave badly, the land will become angry.” Her husband stated that climate change is a worldwide problem and he listed pollution by factories, melting glaciers, rising of the sea level, more extreme natural events etc. She added that Tajik people are afraid of Lake Sarez (footnote 89). Both agreed that climate change is either natural, but also because of human activity. He thought that religion cannot help in regard of environmental problems: “Technology will be the only solution.” But his wife argued that she was afraid of possible rock fall from the hill behind the house when they came to this place. An old woman told her not to worry and brought a *tumor*. She hid it in a horn of a Marco Polo sheep that now protects the house.

They both remembered the last natural disaster three years back: a rock fall combined with a landslide occurred nearby. One house was destroyed, a sheep hit and one big rock fell in the interviewees’ garden. They stated that every winter and spring avalanches occur. The man said that these disasters are naturally occurring because of the geography and the kind of natural environment. The reason that disasters happen, he saw in the fact that there are not enough safe places to build houses in the Pamir. Nevertheless, his wife added: “I feel safer here than in a six-story building in Dushanbe.” He stated that people have to think about how to protect their houses. He told that they first terraced the land around their new house to slow down and finally stop a landslide. She added that during the Soviet period warning devices were installed to alarm people when a landslide started to move and people could evacuate.

Key points:

- Aware of a number of problems; environmental are not at the forefront but considered to be important
- The political circumstances are particularly relevant and hinder development
- They have a technocratic approach for the management of hazards and risks, but also belief in the religious aspects for dealing with risks

Case History IV:

Province: Kuhistani Badakhshon

District: Shugnan

Jamoat: Sokhcharv

Village: Zevardasht

Family size:

3 adults and one child → mother (pensioner, former teacher) with her son (regularly works in Russia) and his wife; one girl

Income earners:

2



Figure 73: Satellite image of Zevardasht along Khorugh Highway (Google Earth 2015; image October 2003)



Figure 74: A cradle, called *gavora*¹⁰⁹ (Source: Zimmermann, 2013)

The interview took place in the well-kept house of the family in Zevardasht (Figure 73). The interviewee told that her husband died in young years. She worked as an English teacher for 36 years and brought up her son on her own. Now she receives a pension of 224 Somoni per month from the government. Her daughter-in-law with her baby (Figure 74) were present, but only listened. Her son was working in the garden.

After the interview the daughter-in-law served tea, fresh bread and mulberry jam. Then the interviewee wanted to show me the garden and the land plot for the new house of a relative. The kitchen garden was well maintained, a lot of various types of fruit trees such as apricot, apple, pear, mulberry, walnut and cherry enriched the lot and the son was just repairing the *tanur*¹¹⁰ on the veranda. He came with us to the river side and showed me the sauna he has constructed for the cold winter time.

Notes:

M. considered crime and corruption, health and education as the most important issues for Tajikistan today. She thought that the government is not interested in the problems the population has: “Government’s employees only interest is to put as much as possible money into their own pocket; and therefore corruption is high.” According to her government employees are even involved in the business around smuggling drugs, gems, cigarettes, etc. The same picture she stated for the health system. People are no longer able to pay the high price for the doctor: “Our neighbour’s wife will deliver her baby soon, but they do not have money for the doctor. So I told the man to renew our veranda and paid him for this.” And last

¹⁰⁹ The whole body of the baby with its arms straightened at its side is tightly wrapped. With special cloths the baby is bound to the cradle. The head is covered with gauze.

¹¹⁰ The Tajik clay oven is a central part of any household. When offering tea, hosts serve it with traditional *non* bread. The host will pass the first loaf of bread with his right hand to the guest while he places his left hand over his heart.

but not least poor people cannot afford a place for their children at the university. “We have clever children from poor families that cannot study and stupid children from rich parents that can become a doctor. Imagine what kind of doctors they will be! In Soviet times we did not have such problems!” She was disappointed when she realised that some of her colleagues took money from students who put money in their exercise books and in return received good marks. She thought that schools might become better if the government increases the teachers' salaries.

She said to be still confident that the government will help Tajik people one day, but as long as the government does not listen to people nothing would change. She argued that they cannot elect a governor or president, not even the *rais* of *jamoat*. “This is not a democracy!” When she sometimes listens to a speech of the president, she always hopes that things will change and tries to believe him. However, she is disappointed when nothing happens later. She considered business opportunities as good, but difficult. One has to pay a lot of taxes. Her opinion concerning the legal system is annihilating: “They do nothing. They only sit on their chairs and look for themselves. I really hate them, even if I should not say this.”

M. considered herself as to be a good Ismaili and stated that it is important for her to save her faith. However, she does not like the *mullohs*: “They are sitting and talking, but only about good behaviour and not about people’s problems.” She desires more group discussions with religious leaders that are not afraid of discussing the manifold serious problems people have with the government and daily life. As a human being she feels responsible for everything in the world, except for the air, because she thinks that here humans cannot do anything. During her time as a teacher she held *akhloq* lessons with topics like natural environment, changing climate and disasters.

She knows about climate change and related problems from TV. She stated that she does not know why it is occurring and assumes: “Whether you want it or not, it happens.” The woman thought that there are no solutions for these problems. She told that the climate was good in Badakhshon, but today it is different. Years ago there was more snow, now there is often water shortage. When a disaster happens, the neighbours collect money and help the families affected. She considered climate change to be natural. She stated that she can observe negative effects: “A lot of fruit trees have diseases, like for example canker worms. Either the trees get too much water because of heavy rain or they have no water because of prolonged drought. To rest under trees was always nice, but now the trees are no longer healthy and beautiful.” She narrated that people of the village addressed the problem of water shortage to MSDSP and the organization installed a water pipe. Unfortunately, the water in the pipe froze during winter time; now the pipe is broken and nobody repairs it.

The last disaster occurred in the neighbouring village in 2011. A landslide destroyed land and houses and killed animals. People were relocated from their houses. She thought that it occurred due to the geography and the natural conditions. After an event people of the village sit together and discuss what to do, e.g. where to build a new house. Although the village has a lot of land, nobody wants to live there because of water shortage.

Key points:

- Main problems are on the socio-economic and political side
- She knows climate change from hearsay; but made some own observations
- She believes in a scientific approach; religion plays a minor role

Case History V:

Province: Kuhistoni Badakhshon

District: Rushan

Jamoat: Rushan

Village: Baghu

Family size:

4 adults and two children → man (private taxi driver) with his wife; son (works in Russia) with his wife and two boys

Income earners:

3



Figure 75: Satellite image of Baghu in Bartang Valley (Google Earth 2015; image October 2003)



Figure 76: Baghu Village (Source: Zimmermann, 2013)

The interview took place in the small house of the family in Baghu (Figure 75 and Figure 76). The man grew up in the village and is working as a taxi driver. His wife originates from Pyanj; she earns some money with sewing clothes for village people. At the same time she teaches her daughter-in-law sewing clothes. Aside they cultivate their kitchen garden and they have one cow with a calf and ten sheep. Unfortunately, they cannot breed chicken, because these would pollute the river near the house. The woman is happy that there is now a shop in the village where she can buy goods or exchange them for her own products.

Notes:

They consider economy, poverty and labour migration as the most important issues for Tajikistan today. The man stated that all young people leave for Russia and only old men remain in the village. This creates big problems because they need the young ones to solve problems like for example constructing an earth dike along the river. He is the head of the Village Organization (VO)¹¹¹ implemented by the Mountain Societies Development Support Programme (MSDSP). More and more he is reaching its limits in solving the manifold problems of the village. His wife added that most people of the village live in poverty because of unemployment. People try to survive by selling some vegetables, sewing clothes, driving people, etc.

She said that the only support is coming from the young people working in Russia; they send remittances home. Her husband thought that government and villagers should work together, but the government does not respond: “Some time ago I asked the government to lend an excavator to the community, for constructing the earth dike along the river. But the government did not respond to the request.

¹¹¹ Only a few years ago, all major decisions in Tajikistan's provinces and districts were made by the state. In an environment where top-down decision-making used to be the norm, the Mountain Societies Development Supporting Programme (MSDSP), an initiative of the Aga Khan Foundation (AKF), started to establish Village Organizations (VOs). These are village-level institutions that are autonomous and transparent, contributing to democratic norms of behaviour and to growth of civil society. People learn self-reliance, to manage their own resource (to mobilise human, physical and financial resources), to improve living standards and to play an active role in civil society. (further discussed in section 9.2.5)

Later I requested FOCUS to support the community. The NGO provided fuel and some money for the rent of an excavator.” His wife mentioned the easy life during the Soviet period. When Riddeh Village was destroyed in 2012, the government was absent but NGOs assisted. The couple considered the health system as corrupt; only with a lot of money one can get a good treatment. The roof of the medical point is leaking, but nobody will repair it. After the many complaints about the difficulties of life the wife stated: “But the most important thing is that we do not have fighting or war.”

The woman had confidence in *khalifas* and *mullohs*, because they teach people how to be a good Ismaili and disseminate the *farmans* from *mawla* (His Highness). The couple stated that human beings have to take care of the environment with all its living creatures. The man assumed that only technology can solve the environmental problems. His wife added that in the past everybody had trust in religion, but today no longer. Fortunately, children learn about this topic during the *akhloq* lessons at school and the grandparents can follow it with their grandchildren.

Regarding climate change the man stated that they observe a changing in the weather conditions in the last years. According to him climate change is mainly caused by human activity. He admitted that Pamiri people sometimes do wrong things, like cutting trees or *teresken* bushes¹¹² for fuel, polluting water, etc. They learnt about the topic in a workshop and training by FOCUS. The man said that the river is causing problems. Therefore, FOCUS established a preparedness team: “These people watch the river during rain and give alarm when they see a sudden change in the flow. In this way the population has time to evacuate.” His wife added that these changing patterns have negative consequences. When there is too much rain, it affects the fruit trees with pests. When there is no rain for a long time, the harvest withers.

The last disaster occurred in 2010. There was heavy rain and landslides destroyed parts of their village. The woman considered the event as an act of God to punish people for their wrong behaviour. Her husband added that people often build houses in dangerous places. He thought that people have to consider the geographical conditions of the place: “Nature is strong and people have to adapt.”

Key points:

- Economy, poverty (unemployment) and labour migration
- Trust in religious affairs
- Observed effects of climate change

¹¹² *Teresken* is (*Ceratoides papposa*) a small dwarf-shrub adapted to semi-arid conditions. *Teresken* bushes can protect the slopes from erosion, but people need it as firewood for heating and cooking. It is a major energy source in this mountainous region.

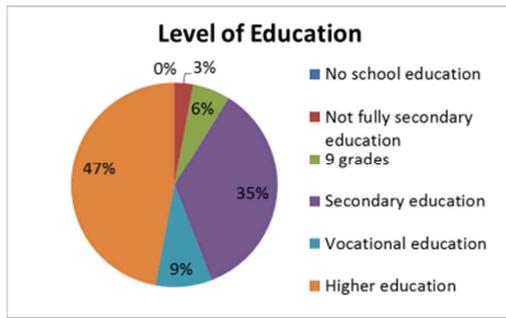


Figure 79: Level of Education of interviewees

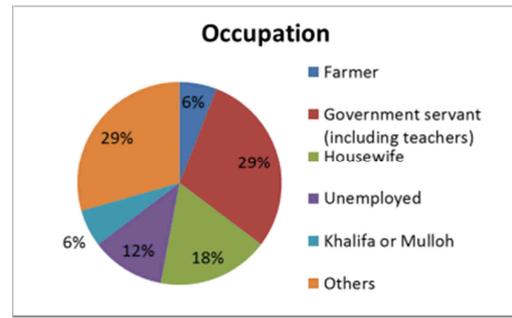


Figure 80: Occupation of interviewees

The majority of the interviewees had a full secondary education (section 4.6) or even a higher education. Only one woman had been taken out of school before finishing secondary education. Figure 79 shows the level of education of the respondents.

The analysis of the occupation of the respondents (Figure 80) revealed that ten of them worked for the government. Out of these ten were lawyer (1), road maintenance worker (1), deputy of Shugnan District Emergency Department (1) and teachers (7, of which 3 directors and 2 deputy director of a school). Six women considered themselves as housewives, bringing up children or taking care of grandchildren while parents are working in Russia. Four interviewees were unemployed; two of them just came back from Russia and therefore first have to look for a job. Only two families were doing subsistence farming. One respondent was the *khalifa* from Khorugh I already interviewed for a former project in 2006. One interviewee was a *mulloh*. Among the respondents that indicated other occupations than the already discussed were one translator (Tajik or Shugni to English and vice versa), two electricians, one who works for an NGO, one commercial accountant, one taxi driver, one construction worker and two pensioners.

A total of 31 respondents stated that they have a kitchen garden; the remaining three interviewees hoped that government will provide them with a kitchen garden soon. These three families (two from Riddeh and one from Dasht) were those who lost their house following major debris flow disasters. It can be generalized that almost everybody has a kitchen garden in the Pamirs, even in Khorugh town.

8.3.2 Results of the Questions

Question 1: "What do you think is the most, the second and the third important issue for Tajikistan today?"

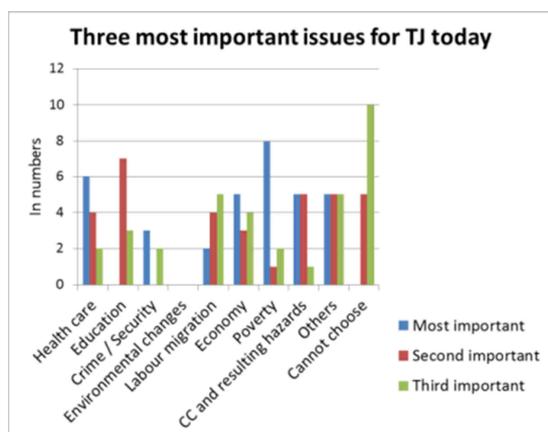


Figure 81: Three most important issues for Tajikistan today

Poverty has been indicated the most, followed by health care (Figure 81). Education, labour migration, economy, and climate change and related hazards were called about equally. Nobody considered environmental changes, like soil and groundwater salinization or soil erosion as important. Crime and security was not such big issue as well. Other issues were: water shortage or lack of clean water, suicides in Roshtqala District due to unemployment, and "everything is a problem". Five respondents chose only one issue as a problem and five other respondents chose two issues.

Health care: Six respondents considered the health system as the most important issue, four as second and two as third. Some statements were:

- "We do not know the composition of the medicine we get."
- "After the Soviet period we had a so called brain drain; all good doctors left the country. New doctors are not well skilled. We do not trust them."
- "We live far away from town and no doctor is available. We only have nurses. We would appreciate a doctor to come to our region."
- "It is very difficult to get a good treatment, because we have not enough money to pay the doctor."
- "Our health system is very weak. It is not fulfilling the demands of the population."

There were relatively few comments on this issue. The interviewees told much more in Question 3 which asks about the confidence in the health system. Obviously, the answers here classified the health system as poor, too expensive or not available at all.

Education: Nobody considered education as the most important issue; seven respondents mentioned it as second and three as third, respectively. Some statements were:

- "During Soviet time one could live from his job as a teacher. Today we teachers have to do some additional work, like farming or doing some small business, because salaries are so low."
- "Some schools still work with old fashioned curricula and the time schedules are not adequate; too little time for one topic."
- "We do no longer have good young teachers. They all leave Kuhistoni Badakhshon."
- "School is quite good. Problems start when you want your children to go to university. You need money to pay these studies, at least 80 USD per month."

The topic education will be discussed under Question 3 in detail.

Crime and Security: Three of the five interviewees who chose crime and security as a top problem regarded this topic as the most important issue, the other two respondents as third important issue. One woman said meaningfully: “When you are not allowed to speak openly...” She also indicated to the political problems they had in Khorugh in July 2012 triggered by the killing of the head of Kuhistoni Badakhshon’s regional branch of the Tajikistan’s State Committee for National Security, General Abdullo Nazarov. According to the Government (see section 5.3) Nazarov was murdered by militants group led by Tolib Aiembekov. The interviewee further told that Aiembekov stated that the General died in an accident. He fell and hit his head on a stone. The respondent thought that officials used this case to bring Kuhistoni Badakhshon under their control. Heavy fighting started in the streets of Khorugh with a death toll of more than eighty, but no civilians, according to officials; however, according to the interviewee, of course there were civilians among the dead. She also narrated that during these days a large amount of women formed a demonstration and walked singing through the streets of Khorugh to stop the fighting. And really, both sides, officials and militants, stopped the fire for this afternoon. Since these days Khorugh did not come to rest, because government was always observing and trying to interfere in Kuhistoni Badakhshon’s affairs. Another younger woman from Shugnan District perceived crime and security also as a problem and she narrated the events in Khorugh 2012 too: “You see how many people died in these clashes.” A woman from the resettlement in New Riddeh was afraid of the unrest in Khorugh as well and stated: “I do not want to live in war. We want peace. Pamirians are peaceful people.”¹¹³

A man who works with an NGO considered corruption as biggest problem of Tajikistan. He explained it, based on an example of Development Cooperation. He said that the funding is not reaching people in the villages. For example, there was a cross border project from the World Bank. According to him, only 30 percent of the funding remained for the project itself.

Labour migration: Two interviewees considered labour migration to be the most important problem; four said it is the second and five third. Out of the 34 interviews 22 mentioned labour migration and the resulting problems in one or the other way during the interview. Fifteen stated that one or more family members are working in Russia. Often grandparents take care of their grandchildren, because both parents are in Russia. One woman from Yomj Village said: “Look around in our village, you can hardly find a man. They are all in Russia.” A man with his wife in Buni Village is taking care of a large piece of land that belongs to the man and his two brothers. The man is constructing a new house for one of his brothers and is cultivating the land of all three. The two brothers send him money for the work and the construction of the new house. Another couple from Buni village, both above 50 years old, narrated that they worked in Russia several times. They have five children and only one is married and financially seen independent. The wife told that she lost her health in Russia. At the end of the interview when her husband already had left the house to look after his cows she whispered that her husband became drug addicted in Moscow. A primary school teacher from Roshtqala District expressed her concern: “When children are working in Russia, they have a lot of difficulties. They are not registered and become only low-paid work, even with higher education. They do not find good apartments; often they live with other Tajik under poor conditions in one small apartment. When they leave here they are convinced to earn lots of money, but this does not happen. The director of a school in Roshtqala District asserted that young teachers are no longer willing to work as a teacher in Tajikistan and more and more leave the country: “Young well educated teachers are so badly paid that they leave the country.” The deputy director of a school in Khorugh added that children raised by their grandparents often become

¹¹³ For further information see *Tajikistan 2014 Human Rights Report*. Country Reports on Human Rights Practices for 2014 United States Department of State • Bureau of Democracy, Human Rights and Labor. <http://www.state.gov/documents/organization/236864.pdf> (last access March 2017)

very difficult: “They show little interest in school, have bad behaviour and often keep bad company.” One woman stated that she always tries to work for AKDN opposite the river in Afghanistan, because the salaries are higher there. The man who works for an NGO told that Tajikistan has 1.3 million labour migrants in Russia: “Low payment, no social welfare in Tajikistan, so people leave the country. We have to create work places, provide free education at the university, implement a functioning health system, etc. Old Soviet style people cannot understand that we have to adapt and change.” A former teacher from Shugnan District stated: “Afghan people go to Canada to work and earn a lot of money, whereas Pamirians are stupid and go to Russia and earn nothing.” A young lawyer with a secret job in Dushanbe remarked that due to climate change and related natural disasters people leave the Pamirs. He thought that it is also because the population grows, but the possible places to live are limited.

Economy: Five respondents stated that economy is the most important issue; three considered it as second and four as third. Generally, people considered economy to be very weak and surely not beneficial for common folks. Several people patted their coat or trouser pocket and said: “You know the pockets of the president and his family are very big; in exchange there is not enough for the population.” Half of those that mentioned economy as a problem originated from Roshtqala District; many of them added another major problem: increased suicides due to economic conditions in the district. One family in Sezhd Village was joking: “Only our 90 years old grandmother is earning money here in Tajikistan, she gets a small pension.” Two sons are working in Moscow and the son who stays with his family in the village was jobless. A man from Roshtqala District stressed that it is the government's duty to create jobs or help people to have better conditions. The director of a school in Rostqala District stated that the Roshtqala valley has such big problems, because the small pieces of arable land cannot provide livelihood for everybody: “We are too many people for this valley. Not everybody can survive here, so people leave the valley or they commit suicide.” And the deputy director of the same school argued that Tajikistan has different natural resources, but is not using and further processing them. He said that they also have natural resources in the valley, but nobody is taking care of these. He mentioned that there are also other possibilities to create jobs or income: “You know, Tajikistan has 510.000 kinds of plants, but only 150 are known and used. Or we have many hot springs we can use as touristic spots. Or we can build green houses and cultivate various vegetables. But Pamirians are inactive and like to wait for somebody who solves the problems for them.” A young woman from Shod Village stated that more and more young people who come back from Russia are disenchanted, cannot find a job in the Pamirs and at last commit suicide.

Poverty: This topic was considered the most important issue. Respondents who chose poverty as an issue were evenly distributed among the districts. A man from the resettlement New Riddeh argued that the food products are too expensive and when one cannot have a kitchen garden, daily life is unaffordable. The deputy of Shugnan District Emergency Department stated that Tajikistan is a very poor country and the mountainous areas are even poorer: “We cannot reach the standard we need.” A woman from Khorugh whispered that it is rumoured that the President's daughter controls the shipping across the Chinese border: “The trucks cross the region without leaving any benefit for the population. They only bring us the pollution.” A *mulloh* from Shugnan District explained that there are a lot of poor families in Kuhistoni Badakhshon: “Unemployment is increasing. We have no factories and therefore only few work places.” The *khalifa* from Khorugh considered poverty also as very high in Kuhistoni Badakhshon. He stated that poverty affects the moral and social life of people and he thought that increasing the social standards would also increase people's moral behaviour. For the moment he realized that families pay less attention to the education of their children because they have other problems and moreover no money for a good education of their children: “This in turn fosters crime and drug problems, but we need a physical and mentally healthy population!” A woman from

Roshtqala District who works as a cleaner in a school felt confident that those working hard can survive. In the same breath she said that she could not survive without the remittances her children send her home, because she only has the kitchen garden and one cow and this very small salary.

Climate change and resulting hazards: For five respondents this topic is the most important issue, four considered it as second and one as third. Nobody from Rushan District chose this topic. Several interviewees indicated that they observe changes in the climate. There are only short comments:

- “We have late April and it is still snowing.” (Sezhd Village, Roshtqala District)
- “Our area is getting more and more waterlogged. For some years we have regularly floods.” (Baroj Village, Roshqala District)
- “Hazards and natural disasters are discussed in the geography classes.” (Shikush Village, Roshtqala District)
- “We have more and more droughts, so that the harvest will be minimal.” (Chohkandez Village, Shugnan District)
- “We live in a dangerous area that is often affected by natural disasters. The disasters are coming from God, because nature is the creation of God.” (Sokhcharv Village, Shugnan District)

Others: Quite often this category has been chosen. A man from Dasht Village who lost his wife and his children in the debris flow stated that Tajikistan has no problems to solve: “Life is normal. We do not have problems. *Hukumat* gave us a piece of land and anything else was provided by FOCUS.” In contrast four interviewees considered everything as a problem in Tajikistan. A family from Sezhd Village narrated that up to October they can get water from the nearby spring. During winter time they have to fetch the water from a well that is a half hour walk away with the donkey. A man from Langar Village was upset because people use too much water and do not take care of the cleanliness of the water.

Question 2: “Please indicate which statement below comes closest to your opinion”: “The government has the duty to solve Tajikistan’s pressing problems” or “The citizens of TJ have to solve Tajikistan’s pressing problems.” or “The government and all citizens of TJ together have to solve Tajikistan’s pressing problems.”

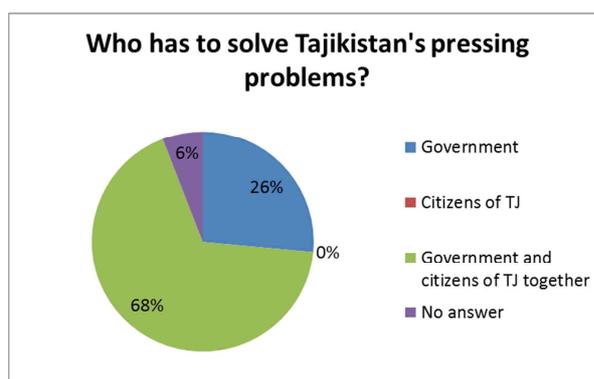


Figure 82: Who has to solve Tajikistan’s pressing problems?

Nobody assumed that it is the job of the citizens alone to solve Tajikistan’s pressing problems, but the majority of 23 respondents considered it as the duty of government and citizens together. Nine interviewees, mainly from Shugnan District, pointed to the government that has to solve the problems. One woman did not know an answer and the young lawyer told that this question is too delicate to answer for him because of his job (Figure 82).

Two young women of a family told that it is the duty of AKDN, but one of the young men disagreed: “I think we people have the duty to try to solve our problems by ourselves. I raised our water problem in front of the assembly at municipal level. One engineer had an idea, but the community wanted to do it in another way and another engineer had a third suggestion. Finally, AKDN spent some money, but the community did not use it in an appropriate way.” The director of a school in Roshtqala District concluded that government and citizens have to work together and gave an example: “Government established this school and the villagers built a playground on a voluntary basis.” She added that sometimes the cooperation does not work: “Last year we had a landslide that damaged the school building. The building already has cracks from a former earthquake. An official from Dushanbe came and had a look, but he considered the damage not to be serious and then nothing happened. Fortunately, a woman from Red Cross Society who implemented the project “repairing water channels” encouraged us to repair the school building by our own, giving us the money that remained of the original project.” Few respondents stated that citizens and government have to work together except in the case of problems concerning schools. Here they thought it is the duty of the government to take care. Several interviewees said: “We have to work together, because government cannot do everything.” Few women stated that the community has to sit together and discuss the problems of the village and search for solutions: “We cannot always wait for help or money from government or NGOs. We have to try to solve our problems by ourselves.” In contrast, only few respondents mentioned that the government has to help the citizens and then NGOs have to assist the government.

Question 3: “How much confidence do you have in ...”

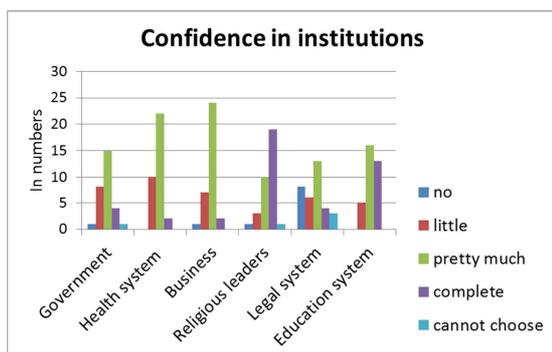


Figure 83: People's confidence in institutions

The evaluation tends to result in rather “pretty much” and “complete” confidence than in “no” or “little” confidence. Religious leaders and the education system received relatively good quotes whereas the legal system has the highest rates of “no” confidence (Figure 83).

Government: In general people have pretty much confidence in the government. A young woman from Roshtqala District without confidence in the government complained about the inactivity of governmental institutions. Another family from Roshtqala District stated to have little confidence in the government as well, however they listed a number of promising points, for instance: “*Hukumat* gives pension to old people in the community.” “We have electricity.” The deputy director of a school in Roshtqala District has little confidence in government as well and said: “When the local government changes, we never know how the new one will be. Maybe they only want to get their pocket filled. But we need a strong leader who takes care of people, listens to them and considers their concerns.” A man from Rostqala District, working for an NGO, stated that one should have confidence in the government, but his confidence is limited: “We have different groups with different interests. The opposition is on a very, very low level. I studied in India. Every day was a cartoon about a political person in the newspaper. When you do it here in Tajikistan, they will put you to jail.” A primary school teacher from Rostqala District with pretty much

confidence in the government reflected after her answer and said: “When I look back to last year’s fighting in Khorugh I am not sure if the government’s action was right. From the one side we cannot blame the government, on the other side people of Khorugh were right too. I hope that such an incident will never happen again. We like peace not struggles. Our Imam told us not to interfere.” One family of Dasht Village agreed that they have complete confidence in the government, because government helped them after the disaster. The *khalifa* from Khorugh answered in a short way: “We believe in our *Mawlana*¹¹⁴ and he says that we have to trust the government and work together with it.” And a *mulloh* from Shugnan District underlined: “First I have to thank our *Mawlana* for his help. The government is not so bad. After the civil war the government tried to help us, but we cannot demand everything from it.” Several respondents, some were employees of the government, answered cautiously that they cannot say too much about this topic. Others clearly stated that they have absolutely no benefit from the government and have no trust in it. Some called it corrupt and weak. One teacher from Shugnan District openly said that he has not full confidence in the government because he has some differences with it concerning land tenure. He has to pay taxes for his land and thought that this is not correct. Furthermore, he complained: “I subscribed for a Russian newspaper because I am teaching Russian and now the government told me that I have to pay it by my own. They are not motivating me with such behaviour!”

Health system: The confidence in the health system is rather high, although people often complained. Nobody stated to have “no” confidence. Only two had “complete” confidence.

Often respondents said that the staff of the health posts is good and is doing its best. The condition of the buildings, the equipment and the lack of medicine is another issue. The *khalifa* from Khorugh pointed out: “When you see the many diseases people have, you know that the health system is quite weak.” A woman from Khorugh mentioned that the staff gets very low salaries and therefore often demand some extra money from the patients. One woman from Chohkandez Village told: “During Soviet time everybody could get free treatment. Today you must have money; otherwise the doctors do not help you.” A woman from Baroj Village said almost the same; additionally, she meant that the medicine is not of good quality and sometimes one have to wait for a long time to get a treatment. Several people from Roshtqala District argued: “After the collapse of the Soviet system it became a habit that students can pay for the diploma and so we cannot be sure if we have a medical doctor with a good education or only with a diploma. And when they make a mistake, nobody dare to complain.” An elderly woman from Andarv Village considered the health point in the region to be good, but not sufficient for the large area to cover. Respondents living near Khorugh were more satisfied with the health system, because they consider the hospital of Khorugh as quite modern with computers and diagnostic equipment. A woman from the resettlement in New Riddeh stated that they have a very nice doctor in the region: “He also treats people who have no money. When one has to go to the hospital in Khorugh he even writes a paper that we have to pay less.”

Business: More than two third of the respondents had pretty much confidence in business affairs. Only one family from Rostqala District stated that they have no confidence in business, because they observe that many people run up debts in order to open a business. A woman from Khorugh said: “When I want to do business, I can do it. The problem is that the loans are too short, so that people have no time to earn enough money to pay back and still have enough for ongoing business and living.” She criticized that people are inactive and do not use their brains: “I think there are a lot of things one can do: cheese making, leather sewing, drying fruits like apricots, etc.” Some respondents were quite satisfied that more and more little shops exist also in remote villages and they do not have to go to Khorugh. The deputy

¹¹⁴ People in the Pamir speak from *Our Mawlana* what is the name for His Highness Prince Karim Aga Khan IV, the leader of the Ismailis.

director of a school in Roshtqala District explained that people need business, but they have to improve. He also stated that government should control the prices because some business people increase their prices as they want: “In Khujand people know what prices are adequate, but here in the Pamir we have arbitrariness.” A woman from Shikush Village mentioned the microloan project from MSDSP where people can get small loans for starting a business: “After the civil war our *Mawlana* told us that we have to do something. It was hard, but he helped us a lot.” Several respondents considered these opportunities to be a good chance, at the same time they complained about the high prices. A former teacher from Shugnan District explained that she is also doing some business to increase her pension. She goes to Khorugh and buys seeds and seedlings and sells them to the women in her village. She had also the idea to dry apricots, but then realized that the transport to Khorugh was too expensive and she was also not sure if Khorugh people would buy her fruits.

Religious leaders: Sometimes people first laughed, especially men, when they heard the question, but at the end 29 interviewees stated to have pretty much or complete confidence in religious leaders.

Most interviewees said that they do daily *namoz*. They like the Friday *namoz* where the *mullohs* or *khalifas* explain and discuss with them the new *farmons* from *Mawlana*. Furthermore, sometimes representatives from ITREC come to the villages and have discussions with the villagers about moral and behaviour. Most respondents, mainly women, told that they go to the *mulloh* or *khalifa* if a family member is ill or if they have a particular wish:

- “I am a widow since 1989 and live with my father-in-law. Three months ago he had a stroke and was paralyzed. We took him to the *khalifa*; he prayed for him and gave him something against his pains, so that father could pass away peacefully.”

- “My husband does not like them, but I like to receive their *tashdobs*. These *tashdobs* are useful and often help. We cannot do it without *mullohs* and *khalifas*.”

- “I do not go to the *mulloh* or *khalifa* very often. I go when I am sick, but there are some diseases also the *khalifa* cannot help.”

- “We need the *khalifa* for *nikoh*¹¹⁵ (religious legislation of marriage) and *charoghravshan*¹¹⁶ (funeral ceremony). When somebody is ill, I go and get *tashdobs* or *tumors*.”

- “*Khalifas* are good, better are the village leaders.”

- “It is hard to say “no confidence”. But today the number of *khalifas* is increasing and we do not exactly know whom we can believe. They often tell us different things.”

- “Everybody can become a *mulloh*. This is not good. In former time *khalifas* originated from *pir*¹¹⁷ families and were educated and knew how to write. Today’s *khalifas* and *mullohs* only want to earn money and cannot even write properly.”

- “You can go to the *mulloh* when you want your disliked neighbour becomes ill, but actually that is forbidden. *Khalifas* and *mullohs* are not allowed to do bad charms that hurt people. Nevertheless, some do it for money.”

Few respondents stated that God and *Mawlana* are important for them. People have great respect for their *Mawlana* and love him. Others said that everything depends on God and that the *khalifas* and *mullohs* only succeed when God wants.

Legal system: A good half of the respondents said to have pretty much or complete confidence in the legal system. Three women stated that they cannot choose an answer because they had nothing to do with the legal system till now, but one added: “Without legal system our society will break up.” A man

¹¹⁵ Zimmermann, B. (2006, pp. 78-81): *A Society in Transition: Ismailis in the Tajik Pamirs*. Master thesis at University of Bern, Switzerland.

¹¹⁶ Ibid. p. 78

¹¹⁷ Pirs are said to be Sayyids, meaning descendants of Prophet Mohammad through his daughter Fatima.

from Shugnan District, like few other respondents, had the opinion that the legal system is doing a good job, but his wife added: “Whenever people want something, it ends with problems. I think that we live in a time where things are not working in the right way. I do not know how this will end.” The director of a school in Shugnan District said that the work of the legal system improved compared to some years ago: “We are very close to the Afghan border. A lot of young unemployed Pamirians become drug-addicted and later start with drug smuggling. The border guards try to prevent this smuggling.” One wife laughed when her husband said that he thinks that they are doing their job and he quickly added: “I am telling the truth.” A couple from Rushan District is satisfied because they can get a passport or an official paper without problem when they need it. The wife added: “Maybe this is because we live in a village far away from the center.” One elderly woman answered: “Whatever they demand from us, we will fulfil it.” A young woman who sat in the room and listened to this interview interrupted us and said: “Do not talk with this woman. She is an old uneducated woman. She cannot answer properly.” A teacher from Shugnan District said that the police became strong after the incidents in Khorugh, because they got new equipment from the government. He hoped that police learnt a lesson and would react more appropriate next time. From the respondents that have no trust in the legal system a woman from Shugnan District told that her husband was killed by people known to her family, but the law enforcers did not react: “One of the murderer already died and the other still live in this village. Imagine - I always have to face him!” Other four respondents mentioned corruption in connection with the legal system. A woman from Khorugh said that some people are very corrupt and gave an example: “You have a car accident and are not to blame. Now they do not help you, because the causer pays them a lot of money.” She also told of the riots in Khorugh in 2012: “It was absolutely not necessary that they started shooting. They could have arrested the murderer and bring him to Dushanbe. This would have been the right way! I collected the children of my neighbourhood and closed them in our bath room to protect them.” This incident was mentioned by several respondents.

Interviewees who stated having little confidence often argued that people are afraid of the legal system, because it measures case by case with different yardsticks.

Education system: Most of the respondents have pretty much or complete confidence in the education system. Only five respondents showed little confidence. For those with little confidence the education system has not undergone a proper reform since the end of the Soviet period. A woman from Khorugh regretted that today’s education system no longer has the quality of former time: “The Ministry of Education has to reform our school system. The ministry has a lot of money, but they do not use it properly. One UN organization made studies and recommendations for a reformation of the school system, but the government does not follow the advices.” Like several other respondents she further told that it is quite impossible for ordinary people to send their children to university. Leadership and professors seem to be corrupt: “As parents we try to do our best, but we are exploited.” Few respondents told another negative aspect: “Young teachers prefer to work with NGOs because they have higher salaries than as teacher.” A man from Khorugh considered the Tajik University as to be of very poor quality: “Fortunately, we Ismailis have the University of Central Asia in Kuhistoni Badakhshon, its quality is much better. The University of Central Asia is bringing progress and change.” Few other interviewees supported this fact.

Many respondents considered the basic school system as rather good, problems only start when the child wants to go to university. Several stated that the teachers are trying to do their best, but the equipment is often limited or of bad quality. School buildings are often in a poor condition. A family from the resettlement in New Riddeh even said that today’s school system is better than in former time. Few interviewees told that when children go to school their daily costs increase and often one of the family members has to go to Russia: “During the school time of our children I went to Russia every year for some months to get the money for the school. Normally we have to pay 25 or 30 Somoni per month and

child.” Some teachers complained about government that always tells them: “Yes, you will get a new school building or the old one repaired. Yes you will get books. But nothing happens.” Or they complain about the low salaries and the high costs they have to remain teacher: “Every teacher must keep a book where the quarterly medical check and attest from the doctor are recorded. This check always costs us 60 Somoni.”

Question 4: “Generally spoken how concerned are you about environmental changes, climate change and natural disasters?”

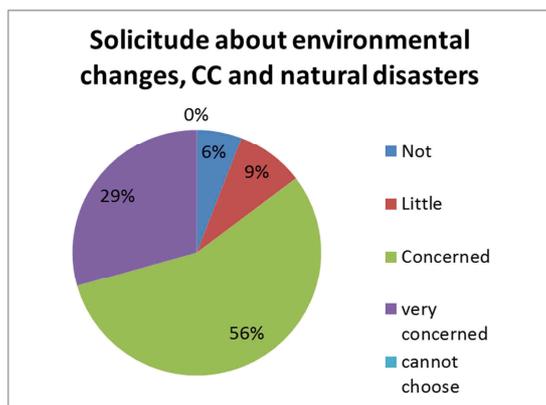


Figure 84: Solicitude about environmental changes, CC and natural disasters



Figure 85: Barsem mudflows: effect of climate change? High temperature and rapid snow and glacier melting triggered a mudflow in Barsem Village, Shugnan District on 16 July 2015 (Source: Zimmermann, 2015)

Out of the 33 respondents, ten were very much and 19 were concerned (Figure 84). Most respondents were concerned because they regularly experience natural hazards and disasters in their villages or valleys (a most recent event where changing climate has to be assumed as trigger occurred in August 2015; Figure 85).

In general people stated that the number of debris flows, rock fall, landslides, avalanches, water shortage and droughts has increased. A family from Khosa Village said: “The increasing droughts affect our life: when we have no water, we have no fodder for the animals and therefore they will die during winter time.” A man from Yomj Village explained: “Look this weather. Winter was very hard and now it is still too cold. Normally we plant during April, but we could not plant. I hope it will become warmer so that we can soon till our fields.” Several interviewees stated that they still could not get their kitchen gardens or fields (end of April / beginning of May) ready and mentioned water shortage. Like few other respondents a woman from Zevardasht Village said that she knows about climate change from TV. A man from Tusion Village stated that he is always afraid from disasters, especially debris flows that sometimes hit his village because the area has the geological characteristics of landslide bodies and movements of the surface are ongoing. Since he is working for an NGO he has learnt a lot about climate change and related hazards and now feels better. A woman from Sezhd Village explained that they do not have a radio or TV and therefore know nothing about the topic, but she observes changes in the environment: “Today we have more rock fall and it gets dangerous to let the animals graze there or to walk there.” But she also said that they completely believe in God and therefore do not worry about climate change: “Everything depends on God.” The *mulloh* from Sokhcharv Village told: “Of course we are very concerned. Changes are happening, we can see them. Some people say that the end of the world will come soon. I do not believe in such predictions. I only believe in our *Mawlana*. We trust him.” Additionally, five

interviewees told that they are afraid of earth quakes. For several respondents Lake Sarez is a danger too.

Question 5: "Here is a list of environmental problems. Which problem, if any, do you think affects your family and your village the most?"

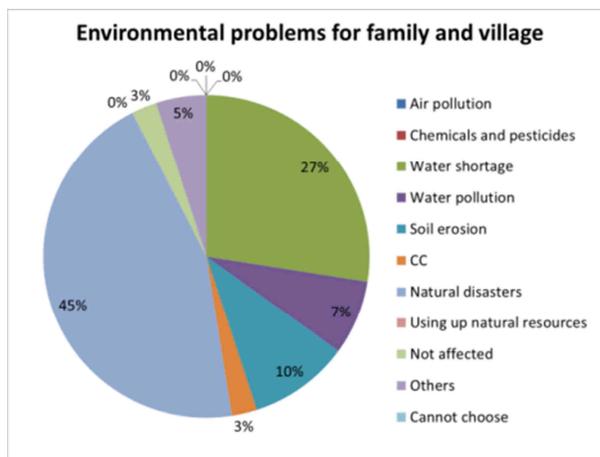


Figure 86: Environmental problems in percentage

Almost half of the respondents (18) consider natural disasters as a major problem, whereas nobody chose air pollution, chemicals and pesticides, or using up natural resources. Six out of the 34 interviewees wanted to choose at least two environmental problems as most important (Figure 86).

Water shortage: Most respondents observed an increased water shortage during summer. Few thought that it happens because people use too much water and because the irrigation systems are leaking and nobody wants to repair and maintain them. The director of a school in Shugnan District considered population growth as one reason for the water shortage: "The more people we have, the less water is available for each."

Water pollution: Several respondents explained that the water from springs or small rivers flows for approximately three months, and then people have to take water from the river that is not clean. Few women got angry over all the people that throw their garbage in the small water channels along the roads or in the rivers. A woman from Yomj Village said that the vegetables are no longer of high quality: "I think it is because of the polluted water. When you do not have a spring and have to take river water, the vegetables do not grow in the right way. During Soviet time the water has always been clean."

Soil erosion: A woman from Durum Village considered soil erosion as a big problem in her environment. She thought that it may occur because of the many not maintained and leaking irrigation channels in the hills. The deputy director of a school in Roshtqala District explained that soil erosion is a big problem in the valley: "Wind is blowing the soil away and the rain washes it out. I think we have to prevent this. We can plant poplar or fruit trees and bushes to stabilize the slopes."

Climate change: One respondent considered climate change as a problem (case history V), because he noticed changes in the weather patterns in the last years. For all the other respondents this was not a prime issue. One interviewee from Buni Village even explained that the family has some land on a hill in the mountainous area behind the village that can only be reached by foot. Meanwhile it is possible to plant there some new crops, because of hotter summers. He clearly considered this as a benefit for the family.

Natural disasters: Based on own experiences most interviewees stated that natural disasters are a problem. Respondents listed disasters like flood, debris flow, rock fall, landslide, avalanche, water shortage and drought. This topic will be discussed in Question 11 in detail.

We are not affected: A couple from Yemtz Village regarded themselves as not yet been affected by environmental problems.

Question 6a and 6b: a) "How much do you feel you know about the causes of environmental problems mentioned under question 5?"

b) "And how much do you feel you know about solutions for environmental problems mentioned under question 5?"

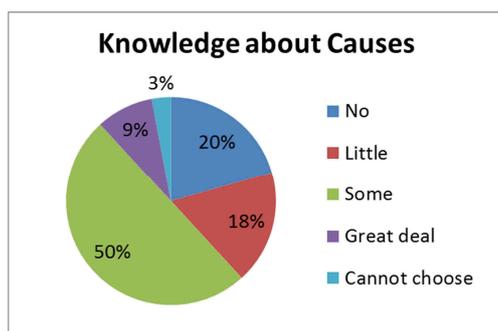


Figure 87: Knowledge about causes of environmental problems

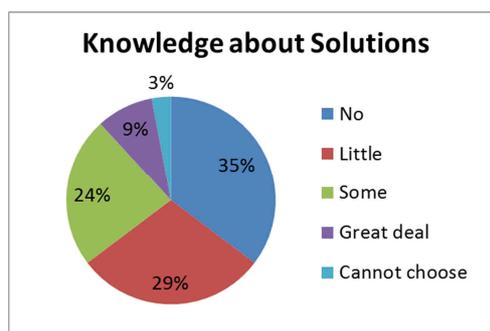


Figure 88: Knowledge about solutions for environmental problems

Knowledge about causes: Seventeen respondents (half) stated that they know something about the causes of environmental problems and seven interviewees (20 %) explained to have no knowledge about the causes of environmental problems (Figure 87).

Respondents who stated to know little about the causes were rather communicative. The deputy director of a school in Roshqala District said: "According to the State TV government tries to do something. Honestly, I do not know where the promised money is going to, because here in the valley we see nothing happening. I think that every institution, government, *hukumat*, *jamoat* etc. takes out some money and at the end nothing remains." A man from Khosa Village thought that air pollution partially stems from the many cars in Tajikistan. The rest of the climate change guilt he saw with the Western countries. A man from Roshtqala District stated that the population still has to learn about the causes and effects; he said: "In Tusion everybody knows that we have a lot of hazards, but nobody reacts. For example, we have an irrigation system that people do not maintain. Because of this fact water is running down to the villages. Now these villages have problems with our water: houses get cracks and the fields are water logged."

A woman from Kushk Village said that she knows something about the topic from TV: sea level rise, heavy storms, debris flows, rise of the temperature etc. Few respondents who thought to have some knowledge about the causes of environmental problems stated the same. A man from Shikush Village said: "The disaster occurs when it rains long and intensely and the soils are waterlogged." The *khalifa* from Khorugh, like few other interviewees, mentioned the melting of the glaciers: "I always have to think about. I do not know what will happen when the melting continues." A family from Dasht Village told that the landslide occurred because a big piece of ice from the glacier fell into the glacier lake and the following wave caused the landslide. Several interviewees were aware that too much rain can trigger debris flows and too much snow can release destructive avalanches. However, only few respondents would appreciate if specialists would map the dangerous zones in Kuhistoni Badakhshon.

Three respondents stated to know quite a lot about the topic. One of them is a member of the Emergency Response Team of Shugnan District and said that he has to know a lot. One woman from Khorugh said to read up on internet about the topic and a teacher from Yomj Village regularly reads a Tajik and a Russian newspaper.

Knowledge about solutions: The majority of the respondents stated to have no or little knowledge about solutions for environmental problems; eight thought that they know something. The three respondents, who said to know a great deal about the causes, stated the same for knowledge about the solutions (Figure 88).

Respondents that considered themselves as knowing nothing about the solutions expressed their helplessness with regard to the manifold environmental problems: “What can we do against the melting of the glaciers?” “We do not know what to do in case of a disaster.” “What can we do when a debris flow is coming down? Nothing!”

An elderly woman from Andarv Village stated to have little knowledge about solutions and added: “Old people say, when a disaster is on its way, give a charitable donation and the disaster will stop.” A man from Tusion Village proposed to do historical profiling to get knowledge about former disasters and to look for new technologies to prevent possible disasters. Three respondents from the Khorugh region listed some measures like reforestation, resettlement, avalanche alert (people with mobile phones have to warn the others), building dams etc. In turn, the *khalifa* from Khorugh handed over the responsibility to the West: “Today all over the world scientists are searching for solutions. I am sure that when they find solutions that will help. We can do nothing! For example, forest fire. People cannot extinguish it. If the Western countries cannot find solutions, I do not know what will happen. We here in Badakhshon can't do anything!”

Interviewees that stated to have some knowledge about the solutions listed examples like evacuation in case of avalanches, dike construction or digging diversions against debris flows or flood, etc. A man from Rushan District said: “It is an act of God, therefore we can do nothing. Only NGOs can help us.”

The three respondents that stated to know a great deal about the solutions listed almost the same examples like the category “some knowledge”. The deputy of Shugnan District Emergency Department told that they try to convince people not to construct houses in dangerous places and he gave an example: “Just outside Khorugh, near the airport, is a petrol station. We told the owner not to build the station in this place because of possible danger from the hill side. He did not listen to us and last winter an avalanche destroyed the station. Now the owner is rebuilding the station in the same place. Imagine!” Two interviewees mentioned the annual emergency trainings.

Question 7: "Please indicate which statement below comes closest to your opinion."

- Climate change is caused mostly by human activity such as burning fossil fuels.
- Climate change is natural.
- Climate change does not exist.
- Do not know.

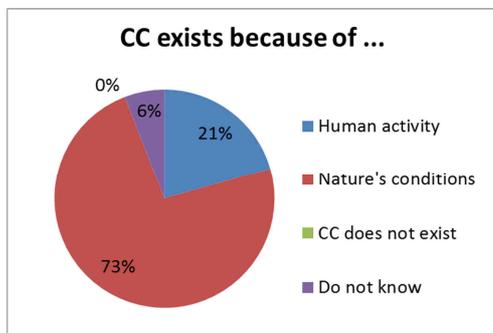


Figure 89: Reasons for CC



Figure 90: Overgrazing due to poor pasture management (Source: Zimmermann, 2015)

The majority of 25 interviewees considered climate change as to be natural and seven mentioned that human being is responsible for climate change (Figure 89).

The majority of the 25 respondents that considered climate change to be natural gave a shrug and said: "Natural. It is not our guilt and we cannot blame God." Three out of these 25 respondents thought that it is God's punishment for human error. A teacher from Khorugh told: "Once I asked my schoolchildren: Why avalanches are occurring? A girl said that her mother told her that disasters are punishments by God. I asked her to explain to her family all she learns about disasters, prevention and preparedness in school." Two interviewees said that climate change is natural and at the same time they blamed the factories of the Western countries: "We cannot blame human being for this. The factories of the Western countries pollute the air. We here in Badakhshon do not have many factories." Few respondents stated that human being cannot do anything regarding climate change, but can try to be somehow prepared.

Seven interviewees made human's activity responsible for climate change, like polluting air, water and soil, cutting all trees or having wrong pasture management (Figure 90). The *khalifa* from Khorugh stated: "Human being is destroying nature. Nature is the creation of God, but we are destroying it. We are very greedy. We should take care of our planet. I am blaming human being." A woman from Shugnan District argued that human beings are not only destroying the planet, but also themselves: "Human beings will become extinct because of all the diseases we provoke with our misbehaviour."

Question 8: "Please indicate which statement below comes closest to your opinion."

- Modern science and technology will solve our environmental problems with little change to our way of life.
- We trust too much in science and not enough in our religious faith.
- There is no solution concerning environmental problems and climate change.
- Do not know.

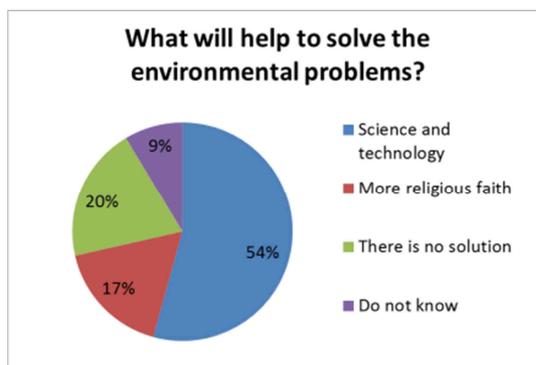


Figure 91: What will help to solve the environmental problems?

Seven respondents saw no solution concerning environmental problems and climate change whereas more than half of the interviewees thought that the problems can be solved with the help of science and technology (Figure 91). One interviewee absolutely wanted to mark two possibilities: "One problem can be solved by religious leaders; another problem can be solved by science. It depends of the kind of problem."

The director of a school in Roshtqala District stated: "*Mullohs* or *khalifas* cannot help. For example, our schoolhouse is situated at the foot of a slope where big rocks can fall down. What can a *mulloh* do in this situation? Some problems can be solved with technology, but others are just given and you cannot do anything." Two out of the seven interviewees that saw no solution that will help to solve environmental problems referred to their destroyed villages (Dasht and Riddeh) where nothing and nobody could prevent these debris flows.

The *khalifa* from Khorugh demanded more trust in faith. He asked: "What do you mean with science? In the old days science and religion was the same. The modern science has to be seen together with religion. You cannot separate them." A family from Sezhd Village stated: "The Pamir is a very dangerous place and thanks to God we can survive here." Two others mentioned that *khalifas* can stop a coming disaster but also stated that people can do something, for example planting trees that help stop mud flows.

Some interviewees said that only science and technology, surely not the religion, can solve the problems. They listed measures and ideas like factories with filter or not build the houses near a river. Others stated that science and technology is to choose, but they did not exclude that a good *mulloh* or *khalifa* can help in case of a disaster. A woman from Shugnan District explained: "In Khorugh is a slope where people live and where rock fall is possible. So people terraced their plots to stop the stones and rocks. But in the case of possible avalanches we go to the *khalifa* and he writes *tashdobs* to stop the avalanches."

Question 9: "Please indicate which statement below comes closest to your opinion."

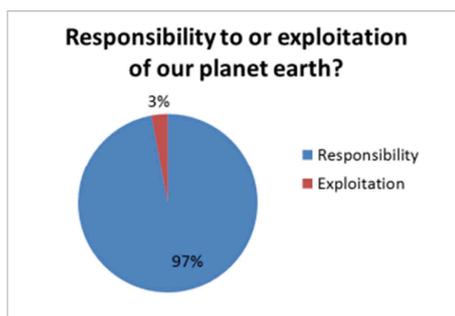


Figure 92: Responsibility to or exploitation of our planet earth?

Thirty-three respondents spontaneously stated that human being has the task of living in a responsible manner towards animals, plants and the resources of our planet that are not just only for human benefit. Only one couple from Rushan District said: "The whole nature is dependent on human being; therefore, we have the right to use it like we want." (Figure 92)

Twelve interviewees gave an additional comment about their choice. Here some statements:

- "Three things have been created by God: human beings, plants and animals. They have been created for each other. They cannot be separated from each other."
- "We are allowed to kill our livestock, but we have to take care to all other animals."
- "Our *Mawlana* says that we have to use our brain and behave in a good way."
- "Not to take care is a waste of life. Nature is beautiful and gives us a lot of things. For example, when we need wood for the construction of a house, we can cut trees, not fruit trees, others, for example willows."
- "We should only cut a tree, when we plant a new one. I think that we can protect the soil from erosion with trees. Trees are also good against air pollution. And it is not right that people kill the Marco Polo sheep for fun."
- "During the Soviet time borders were closed, nobody could come in the Pamir. Today everybody can enter and pollute our nature."
- "If you choose the second answer, you do not think about the environment."

Question 10: "Are environmental issues, climate change and natural disasters addressed in your works of ethics (*akhloqs*)?"

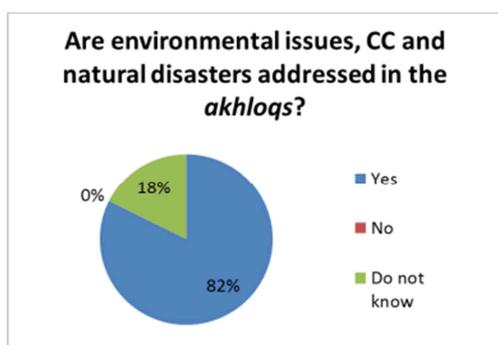


Figure 93: Are environmental issues, CC and natural disasters addressed in the *akhloqs*?

The majority of the respondents (28) stated that environmental issues, climate change and natural disasters are discussed in their *akhloqs* and nobody said "no". Six interviewees did not know (Figure 93).

It turned out that almost everybody meant the *akhloq va ma'rifat* (Zimmermann 2006) how people still call it. Today it is named *Ta'lim*¹¹⁸ programme and is developed and maintained by the Institute of Ismaili Studies. The interviewees explained that the books are about God and their Ismaili history and religion, all about the planet earth and how to take care of it and about moral and ethics. A teacher from Khorugh gave an example from one of these books: "In one book is an example of the river Nile and how people protect their house and land. In our geography lessons we always try to give examples from around the world." The director of a school in Roshtqala District explained that the schools get these books from the Ismaili Tariqah and Religious Education Board (ITREB), together with other school supplies like pencils, exercise books etc. A young mother from Yomj Village told that the books also discuss disasters and that the schoolchildren regularly have earthquake trainings. Only four respondents mentioned other *akhloqs* that they read. The *khalifa* from Khorugh stated that he knows the *akhloq va ma'rifat*, but reads other books of ethics, old ones and newer ones.

Question 11a: "Please, remember the last natural disaster you had in your village. What was it and when did it occur?"

Table 21: Selected Villages and their "last disaster"

District	Village	Last Disaster	Year
Roshtqala	Durum	No disaster	
	Sezhd	Rock fall Flood	April 2012 April 2012
	Baroj	Slide / flow* Flood Avalanche	April 2012 April 2012 2012
	Langar	Slide / flow	April 2012
	Dasht	Slide / flow	August 2002
	Shikush	Flood Slide / flow	April 2012
	Andarv	Slide / flow	April 2012
	Shod	Rock fall	Long time ago
	Tusion	Slide / flow	2012
Shugnan	Khorugh	Avalanche Rock fall	2012 2010
	Zevardasht	No disaster	
	Choshtkandez	Slide / flow	2010

¹¹⁸ The curriculum draws upon modern principles of education, with the intention of making learning a creative and engaging experience for young minds, as well as seeking to bridge religious and secular education. The teaching and learning materials produced include student readers and textbooks, guides for teachers and parents, and learning resources which include activity books, posters and picture cards. <http://www.iis.ac.uk/curriculum> (last access September 2015)

District	Village	Last Disaster	Year
	Buni	Flood	Every year
	Yomj	Rock fall	2011
	Sokhcharv	No disaster	
	Khosa	Avalanche	1998
	Khushk	Earthquake	2011
Rushan	Baghu	No disaster	
	Yemtz	Slide / flow	1977
	(New) Riddeh	Slide / flow	August 2012

* Slide / flow can be landslide, debris flow or mud flow. It was not always clear what it really was. This might be because of missing corresponding Tajik words.

It is obvious that the remote Pamir region has a lot of natural disasters, they occur in almost all places. Therefore, the hazards and the resulting risks are omnipresent and relevant for most of the people.

Question 11b: "Why did the disaster occur?"

- Geography and nature of the area
- It was because people failed to fulfil the demands of the laws of nature. For example, building their house in a dangerous place
- Administrative negligence of the authorities who have to protect us
- It was an act of God

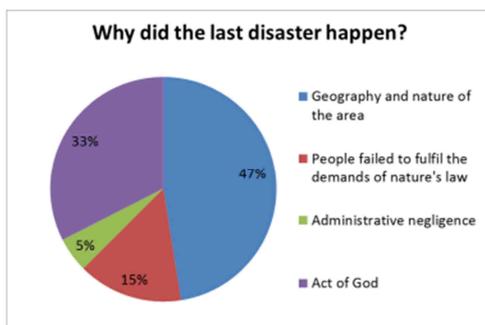


Figure 94: Why did the last disaster happen?



Figure 95: Blocked main road to the Pamir (Source: Zimmermann, 2003)

The majority of the respondents (19) stated that the disaster occurred because of the geography and nature of the area, three of them in combination with an act of God. Six interviewees saw the guilt with people who did not fulfil nature's law, two of them in combination with an act of God and one with the administrative negligence of the authorities. Three interviewees stated that the disaster occurred because of the negligence of administrative authorities, always in combination with the geography and nature of the area or with people's failing to fulfil nature's law. Eight considered it solely as an act of God (Figure 94).

Those who chose “geography and nature” rarely commented their choice. The deputy director of a school in Khorugh explained that disasters are occurring because of the geographical situation of the area: “You know, we live in a high risk area and people have no choice to live elsewhere. Even our roads are always at risk and we never know, if we can pass or not.” (Figure 95) A man from Tusion Village explained: “Look our geographical conditions. We only have steep slopes, high mountains and almost no flat land.” Some respondents who only chose “geography and nature” nevertheless mentioned the power of God and of religious leaders. A man from Shugnan District said: “There is a shrine near our garden that protects us from rock fall.”

Those interviewees that chose “geography and nature” and an “Act of God” thought that disasters mainly occur because of the former, but added that sometimes they consider it also as a punishment from God, because they do not listen enough to his advices. Similar thoughts had the interviewees who said that it was an act of God. One woman from Roshtqala District mentioned the increasing suicides in Roshtqala Valley and assumed that there is a connection between the disasters and the suicides: “God punishes us because we do not follow the *farmons* properly. He sends us disasters and then we lose our yield and poverty increases. That may be why especially young people commit suicide.” The disaster in Dasht Village in 2002 was mainly seen as a punishment of God.

The respondents who stated that disasters occur because people do not fulfil nature’s law argued that disasters mainly happen because people live in a dangerous place. A woman from Khorugh got upset: “In Soviet time it was not allowed to build houses in dangerous places. I cannot understand why government does not care about the problem and allows building houses everywhere.”

Question 11c: “Do you think that villagers can actively contribute to prevent disasters from occurring?”

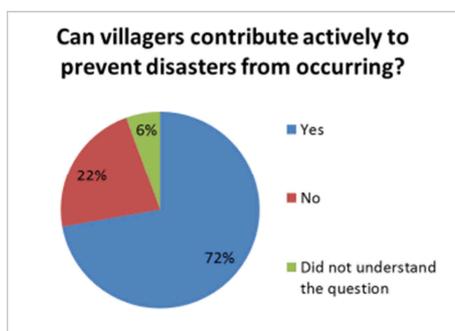


Figure 96: Villagers contribution to actively prevent disasters from occurring



Figure 97: Dam construction to protect the village (Source: Zimmermann, 2013)

Twenty-five respondents stated that villagers can contribute actively to help to prevent disasters from occurring, whereas seven said that they do not know what to do. Two women did not properly understand the question and were confused when we tried to clarify the question (Figure 96).

Five respondents stated that the last disaster was an act of God and therefore do not know what to do; they felt helpless.

The interviewees that answered positively that villagers can contribute to the prevention of disasters had many ideas. Here some statements from various places:

- “When we heard the water coming, we tried to divert the water by digging channels so that it did not run into the school building.” (Baroj Village, Rostqala District)

- “We should have a metal roof and not a roof made from mud. When it rains the roof gets very heavy and this is dangerous.” (Yomj Village, Shugnan District)
- “We can construct a dike or river banks in order to prevent floods. We can plant more trees against avalanches. To prevent rock fall – this I do not know.” (Yomj Village, Shugnan District Figure 97)
- “When we realized that we will have a flood, we put stones and wood around our house to protect it.” (Baroj Village, Roshtqala District)
- “We have to plant more trees, construct protection dikes and deviation channels. (wife) “First we have to study the endangered place to find out what is best to do in this case.” (husband) (Khosa Village, Shugnan District)
- “In case of an avalanche the road must be closed.” (Tusion Village, Roshtqala District)
- “We have to build a dike along the river to protect our houses.” (wife) “We wanted to build such a dike, but Afghan people did not agree. They said that the channelled water can destroy the riverbank on their side.” (husband) (Buni Village, Shugnan District)
- “We have to be prepared. We must have a bag with necessary items so that we can immediately leave the house when the disaster comes.” (resettlement in New Riddeh)
- “First we have to think about the location where we want to build a house. We have four children that need a house and they do not listen to me. They took the place they got for not too much money.” (Kushk Village, Shugnan District)

9 Discussion of Results

"Everything depends on God. Whatever he decides, we have to bear it."

"With modern science and technology human beings can ameliorate the deteriorating situation of our earth."

(Two statements from a teacher in Roshtqala, Kuhistoni Badakhshon 2013)

The two case studies in Khatlon and in the Pamir have provided valuable insights into the perception, interpretation and managing of contemporary and daily problems people face in the two selected Tajik regions. Based on the fact that the main objective of this research was to investigate people's perception, interpretation and managing of climate change and related natural hazards, risk and disasters, it became obvious that these problems are usually known but are "only" one risk among many existential daily risks the Tajik citizens are facing and coping with.

The focus group discussions in Khatlon and the interviews with individuals in Khatlon and Kuhistoni Badakhshon pointed to prevailing hazards and risks and to the citizens' view on these. The key results of both study areas are discussed and compared in this chapter. The socio-cultural approach by Mary Douglas and Aaron Wildavsky (1978, 1982, and 1985), the psychological approach by Slovic (1987, 1992, and 1999) and the sociological approach by Pierre Bourdieu (1977, 1984, 1985, 1986 and 1992; particularly his three forms of capital) are used to explain some of the citizens' views and behaviours.

In addition, the results of this research are compared, where appropriate, with very practical views and results of surveys of local and international organizations and institutions about the respective topics.

9.1 Overall appraisal

9.1.1 Prevailing risks

Tajikistan's economy was highly subsidized during Soviet period. The collapse of the Soviet Union provoked a dramatic economic depletion in Tajikistan and, together with the consequences of the following civil war, triggered immense poverty and labour migration. The World Bank (2014) stated in its *Tajikistan Economic Report* that Tajikistan's economic growth is slowing down and vulnerability to shocks is increasing. As reasons the World Bank (2014: p. 1) identified "...a range of external and domestic risks including a slowdown in remittances and trading, low-prices for aluminium and cotton, governance issues in the financial sector, and fiscal risks from ill-governed state-owned enterprises." In addition to the weak economy the World Bank mentioned in its *Poverty Assessment Report* (World Bank 2009b) the increasing poverty in Tajikistan: low incomes, limited access to well-paid jobs and related labour migration, waning access to basic education and precarious health services. In both study areas increased labour migration is one of the most frequent strategies in response to shocks and stresses from environmental and other serious problems. All these facts were unanimously mentioned and discussed by the respondents of both study sites.

In Khatlon the insufficient health service was listed first; in Kuhistoni Badakhshon it was the overwhelming poverty of people, mainly in very remote areas. It became obvious that the main topic of this research, namely questions around environmental changes, climate change and related hazards and risks, are surely not on top of people's agenda. Yet, the topic has been discussed during all

interviews and focus group discussions with interest. However, respondents immediately linked these problems with their core issues. Soon it became very apparent that the problems people face cannot be viewed in isolation. Every problem entails another problem; and it is very difficult to break through this cycle.

The two introductory statements by a teacher of a school in Kuhistoni Badakhshon are representative for many respondents' answers: on the one side the teacher shows a certain fatalistic attitude, on the other side he has ideas on how to address major problems with a clear hierarchical perception for problem solving. Such ambiguities run like a common thread through the interviews and focus group discussions in both study areas. The analysis of the data revealed that the four types of social orientation, similar to the *ways of life*, usually called individualism, hierarchy, egalitarianism, and fatalism described by Douglas and Wildavsky (1982) in their Cultural Theory of Risk (section 2.1.3), can be identified, but the four types correlate only partially, so that their independence from one another is not given like in the example above. Respondents often do not belong to one, but to a combination of mainly two social orientations. This is in contrary to Douglas and Wildavsky (1983) who hold the view that basically everyone belongs to one *way of life*, but it supports the findings of Dake (1992: p. 33) who is convinced that people can easily have contradictory belief systems. Another characteristic became obvious during the discussions: people's perception of risk does not coincide with technical risk assessments. This objective risk assessment with its scientific / professional standards and "good practices" in the field is accompanied by the risk perception and attitude of the individual (typically "lay person"). This confirms what the Psychometric Paradigm (Slovic 1987 and 1992) is underlining: respondents' perceptions depend on the degree to which a risk is understood, the degree to which it evokes a feeling of dread and the number of people exposed to the risk. Furthermore, it became obvious that poor and hungry people only want to survive; they, therefore, have a value system which focusses on imminent needs and not on environmental or other issues which are farther away. During the studies I got the impression that technical experts sometimes have a hard time to get heard. Although people often understand the experts' concern and suggestions (because they realise it too), they tend to trivialize the problem with the help of different explanations (e.g. lack of money, divine order).

9.1.2 Khatlon and Pamir: Similarities and Differences



Figure 98: Pastbajuv village, Rushan district in Kuhistoni Badakhshon
(Source: Zimmermann, 2013)



Figure 99: Somonchi village, Farkhor District in Southern Khatlon
(Source: Zimmermann, 2010)

From a geographical point of view Kuhistoni Badakhshon (Figure 98) and Southern Khatlon (Figure 99) are rather different: the Pamir is a high mountain area with narrow valleys, glaciers and steep mountains; in contrast Southern Khatlon consists of relatively wide valleys, hills and flood plains.

From a socio-cultural point of view the Western Pamirians mainly belong to the Nizari Ismaili whereas in Southern Khatlon Sunni Muslims are predominant. The geographical and cultural differences are also manifest in the results of the interviews: there are a number of clear differences in answers of the two study areas but also between the various stakeholder groups interviewed. The table below (Table 22) outlines the major similarities and differences between the two study sites.

Table 22: Comparison Khatlon – Kuhistoni Badakhshon

<u>Geography, economy and culture</u>	Southern Khatlon	Western Kuhistoni Badakhshon
Topographic setting	Flood plains and hills Large fertile land on flood plains	Mountainous, narrow valley bottom for settlements and infrastructure
Agricultural production	Large-scale farming (cotton, rice, corn) Small-scale farming Scarce agricultural production in hill areas Irrigation most relevant Pastures in hills (limited production)	Scarce agricultural production in general Small-scale farming (various crops) Irrigation most relevant Pastures immediately outside of settlements
Religious affiliation	Predominantly Sunni	Predominantly Nizari Ismaili
Self-esteem	Consider themselves as Tajiks, attached to ancestral place	Consider themselves as Pamirians, attached to ancestral place
<u>Similar problems; with sometimes different views</u>	Deteriorating health services and poverty as major problems	Poverty and deteriorating health services as major problems
	Deteriorating education system with increased corruption	Deteriorating education system with increased corruption
	Endangered food security Increased neglecting of kitchen gardens because of various reasons	Endangered food security Importance of kitchen garden underlined
	Increased burden on women because of labour migration	Increased burden on women because of labour migration
	Fear of Afghan people (kidnapping of girls & drug trafficking routes)	Fear of Afghan people (supernatural forces & drug trafficking routes)
	Increase of drug dealers and addicts	Increase of drug dealers and addicts
	Responsibility towards nature and environment is considered to be an issue, but not a very important one	Responsibility towards nature and environment is considered to be very important
	Consult religious leaders mainly for healing and prevention of diseases	Consult religious leaders for healing and prevention of diseases or natural disasters
	Aware of increasing environmental changes, effects of climate change and related natural hazards	Aware of increasing environmental changes, effects of climate change and related natural hazards
<u>Major differences between Khatlon and Kuhistoni Badakhshon</u>	General dissatisfaction	Beside all problems, often satisfied
	Girls' education is increasingly considered as not to be very important	Importance of girls' education is stressed
	Many women lack self-confidence and they consider themselves to be uneducated	Women often have a clear self-confidence

	Southern Khatlon	Western Kuhistani Badakhshon
<u>Interview conditions</u>	People were sometimes a bit reserved and hesitant. I was seldom invited for a cup of tea; and if yes, then from wealthier households	Pamirians liked to talk with me and asked me to write everything down they told me. They were of an overwhelming hospitality.
	Interviews only with individuals	Often parts of or the whole family wanted to listen to or even participate in the interview

These similarities and differences and those between the various stakeholder groups are further discussed in detail in the following sections.

9.1.3 Conditions in which Individuals or Households Live

The results from Khatlon and to a certain degree from Kuhistani Badakhshon revealed that people's view on Tajikistan's main problems is often a view on their very personal situation. From most of the respondents' statements I can assume that "their world" is made of their immediate environment. Residents rarely had a wider view of the regional, national or global problems.

Respondents in Khatlon often said that they only care for their family, neighbourhood and village, at the most about their *jamoat* (municipality); but they are not much concerned about the district, the rest of Tajikistan or beyond. Individuals have a feeling of abandonment by the government and being cheated by wealthy families. A latent mistrust dominates and people often fear to lose what they have. They try to survive by their own and with the help of the *mahalla* community. *Mahallas* more and more try to get development funds or collaborate with NGOs. In case of an emergency, like for example a natural disaster, individuals regularly feel as member of the community and act accordingly.

In Kuhistani Badakhshon the personal situation is important as well; problems are manifold and people suffer from many shortcomings. However, there is a pronounced self-esteem of the Pamiri people. They consider themselves as Pamirians (and Nizari Ismaili) and not directly as Tajiks; they underline this at every occasion. Nizari Ismailis in Tajikistan are fortunate to belong to a community that has an esteemed modern thinking Imam who gives them a clearly defined identity and who has influence and means to look for his community. With the help of the Aga Khan Development Network (AKDN), a contemporary endeavour of the Ismaili Imam, Pamirians could re-join post-war Tajikistan as a revitalized and confident community (Bliss 2006, Zimmermann 2006). This pronounced group feeling with shared goals and values, with a strong us-versus-them attitude and feeling, and with a relatively modern egalitarian social role of women point to an egalitarian society in the sense of Douglas and Wildavsky (1982), although the society is guided by a leader, His Highness Prince Aga Khan IV. Nizari Ismailis call themselves and their wider community *jama'at* (community).

Comparing the interviews in the two study sites, it became obvious that the social cohesion in Western Kuhistani Badakhshon is more pronounced than in Southern Khatlon. According to Stanley (2003: p.5) social cohesion is defined as "the willingness of members of a society to cooperate with each other in order to survive and prosper." Along with Durkheim (see section 2.3.2), it was found that the bonds of morality and loyalty are stronger in Western Kuhistani Badakhshon than in Southern Khatlon. Members of the Pamirian society are more willing to adapt their behaviour to the perceived needs of society (Zimmermann 2006).

I guess that the cohesion of the Pamiri extended families is higher than that in the extended families in Southern Khatlon, where respondents sometimes made clear that they care only about their own interests. The willingness to assist each other often only arises in times of crisis, for example after a natural disaster.

9.1.4 Clear Identification of Problems and a Hierarchy of Risks

Practical frameworks whether from international organizations or private sector demand risk knowledge and the understanding of people's perception as primary issue. In the new global framework, the "Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR 2015) the knowledge about risks and people's view on these is explicitly outlined in paragraph 23¹¹⁹; it is also clearly demanded in Switzerland's DRR Vision and Strategy (PLANAT 2005: pp. 1-4), where two of the three basic questions address risk knowledge and weighting of these risks with regard to risk management. Also for purely economic oriented entities like the Swiss Re, the risk management starts with the perception of these risks as David Bresch stated (WSL 2014): "Erst wenn man ein gemeinsames Verständnis davon hat, was das Risiko im spezifischen Fall ist, kann man dieses in einem nächsten Schritt analysieren, möglicherweise quantifizieren und dann als Folgeschritt Massnahmen ableiten, welche das Risiko vermeiden oder vermindern können" (Translation: "Only when you have a common understanding of what is the risk in the specific case, you can analyse this in the next step, possibly quantifying it and then, as a resulting step, derive measures that may prevent or reduce risk. ")

In general the interviews provided a rather clear picture about the importance and perception of problems, risks and threats people face: health, economy (poverty) and education are unanimously considered to be at the forefront. So called "lay persons" are fairly good in identifying, estimating and weighting risks, as outlined in the Psychometric Paradigm (Slovic et al. 1985). Environmental issues, effects of climate change and related natural hazards are known and perceived; however, the relevance is considered to be less important as compared to the main problems.

The many statements „It was an act of God" or "It was a punishment" point to the world view "fatalism". Douglas claims that people may have a fatalistic view on risks because they think that they cannot alter their pre-determined destiny by taking precautionary or reactionary measures (Douglas 1992). At the same time she says that it is often excluded from the policy discussions or by definition. Contemporary risk research describes it in a slightly different way. According to my interpretation, fatalistic attitudes may suggest helplessness and therefore need to be further discussed. Information about residents' views and weighting is highly relevant when talking to people about climate change adaptation or disaster risk reduction.

¹¹⁹ Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters. http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf (last access October 2015)

9.2 Views on Environment and Risks from Climate Change and Related Natural Hazards

Environmental changes, risks from natural hazards and effects of climate change are not at the forefront of people's mind, neither in Khatlon nor in the Pamir. Logically, other pressing issues and needs are predominant as outlined above. Although environmental problems are named, possible measures discussed and occasionally their implementation reported in both places, there are clear differences between the two study sites and between various stakeholder groups.

9.2.1 Environmental Issues

When asking about environmental issues in Khatlon, I remember only one case where an elderly lady was talking very positively about her good life in a more or less intact natural environment. She said that she is happy to live with a nice family where everybody tries to act in a responsible manner, also vis-à-vis nature. The lady, her daughter and her daughter-in-law showed me around their house and explained to me who of the family is responsible for what and what they have planted in their garden. Indeed, the kitchen garden was well maintained and offered a lot of vegetables and fruits. Most of the respondents were aware of their obviously deteriorated environment, similar to the outcome of the study by Olimova and Olimov (2012: p.21, Figure 100). Residents complained about the hardship they face and the despair they feel. Basically they were complaining about almost everything. Sometimes I got the impression that people can no longer see the beautiful part of their environment.

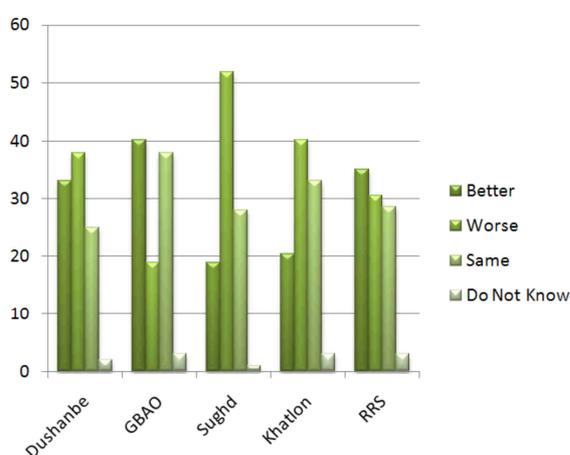


Figure 100: Perceived environmental situation at the regional cross-section
(Source: Olimova and Olimov 2012: p. 21)

In contrary, respondents in Kuhistoni Badakhshon normally started the discussion about environmental issues by acknowledging that they live in the most beautiful spot on earth. People know that the Tajik Pamir is one of Central Asia's most significant reservoirs of biodiversity and water. They are very proud about animals, plants and the purity of the fresh water. The wide variety of rich natural resources, inter alia enough water, a rich biodiversity, and scenic beauties (with the potential for tourism) are facts that have also been described from a scientific point of view, e.g. by Breu and Hurni (2003). Scientific description and people's perception are congruent. In Kuhistoni Badakhshon no one chose environmental changes as a priority problem (see Figure 81 in section 8.3.2); nevertheless, in the course of the interview it was discussed and concerns were articulated. Olimova

and Olimov (2012: 21) assert in their cross-regional study that: “In GBAO, in contrast, only 18.8% of respondents believed that the environmental situation had deteriorated in recent years.”¹²⁰

Nevertheless, climate change and natural disasters always were important discussion points. Respondents stated that they had to live with natural disasters for centuries and that they are used to “cooperate” with an inhospitable and difficult environment. Maybe this fact is the reason that people of Kuhistoni Badakhshon do not perceive the environmental situation as deteriorating, when asked directly. In the course of the interviews several respondents in the Pamir admitted that people often act with nature in a non-favourable manner, either because they do not know or because poverty forces them to exploit nature. Many Pamirian households are increasing their vulnerability by building houses in hazardous zones, constructing roads without geological exploration, failing to observe the water use regime, tilling and watering unstable slopes, illegally cutting of trees and *teresken* bushes for fuel and animal fodder (already identified by Breu and Hurni 2003), ploughing of sloping lands (Figure 101), poaching or having an exploiting pasture management. One man stated that the land where trees and *teresken* were logged has been converted to cropland and meadows to keep up with the dramatic population growth. He emphasized that the trees used to serve as windbreak and now when missing; the erosion by wind can worsen the situation. He clearly outlined the need for Pamirians to have fewer children. Some respondents realised that this “wrong behaviour” (as they call it) on the one hand leads to increased risk from exposure to natural hazards and on the other hand can cause significant socio-economic losses. In the past decades land degradation has reduced biodiversity, polluted water reserves and impoverished farmers. Such anthropogenic pressures on the natural environment together with the effects of climate change are dramatic for the region.



Figure 101: Farming in slopes in Andarv, Roshtqala District
(Source: Zimmermann, 2013)

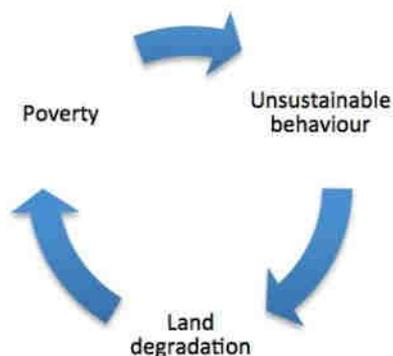


Figure 102: This “poverty-environment nexus” creates a vicious cycle of reduced earnings and a degraded environment
(Source: Christopoulos and Siebenbrunner 2014)

In both study areas the connectivity of poverty and environmental degradation was striking: smallholders are using (over-exploiting) the commons because of limited own land resources. This in turn has very negative effects on vegetation cover and fodder production. Christopoulos and Siebenbrunner (2014) call it a vicious cycle (Figure 102).

I realised that the poorer people are, the more they tend to consider hazards and disasters as an unavoidable affliction and they act unreasonable. This motivated me to consider Bourdieu's (1977b) statement for human action. According to Bourdieu human action shapes and is shaped by the broader structural and cultural barriers of particular contexts. Furthermore, he argues that human

¹²⁰ In contrast means: the majority of respondents (52.3%) in Sughd Province indicated an obviously deteriorated environment.

action is a product of the dialectical relationship between objective and subjective structure (cognitive structure). This underlines my conclusion that in the case of despair and hardship humans “forget” about these deeply inscribed dispositions that pretend how to act in a practical sense and “adapt to” the specific, new situation.

9.2.2 Climate Change

According to Bourdieu (1984) the habitus determines class-specific ways of thought patterns, perception schemes and judgement schemes. Habitus is created by result of free will and determined by structures that are both shaped by past events and structures. In turn, these dispositions shape current practices and structures and people’s perception. These issues play an important role of people's understanding, behaviour and valuing of climate change, natural hazards and related risks.

Farmers in Khatlon reported that they experience effects of climate change and their impact on production. They recognize unreliable availability of rain and stream flow, reduction in crop yields or loss of biodiversity. And they realize that it is becoming increasingly difficult to adjust to climate change and extreme weather in a proper manner. Local (indigenous) knowledge, practises and traditional customs can help to overcome such threats. Surprisingly, environmental and agricultural local (indigenous) knowledge seemed to be not well developed in Southern Khatlon or even seemed to have vanished during the Soviet period. I remember one man who told me that he is originally from Shurobod District (a mountainous area), but is now living in Hamadoni District in a flood plain. He acknowledged having hardly any local knowledge or beliefs that is appropriate for this region. When the question about indigenous knowledge was repeated two or three times, especially elderly people started to discuss among each other and often they came up with certain local knowledge or practises. For practical work, like those implemented by NGOs, it is important to recognize the diversity and complexity of local knowledge and practices, to understand local contexts and needs for combining local knowledge with scientific knowledge (Dekens 2007a, Schmid 2009). According to Dekens (2007b) it is more appropriate to identify the available local knowledge, the practices and contexts of a community than to assess its vulnerability and missing knowledge. This helps adapting external knowledge to local contexts and integrating the community into any development endeavour. On the other hand the focus group discussions in Khatlon revealed that few farmers have certain resilience to environmental difficulties. These farmers try to adjust their farming methods by changing the crop variety, planting trees to get some shade for crops, building a water-harvesting scheme or implementing soil conservation techniques. Other farmers, however, adjust in a questionable way like flooding the fields instead of irrigating them in an appropriate manner or they reported changing from crop to livestock which is in many areas not sustainable because of limited fodder availability. Some farmers see also some opportunities in climate change, for example in new plants that can grow in a warmer environment. But the majority of the interviewed farmers has no information on how to adapt or has no means to do so.

Most Pamirian respondents considered the intensification of global climate change processes as a problem. They observe changes in weather patterns, like more droughts or longer winters, more intense precipitation and they observe the increased melting of the glaciers. These changes not only threaten people’s lives but also the resources and sources for their existence. Local (indigenous) knowledge is more prevalent than in Khatlon. In Kuhistoni Badakhshon oral tradition and instruction of the young generation is still ongoing and is promoted by the different Aga Khan institutions, like Ismaili Tariqah and Religious Education Board (ITREB), Focus Humanitarian Assistance and Mountain Societies Development Support Programme.

9.2.3 Natural Hazards

In Southern Khatlon the effects of natural hazards (and climate change) strongly depend on the location of the village. In Farkhor most respondents mentioned flooding of Pyanj River, strong wind and drought. In Shurobod mudflows, landslide, damaged roads and bridges are the main problems. In Pyanj people from one village feared the collapsing of the hill situated nearby, because it contains water. Other problems are river bank erosion, flooding of the Pyanj River, and mud flows. The increasing extreme weather events are another factor that contributes to the high vulnerability of the population in Khatlon.

Flooding, often in combination with high groundwater level (e.g. due to intense irrigation) is the most common natural hazard in Khatlon. People, especially near Pyanj or Surkhob River, are highly concerned. Floods regularly destroy natural resources and crops (beside assets and infrastructure) and have, therefore, a tremendous effect on peoples' live and livelihood.

Respondents stated that they consider themselves as responsible for their neighbours during and after a natural disaster. Villages communicate with neighbouring villages or notify each other about forthcoming floods. In a number of households people could even show me a bag prepared with useful items and important documents, ready to take with. Most of the families will try to escape to a safe haven in case of flood or other sudden-onset disaster. However, many complained that it is not known to them where the safe place is located and how to reach it as transportation capacities are limited. Therefore, awareness raising and capacity building in preparedness and response is required. According to the unpublished Baseline Assessment Report for the Community Participatory Flood Management Project in Khatlon District (ACTED 2009) over 80 percent of the villages in Khatlon are missing hazard and risk maps, evacuation plans and action plans for the prevention of floods and other disasters; although local government officials pretend that the level of awareness and knowledge is quite well. On the other hand, early warning systems seem to function in almost 70 percent of the villages. Half of the villages have already a dedicated person who is responsible for the warning in case of an emergency.

Pamiri people are used to live with different natural hazards; this is also known from other mountainous places (Zimmermann & Keiler 2015). They like to talk about the topic. Settlements in the Western Kuhistoni Badakhshon are located in valley bottoms along rivers or on alluvial fans where people are mainly engaged in irrigation farming. People know that the probability for natural hazards like mudflows, avalanches or floods is high and that such events can easily destroy parts of the village and agricultural land. But to stay on ancestral land is often valued much higher than the fear of repetition of an event like the Dasht flash flood (see case history II, section 8.2). Such behaviour is also known from other places, e.g. in Switzerland, where the disasters of 2005 and 2011 in Brienz and Guttannen provoked similar discussions (personal communication).

The lack of arable land and often unfertile soils in the Pamir require high labour input for farming. And people are hardly able to produce sufficient yield for subsistence. Due to population growth in the more urbanised centres the pressure on land increases; this in turn provokes that people are more and more settling and farming in areas prone to natural hazards although they are fully aware to be eventually hit in future by an avalanche, debris flow or a similar event. This is a well-known risk management strategy where benefits are valued much higher than an eventual loss in far future. However, it became clear that many respondents feel helpless in the face of these manifold problems and either expect help from government, NGOs or His Highness the Aga Khan. They often stated that everything is in the hands of God and that they only can try to survive from one day to the next. Such views can be confirmed by Douglas and Wildavsky (1982) who point out that attention to environmental risks involves a choice: either people have less time and fewer resources to other

problems like poverty or they neglect the environmental issues and “go into the hands of God” how people in Tajikistan call it and care mainly about their daily hardships. Douglas (1982) interprets poverty as a clear “restriction of choice”. But it would be too easy to blame only the practices of poor farmers for the environmental degradation. Government’s negligence, corrupt politicians and officials, wealthy people, etc. contribute to the poverty of the population and are therefore responsible for people’s vulnerability as well.

9.2.4 Relation to God or Supernatural Forces

About half of the respondents in Khatlon and about one third of the respondents in Kuhistoni Badakhshon considered natural disasters as an act of God. The idea of God who punishes and directs man to his place in the hierarchy is still valid in large parts of the Tajik population; an idea that was also widespread in our Western thinking till about the 18th century and is today no longer pursued (Felgentreff et al. 2012: p. 24 and 50), with some exceptions. Some religious leaders (and sometimes even politicians) explain the event with using metaphors like “punishment of God”, “revenge of nature”, “wrath of God”, etc. (Bimal and Nadiruzzaman 2013; wikipedia.org¹²¹) if the dimension of the catastrophe is too big and for people no longer explicable (e.g. the Indian Ocean tsunami 2004 with approximately 230.000 victims or Hurricane Katrina 2005 with 1,836 victims). In the United States of America insurance companies of different states categorize a list of events (like floods, storms or earthquakes) caused by natural forces that cannot be controlled or prevented as “Acts of God” (but definitely not as punishment) and the insurance might pay for some of the damage (Hollingsworth 2015).

Generally spoken, people in traditional societies tend to perceive the role of God in disasters as more immediate, simple and direct than do people in urban-industrial societies. In countries like Tajikistan where poverty is high and people are often overwhelmed by the manifold problems they have, religion can be a key force behind the way individuals or communities interact with notions of natural disasters. Fatalistic attitudes in relation with natural disasters may also be seen as a natural response to forces that seem beyond the particular individual’s control. Usually Tajik people practise their religion and the perception and explanation of God, who punishes people by means of avenging nature, is widespread and accepted. Several respondents stated that “people did something wrong and therefore had to be punished by God in the form of a natural disaster”. According to Hitzhusen and Tucker (2013) “Religion has a central role in the formulation of worldviews that orient humans to the natural world and the articulation of ethics that guide human behaviour.” During the interview with the man who lost his family in the 2002 Dasht mudflow (case history II in section 8.2.), it became clear little by little that he considered himself responsible for the personal consequences of this disaster. At the time of the disaster he was working far away from his family. He thought that he had to be punished with the death of almost his whole family because his social behaviour was not according to the rules at this time. Douglas & Wildavsky (1982) call this behaviour fatalistic attitude. But the man’s attitude does not represent a pure fatalism. He has chosen the option to change his behaviour, because he thinks that God gives him a second chance. In this way, the types of experiences that someone has in his life can make religious explanations more or less useful for him.

The interviews and focus group discussions in Khatlon revealed that in general villagers and farmers perceived the role of God in disasters more immediate, simple and direct than did religious leaders,

¹²¹ https://en.wikipedia.org/wiki/Hurricane_Katrina_as_divine_retribution (last access September 2015)

respected villagers, villagers in leading positions or schoolchildren. Nevertheless, having asked related questions about religious aspects in the course of the interviews, the answers of the adults were often rather ambiguous. This ambiguity may result from the helplessness many villagers or farmers feel towards the problems they face. On the one hand they realise people's misuse of natural resources, environmental mistakes and subsequent losses, on the other hand they show a clear resistance for changes towards improved conditions and higher benefits, maybe also because of religious reasons, like "we anyway cannot change our destiny". According to Finucane et al. (2000) the inverse relation between perceived risk and perceived benefit of an activity is linked to the strength of positive or negative affect associated with this activity. People, who have a good feeling with one thing, have the tendency to underestimate risks and overestimate benefits. People, who have a bad feeling with one thing, have the tendency to overestimate risks and underestimate benefits.

Furthermore, they often have an outspoken lack of confidence in the social system, they do not have the means (adequate knowledge, tools, funds etc.) and assistance (from professionals, government etc.) to behave differently and to solve these problems. They normally also have a clear lack of self-confidence to initiate changes.

In contradiction to the statements about God's will and inability to initiate changes, almost everybody (Khatlon 82 percent and Kuhistoni Badakhshon 97 percent) considered humans as vicegerent (*khalifa*) of God on earth; and they agreed that humans have the role of global stewardship and therefore have to take care for the integrity of Creation as an intrinsic value. Furthermore, several respondents were aware that our earth has to be preserved for future generations. Mainly women got angry about the increasing cutting of trees and the degradation of the vegetation cover.

The interviewed schoolchildren in Khatlon rarely used religious aspects to explain climate change and related natural hazards. They showed a differentiated perception that clearly varies from the other stakeholder groups. It became obvious that children and youth look at these issues in a natural way, but at the same time they are not very much concerned. Although they already discussed natural disasters at school or at home, they are often not aware of climate change and have little knowledge. Everybody agreed having these topics integrated into the official school curriculum and not only briefly touched in environmental education. Such efforts were discussed on national level and appeared already in 2008 in the first draft of the *National Disaster Risk Management Strategy for the Republic of Tajikistan 2009-2015*. However, despite of commitments by the disaster management sector it remains a long way to have it fully anchored in the official school curricula, and finally to arrive at schools in rural places of the country.

In Khatlon respondents sometimes find support in ritual practices like *arshigulon*¹²², the rain prayer. Mainly women narrated from this event during spring time where people sing and ask the rain to fall and bring fertility to their agricultural land. The text of the song was made available by the National Programme Officer for Art and Culture from SDC who interviewed for me an old man from Khatlon who knows a lot about traditions and rituals:

"Аршагулони ростина	<i>Arshaguloni rostina</i>	The real Arshigulon
Як бор бичунбон остина	<i>Yak bor bijunbon ostina</i>	Please shake your sleeves
Галлаи сабзи мо кок шудай	<i>Ghallai sabzi mo qoq shudai</i>	Our green millet became dry
Як бор бирезон борона"	<i>Yak bor birezon borona</i>	Please spill the rain just once

¹²² Breed (2015) examines environmental aesthetics and social engagement, as well as cultural histories in conflict resolution, through examples of her work in Central Asia. <https://angiespoliticsofperformanceandmemory.wordpress.com/precis/> (last access August 2015)

According to Dekens (2007b: p. 58) religious and spiritual beliefs and practices help people to deal with the uncertainties of life. She calls it an important coping strategy. And Koen (2003) states that supernatural forces have a positive influence on peoples' daily lives and a strong healing effect as well.

Only few respondents in Kuhistoni Badakhshon were convinced that the problems mainly exist because people are not living in a responsible manner towards nature and environment. This statement is in contrast to the results of question 9 where almost everybody said that human beings have to live in a responsible manner towards nature and environment. Several people desired more education and awareness raising programmes for the population. One respondent thought that the will to do something is given, but people do not have the means, be it money or know-how.

Several villagers who live along the river Pyanj narrated that they tend to blame Afghan people for certain natural disasters. Villagers from Khorugh, Sokhcharv, Buni and Choshtkandez confessed that people opposite the river in Afghanistan have very strong beliefs and charismatic *mullohs* with supernatural forces. It is said that in Chosnudi Bolo Village in Shugnan District (Afghan Badakhshan) people keep a strong magic book, where magical practices are written down. Several examples should document this influence: the river Pyanj is meandering and when the water is mainly flowing on the Afghan side and the accumulation of sediments occurs on the Tajik side, Pamirians are convinced that Afghan people are able to change the course of the river. One winter Afghan people were also able to "release" a huge avalanche that destroyed agricultural land on the Tajik side. The scariest story was about how Afghan people can change the weather: according to one respondent a religious leader has to hold a human head into the river while singing until the weather changes. Like in Central Asia, where people believe in supernatural forces and shamanism, Afghanistan has shamanistic traditions as well (Sidky 1990). According to Sidky remains of ancient shamanic elements are especially found in association with the sacred shrines, and in the beliefs and practices of Afghan ascetics like the *malang*. Such beliefs and practices constitute still an important part of the total cosmology of both rural and urban populations. Supernatural forces and shamanism help people in Tajikistan as well as in Afghanistan to cope with the ultimate problems of human existence.

9.2.5 Sources of Information about the Topic

In Southern Khatlon *mahalla* committees, CoES committees and the *mullohs* are important institutions to get informed and instructed concerning the manifold problems of villages, including climate change and related natural hazards. Whereas *mahalla* committees try to engage people in community work like cleaning of water channels, repairing roads, construct small-scale protection works against floods, helping poor families etc, the CoES committees clearly focus on response and recovery after disasters, but also on disaster risk reduction. The *mullohs* act as mediator between the different committees and the population or between individuals (see section 7.3). Furthermore, *mullohs* inform and explain news from the local or regional *hukumat* or from NGOs in the mosque. As such they play an important role in addressing and solving all kinds of problems. Particularly the less educated villagers will carefully listen to them. Several respondents underlined the effectiveness of working with religious leaders, recognizing the influential role they have upon the setting of social norms or to get informed about changes in Tajikistan. Almost half of the villagers listed the *raisi mahalla*, their neighbours and relatives as sources of information, indicating that sharing information by word of mouth is still a common practice among rural people. In general, men were better informed than women what can partially be explained by their better education levels and literacy, as well as their culturally defined roles in decision making and division of labour.

In turn, in Kuhistoni Badakhshon the Village Organizations (VOs) are the most important institutions to get informed and instructed concerning the manifold problems of villages, followed by CoES committees, *khalifas* and *mullohs*. VOs can mobilise human, physical and financial resources for community projects. The aim is to foster the economic development and to strengthen the capability of villagers to manage their own resources and increase their resilience and standard of living. In Kuhistoni Badakhshon religious leaders play an important role in the life of villagers as well. While *khalifas* are mostly appreciated, there is a certain reservation vis-à-vis *mullohs* who are said to be a kind of businessmen with the desire to earn money. Especially the younger generation does not fully appreciate the advices of the *mullohs*. The *Khalifas* are highly appreciated, because they bring and explain the *farmons* of the Aga Khan. Originally such *farmons* deal with questions about religious practice and doctrine. I was told several times that nowadays *farmons* also address environmental issues. Especially in remote villages residents appreciate when the *khalifa* is coming and discusses with them daily problems or gives them general advice on life decisions. Information sharing by word of mouth is a common practice in the Pamir as well, like a Pamirian friend of mine said: "I think, every Pamiri knows everything about the other Pamiris. Not even abroad one is safe from the bush telephone."

In general, the local mosque (in Khatlon) or the *jamoat khona* (Kuhistoni Badakhshon) serve as a gathering place when it comes to inform villagers about important news or discuss problems of the community.

In both study areas many respondents also learn with their children or grand-children about the topic, when children bring home their knowledge from school. Radio and TV are sources of information as well, but not very reliable, because of non-availability of radio and TV sets and of poor electricity supply. Newspapers are too expensive; only a small group can afford to buy them. Similar results were found during a Social Survey in the course of an ADB project in Khatlon in 2007 (unpublished report) and Wiegmann (2009) for Tajikistan.

9.3 Interlinked Risks and Challenges

Besides the above described vulnerability to climate change and related natural hazards, several other problems put people's well-being at risk. Precarious health conditions, a deteriorating school system, economic constraints or missing trust in the political system constitute major challenges for a prosperous life and livelihood. According to Schneiderbauer and Ehrlich (2006: 84) "Vulnerability is related to poverty. The poorest societies have the fewest resources and opportunities to significantly reduce vulnerability." This is obvious in some of the very rural and mountainous areas of Southern Khatlon (e.g. villages in Shurobod district) and Western Kuhistoni Badakhshon (in particular in faraway valleys like the Bartang) where poverty is widespread and communities struggle with risks from natural hazards, health or economic risks.

9.3.1 Health, Education, and Daily Corruption

Health risks are by far the most important current problem that concern and stress individuals and households in Khatlon and Kuhistoni Badakhshon. Almost everybody complained about the insufficient and expensive health care system. During the Soviet period primary health services were free of charge. However, the health care system collapsed after the independence and the following civil war. Low-paid doctors, nurses, hospital administrators and others started to demand informal out-of-pocket

payments (Khodjamurodov and Rechel 2010). Many respondents in Khatlon and Kuhistoni Badakhshon, especially the very poor ones, stated that almost nobody is able to pay these high demands.

The situation is precarious because of various reasons: the two frequently mentioned were: (1) There is a lack of professional doctors, nurses, health workers and health points in Khatlon. According to most respondents this reflects the overall critical economic situation and (2) People are increasingly ill because of various reasons; among others: food shortage and malnutrition is quite widespread among children, women, elderly and handicapped persons, especially in remote villages; it contributes to a generally weak physical condition and higher susceptibility to become ill. School feeding programmes in a number of villages are welcomed in Khatlon and Kuhistoni Badakhshon, but are only a short-term remedy. Nevertheless, according to UNICEF¹²³ "school feeding contributes to the education and well-being of children. A hungry child does not grow, cannot learn as well and faces many health risks in the future." And Lambers (2009) argues that school feeding has another positive effect: parents send their children regularly to school, knowing that their children have at least one hot meal per day. Many parents in the remote sites of Shurobod District (Khatlon) positively mentioned the WFP/UNICEF programme (Figure 103) where their children get a meal after the second class of the day.



Figure 103: Children's soup is accompanied by bread made from WFP fortified wheat flour (Source: www.examiner.com).



Figure 104: Bilateral development assistance, often through NGOs, provides basic health care facilities. However, the issue of personnel is not resolved with physical structures (Source: Zimmermann, 2014)

One example in Kuhistoni Badakhshon impressed me and was thought-provoking for the relation between economic constraints and health: The head of the family in a village in Kuhistoni Badakhshon told that his mother tumbled down the stairs two months ago; the nurse from the nearby health post (Figure 104) diagnosed her with a fracture of the femur. The son asked about treatment in the hospital, but the transport and the hospital costs were too expensive for the family and now the grandmother is kept at home. The *mulloh* administers some pain-mitigating herbs. The grandmother was sitting on the veranda during the interview and everybody who passed by took care of her in a lovingly way. The family said that grandmother is never complaining.

Tajikistan is currently in the transition process from a Soviet specialist-based system to a family medicine based primary health care (PHC) system. This system aims to be more accessible and affordable for the poor (National Development Strategy of the Republic of Tajikistan for the Period to 2015)¹²⁴. Due to lack of funds from the government side, different foreign countries (for example

¹²³ <http://www.un.org/en/ecosoc/innovfair2011/docs/wfp.pdf> (last access September 2015)

¹²⁴ <http://www.unpei.org/sites/default/files/PDF/TAJ-National-Development-Strategy-en.pdf> (last access September 2015)

Switzerland) and NGOs (for example Caritas) try to fill the gap and fund and implement corresponding projects. While often there are sufficient resources for the construction of facilities, the issue of available, well educated personnel remains unattended.

Beside the perceived overwhelming health and nutrition problems, respondents in Khatlon and Kuhistoni Badakhshon clearly manifested deficiencies in the educational system. Most people acknowledged that good education is crucial for the future well-being and they complained about the lack of everything concerning the school system. They regret that teachers and other specialists in the region move to bigger cities or even abroad, because salaries are very low; as one man said: “Teachers are so badly paid that they either leave the village or become corrupt.” Furthermore, young people that have the chance to study in the capital or even abroad hardly come back to their village after the education is accomplished.

In some remote villages in Southern Khatlon is a growing tendency for parents to see their sons as future breadwinners and to consider that girls (future wives and mothers) only need basic literacy and numeracy skills in primary school and are of higher value when staying at home, helping in the household and getting introduced in a wife’s domestic sphere. A number of interview partners in those places have even the opinion that girls do not have to go to school the compulsory 11 years. Marriage at the age of 16 or younger is no longer unusual for girls, despite the fact that marriage for persons less than 18 years of age is prohibited by national law (Malyuchenko 2015). When a girl marries, she will become a member of her husband’s family and will no longer be an economic burden for her family of origin (UNICEF 2010)¹²⁵. According to a report by the Eurasia Foundation (Ranjbar 2012), Tajikistan’s widespread poverty is one of the main drivers of early marriage in the country, although my respondents explained it with their tradition: now, after the Soviet period, this tradition can be lived again. Marriage (like funeral) seemed to me as one of the last strongholds of “traditional culture” in a time where people are challenged with development pressures and rapidly changing social structure. To explain it with Bourdieu (1977b): a person, who wants to correspond to the social norm of its society, strives more to social approval (integration), rather than to pursue profit maximization. I consider the two described views (UNICEF/Ranjbar and Bourdieu) as to be interconnected. The subject is highly complex (ambiguous) and would be worth for closer examination.

Lack of education is a distinct disadvantage, for example in case of divorce. The woman’s family hardly wants her daughter back and so the woman has to manage her life as a single mother with no support. The gender gap and education inequality continue to grow. I consider this development as a clear step backward as compared to the Soviet period where a well-functioning school system for girls and boys was prevalent (see also section 9.3.2 on Gender Aspects below).

Contrary to the above described attitude of people in remote places, several females clearly manifested during interviews and focus group discussions that they regret to be that poorly educated. They were often ashamed and some of them desired to have the opportunity to learn or visit courses but concluded that their life, unfortunately, consists of working for the family only. Few women and men explicitly noticed that girls should have the opportunity to go to school as long as possible. In Kuhistoni Badakhshon the education system is rather well functioning and the region has a comparatively high educational standard based on the unifying vision of the Nizari Ismaili culture. It clearly came out that schools that are supported by AKDN are better off than government schools. Teachers of government schools complained about low salary, the compulsory quarterly medical check, bad conditions of school buildings, not well equipped school rooms (tables, chairs, books,

¹²⁵ http://www.unicef.org/protection/57929_58008.html (last access September 2015)

notebooks, writing utensils, etc.), old curricula etc. No teacher can survive only with his salary; they all have either a second job or they additionally work in agriculture.

In Kuhistoni Badakhshon boys and girls go to school for at least the compulsory 11 years. People told that his Highness the Aga Khan always states that the education of girls is very important for women and the society, like one of my friends confirmed: “My father always said: Education is a golden bracelet for a woman.” The Aga Khan Education Services (AKES) operates schools and advanced educational programmes that provide quality pre-school, primary, secondary, and higher secondary education services. AKES operates two model schools in Central Asia, one in Khorugh, the capital of Kuhistoni Badakhshon and the other in Osh in the Kyrgyz Republic. For further information see <http://www.akdn.org/akes> (last access September 2015)

In both study sites it seems to be a big problem for young people to go to the university: respondents complained about corrupt professors who demand “entry fees” or money for getting a diploma. “Not the cleverness counts, but money” like one respondent from Khorugh stated. Poor families rarely have the chance to let their children go to university; in contrary the wealthy families are able to buy a doctor’s degree for their child, like the family in Kuhistoni Badakhshon who paid for a dentist’s degree for her daughter and finally equipped a dental clinic for her. Bourdieu (1977a) observed that the middle or upper-class child often enjoys cultural as well as economic advantages. For the case described above this may be true. For the family in case history III the situation is somewhat different. The parents definitely have the cultural capital, but not the economic one what make the situation difficult for them.

9.3.2 Gender Aspects

In the course of this research it became obvious that gender aspects are highly important in the daily life of households and communities (women-headed households, missing men’s workforce in agriculture, etc.). In this short section only a few aspects can be highlighted; the magnitude of the issues would require a research in itself.

The policy pursued by the Government of Tajikistan is to create equal conditions for men's and women’s development according to the *State Programme on Main Directions of the State Policy on Providing Equal Rights and Opportunities for Men and Women in the Republic of Tajikistan in 2001-2010*¹²⁶. Furthermore, the National Strategy 2011-2020 aims for enhancing the role of women. These goals are far from being reached.

After the civil war life in general became difficult. Men were those who could get a job. Women were more and more forced to stay at home and manage the domestic work and child rearing (Khuseynova 2013). Furthermore, women’s workload is growing with increasing labour migration of men. According to Olimova and Bosc (2003) family agriculture is not a traditional female activity in Tajikistan, but it has become women’s responsibility as a result of male labour migration.

In Southern Khatlon it is a huge disadvantage that women hardly obtain plots of land from privatized corporate farms. Therefore, they often have to work in *dekhan* farms where they work hard for getting almost nothing. A social survey in the course of an ADB project in Khatlon revealed that sometimes women are even not paid, but receive a certain amount of wheat or dry cotton seeds (ADB 2007). During this survey it became obvious that women headed families have a hard time; women

¹²⁶ <http://www.stat.tj/en/Gender6/gender12/> (last access September 2015)

are responsible for almost everything in the household and have a much higher workload. Psychological stress, shame and anxiety are high among these women. Labour migration may also have negative effects on child education, because the father is missing or children (and women) are exploited by teachers or land owners. Sometimes women become more self-assured and they will rebel when the husband comes back and wants a daily life as before. The high workload might be one reason why the very important kitchen gardens are disappearing as many respondents reported. As long as the family members can send remittances to their families the economic conditions are bearable. However, it constitutes an extremely burden when the money flow from abroad ceases. Living far from home often changes people's expectations and their view of the constraints of tradition in Tajikistan. Sometimes men go on to put down roots in Russia, divorce their wives back in Tajikistan and remarries. Life becomes very difficult, especially for divorced women living with the relatives of their absent husband (Varbaro Glenn 2009). Such women often perceive their situation or position as lowest level. They do not know their rights (Ranjbar 2012) and think that they are of no value and try to meet the demands of the husband's family, so that the family does not ask her to leave. According to Bourdieu, three factors contribute to the perception a person has of its position: internalized objective reality (*habitus*), assets (*capitals*) and time. Above described women think that they have neither the one nor the other. Women in the families of their husband often have some cultural capital that they received in their family of origin. In the new family their position is rather low and they do not have economic capital to further develop. and they do not have the time to get more cultural or economic capital. They are dependent on the goodwill of the family, especially their mother-in-law.

Women in Kuhistoni Badakhshon traditionally enjoy better status as compared to other regions of the country due to religious and cultural factors in the region. However, after the collapse of the Soviet Union there has been a dramatic change in the gender balance within all topics of life due to the political and economic transition. As it became difficult to get a job for everybody, women were the first to remain at home and to learn to adopt "the old roles", meaning to be responsible for the domestic sphere. Women had been forced back into subsistence production, housework, and, if possible, small trading in order to cope with the very difficult economic situation. Due to the absence of men (who are working abroad) wives or grandmothers are responsible for a number of seasonal activities. Often they also have to do work that has been done by men in the past. Furthermore, wives and grandmothers are more and more solely responsible for the child rearing. These responsibilities are often too much and it happens that children get neglected. In addition, women no longer had time to participate actively in the "public" decision-making scene and they have limited access to resources and income generating opportunities. Being more restricted and less mobile than men, it remains a challenge for women to rely on safe living conditions, on good social services and on income opportunities in the vicinity. The Mountain Societies Development Support Programme (MSDSP) is addressing some of these issues in a number of projects with a particular gender lens (Bliss 2006 and AKDN 2002). In general, Pamirian families try to avoid sending their men to Russia or elsewhere for work. In this effort the extended Pamiri family plays an important role (Zimmermann 2006).

10 Conclusion

"All technology is coming from countries like yours and as these countries are mainly responsible for the problems with climate change, you can give us your technology to solve them. It is up to you!"
(Farmer in Pyanj District 2012)

This chapter concludes the research by commemorating the background, discussing the results based on the research questions and hypotheses, and reflecting on possible consequences for research and practice in future.

Background:

The research aimed to contribute to the understanding of Central Asian Muslim's perception and interpretation of nature and their views and approaches to today's environmental changes and risks. Central Asia is highly disaster-prone; particularly in Tajikistan, climate-induced disasters like floods, droughts, or mud flows constitute a major threat to people's live, livelihood and (sustainable) development. Whereas scientific technical knowledge about climate change and resulting natural hazards and environmental degradation exists to a certain extent, the knowledge about local people's perception and interpretation of nature and its hazardous development is scarce. This gap was addressed by fieldwork using ethnographic methods carried out in selected villages in Southern Khatlon and Western Kuhistoni Badakhshon in Tajikistan. The interpretation of the results explains differences of the scientific technical and local citizens' views and highlight to what extent the perception and resulting actions are influenced by various constraints like health, economy or social security on the one side, and educational background, religious affiliation and depth of religiosity or gender on the other side. Furthermore, an extended review of today's literature of the Muslim academic community about Islam and the natural order, environment and climate change was conducted, analysed and discussed.

Discussion concerning the research questions and the hypotheses:

There were two specific objectives that the research intended to address: (1) To review the current state of scientific knowledge in the ongoing international debate among Muslim academics on "Islam and the natural order, environment and climate change" in general, and (2) To contribute to the understanding of people's perception, interpretation and ways to manage risks from climate change and related natural hazards in Tajikistan. Based on these two objectives, the results of this research give answers to the research questions outlined in chapter 1. In the following paragraphs these research questions are taken up, discussed and interpreted using the results given in chapters 4 to 9. In addition, the initially identified three hypotheses will be checked.

The 1st research question asks on what specific religious grounds (Qur'an, Hadith and others) Muslim academics argue to protect the environment and to cope with climate change and related natural hazards.

Religious worldviews are important in shaping individuals' and communities' perception and interpretation of environmental issues, climate change and related natural hazards. Religious beliefs,

attitudes, and values can promote or inhibit people’s behaviour towards environmental issues. Muslim scholars and scientists from various sciences have recognized that the guidelines for environmental ethics fit well with the Islamic concepts. They promote a relationship between humans and the environment that is based on responsibility and humans’ God-given role as vicegerent on earth who has to take care of God’s creation. They mainly justify this with the written ethical code in the Qur’an and to a lesser extent with the Hadith. Furthermore, they argue with the Islamic concepts (also called principles) that they derive from Qur’an, Hadith and Shari’a (see section 4.3). Knowing that Qur’an and Hadith emerged at a time and in an area where life was marked by a struggle for survival and limited natural resources, one can understand that these concepts were important for the survival in those days. Today Muslim scholars and scientists adapt these concepts (Table 23; the same table like table 5 in chapter 4.3) to modern times and apply them to discuss today’s environmental issues, like protection of the environment or coping with climate change and related natural hazards.

Table 23: Explanation of concepts related to today's environmental problems

Arabic	Today's explanation related to the research topic
<i>āyah;</i> <i>āyāt</i>	Scientists explain that everything in nature is a sign of God and they express their concerns regarding nature, environment, climate change and natural disasters with selected verses.
<i>tawhīd</i>	Each individual is responsible solely to God for his actions. Therefore, abusing any of God's creations (living beings or natural resources) is a sin.
<i>fiṭrah</i>	The key concept of <i>fiṭrah</i> underlies Muslims’ responsibility to the environment. No change should be in the creation of God, but human's behaviour is disrupting the balance of earth’s nature. Humans disobey God’s will and therefore violate <i>fiṭrah</i> .
<i>mizān</i>	Scientists use for the sensitive ecological balance the term <i>mizān</i> and argue with it when it comes to disturbing phenomena in nature, like the greenhouse effect.
<i>khalīfa</i>	Contemporary commentators define the word <i>khalīfa</i> as “God’s vicegerent” on earth. God has as entrusted humans with its safekeeping.
<i>ribā</i>	Some scientists think that the intense economic activities with its profit motive have to be reduced or stopped, so that the exploitation of resources can be prevented.
<i>tawakkul</i>	The Qur’an says that God will take care of human’s maintenance, but unconditionally trust or a misreading of this <i>tawakkul</i> can also be unreasonable and can lead to harm.

Muslim scholars and scientists argue that Muslims are an integral part of nature (environment) and therefore responsible for the use of it, not only because nature is a “sign of God”, but also, because “nature is God”. The natural order is seen as *āya* or *āyāt* that refers to signs of God’s existence in nature and in the Qur’an as verses. The concept of *tawhīd* indicates the monotheistic unity of God and is an expression of the unity of God with all of creation. This unity with creation gives expression to the fact that everything in the world is part of creation and is related to everything else, which makes the entire world significant, valuable, and worthy of protection. The concept of *fiṭrah* is understood as the original state of creation or the original nature of things. Fazlun Khalid (2002a) attaches great importance to this concept. He thinks that earlier civilisations' tendency to act in a good or bad manner was kept in check by the natural order of things and that humans unconsciously lived within the unwritten laws of nature. This was lost more or more. Therefore, Khalid calls for a re-establishment of the state of *fiṭrah*. In addition, Muslim scholars and scientists are using the concept of *khalīfa* (stewardship) to interpret the role of human as steward or vicegerent of God on earth who carefully nurse, look after and accurately use nature and the respective natural resources. Furthermore, Muslim scholars and scientists use additional concepts to explain how people should deal with environmental issues, climate change and natural hazards. They often use the concept of *mizān* (balance) to show that humans are part of the balance of nature that is responsible for the human

well-being. When humans disturb this balance, for example with environmental degradation, an imbalance is created. However, disturbances of this imbalance are not necessarily seen as disastrous. Only from the anthropogenic perspective they may be considered as a disaster. This concept is very well in line with today's discussion about sustainability and sustainable development: the use of natural resources has to be balanced and should not exceed what nature is able to reproduce. Concerning the topic of this research two other concepts have been important for few authors as well: *ribā and tawakkul*. According to the majority view of Islamic economic laws, all natural resources on the land, in the sea and in the space belong to the general public. God allows all people to benefit from these resources in a rational way. Therefore, they should not be monopolized by certain persons, classes or societies and thus harm other people. Overexploitation is forbidden, can be considered as *ribā* (usury). This concept fits well with today's propagation of a balanced resource management. The concept of *tawakkul* (trust in God) means a Muslim's trust and acceptance of the divine will. Muslim scholars and scientists think that depending on the person *tawakkul* can also include elements of laziness, disability, a resigned or careless attitude and state that *tawakkul* does not mean that humans should not plan and work based on what God has blessed them in knowledge, intelligence and free will. That is why Kowanda (2011) warns the faithful to think critically and to adapt to today's situation, as well as environmental issues and natural resources.

Nowadays, the Western scientific view on nature, climate change and natural resources considerably changed: resources are limited and climate change needs to be firmly addressed to avoid future losses (Stern 2006). According to the Qur'an (14: 32-33 or 45: 12-13) it is God who has created the heavens and the earth and has made the the whole earth subject to humans. He has also appointed a vicegerent on earth (2: 30). As such, Islamic teaching appeals to a grateful use of nature.

These various aspects outline an obvious difference between our Western, mainly secular view and Muslims' view on the topic. Western scientists have a scientific-technical view, whereas Muslim scientists use a strong spiritual framework beside a scientific-technical one.

The 2nd research question explores whether results of the Muslims scientific debate about environment and environmental changes reach the various levels of the Tajik society, including villagers.

Scientists in Tajikistan are using a strong science-based framework to discuss issues related to the environment. The two adopted frameworks as outlined above (scientific and spiritual) are not present in this debate. In the Tajik's science community the more Western view predominates, using scientific-technical explanations on causes and consequences of environmental changes and related issues (see section 5.9). This might be explained with the long period of Soviet dependence where a forced secularization in Central Asia took place (Thibault 2015). Furthermore, everybody had a secular education and universities were purely scientific.

The practical work of the many NGOs in Tajikistan in this topic is abundant (e.g. FOCUS 2008). Their work is Western oriented and the spiritual realm is almost completely missing. The same is valid for governmental agencies; they value environmental issues but operate on a rather technocratic manner, with limited consideration of social issues, and completely neglecting the spiritual aspects.

The mass media are marginally covering environmental issues. When they are reporting it remains on a technical level. Occasionally an analytical story by a scientific expert about the topic is being printed. In general, journalists do not have specialized knowledge to gather, critically analyse and report on this topic. Definitely, the international debate in Muslim scientific communities about these themes is not reflected in Tajik media news articles or in editorials.

The situation is rather different when talking to the local level: many farmers, respected villagers or religious leaders have explanations in these two realms. Some of them may have a technical explanation but the spiritual part is often as important or even dominates. However, this is not

because the fruits of the scientific debate trickle down to the villagers' level but the latter argue in certain respects in a similar way as Muslim scientists do: they are using the Islamic concepts and related advices given in the Qur'an and Hadith based on their laypersons' interpretation. Overall, they consider God on top of all developments and decisions; therefore, most of the people fully believe in the *tawhīd* concept. In particular Pamiri people are often prising their environment, calling it a paradise (*bihisht*).

Two concepts were named like the Muslim scholars and scientists do: *khalīfa* (vicegerent of God) and *mīzān* (balance). Most of the interviewees believe that humans were elected by God to be his vicegerent (*khalīfa*) on earth. They know that in this function they have to live in a responsible manner towards every living being and the nature. And many of them realise that this principle is in danger because corruption and greed, but also poverty are increasingly destroying the resources of the earth. The concept of God's purposeful balance (*mīzān*) in creation is also known in the understanding of several interviewees. Especially women are getting excited about the increasing disorder of the earth's fine equilibrium. They think that the balance is at stake and that humans are increasingly misguided and short-sighted. They realise that the waste of the resources of the earth threatens the life itself and the sustainability of the entire earth more and more. For many of them the overexploitation of nature, often in connection with the greed of individual families, is of major concern, in Sunni Khatlon as well as in the Ismaili Pamir. This may be explained with the concept of *ribā* (here usury), also it was not named as such. As part of a question, some of the interviewees said that people should believe more strongly in God, that *tawakkul* (trust in God) is important. At the same time they think that man should think about what God would do and act accordingly.

With the answers of research questions 1 and 2 the first hypothesis (*There is a different understanding of nature, environmental risks and its management in international Muslim scientific and theological communities and in Muslim societies in Tajikistan*) can only be partly confirmed. The international academic community as well as the locals in Tajikistan are both using two realms to address environment and risks: a technical and a spiritual one; otherwise, "official" Tajik societies (government, media, NGOs, Tajik scientist) stick to the technical view and disregard the important spiritual domain.

The 3rd and 4th research questions ask about the view of villagers on nature, how they perceive and interpret risks and how they are using their local knowledge to manage them? And secondly, explore the determining factors (e.g. local traditions, religion, economy, past experience) and to what extent they guide villagers and village leaders to consider (or not) risks from climate change and natural hazards in their daily life.

In general, the interviews provided a rather clear picture about the importance and perception of problems, risks and threats people face: health, economy (basically poverty issues) and education are unanimously considered to be at the forefront. Lay people are fairly good in identifying, estimating and weighting risks, as outlined in the Psychometric Paradigm (Slovic et al. 1985). Environmental changes, risks from natural hazards and effects of climate change are clearly not at the forefront of people's mind, neither in Khatlon nor in the Pamir.

The most obvious observation in Southern Khatlon is the fact that people know that their environment is changing and deteriorating. They observe rising temperatures and, as a result, vector-borne and other dangerous diseases, including malaria, spreading significantly. They complain about the Afghan wind that becomes stronger every year and even makes the sun to disappear behind a yellowish-grey fog and let people feel uncomfortable. They narrate from the more frequent and intense extreme weather events, like cold winters, floods or heat waves. In general, villagers also discuss the possible reasons and often directly blame others: neighbours, government, Afghan or Chinese people, or

Western countries. Only few respondents acknowledge the villagers' own responsibility: hurting the environment with the pollution of water or soil, cutting trees, causing overgrazing of pastures and committing other environmental sins. Almost half of the respondents answered that the last disaster was "an act of God" (or more pronounced) "a divine punishment" that one has to accept. The majority of the other half considered human misbehaviour vis-à-vis nature to be the main reason for losses (this includes administrative negligence and disregard of nature's laws); this is underlined by the mizan approach, taking into account a balanced use of nature and its resources. Only few made the geographical conditions of the area responsible for the occurrence of disasters. Most residents expect assistance from the outside, arguing that they do not have the means and the technology to mitigate risks and to address disaster losses on their own. Seldom people try to solve the problems by themselves and only few individuals have ideas, like the farmer who cultivated different cereal varieties to see which grows best in a changing environment. All in all, answers in Southern Khatlon are rather diverse and show an overall dissatisfaction with the current environmental situation.

In contrary, Pamirians first praise their beautiful environment. Then they explain that they have to live with natural hazards for centuries and as last issue they mention observing some changes in the climate. Almost half consider the geography and the nature of the area to be the reason of the last disaster and several explained that the last disaster happened "because people did not fulfil the demands of nature's law"; this is not in contradiction with the tawhid doctrine that also prevails with the Pamiris as there is a strong belief in the Oneness of God and nature. Only one third of the respondents answered that the last disaster was a "divine punishment". Although the Pamiris fear the effects of climate change, e.g. the melting of glaciers, they are not really aware about the long-term consequences. Few respondents also see positive effects of climate change, like better harvest or the opportunity to plant new cereals because of hotter summers. Furthermore, they judge the probability to be hit by a natural disaster higher than the "far away" effects of climate change.

My second hypothesis (*Fatalistic attitudes towards risks from natural hazards, also related to climate change, are often justified by religious beliefs*) cannot be confirmed. Although a considerable number of respondents see disasters as God's punishment that one has to accept, many of them, particularly in the Pamir, also see the natural environment or imprudent human behaviour vis-à-vis nature as an important reason. Many respondents considered a disaster to be an act of God, but in the same breath they pronounced their absolute trust in science and technology to manage risks and future disasters.

Local (indigenous) knowledge and traditions for environmental issues and agricultural activities seemed not to be well developed in Southern Khatlon or even seemed to have vanished during the Soviet period. People struggle to adapt to post-Soviet life and negotiate with the new bureaucracy in the face of "de-modernization" and the loss of jobs, income, access to productive land, and so on. In contrast, in Kuhistoni Badakhshon environmental and agricultural local (indigenous) knowledge is available to a certain extent. On the one hand oral instruction of the young generation about traditions is still on-going, but on the other hand many Pamirian households act in an unreasonable manner and increase their vulnerability by building houses in hazardous zones, constructing roads without geological exploration, failing to observe the water use regime, tilling and watering unstable slopes, illegally logging or cutting of trees and teresken bushes for fuel and animal fodder (already identified by Breu and Hurni 2003), ploughing of sloping lands, poaching or having an exploiting pasture management.

People reflect on religion and old traditions, because traditions link the present (perception, practices, institutions etc.) with the past. Pamiri people have a spiritual and secular guidance through the Aga Khan and a wealthy institution that takes care of them. They regained their identity relatively quickly

after the end of the Soviet period and the civil war and they were able to reactivate their cultural traditions. People in Southern Khatlon are still looking for their identity. Their cultural traditions are not as far developed as in the Pamir, but the return to cultural traditions takes place like those related to marriage or funeral, and serves to secure continuity in times of change and insecurity; it can even be called a lifeline.

In general, local knowledge is not as well developed as one could assume in those mainly rural societies. This may be because today's knowledge available to farmers is a mix of old traditional knowledge that is still in the mind of elderly citizens, but often not activated, the Soviet agricultural and educational system represented by universities, research institutes and academy of sciences, and finally the Western-style knowledge, mainly introduced by development agencies. The collection (and promotion) of good practices in the field of sustainable land management and agriculture by the Centre for Development and Environment (CDE) through its WOCAT programme (University of Bern, www.wocat.org) is one encouraging example of supporting these aspects. In Kuhistoni Badakhshon a promising example is the FOCUS project that supports a Pamiri community in Durum who observes the Durum Kul (a lake created by a landslide dam) and its environment. They are using local knowledge together with modern techniques to be able to react in an adequate manner in case of a lake outburst. However, traditional knowledge might be of little help, when people are increasingly confronted with new phenomena (like permafrost melting or long-lasting droughts), which they are not yet able to deal with.

Traditional knowledge systems (donishi an'anavi) play an important role in the perception, interpretation and management of risks from climate change and related natural hazards. My third hypothesis seemed to be important in pre-Soviet times as I could hear from the discussions, but faded away once Soviet bureaucracy took hold. With the end of the Soviet Union people had to realign and are still in this process. Therefore, the third hypothesis cannot be supported. Indigenous knowledge, traditional practises and local customs to manage risks only exist to a limited extent in Southern Khatlon. Slightly more pronounced is the availability of indigenous knowledge in mountainous societies like the Pamirians or the Tugul villagers (in Southern Khatlon).

Outlook:

Present knowledge of climate resilience of individuals, households and communities is crucial for mankind's wish to adapt to climate change and to reduce disaster risks. Unfortunately, little attention has been paid to the role of motivation in the process of adaptation till today. Whatever external pressures individuals experience, they must perceive a need, an ability and motivation to act. The goals of the United Nations Framework Convention on Climate Change (UNFCCC) suggest that the climate change problem is manageable and self-contained. It is, however, part of a wider system of relationships between people and their environment from which it cannot be detached. Thus, full comprehension of the adaptation process may require further segmentation of the complex relationships among the characteristics of individuals, of their present (economic) conditions, how they perceive and acquire information about risk, and the role of social identity in their motivation to act. Several factors determine risk perception, in particular, people balance perceived risks with tangible benefits. Risks are overshadowed by more directly experienced everyday life or resentment due to feeling of lacking personal power to influence anything. In this context, former UN General Secretary Ban Ki-moon explained at a Workshop on the Moral Dimensions of Climate Change and

Sustainable Development "Protect the Earth, Dignify Humanity" in Vatican City (2015)¹²⁷: "...Mitigating climate change and adapting to its effects are necessary to eradicate extreme poverty, reduce inequality and secure equitable, sustainable economic development. That is why I say climate change is the defining issue of our time. Responding to it effectively is essential for sustainable development. Climate change is intrinsically linked to public health, food and water security, migration, peace and security. It is a moral issue. It is an issue of social justice, human rights and fundamental ethics..."

Ban Ki-moon's remarks can be underlined, but remembering the many statements of the villagers in the study areas, one may argue that Ban Ki-moon's words could also be interpreted differently. The farmer may say: "First I have to look for the well-being of my family (and to cover the basic needs) before I have the freedom to address climate change. The eradication of poverty is necessary for me to be in a position to talk about climate change (mitigation)."

Risks from climate change and natural hazards are not on top of peoples' agenda in both study areas. Poor and sometimes even hungry people only want to survive; they have a value system which focusses on imminent needs and not on environmental or other issues which are farther away. This is an occasion where the government or development agencies have to raise awareness and convince people of the benefit of the long-term environmental programmes like disaster risk reduction or climate change adaptation. But they also have to underline the importance of direct (double) benefits to people. Agencies who like to implement climate change adaptation and disaster reduction programmes clearly have to provide an added value to the communities which might not be directly linked to risk reduction but need to have a tangible benefit. Communities must feel this benefit, be it material or psychological, like empowering local communities to take action on their vulnerability to climate change. Moreover, the cultural and religious aspects might further determine the success of such type of activities. Similarly, the support of "local champions" will help to spread good practices like that of the elderly villager who stabilised a slope by planting fruit trees and at the same time maintaining a good pasture. After his explanations he concluded: "I know that this project has a long-term effect and its gains are for future generations."

The research clearly shows that Tajikistan is a society at risk, even at high risk. Looking at Tajikistan as one small player in the world community, one can explain its position with the words of Ulrich Beck who is talking about a "World Risk Society". Beck looks at "globality" as a kind of world society in which groups and countries cannot be separated because "from now on nothing which happens in our planet is only a limited event, all inventions, victories and catastrophes affect the whole world." (2000: p. 11). In this sense Beck sees globalization as a transnational networking of actors. Modern risks relate to the whole of humanity and do not distinguish between privileged and underprivileged, well-educated and not educated or poor and rich. Nevertheless, Beck (1992: p. 36) once stated: "Not ist hierarchisch, Smog ist demokratisch" ("Poverty is hierarchic, smog is democratic"). This statement suits well with the fact that Tajikistan is one of the countries least responsible for the emissions of greenhouse gases that are said to be responsible for climate change to a large extent. And at the same time Tajikistan's vulnerability is very high and its adaptive capacity to climate change is rather low. Indeed, few respondents told that the Western countries are to blame for climate change and therefore must support Tajikistan with knowledge and means. And even if the poor are perhaps to blame for their economic poverty (according to the liberal view) and their underdevelopment, they are little or even not responsible for climate change.

¹²⁷ <http://www.un.org/sg/statements/index.asp?nid=8584> (last access October 2015)

In the above described context the research clearly shows that further research is needed and its results translated into recommendations for practical programmes and projects.

In particular research has to focus on:

A) the perception of risks from climate change and natural hazards in different contexts. The research covered only two geographically limited areas in Tajikistan. Other areas in Tajikistan (and Central Asia) like the low lands of the Ferghana Valley, hills and mountains in Northern Khatlon or urban areas may show different results.

B) the availability of local knowledge in the field of disaster risk reduction and climate change adaptation in other rural areas like the Zerafshan or the Rasht. Local conditions vary considerably from one geographical context to the other; therefore, the local knowledge might be different as well. It can be assumed that local knowledge in mountain regions (like the Pamir) might be better developed than what was observed in Southern Khatlon.

C) how to translate research results from climate change and related natural hazards studies into understandable guidance for different subcultures with different values, customs, religions, beliefs, gender roles, and perceptions of ownership and justice. At present this socio-cultural realm starts to be addressed by research, but is often missing in practical programmes.

D) research that has to address how to integrate spiritual aspects into awareness and capacity building and into specific development programmes. In addition, mechanisms have to be developed to better cooperate with religious leaders for the practical implementation of programmes, because they still play a role in Tajik communities that should not be underestimated.

Moreover, I recommend that practical projects in the field of disaster risk reduction and climate change adaptation should be accompanied by socio-cultural specialists with a strong focus on people's needs, views and behaviours, as well as on social structures and networks of relationships and obligations. It is important to respect the indigenous cultural identity and to consider the opinions of the different sub-groups in a society when introducing new ways of action.

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13 Appendices

13.1 Appendix 1: Important Knowledge Base for the Topic

This chapter is an introduction in the key terms of the research that might not be commonly understood by social scientists, respectively natural scientists. Several definitions are taken from the United Nations Office for Disaster Risk Reduction's (UNISDR's) *Terminology on Disaster Risk Reduction*¹²⁸. Some terms are concisely described, others, especially the term "risk perception", are explained in detail. The translation of the terms into Tajik are sometimes paraphrased, as the special term in Tajik is missing.

Climate: Climate encompasses the temperatures, humidity, atmospheric pressure, winds, rainfall, atmospheric particle count and numerous other meteorological elements in a given region over long periods of time. The climate of a location is affected by its latitude, terrain, altitude, persistent ice or snow cover, as well as nearby oceans and their currents. Climates can be classified using parameters such as temperature and rainfall to define specific climate types. The standard averaging period is 30 years, but other periods may be used depending on the purpose. Climate also includes statistics other than the average, such as the magnitudes of day-to-day or year-to-year variations.

The difference between climate and weather is usefully summarized by the popular phrase: "Climate is what you expect, weather is what you get!"¹²⁹ That is: The term weather refers to the current activity of the elements explained before.

In Tajik: *iqlim* (иқлим) → Climate

Climate Change (CC): The UNISDR terminology (2009) gives two definitions based on two different institutions: (a) The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing or to persistent anthropogenic changes in the composition of the atmosphere or in land use".

(b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

In Tajik: *tagh'iryobi iqlim* (тағъирёбии иқлим) → Changing, modification of the climate; used for climate change.

Climate Change Adaptation (CCA): CCA is the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities. (IPCC 2007)

In Tajik: *mutobiqshavi ba tagh'iryobi iqlim* (Мутобиқшавӣ ба тағъирёбии иқлим) → Adaptation on climate change

¹²⁸ UNISDR developed these basic definitions on disaster risk reduction to promote a common understanding on the subject for use by the public, authorities and practitioners. The terms are based on a broad consideration of different international sources. Meanwhile the terminology is available online in 16 languages: <http://www.unisdr.org/we/inform/terminology> (last access July 2015)

¹²⁹ Most probably a quote from Robert Heinlein in his novel *Time Enough for Love* (1973).

Disaster: A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. (UNISDR 2009)

In Tajik: *ofat* (офат) → Calamity, disaster

Disaster Risk: The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period (UNISDR 2009).

In Tajik: *khatari ofat* (хатари офат) → Risk (hazard, danger) of calamity, disaster

Disaster Risk Reduction: The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR 2009).

In Tajik: *past namudani sathi khatari ofatho* (паст намудани сатҳи хатари офатҳо) → Reduction of the level of risk of calamity / disaster

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR 2009).

In Tajik: *khatar* (хатар) → Hazard, also risk, danger and adventure

Indigenous Knowledge: According to UNESCO.org¹³⁰ Indigenous Knowledge (IK) is the knowledge that an indigenous (local) community accumulates over generations of living in a particular environment. This definition encompasses all forms of knowledge – technologies, know-how skills, practices and beliefs – that enable the community to achieve stable livelihoods in their environment. Indigenous knowledge is unique to every culture and society. The culture of a particular society is considered as a set of values, beliefs and behaviours. The perception within this culture defines how the world (with its values, beliefs and behaviours) is seen and interpreted.

To be effective, an integrated approach is required that values mainstream science and traditional knowledge systems and also incorporates fundamental linkages between human communities and ecosystem services.

In Tajik: *donishi an'anavi* (Тажик: дониши анъанавӣ) → Traditional knowledge

Natural hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. (UNISDR 2009)

In Tajik: *khavfi tabii* (хавфи табиӣ) → Natural hazard

Resilience: Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR 2009).

Resilience can be considered from an individual and collective basis. Both, individual resilience and collective resilience are influenced by a wide range of factors:

¹³⁰ http://www.unesco.org/education/tlsf/mods/theme_c/mod11.html (last access July 2015)

Individual Resilience

Poverty
Dependence
Disposable income
Location
Adaptability
State of housing (including tenure)
Awareness

Collective Resilience

Resources (GDP)
Institutional networks and structures
Inequality
Geography
Economic structure
Landscape
Ecology
Governance (in particular coordination between various actors)

In Tajik: *tobovari* (тобоварӣ) → Endurance

Risk: Risk is the combination of the probability of an event and its negative consequences (UNISDR 2009). Risk = Hazard x Vulnerability

In Tajik: *khatar* (хатар) → Risk, also danger

Risk Perception: According to Rohrmann (2008) risk perception refers to people's judgments and evaluations of hazards they (or their facilities, or environments) are or might be exposed to. Such perceptions steer decisions about the acceptability of risks and are a core influence on behaviors before, during and after a disaster. People's risk appraisals are a complex result of hazard features and personal philosophies.

In Tajik: *darki khatar* (дарки хатар) → Perception, understanding, comprehension of risk

Scientific Knowledge: The scientific knowledge system generates and provides scientific knowledge about climate, climate change and possible adaptation measures. It also builds capacity and partnership for communicating, integrating and applying knowledge for adaptation. To be effective, an integrated approach is required that values mainstream science and traditional knowledge systems and also incorporates fundamental linkages between human communities and ecosystem services. (IPCC 2012)

In Tajik: *donishi ilmyi* (дониши илмӣ) → Scientific knowledge

Socio-natural hazard: The phenomenon of increased occurrence of certain geophysical and hydro-meteorological hazard events, such as landslides, flooding, land subsidence and drought, that arise from the interaction of natural hazards with overexploited or degraded land and environmental resources. (UNISDR 2009)

In Tajik: *khatar ijtimoii-tabiiy* (хатари иҷтимоӣ-табӣӣ) → Socio-natural hazard (also risk, danger, adventure)

Technical knowledge: The technical knowledge system collects and interprets the necessary climate-related information, develops adaptation concepts, implements effective technologies for adaptation and monitors and evaluates the implemented technologies. These technologies must be cost-efficient, environmentally sustainable, culturally compatible and socially acceptable. To be effective, an integrated approach is required that values mainstream science and traditional knowledge systems and also incorporates fundamental linkages between human communities and ecosystem services. (IPCC 2012)

In Tajik: *donishi tekhnikiy* (дониши техникӣ) → Technical knowledge

Technological hazard: A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. (UNISDR 2009)

In Tajik: *khatarī tekhnologyi* (хатари технологӣ) → Technological hazard (also risk, danger, adventure)

The five principle concepts of the Kyoto Protocol: (1) All countries who have committed to the agreement have to reduce the emissions of the greenhouse gases. (2) The parties have to prepare policies, find out means to reduce greenhouse gases, and finally also have to implement them. (3) The parties have to try to minimize the impacts on developing countries with the help of an adaptation fund for climate change. (4) The parties have to account, report and review every action to ensure the integrity of the Protocol and to prevent misuse of the terms. (5) A compliance committee has to enforce compliance with the commitments under the Protocol. (The United Nations Framework Convention on Climate Change¹³¹)

Vulnerability: Vulnerability is the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. (UNISDR 2009)

In Tajik: *osebpaziryi* (осебпазирӣ) → harm, injury, damage, loss

Comment to the translation of some technical terms: As one may have realised the Tajik word for hazard (*khatar*) and risk (*khatar*) is the same, whereas natural hazard (*khavfi tabii*) is different. Here the fear of nature plays a role. *Khavfi tabii* means "khavf - fear, dread or threat" and "tabii - natural". Coming with the Western approach where all these terms are clearly defined, one has to be aware of this different choice of words in Tajikistan.

¹³¹ http://unfccc.int/kyoto_protocol/items/2830.php (last access July 2015)

13.2 Appendix 2: Suras Referred to in the Papers with Relation to Nature, Environment or Disasters

Sura no.	Sura (Qur'an Translation by Abdullah Yusuf Ali)	Relation to nature and natural processes	
1:1	In the name of Allah, Most Gracious, Most Merciful.	one master and possessor of nature	B
1:2	Praise be to Allah, the Cherisher and Sustainer of the worlds;	Unity principle (<i>tawhīd</i>)	A C
1:5-7	Thee do we worship, and Thine aid we seek. Show us the straight way, The way of those on whom Thou hast bestowed Thy Grace, those whose (portion) is not wrath, and who go not astray.	Spiritual dependency on God	H
2:11	When it is said to them: "Make not mischief on the earth," they say: "Why, we only Want to make peace!"	Man is weak & full of mistakes No chaos & unrest	H
2:19-20	Or (another similitude) is that of a rain-laden cloud from the sky: In it are zones of darkness, and thunder and lightning: They press their fingers in their ears to keep out the stunning thunder-clap, the while they are in terror of death. But Allah is ever round the rejecters of Faith! The lightning all but snatches away their sight; every time the light (Helps) them, they walk therein, and when the darkness grows on them, they stand still. And if Allah willed, He could take away their faculty of hearing and seeing; for Allah hath power over all things.	Natural order /signs of God (<i>āyāt</i>) / some man as doubters (Maududi)	H
2:22-23	Who has made the earth your couch, and the heavens your canopy; and sent down rain from the heavens; and brought forth therewith Fruits for your sustenance; then set not up rivals unto Allah when ye know (the truth). And if ye are in doubt as to what We have revealed from time to time to Our servant, then produce a Sura like thereunto; and call your witnesses or helpers (If there are any) besides Allah, if your (doubts) are true.	Natural order / signs of God (<i>āyāt</i>)	H
2:26	Indeed, Allah is not timid to present an example - that of a mosquito or what is smaller than it. And those who have believed know that it is the truth from their Lord. But as for those who disbelieve, they say, "What did Allah intend by this as an example?" He misleads many thereby and guides many thereby. And He misleads not except the defiantly disobedient,	Man needs nature to understand the Qur'an	H
2:29	It is He Who hath created for you all things that are on earth; Moreover His design comprehended the heavens, for He gave order and perfection to the seven firmaments; and of all things He hath perfect knowledge.	Natural order Man's responsibility: master or vicegerent (<i>khalīfah</i>)?	B D
2:30	Behold, thy Lord said to the angels: "I will create a vicegerent on earth." They said: "Wilt Thou place therein one who will make mischief therein and shed blood? – whilst we do celebrate Thy praises and glorify Thy holy (name)?" He said: "I know what ye know not."	Man as God's vicegerent (<i>khalīfah</i>)	C H
2:31	And He taught Adam the names of all things; then He placed them before the angels, and said: "Tell me the names of these if ye are right."	Man as God's vicegerent (<i>khalīfah</i>)	C H
2:32	They said: "Glory to Thee, of knowledge We have none, save what Thou Hast taught us: In truth it is Thou Who art perfect in knowledge and wisdom."	Man as God's vicegerent (<i>khalīfah</i>)	C H
2:33	He said: "O Adam! Tell them their names." When he had told them, Allah said: "Did I not tell you that I know the secrets of heaven and	Man as God's vicegerent (<i>khalīfah</i>)	C H

	earth, and I know what ye reveal and what ye conceal?"		
2:34	And behold, We said to the angels: "Bow down to Adam" and they bowed down. Not so Iblis: he refused and was haughty: He was of those who reject Faith.	Man as God's vicegerent (<i>khalīfā</i>)	C H
2:35-37	We said: "O Adam! dwell thou and thy wife in the Garden; and eat of the bountiful things therein as (where and when) ye will; but approach not this tree, or ye run into harm and transgression." Then did Satan make them slip from the (garden), and get them out of the state (of felicity) in which they had been. We said: "Get ye down, all (ye people), with enmity between yourselves. On earth will be your dwelling-place and your means of livelihood - for a time." Then learnt Adam from his Lord words of inspiration, and his Lord Turned towards him; for He is Oft-Returning, Most Merciful.	Man is weak & full of mistakes	H
2:43	And be steadfast in prayer; practise regular charity; and bow down your heads with those who bow down (in worship).	Natural order: all nature is <i>muslim</i>	D
2:66	So We made it an example to their own time and to their posterity, and a lesson to those who fear Allah.	Natural disasters as a means to discipline errant individuals and nations → as examples for next generations	F
2:99	We have sent down to thee Manifest Signs (ayat); and none reject them but those who are perverse.	Qur'an's verses as sign (<i>āyāt</i>)	F
2:115	To Allah belong the east and the West: Whithersoever ye turn, there is the presence of Allah. For Allah is all-Pervading, all-Knowing.	Natural order & unity principle (<i>tawḥīd</i>) (Ibn Arabi)	D H
2:136	Say ye: "We believe in Allah, and the revelation given to us, and to Abraham, Isma'il, Isaac, Jacob, and the Tribes, and that given to Moses and Jesus, and that given to (all) prophets from their Lord: We make no difference between one and another of them: And we bow to Allah (in Islam)."	Monotheism (<i>tawḥīd</i>)	G
2:155	Be sure we shall test you with something of fear and hunger, some loss in goods or lives or the fruits (of your toil), but give glad tidings to those who patiently persevere,	Divine ownership	C
2:156	Who say, when afflicted with calamity: "To Allah We belong, and to Him is our return":-	Divine ownership	C
2:164	Behold! In the creation of the heavens and the earth; in the alternation of the night and the day; in the sailing of the ships through the ocean for the profit of mankind; in the rain which Allah Sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they Trail like their slaves between the sky and the earth;- (Here) indeed are Signs for a people that are wise.	Natural order /physical world as signs of God (<i>āyāt</i>)	E F H
2:171	The parable of those who reject Faith is as if one were to shout Like a goat-herd, to things that listen to nothing but calls and cries: Deaf, dumb, and blind, they are void of wisdom.	Natural order /signs of God (<i>āyāt</i>) / some man do not understand	H
2:195	And spend of your substance in the cause of Allah, and make not your own hands contribute to (your) destruction; but do good; for Allah loveth those who do good.	Correct action & avoiding mistakes as key guiding principle of risk reduction	G
2:205	When he turns his back, His aim everywhere is to spread mischief through the earth and destroy crops and cattle. But Allah loveth not mischief.	Protection of nature & prohibition of destroying	H
2:238	Guard strictly your (habit of) prayers, especially the Middle Prayer; and stand before Allah in a devout (frame of mind).	Natural order: all nature is <i>muslim</i>	D
2:252	These are the Signs of Allah: we rehearse them to thee in truth: verily	Qur'an's verses as sign	F

	Thou art one of the messengers.	(<i>āyāt</i>)	
2:255	Allah! There is no god but He,-the Living, the Self-subsisting, Eternal. No slumber can seize Him nor sleep. His are all things in the heavens and on earth. Who is there can intercede in His presence except as He permitteth? He knoweth what (appeareth to His creatures as) before or after or behind them. Nor shall they compass aught of His knowledge except as He willeth. His Throne doth extend over the heavens and the earth, and He feeleth no fatigue in guarding and preserving them for He is the Most High, the Supreme (in glory).	Divine ownership	C
2:275	Those who devour usury will not stand except as stand one whom the Evil one by his touch Hath driven to madness. That is because they say: "Trade is like usury," but Allah hath permitted trade and forbidden usury. Those who after receiving direction from their Lord, desist, shall be pardoned for the past; their case is for Allah (to judge); but those who repeat (The offence) are companions of the Fire: They will abide therein (for ever).	Usury (<i>ribā</i>)	A B E
2:278	O ye who believe! Fear Allah, and give up what remains of your demand for usury, if ye are indeed believers.	Usury (<i>ribā</i>)	A B E
2:279	If ye do it not, Take notice of war from Allah and His Messenger: But if ye turn back, ye shall have your capital sums: Deal not unjustly, and ye shall not be dealt with unjustly.	Usury (<i>ribā</i>)	A B E
3:83	Do they seek for other than the Religion of Allah?-while all creatures in the heavens and on earth have, willing or unwilling, bowed to His Will (Accepted Islam), and to Him shall they all be brought back.	Natural order: all nature is <i>muslim</i>	D
3:101	And how would ye deny Faith while unto you are rehearsed the Signs of Allah, and among you Lives the Messenger? Whoever holds firmly to Allah will be shown a way that is straight.	Qur'an's verses as sign (<i>āyāt</i>)	F
3:104	Let there arise out of you a band of people inviting to all that is good, enjoining what is right, and forbidding what is wrong: They are the ones to attain felicity.	Moral authority of being of service of humanity Concept of "Command the good and forbid the evil" (<i>amr bil ma'ruf wa nahy an al munkar</i>) (G)	A B G H
3:108	These are the Signs of Allah: We rehearse them to thee in Truth: And Allah means no injustice to any of His creatures.	Qur'an's verses as sign (<i>āyāt</i>)	F
3:110	Ye are the best of peoples, evolved for mankind, enjoining what is right, forbidding what is wrong, and believing in Allah. If only the People of the Book had faith, it were best for them: among them are some who have faith, but most of them are perverted transgressors.	Concept of "Command the good and forbid the evil" (<i>amr bil ma'ruf wa nahy an al munkar</i>)	G
3:130	O ye who believe! Devour not usury, doubled and multiplied; but fear Allah; that ye may (really) prosper.	Usury (<i>ribā</i>)	E
3:185	Every soul shall have a taste of death: And only on the Day of Judgment shall you be paid your full recompense. Only he who is saved far from the Fire and admitted to the Garden will have attained the object (of Life): For the life of this world is but goods and chattels of deception.	Death is unavoidable	F
3:190	Behold! In the creation of the heavens and the earth, and the alternation of night and day,- there are indeed Signs for men of understanding,-	Natural order / physical world as signs of God (<i>āyāt</i>)	D F
3:191	Men who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (With the thought): "Our Lord! Not for naught Hast Thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire.	Natural order created by a creator Not without sense To preserve & protect nature	D H
4:36	Serve Allah, and join not any partners with Him; and do good- to parents, kinsfolk, orphans, those in need, neighbours who are near,	Humility towards creation	H

	neighbours who are strangers, the companion by your side, the wayfarer (ye meet), and what your right hands possess: For Allah loveth not the arrogant, the vainglorious;-		
4:48	Allah forgiveth not that partners should be set up with Him; but He forgiveth anything else, to whom He pleaseth; to set up partners with Allah is to devise a sin Most heinous indeed.	Unity principle (<i>tawhīd</i>)	C
4:58	Allah doth command you to render back your Trusts to those to whom they are due; And when ye judge between man and man, that ye judge with justice: Verily how excellent is the teaching which He giveth you! For Allah is He Who heareth and seeth all things.	Justice: moral commitment	C
4:59	O ye who believe! Obey Allah, and obey the Messenger, and those charged with authority among you. If ye differ in anything among yourselves, refer it to Allah and His Messenger, if ye do believe in Allah and the Last Day: That is best, and most suitable for final determination.	Leadership of wise, elite, intellect and experts	G
4:78	"Wherever ye are, death will find you out, even if ye are in towers built up strong and high!" If some good befalls them, they say, "This is from Allah"; but if evil, they say, "This is from thee" (O Prophet). Say: "All things are from Allah." But what hath come to these people, that they fail to understand a single fact?	Death is unavoidable Concept of sin, corruption or mischief → can result in disasters	F G
4:79	Whatever good, (O man!) happens to thee, is from Allah; but whatever evil happens to thee, is from thy (own) soul. And We have sent thee as a messenger to (instruct) mankind. And enough is Allah for a witness.	Concept of sin, corruption or mischief → can result in disasters	G
4:85	Whoever recommends and helps a good cause becomes a partner therein: And whoever recommends and helps an evil cause, shares in its burden: And Allah hath power over all things.	Justice: moral commitment	C
4:122	But those who believe and do deeds of righteousness,- we shall soon admit them to gardens, with rivers flowing beneath,-to dwell therein for ever. Allah's promise is the truth, and whose word can be truer than Allah's?	Correct action & avoiding mistakes as key guiding principle of risk reduction	G
4:126	But to Allah belong all things in the heavens and on earth: And He it is that Encompasses all things.	Unity principle (<i>tawhīd</i>)	A B
4:135	O ye who believe! Stand out firmly for justice, as witnesses to Allah, even as against yourselves, or your parents, or your kin, and whether it be (against) rich or poor: for Allah can best protect both. Follow not the lusts (of your hearts), lest ye swerve, and if ye distort (justice) or decline to do justice, verily Allah is well-acquainted with all that ye do.	Ethical dimension: law Justice: moral commitment	B C E
4:140	Already has He sent you Word in the Book, that when ye hear the signs of Allah held in defiance and ridicule, ye are not to sit with them unless they turn to a different theme: if ye did, ye would be like them. For Allah will collect the hypocrites and those who defy faith - all in Hell:-	Qur'an's verses as sign (<i>āyāt</i>)	F
4:147	What can Allah gain by your punishment, if ye are grateful and ye believe? Nay, it is Allah that recogniseth (all good), and knoweth all things.	Natural disasters as a means to discipline errant individuals and nations	F
4:171	O People of the Book! Commit no excesses in your religion: Nor say of Allah aught but the truth. Christ Jesus the son of Mary was (no more than) a messenger of Allah, and His Word, which He bestowed on Mary, and a spirit proceeding from Him: so believe in Allah and His messengers. Say not "Trinity" : desist: it will be better for you: for Allah is one Allah: Glory be to Him: (far exalted is He) above having a son. To Him belong all things in the heavens and on earth. And enough is Allah as a Disposer of affairs.	Divine ownership	C
5:8	O ye who believe! Stand out firmly for Allah, as witnesses to fair dealing, and let not the hatred of others to you make you swerve to	Justice: moral commitment	C E

	wrong and depart from justice. Be just: that is next to piety: and fear Allah. For Allah is well-acquainted with all that ye do.		
5:23	(But) among (their) Allah-fearing men were two on whom Allah had bestowed His grace: They said: "Assault them at the (proper) Gate: when once ye are in, victory will be yours; But on Allah put your trust if ye have faith."	Faith/trust in God (<i>tawakkul</i>)	H
5:42	(They are fond of) listening to falsehood, of devouring anything forbidden. If they do come to thee, either judge between them, or decline to interfere. If thou decline, they cannot hurt thee in the least. If thou judge, judge in equity between them. For Allah loveth those who judge in equity.	Justice: moral commitment	C
5:48	To thee We sent the Scripture in truth, confirming the scripture that came before it, and guarding it in safety: so judge between them by what Allah hath revealed, and follow not their vain desires, diverging from the Truth that hath come to thee. To each among you have we prescribed a law and an open way. If Allah had so willed, He would have made you a single people, but (His plan is) to test you in what He hath given you: so strive as in a race in all virtues. The goal of you all is to Allah; it is He that will show you the truth of the matters in which ye dispute;	Natural order Doing goodness not mischief	B F
5:53	And those who believe will say: "Are these the men who swore their strongest oaths by Allah, that they were with you?" All that they do will be in vain, and they will fall into (nothing but) ruin.	Good interpersonal relationships	H
5:100	Say: "Not equal are things that are bad and things that are good, even though the abundance of the bad may dazzle thee; so fear Allah, O ye that understand; that (so) ye may prosper."	Man's vulnerability	E
6:13	To him belongeth all that dwelleth (or lurketh) in the night and the day. For he is the one who heareth and knoweth all things."	Divine ownership	C
6:38	There is not an animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you. Nothing have we omitted from the Book, and they (all) shall be gathered to their Lord in the end.	Natural order Human and animals constitute autonomous communities (<i>ummahs</i>)	B D F H
6:42-43	Before thee We sent (messengers) to many nations, and We afflicted the nations with suffering and adversity, that they might learn humility. When the suffering reached them from us, why then did they not learn humility? On the contrary their hearts became hardened, and Satan made their (sinful) acts seem alluring to them.	Natural disasters as a means to discipline errant individuals and nations	F
6:59-62	With Him are the keys of the unseen, the treasures that none knoweth but He. He knoweth whatever there is on the earth and in the sea. Not a leaf doth fall but with His knowledge: there is not a grain in the darkness (or depths) of the earth, nor anything fresh or dry (green or withered), but is (inscribed) in a record clear (to those who can read). It is He who doth take your souls by night, and hath knowledge of all that ye have done by day: by day doth He raise you up again; that a term appointed be fulfilled; In the end unto Him will be your return; then will He show you the truth of all that ye did. He is the irresistible, (watching) from above over His worshippers, and He sets guardians over you. At length, when death approaches one of you, Our angels take his soul, and they never fail in their duty. Then are men returned unto Allah, their protector, the (only) reality: Is not His the command? And He is the swiftest in taking account.	Death is unavoidable, it's destiny	F
6:71	Say: "Shall we indeed call on others besides Allah, - things that can do us neither good nor harm,- and turn on our heels after receiving guidance from Allah? - like one whom the evil ones have made into a fool, wandering bewildered through the earth, his friends calling, come to us', (vainly) guiding him to the path." Say: "Allah's guidance is the (only) guidance, and we have been directed to submit ourselves	Unity principle (<i>tawhīd</i>)	C

	to the Lord of the worlds;-		
6:72	"To establish regular prayers and to fear Allah: for it is to Him that we shall be gathered together."	Unity principle (<i>tawhīd</i>)	C
6:73	It is He who created the heavens and the earth in true (proportions): the day He saith, "Be," behold! It is. His word is the truth. His will be the dominion the day the trumpet will be blown. He knoweth the unseen as well as that which is open. For He is the Wise, well acquainted (with all things).	Unity principle (<i>tawhīd</i>)	C
6:79	"For me, I have set my face, firmly and truly, towards Him Who created the heavens and the earth, and never shall I give partners to Allah."	Natural order & man's place in it	H
6:97	It is He Who maketh the stars (as beacons) for you, that ye may guide yourselves, with their help, through the dark spaces of land and sea: We detail Our signs for people who know.	Natural order / physical world as signs of God (<i>āyāt</i>) Predestination (<i>qadar</i>)	F
6:99	It is He Who sendeth down rain from the skies: with it We produce vegetation of all kinds: from some We produce green (crops), out of which We produce grain, heaped up (at harvest); out of the date-palm and its sheaths (or spathes) (come) clusters of dates hanging low and near: and (then there are) gardens of grapes, and olives, and pomegranates, each similar (in kind) yet different (in variety): when they begin to bear fruit, feast your eyes with the fruit and the ripeness thereof. Behold! In these things there are signs for people who believe.	Natural order / biodiversity as signs of God (<i>āyāt</i>)	F
6:141	It is He Who produceth gardens, with trellises and without, and dates, and tilth with produce of all kinds, and olives and pomegranates, similar (in kind) and different (in variety): eat of their fruit in their season, but render the dues that are proper on the day that the harvest is gathered. But waste not by excess: for Allah loveth not the wasters.	Ethical dimension: to be moderate, no waste	B C E
6:165	It is He Who hath made you (His) agents, inheritors of the earth: He hath raised you in ranks, some above others: that He may try you in the gifts He hath given you: for thy Lord is quick in punishment: yet He is indeed Oft-forgiving, Most Merciful.	Trusteeship (<i>amānāh</i>) Responsibility principle Man as God's vicegerent (<i>khalīfā</i>)	B C
7:31	O Children of Adam! Wear your beautiful apparel at every time and place of prayer: eat and drink: But waste not by excess, for Allah loveth not the wasters.	Ethical dimension: to be moderate, no waste	C H
7:34	To every people is a term appointed: when their term is reached, not an hour can they cause delay, nor (an hour) can they advance (it in anticipation).	Death is unavoidable, it's destiny	F
7:56	Do no mischief on the earth, after it hath been set in order, but call on Him with fear and longing (in your hearts): for the Mercy of Allah is (always) near to those who do good.	Doing goodness not mischief	F
7:78	So the earthquake took them unawares, and they lay prostrate in their homes in the morning!	Earthquake: sudden occurrence of disasters	G
7:85-90	To the Madyan people We sent Shu'aib, one of their own brethren: he said: "O my people! Worship Allah; Ye have no other god but Him. Now hath come unto you a clear (Sign) from your Lord! Give just measure and weight, nor withhold from the people the things that are their due; and do no mischief on the earth after it has been set in order: that will be best for you, if ye have Faith. "And squat not on every road, breathing threats, hindering from the path of Allah those who believe in Him, and seeking in it something crooked; But remember how ye were little, and He gave you increase. And hold in your mind's eye what was the end of those who did mischief. "And if there is a party among you who believes in the message with which I have been sent, and a party which does not believe, hold	Catastrophic chastisement: earthquake & devastating blast because of violating the moral laws (7:85-91) Protection of nature & prohibition of destruction	F H

	<p>yourselves in patience until Allah doth decide between us: for He is the best to decide.</p> <p>The leaders, the arrogant party among his people, said: "O Shu'aib! we shall certainly drive thee out of our city - (thee) and those who believe with thee; or else ye (thou and they) shall have to return to our ways and religion." He said: "What! even though we do detest (them)?"</p> <p>"We should indeed invent a lie against Allah, if we returned to your ways after Allah hath rescued us therefrom; nor could we by any manner of means return thereto unless it be as in the will and plan of Allah, Our Lord. Our Lord can reach out to the utmost recesses of things by His knowledge. In the Allah is our trust. our Lord! decide Thou between us and our people in truth, for Thou art the best to decide."</p> <p>The leaders, the unbelievers among his people, said: "If ye follow Shu'aib, be sure then ye are ruined!"</p>		
7:91-93	<p>But the earthquake took them unawares, and they lay prostrate in their homes before the morning!</p> <p>The men who reject Shu'aib became as if they had never been in the homes where they had flourished: the men who rejected Shu'aib – it was they who were ruined!</p> <p>So Shu'aib left them, saying: "O my people! I did indeed convey to you the messages for which I was sent by my Lord: I gave you good counsel, but how shall I lament over a people who refuse to believe!"</p>	<p>Catastrophic chastisement: earthquake and devastating blast because of violating the moral laws</p> <p>Earthquake: sudden occurrence of disasters</p>	<p>F</p> <p>G</p>
7:94-96	<p>Whenever We sent a prophet to a town, We took up its people in suffering and adversity, in order that they might learn humility. Then We changed their suffering into prosperity, until they grew and multiplied, and began to say: "Our fathers (too) were touched by suffering and affluence" ... Behold! We called them to account of a sudden, while they realised not (their peril).</p> <p>If the people of the towns had but believed and feared Allah, We should indeed have opened out to them (All kinds of) blessings from heaven and earth; but they rejected (the truth), and We brought them to book for their misdeeds.</p>	<p>Natural disasters as a means to discipline errant individuals and nations</p>	<p>F</p>
7:127-141	<p>Said the chiefs of Pharaoh's people: "Wilt thou leave Moses and his people, to spread mischief in the land, and to abandon thee and thy gods?" He said: "Their male children will we slay; (only) their females will we save alive; and we have over them (power) irresistible."</p> <p>Said Moses to his people: "Pray for help from Allah, and (wait) in patience and constancy: for the earth is Allah's, to give as a heritage to such of His servants as He pleaseth; and the end is (best) for the righteous.</p> <p>They said: "We have had (nothing but) trouble, both before and after thou camest to us." He said: "It may be that your Lord will destroy your enemy and make you inheritors in the earth; that so He may try you by your deeds."</p> <p>We punished the people of Pharaoh with years (of droughts) and shortness of crops; that they might receive admonition. ...</p>	<p>Catastrophic chastisement because of violating the moral laws</p>	<p>F</p>
7:155	<p>And Moses chose seventy of his people for Our place of meeting: when they were seized with violent quaking, he prayed: "O my Lord! If it had been Thy will Thou couldst have destroyed, long before, both them and me: wouldst Thou destroy us for the deeds of the foolish ones among us? This is no more than Thy trial: by it Thou causest whom Thou wilt to stray, and Thou leadest whom Thou wilt into the right path. Thou art our Protector: so forgive us and give us Thy mercy; for Thou art the best of those who forgive.</p>	<p>Catastrophic chastisement: earthquake because of violating the moral laws</p>	<p>G</p>
7:171	<p>When We shook the Mount over them, as if it had been a canopy, and they thought it was going to fall on them (We said): "Hold firmly to what We have given you, and bring (ever) to remembrance what is therein; perchance ye may fear Allah."</p>	<p>Catastrophic chastisement: earthquake because of violating the moral laws</p>	<p>G</p>
8:2	<p>For, Believers are those who, when Allah is mentioned, feel a tremor in their hearts, and when they hear His signs rehearsed, find their</p>	<p>Qur'an's verses as sign</p>	<p>F</p>

	faith strengthened, and put (all) their trust in their Lord;	(<i>āyāt</i>)	
8:25	And fear tumult or oppression, which affecteth not in particular (only) those of you who do wrong: and know that Allah is strict in punishment.	Warning: collective punishment	E F
8:31	When Our Signs are rehearsed to them, they say: "We have heard this (before): if we wished, we could say (words) like these: these are nothing but tales of the ancients."	Qur'an's verses as sign (<i>āyāt</i>)	F
8:66	For the present, Allah hath lightened your (task), for He knoweth that there is a weak spot in you: But (even so), if there are a hundred of you, patient and persevering, they will vanquish two hundred, and if a thousand, they will vanquish two thousand, with the leave of Allah: for Allah is with those who patiently persevere.	Man is weak & full of mistakes	H
10:5	It is He Who made the sun to be a shining glory and the moon to be a light (of beauty), and measured out stages for her; that ye might know the number of years and the count (of time). Nowise did Allah create this but in truth and righteousness. (Thus) doth He explain His Signs in detail, for those who understand.	Natural order / signs of God (<i>āyāt</i>)	B
10:90-92	We took the Children of Israel across the sea: Pharaoh and his hosts followed them in insolence and spite. At length, when overwhelmed with the flood, he said: "I believe that there is no god except Him Whom the Children of Israel believe in: I am of those who submit (to Allah in Islam)." (It was said to him): "Ah now!- But a little while before, wast thou in rebellion!- and thou didst mischief (and violence)! "This day shall We save thee in the body, that thou mayest be a sign to those who come after thee! But verily, many among mankind are heedless of Our Signs!"	Catastrophic chastisement: flood because of violating the moral laws	F
10:98	Why was there not a single township (among those We warned), which believed,- so its faith should have profited it,- except the people of Jonah? When they believed, We removed from them the penalty of ignominy in the life of the present, and permitted them to enjoy (their life) for a while.	Catastrophic chastisement was lifted because people's repentance	F
11:6	There is no moving creature on earth but its sustenance dependeth on Allah: He knoweth the time and place of its definite abode and its temporary deposit: All is in a clear Record.	Natural order: human and animals constitute autonomous communities (<i>ummahs</i>)	D F
11:25-44	We sent Noah to his people (with a mission): "I have come to you with a Clear Warning: "That ye serve none but Allah: Verily I do fear for you the penalty of a grievous day." But the chiefs of the Unbelievers among his people said: "We see (in) thee nothing but a man like ourselves: Nor do we see that any follow thee but the meanest among us, in judgment immature: Nor do we see in you (all) any merit above us: in fact we think ye are liars!" He said: "O my people! See ye if (it be that) I have a Clear Sign from my Lord, and that He hath sent Mercy unto me from His own presence, but that the Mercy hath been obscured from your sight? Shall we compel you to accept it when ye are averse to it? "But construct an Ark under Our eyes and Our inspiration, and address Me no (further) on behalf of those who are in sin: for they are about to be overwhelmed (in the Flood)."	Catastrophic chastisement: flood because of violating the moral laws	F
11:67	The (mighty) Blast overtook the wrong-doers, and they lay prostrate in their homes before the morning,-	Natural cataclysm: mighty blast (<i>sayhah</i>)	F
11:77-83	When Our messengers came to Lut, he was grieved on their account and felt himself powerless (to protect) them. He said: "This is a distressful day." And his people came rushing towards him, and they had been long in the habit of practising abominations. He said: "O my people! Here are my daughters: they are purer for you (if ye marry)! Now fear Allah,	Catastrophic chastisement because of violating the moral laws	F

	<p>and cover me not with shame about my guests! Is there not among you a single right-minded man?"</p> <p>They said: "Well dost thou know we have no need of thy daughters: indeed thou knowest quite well what we want!"</p> <p>He said: "Would that I had power to suppress you or that I could betake myself to some powerful support."</p> <p>(The Messengers) said: "O Lut! We are Messengers from thy Lord! By no means shall they reach thee! Now travel with thy family while yet a part of the night remains, and let not any of you look back: but thy wife (will remain behind): To her will happen what happens to the people. Morning is their time appointed: Is not the morning nigh?"</p> <p>When Our Decree issued, We turned (the cities) upside down, and rained down on them brimstones hard as baked clay, spread, layer on layer,-</p> <p>Marked as from thy Lord: Nor are they ever far from those who do wrong!</p>		
11:91	<p>They said: "O Shu'aib! Much of what thou sayest we do not understand! In fact among us we see that thou hast no strength! Were it not for thy family, we should certainly have stoned thee! For thou hast among us no great position!"</p>	Man is weak & full of mistakes	H
11:94-95	<p>When Our decree issued, We saved Shu'aib and those who believed with him, by (special) mercy from Ourselves: But the (mighty) blast did seize the wrong-doers, and they lay prostrate in their homes by the morning,-</p> <p>As if they had never dwelt and flourished there! Ah! Behold! How the Madyan were removed (from sight) as were removed the Thamud!</p>	Natural cataclysm: earthquake with a devastating blast (<i>sayhah</i>) (11:84-95)	F
12:1	A.L.R. These are the symbols (or Verses) of the perspicuous Book.	Qur'an's verses as sign (<i>āyāt</i>)	F
13:2-4	<p>Allah is He Who raised the heavens without any pillars that ye can see; is firmly established on the throne (of authority); He has subjected the sun and the moon (to his Law)! Each one runs (its course) for a term appointed. He doth regulate all affairs, explaining the signs in detail, that ye may believe with certainty in the meeting with your Lord.</p> <p>And it is He who spread out the earth, and set thereon mountains standing firm and (flowing) rivers: and fruit of every kind He made in pairs, two and two: He draweth the night as a veil o'er the Day. Behold, verily in these things there are signs for those who consider!</p> <p>And in the earth are tracts (diverse though) neighbouring, and gardens of vines and fields sown with corn, and palm trees – growing out of single roots or otherwise: watered with the same water, yet some of them We make more excellent than others to eat. Behold, verily in these things there are signs for those who understand!</p>	<p>Natural order / biodiversity as signs of God (<i>āyāt</i>)</p> <p>Concepts of earth's plate tectonics & evolution of earth (13:4)</p>	F G
13:8	Allah doth know what every female (womb) doth bear, by how much the wombs fall short (of their time or number) or do exceed. Every single thing is before His sight, in (due) proportion.	Proportion & measure (<i>qadar or miqdar</i>) / balance (<i>mizān</i>)	F
13:13	Nay, thunder repeateth His praises, and so do the angels, with awe: He flingeth the loud-voiced thunder-bolts, and therewith He striketh whomsoever He will..yet these (are the men) who (dare to) dispute about Allah, with the strength of His power (supreme)!	Natural order: all nature is <i>muslim</i>	D
14:32-34	<p>It is Allah Who hath created the heavens and the earth and sendeth down rain from the skies, and with it bringeth out fruits wherewith to feed you; it is He Who hath made the ships subject to you, that they may sail through the sea by His command; and the rivers (also) hath He made subject to you.</p> <p>And He hath made subject to you the sun and the moon, both diligently pursuing their courses; and the night and the day hath he (also) made subject to you.</p> <p>And He giveth you of all that ye ask for. But if ye count the favours of Allah, never will ye be able to number them. Verily, man is given up to injustice and ingratitude.</p>	<p>Man's responsibility: master or vicegerent (<i>khalifah</i>)?</p> <p>Anthropocentrism For the use of man (<i>asad</i>)</p>	D H

15:1	A. L. R. These are the Ayats of Revelation,- of a Qur'an that makes things clear.	Qur'an's verses as sign (<i>āyāt</i>)	F
15:22	And We send the fecundating winds, then cause the rain to descend from the sky, therewith providing you with water (in abundance), though ye are not the guardians of its stores.	Natural blessing: wind & water	F
15:26	We created man from sounding clay, from mud moulded into shape;	Man is, physical seen, a part of the earth	H
15:61-74	At length when the messengers arrived among the adherents of Lut, He said: "Ye appear to be uncommon folk. " They said: "Yea, we have come to thee to accomplish that of which they doubt. "We have brought to thee that which is inevitably due, and assuredly we tell the truth. "Then travel by night with thy household, when a portion of the night (yet remains), and do thou bring up the rear: let no one amongst you look back, but pass on whither ye are ordered." And We made known this decree to him, that the last remnants of those (sinners) should be cut off by the morning. The inhabitants of the city came in (mad) joy (at news of the young men). Lut said: "These are my guests: disgrace me not: "But fear Allah, and shame me not." They said: "Did we not forbid thee (to speak) for all and sundry?" He said: "There are my daughters (to marry), if ye must act (so)." Verily, by thy life (O Prophet), in their wild intoxication, they wander in distraction, to and fro. But the (mighty) Blast overtook them before morning, And We turned (the cities) upside down, and rained down on them brimstones hard as baked clay.	Catastrophic chastisement: earthquake because of violating the moral laws	F
15:85	We created not the heavens, the earth, and all between them, but for just ends. And the Hour is surely coming (when this will be manifest). So overlook (any human faults) with gracious forgiveness.	Ethical dimension: justice	B
16:26	Those before them did also plot (against Allah's Way): but Allah took their structures from their foundations, and the roof fell down on them from above; and the Wrath seized them from directions they did not perceive.	Catastrophic chastisement: earthquake because of violating the moral laws	G
16:65-69	And Allah sends down rain from the skies, and gives therewith life to the earth after its death: verily in this is a Sign for those who listen. And verily in cattle (too) will ye find an instructive sign. From what is within their bodies between excretions and blood, We produce, for your drink, milk, pure and agreeable to those who drink it. And from the fruit of the date-palm and the vine, ye get out wholesome drink and food: behold, in this also is a sign for those who are wise. And thy Lord taught the Bee to build its cells in hills, on trees, and in (men's) habitations; Then to eat of all the produce (of the earth), and find with skill the spacious paths of its Lord: there issues from within their bodies a drink of varying colours, wherein is healing for men: verily in this is a Sign for those who give thought.	Natural order / Signs of God (<i>āyāt</i>)	B D
16:89	One day We shall raise from all Peoples a witness against them, from amongst themselves: and We shall bring thee as a witness against these (thy people): and We have sent down to thee the Book explaining all things, a Guide, a Mercy, and Glad Tidings to Muslims.	Qur'an can unfold multiple meanings & can be used for the perfection of human life	G
17:9	Verily this Qur'an doth guide to that which is most right (or stable), and giveth the Glad Tidings to the Believers who work deeds of righteousness, that they shall have a magnificent reward;	Correct action & avoiding mistakes as key guiding principle of risk reduction	G
17:36	And pursue not that of which thou hast no knowledge; for every act of hearing, or of seeing or of (feeling in) the heart will be enquired	One day man has to account for his	H

	into (on the Day of Reckoning).	decisions	
17:37	Nor walk on the earth with insolence: for thou canst not rend the earth asunder, nor reach the mountains in height.	Catastrophic chastisement: earthquake (G) because of violating the moral laws	G H
17:44	The seven heavens and the earth, and all beings therein, declare His glory: there is not a thing but celebrates His praise; And yet ye understand not how they declare His glory! Verily He is Oft-Forbear, Most Forgiving!	Natural order: all nature is <i>muslim</i> Human and animals constitute autonomous communities (<i>ummahs</i>)	D E F H
17:68	Do ye then feel secure that He will not cause you to be swallowed up beneath the earth when ye are on land, or that He will not send against you a violent tornado (with showers of stones) so that ye shall find no one to carry out your affairs for you?	Catastrophic chastisement: earthquake because of violating the moral laws	G
17:70	We have honoured the sons of Adam; provided them with transport on land and sea; given them for sustenance things good and pure; and conferred on them special favours, above a great part of our creation.	Man as God's vicegerent (<i>khalifa</i>)	F H
18:29	Say, "The truth is from your Lord": Let him who will believe, and let him who will, reject (it): for the wrong-doers We have prepared a Fire whose (smoke and flames), like the walls and roof of a tent, will hem them in: if they implore relief they will be granted water like melted brass, that will scald their faces, how dreadful the drink! How uncomfortable a couch to recline on!	Man has to decide if he wants to believe in God or not	H
18:30	As to those who believe and work righteousness, verily We shall not suffer to perish the reward of any who do a (single) righteous deed.	Correct action & avoiding mistakes as key guiding principle of risk reduction	G
19:58	Those were some of the prophets on whom Allah did bestow His Grace,- of the posterity of Adam, and of those who We carried (in the Ark) with Noah, and of the posterity of Abraham and Israel of those whom We guided and chose. Whenever the Signs of (Allah) Most Gracious were rehearsed to them, they would fall down in prostrate adoration and in tears.	Qur'an's verses as sign (<i>āyāt</i>)	F
20:6	To Him belongs what is in the heavens and on earth, and all between them, and all beneath the soil.	Divine ownership	C
20:50	He said: "Our Lord is He Who gave to each (created) thing its form and nature, and further, gave (it) guidance."	Natural order / signs of God (<i>āyāt</i>) / proportion and measure (<i>qadar or miqdar</i>)	B D
21:16	Not for (idle) sport did We create the heavens and the earth and all that is between!	Natural order / signs of God (<i>āyāt</i>)	B D
21:17	If it had been Our wish to take (just) a pastime, We should surely have taken it from the things nearest to Us, if We would do (such a thing)!	Natural order / signs of God (<i>āyāt</i>)	D
21:19	To Him belong all (creatures) in the heavens and on earth: Even those who are in His (very) Presence are not too proud to serve Him, nor are they (ever) weary (of His service):	Divine ownership	C
21:30	Do not the Unbelievers see that the heavens and the earth were joined together (as one unit of creation), before we clove them asunder? We made from water every living thing. Will they not then believe?	All life come from water	H
22:1	O mankind! Fear your Lord! For the convulsion of the Hour (of Judgment) will be a thing terrible!	The only global natural disasters are those associated with eschatological incidents	F

22:18	Seest thou not that to Allah bow down in worship all things that are in the heavens and on earth,- the sun, the moon, the stars; the hills, the trees, the animals; and a great number among mankind? But a great number are (also) such as are fit for Punishment: and such as Allah shall disgrace,- None can raise to honour: for Allah carries out all that He wills.	Natural order: all nature is <i>muslim</i> Man has to treat the other creatures with fairness	D H
23:23-27	(Further, We sent a long line of prophets for your instruction). We sent Noah to his people: He said, "O my people! Worship Allah! Ye have no other god but Him. Will ye not fear (Him)?" The chiefs of the Unbelievers among his people said: "He is no more than a man like yourselves: his wish is to assert his superiority over you: if Allah had wished (to send messengers), He could have sent down angels; never did we hear such a thing (as he says), among our ancestors of old." (And some said): "He is only a man possessed: wait (and have patience) with him for a time." (Noah) said: "O my Lord! help me: for that they accuse me of falsehood!" So We inspired him (with this message): "Construct the Ark within Our sight and under Our guidance: then when comes Our Command, and the fountains of the earth gush forth, take thou on board pairs of every species, male and female, and thy family- except those of them against whom the Word has already gone forth: And address Me not in favour of the wrong-doers; for they shall be drowned (in the Flood).	Catastrophic chastisement: flood because of violating the moral laws or Noah's Ark: example of how to be safe in a disaster (23:27)	F G
23:88	Say: "Who is it in whose hands is the governance of all things,- who protects (all), but is not protected (of any)? (say) if ye know."	Natural order as another branch of reality that is divine (Hossein Nasr)	H
23:115	"Did ye then think that We had created you in jest, and that ye would not be brought back to Us (for account)?"	Natural order / signs of God (<i>āyāt</i>)	D
24:35	Allah is the Light of the heavens and the earth. The Parable of His Light is as if there were a Niche and within it a Lamp: the Lamp enclosed in Glass: the glass as it were a brilliant star: Lit from a blessed Tree, an Olive, neither of the east nor of the west, whose oil is well-nigh luminous, though fire scarce touched it: Light upon Light! Allah doth guide whom He will to His Light: Allah doth set forth Parables for men: and Allah doth know all things.	Natural order: because of new technologies man can no longer see God's nature (Le Gai Eaton)	H
24:41-42	Seest thou not that it is Allah Whose praises all beings in the heavens and on earth do celebrate, and the birds (of the air) with wings outspread? Each one knows its own (mode of) prayer and praise. And Allah knows well all that they do. Yea, to Allah belongs the dominion of the heavens and the earth; and to Allah is the final goal (of all).	Natural order: all nature is <i>muslim</i>	D H
24:45	And Allah has created every animal from water: of them there are some that creep on their bellies; some that walk on two legs; and some that walk on four. Allah creates what He wills for verily Allah has power over all things.	Natural order / divine ownership / every creature on earth needs water (Le Gai Eaton)	H
25:2	He to whom belongs the dominion of the heavens and the earth: no son has He begotten, nor has He a partner in His dominion: it is He who created all things, and ordered them in due proportions.	Natural order, balance & proportion	B
25:48-49	And He it is Who sends the winds as heralds of glad tidings, going before His mercy, and We send down pure water from the sky, - That with it We may give life to a dead land, and slake the thirst of things We have created,- cattle and men in great numbers.	Natural blessing: wind & water Natural order: human and animals constitute autonomous communities (<i>ummahs</i>)	F
25:58	And put thy trust in Him Who lives and dies not; and celebrate his praise; and enough is He to be acquainted with the faults of His	Faith/trust in God	H

	servants;-	(<i>tawakkul</i>)	
26:6	They have indeed rejected (the Message): so they will know soon (enough) the truth of what they mocked at!	Catastrophic chastisement because of violating the moral laws	H
26:217-218	And put thy trust on the Exalted in Might, the Merciful,- Who seeth thee standing forth (in prayer),	Faith/trust in God (<i>tawakkul</i>)	H
27:1	These are verses of the Qur'an,-a book that makes (things) clear;	Qur'an's verses as sign (<i>āyāt</i>)	F
27:16-18	And Solomon was David's heir. He said: "O ye people! We have been taught the speech of birds, and on us has been bestowed (a little) of all things: this is indeed Grace manifest (from Allah.)" And before Solomon were marshalled his hosts,- of Jinns and men and birds, and they were all kept in order and ranks. At length, when they came to a (lowly) valley of ants, one of the ants said: "O ye ants, get into your habitations, lest Solomon and his hosts crush you (under foot) without knowing it."	Natural order: human and animals constitute communities (<i>ummahs</i>)	D
27:63-65	Or, Who listens to the (soul) distressed when it calls on Him, and Who relieves its suffering, and makes you (mankind) inheritors of the earth? (Can there be another) god besides Allah? Little it is that ye heed! Or, Who guides you through the depths of darkness on land and sea, and Who sends the winds as heralds of glad tidings, going before His Mercy? (Can there be another) god besides Allah?- High is Allah above what they associate with Him! Or, Who originates creation, then repeats it, and who gives you sustenance from heaven and earth? (Can there be another) god besides Allah? Say, "Bring forth your argument, if ye are telling the truth!" Say: None in the heavens or on earth, except Allah, knows what is hidden: nor can they perceive when they shall be raised up (for Judgment).	Efforts for proper behaviour in all areas of life	H
27:88	Thou seest the mountains and thinkest them firmly fixed: but they shall pass away as the clouds pass away: (such is) the artistry of Allah, who disposes of all things in perfect order: for he is well acquainted with all that ye do.	Natural Order / physical world as signs of God (<i>āyāt</i>)	D F
28:2	These are Verses of the Book that makes (things) clear.	Qur'an's verses as sign (<i>āyāt</i>)	F
28:4	Truly Pharaoh elated himself in the land and broke up its people into sections, depressing a small group among them: their sons he slew, but he kept alive their females: for he was indeed a maker of mischief.	Catastrophic chastisement because of violating the moral laws	F
28:40	So We seized him and his hosts, and We flung them into the sea: Now behold what was the end of those who did wrong!	Catastrophic chastisement because of violating the moral laws	F
28:77	"But seek, with the (wealth) which Allah has bestowed on thee, the Home of the Hereafter, nor forget thy portion in this world: but do thou good, as Allah has been good to thee, and seek not (occasions for) mischief in the land: for Allah loves not those who do mischief."	Concept of sin, corruption or mischief → can result in disasters	G
28:84	If any does good, the reward to him is better than his deed; but if any does evil, the doers of evil are only punished (to the extent) of their deeds.	Correct action & avoiding mistakes as key guiding principle of disaster risk reduction	G
29:14	We (once) sent Noah to his people, and he tarried among them a thousand years less fifty: but the Deluge overwhelmed them while they (persisted in) sin.	Natural cataclysm: flood (<i>tufan</i>)	F

29:37	But they rejected him: Then the mighty Blast seized them, and they lay prostrate in their homes by the morning.	Natural cataclysm: earthquake (<i>raifah</i>)	F G
29:40	Each one of them We seized for his crime: of them, against some We sent a violent tornado (with showers of stones); some were caught by a (mighty) Blast; some We caused the earth to swallow up; and some We drowned (in the waters): It was not Allah Who injured (or oppressed) them:” They injured (and oppressed) their own souls.	Catastrophic chastisements because of violating the moral laws Concept of sin, corruption or mischief → can result in disasters	F G
30:9	Do they not travel through the earth, and see what was the end of those before them? They were superior to them in strength: they tilled the soil and populated it in greater numbers than these have done: there came to them their messengers with Clear (Signs). (Which they rejected, to their own destruction): It was not Allah Who wronged them, but they wronged their own souls.	Leadership of wise, elite, intellect and experts	G
30:22-25	And among His Signs is the creation of the heavens and the earth, and the variations in your languages and your colours: verily in that are Signs for those who know. And among His Signs is the sleep that ye take by night and by day, and the quest that ye (make for livelihood) out of His Bounty: verily in that are signs for those who hearken. And among His Signs, He shows you the lightning, by way both of fear and of hope, and He sends down rain from the sky and with it gives life to the earth after it is dead: verily in that are Signs for those who are wise. And among His Signs is this, that heaven and earth stand by His Command: then when He calls you, by a single call, from the earth, behold, ye (straightway) come forth.	Natural order / physical world as signs of God (<i>āyāt</i>)	F
30:26	To Him belongs every being that is in the heavens and on earth: all are devoutly obedient to Him.	Divine ownership	C
30:30	So set thou thy face steadily and truly to the Faith: (establish) Allah’s handiwork according to the pattern on which He has made mankind: no change (let there be) in the work (wrought) by Allah: that is the standard Religion: but most among mankind understand not.	Natural order: man’s place in it Creation principle (<i>fiṭrah</i>)	A B C H
30:41	Mischief has appeared on land and sea because of (the meed) that the hands of men have earned, that (Allah) may give them a taste of some of their deeds: in order that they may turn back (from Evil).	God let us taste some effects of our misdeeds, but he also forgives much	B E F
31:2	These are Verses of the Wise Book,-	Qur’an’s verses as sign (<i>āyāt</i>)	F
31:8	For those who believe and work righteous deeds, there will be Gardens of Bliss,-	Correct action & avoiding mistakes as key guiding principle of risk reduction	G
31:18	”And swell not thy cheek (for pride) at men, nor walk in insolence through the earth; for Allah loveth not any arrogant boaster.	Humility towards creation	H
31:22	Whoever submits his whole self to Allah, and is a doer of good, has grasped indeed the most trustworthy hand-hold: and with Allah rests the End and Decision of (all) affairs.	Submission to God: accept that earthquakes occur, at the same time appropriate good deeds	G
33:72	We did indeed offer the Trust to the Heavens and the Earth and the Mountains; but they refused to undertake it, being afraid thereof: but man undertook it;- He was indeed unjust and foolish;-	Trusteeship (<i>amānāh</i>)	B E H
34:9	See they not what is before them and behind them, of the sky and the earth? If We wished, We could cause the earth to swallow them up, or cause a piece of the sky to fall upon them. Verily in this is a	Catastrophic chastisement: earthquake because of	G

	Sign for every devotee that turns to Allah (in repentance).	violating the moral laws	
34:37	It is not your wealth nor your sons, that will bring you nearer to Us in degree: but only those who believe and work righteousness – these are the ones for whom there is a multiplied Reward for their deeds, while secure they (reside) in the dwellings on high!	Proper behaviour in all areas of life	H
35:43	On account of their arrogance in the land and their plotting of Evil, but the plotting of Evil will hem in only the authors thereof. Now are they but looking for the way the ancients were dealt with? But no change wilt thou find in Allah's way (of dealing): no turning off wilt thou find in Allah's way (of dealing).	Natural order: to learn from mistakes, concept of a period of respite	E
35:45	If Allah were to punish men according to what they deserve. He would not leave on the back of the (earth) a single living creature: but He gives them respite for a stated Term: when their Term expires, verily Allah has in His sight all His Servants.	God let us taste some effects of our misdeeds, but he also forgives much	E F
36:38	And the sun runs his course for a period determined for him: that is the decree of (Him), the Exalted in Might, the All-Knowing.	Natural order / signs of God (<i>āyāt</i>) Predestination (<i>qadar</i>)	F
36:83	So glory to Him in Whose hands is the dominion of all things: and to Him will ye be all brought back.	Man's responsibility: master or vicegerent (<i>khalīfah</i>)?	D
38:27	Not without purpose did We create heaven and earth and all between! That were the thought of Unbelievers! But woe to the Unbelievers because of the Fire (of Hell)!	Natural order: nature and ethics, moral dimension	B D H
39:42	It is Allah that takes the souls (of men) at death; and those that die not (He takes) during their sleep: those on whom He has passed the decree of death, He keeps back (from returning to life), but the rest He sends (to their bodies) for a term appointed verily in this are Signs for those who reflect.	Death is unavoidable, it's destiny	F
40:57	Assuredly the creation of the heavens and the earth is a greater (matter) than the creation of men: Yet most men understand not.	Natural order: man is only part of creation	A B
41:11	Moreover He comprehended in His design the sky, and it had been (as) smoke: He said to it and to the earth: "Come ye together, willingly or unwillingly." They said: "We do come (together), in willing obedience."	Natural order: all nature is <i>muslim</i> / nature as a whole as a living being	D
41:12	So He completed them as seven firmaments in two Days, and He assigned to each heaven its duty and command. And We adorned the lower heaven with lights, and (provided it) with guard. Such is the Decree of (Him) the Exalted in Might, Full of Knowledge.	Natural order / signs of God (<i>āyāt</i>) Predestination (<i>qadar</i>)	F
41:53	Soon will We show them our Signs in the (furthest) regions (of the earth), and in their own souls, until it becomes manifest to them that this is the Truth. Is it not enough that thy Lord doth witness all things?	Natural order / physical world as signs of God (<i>āyāt</i>)	D F
42:15	Now then, for that (reason), call (them to the Faith), and stand steadfast as thou art commanded, nor follow thou their vain desires; but say: "I believe in the Book which Allah has sent down; and I am commanded to judge justly between you. Allah is our Lord and your Lord: for us (is the responsibility for) our deeds, and for you for your deeds. There is no contention between us and you. Allah will bring us together, and to Him is (our) Final Goal.	Ethical dimension: no compromise with truth and justice	B
42:30	Whatever misfortune happens to you, is because on the things your hands have wrought, and for many (of them) He grants forgiveness.	God let us taste some effects of our misdeeds, but he also forgives much	F
42:38	Those who hearken to their Lord, and establish regular Prayer; who (conduct) their affairs by mutual Consultation; who spend out of what We bestow on them for Sustenance;	Group work, social activities and responsibilities, cooperation is of high	G

		value	
43:55-56	When at length they provoked Us, We exACTED retribution from them, and We drowned them all. And We made them (a people) of the Past and an Example to later ages.	Natural disasters as a means to discipline errant individuals and nations → as examples for next generations (43:56)	F
44:38-39	We created not the heavens, the earth, and all between them, merely in (idle) sport: We created them not except for just ends: but most of them do not understand.	Natural order	F
45:13	And He has subjected to you, as from Him, all that is in the heavens and on earth: Behold, in that are Signs indeed for those who reflect.	Man's responsibility: master or vicegerent? Man as God's vicegerent (<i>khalīfa</i>)	F
45:30	Then, as to those who believed and did righteous deeds, their Lord will admit them to His Mercy that will be the achievement for all to see.	To believe and to do good deeds	H
47:12	Verily Allah will admit those who believe and do righteous deeds, to Gardens beneath which rivers flow; while those who reject Allah will enjoy (this world) and eat as cattle eat; and the Fire will be their abode.	To believe and to do good deeds	H
47:24	Do they not then earnestly seek to understand the Qur'an, or are their hearts locked up by them?	Punishment for the nonbeliever	D
49:13	O mankind! We created you from a single (pair) of a male and a female, and made you into nations and tribes, that ye may know each other (not that ye may despise (each other)). Verily the most honoured of you in the sight of Allah is (he who is) the most righteous of you. And Allah has full knowledge and is well acquainted (with all things).	Living together in participation	E
51:20-21	On the earth are signs for those of assured Faith, As also in your own selves: Will ye not then see?	Natural order / Signs of God (<i>āyāt</i>)	A B D
51:41	And in the 'Ad (people) (was another Sign): Behold, We sent against them the devastating Wind:	Natural cataclysm: wind	F
51:56	I have only created Jinns and men, that they may serve Me.	Different creatures have to serve God	H
53:62	But fall ye down in prostration to Allah, and adore (Him)!	Natural order: all nature is <i>muslim</i>	D
54:9-14	Before them the People of Noah rejected (their messenger): they rejected Our servant, and said, "Here is one possessed!", and he was driven out. Then he called on his Lord: "I am one overcome: do Thou then help (me)!" So We opened the gates of heaven, with water pouring forth. And We caused the earth to gush forth with springs, so the waters met (and rose) to the extent decreed. But We bore him on an (Ark) made of broad planks and caulked with palm-fibre: She floats under our eyes (and care): a recompense to one who had been rejected (with scorn)!	Catastrophic chastisement: flood because of violating the moral laws	F
54:34	We sent against them a violent Tornado with showers of stones, (which destroyed them), except Lut's household: them We delivered by early Dawn,-	Natural cataclysm: violent tornado (<i>hasīb</i>)	F
54:49	Verily, all things have We created in proportion and measure.	Natural order Proportion & measure (<i>qadar or miqdar</i>)	E F

		balance (<i>mizān</i>)	
55:1-7	(Allah) Most Gracious! It is He Who has taught the Qur'an. He has created man: He has taught him speech (and intelligence). The sun and the moon follow courses (exactly) computed; And the herbs and the trees – both (alike) prostrate in adoration. And the Firmament has He raised high, and He has set up the Balance (of Justice),	Balance principle (<i>mizān</i>) Proportion & measure (<i>qadar or miqdar</i>)	B C D E F H
55:8-13	In order that ye may not transgress (due) balance. So establish weight with justice and fall not short in the balance. It is He Who has spread out the earth for (His) creatures: Therein is fruit and date-palms, producing spathes (enclosing dates); Also corn, with (its) leaves and stalk for fodder, and sweet-smelling plants. Then which of the favours of your Lord will ye deny?	Balance principle (<i>mizān</i>) For all living beings Proportion & measure (<i>qadar or miqdar</i>) Natural order: human and animals constitute autonomous communities (<i>ummahs</i>)	C D E F H
55:60	Is there any Reward for Good – other than Good?	Responsibility principle	B
57:23	In order that ye may not despair over matters that pass you by, nor exult over favours bestowed upon you. For Allah loveth not any vainglorious boaster,-	Man was honoured by God, but man is also weak → balance principle (<i>mizān</i>)	H
59:21	Had We sent down this Qur'an on a mountain, verily, thou wouldst have seen it humble itself and cleave asunder for fear of Allah. Such are the similitudes which We propound to men, that they may reflect.	Faith/trust in God (<i>wahdat al-wuġud</i>)	H
62:1	Whatever is in the heavens and on earth, doth declare the Praises and Glory of Allah, - the Sovereign, the Holy One, the Exalted in Might, the Wise.	Divine ownership	C
65:3	And He provides for him from (sources) he never could imagine. And if any one puts his trust in Allah, sufficient is (Allah) for him. For Allah will surely accomplish his purpose: verily, for all things has Allah appointed a due proportion.	Faith/trust in God (<i>tawakkul</i>)	H
67:3-4	He Who created the seven heavens one above another: No want of proportion wilt thou see in the Creation of (Allah) Most Gracious. So turn thy vision again: seest thou any flaw? Again turn thy vision a second time: (thy) vision will come back to thee dull and discomfited, in a state worn out.	Natural order / physical world as signs of God (<i>āyāt</i>) Clear of any contradiction	D F
67:15	It is He Who has made the earth manageable for you, so traverse ye through its tracts and enjoy of the Sustenance which He furnishes: but unto Him is the Resurrection.	Man's responsibility: master or vicegerent (<i>khalīfa</i>)?	D
67:16	Do ye feel secure that He Who is in heaven will not cause you to be swallowed up by the earth when it shakes (as in an earthquake)?	Catastrophic chastisement: earthquake because of violating the moral laws	G
67:19	Do they not observe the birds above them, spreading their wings and folding them in? None can uphold them except (Allah) Most Gracious: Truly (Allah) Most Gracious: Truly it is He that watches over all things.	Natural order / signs of God (<i>āyāt</i>)	H
69:4-7	The Thamud and the 'Ad People (branded) as false the Stunning Calamity! But the Thamud,- they were destroyed by a terrible Storm of thunder and lightning! And the 'Ad, they were destroyed by a furious Wind, exceedingly violent; He made it rage against them seven nights and eight days in succession: so that thou couldst see the (whole) people lying prostrate in its (path), as they had been roots of hollow palm-trees tumbled down!	Catastrophic chastisement: storm & earthquake because of violating the moral laws	G

70:19-27	Truly man was created very impatient;- Fretful when evil touches him; And niggardly when good reaches him;- Not so those devoted to Prayer;- Those who remain steadfast to their prayer; And those in whose wealth is a recognised right. For the (needy) who asks and him who is prevented (for some reason from asking); And those who hold to the truth of the Day of Judgment; And those who fear the displeasure of their Lord,-	Man is weak & full of mistakes	H
79:27	What! Are ye the more difficult to create or the heaven (above)? (Allah) hath constructed it:	Natural order: like nature is man only part of creation	H
80:24-32	Then let man look at his food, (and how We provide it): For that We pour forth water in abundance, And We split the earth in fragments, And produce therein corn, And Grapes and nutritious plants, And Olives and Dates, And enclosed Gardens, dense with lofty trees, And fruits and fodder,- For use and convenience to you and your cattle.	Natural order / signs of God (<i>āyāt</i>)	D
81:8-9	And when the girl [who was] buried alive is asked For what sin she was killed	Lack of trust in God (barbarous custom)	H
86:5-7	Now let man but think from what he is created! He is created from a drop emitted- Proceeding from between the backbone and the ribs:	Man was honoured by God, but man is also weak → find the balance	H
88:17-20	Do they not look at the Camels, how they are made?- And at the Sky, how it is raised high?- And at the Mountains, how they are fixed firm?- And at the Earth, how it is spread out?	Natural order / signs of God (<i>āyāt</i>)	D
89:27	(To the righteous soul will be said:) "O (thou) soul, in (complete) rest and satisfaction!	Humility towards creation promises peace	H
92:11	Nor will his wealth profit him when he falls headlong (into the Pit).	Catastrophic chastisement because of violating the moral laws	H
96:1-2	Proclaim! (or read!) in the name of thy Lord and Cherisher, Who created- Created man, out of a (mere) clot of congealed blood:	Natural order: metaphysical dimension of nature	B D
99:1	When the earth is shaken to her (utmost) convulsion,	The only global natural disasters are those associated with eschatological incidents	F
99:1-8	When the earth is shaken to her (utmost) convulsion, And the earth throws up her burdens (from within), And man cries (distressed): 'What is the matter with her?'- On that Day will she declare her tidings: For that thy Lord will have given her inspiration. On that Day will men proceed in companies sorted out, to be shown the deeds that they (had done). Then shall anyone who has done an atom's weight of good, see it! And anyone who has done an atom's weight of evil, shall see it.	Catastrophic chastisement: earthquake because of violating moral laws or description of an earthquake & how people deal with it Responsibility principle	G D
101:1-11	The Striking Calamity - What is the Striking Calamity? And what can make you know what is the Striking Calamity?	Reduction of losses from natural events is possible by best human	G

	<p>It is the Day when people will be like moths, dispersed, And the mountains will be like wool, fluffed up. Then as for one whose scales are heavy [with good deeds], He will be in a pleasant life. But as for one whose scales are light, His refuge will be an abyss. And what can make you know what that is? It is a Fire, intensely hot.</p>	performance	
103:1-3	<p>By (the Token of) Time (through the ages), Verily Man is in loss, Except such as have Faith, and do righteous deeds, and (join together) in the mutual teaching of Truth, and of Patience and Constancy.</p>	<p>Correct action & avoiding mistakes as key guiding principle of risk reduction Man is weak & full of mistakes → prompt to do good</p>	H
112:1-4	<p>Say: He is Allah, the One and Only; Allah, the Eternal, Absolute; He begetteth not, nor is He begotten; And there is none like unto Him.</p>	<p>Unity principle (<i>tawḥīd</i>) Faith/trust in God (<i>waḥdat al-wuḡud</i>)</p>	B C H
114:1-3	<p>Say: I seek refuge with the Lord and Cherisher of Mankind, The King (or Ruler) of Mankind, The god (or judge) of Mankind,-</p>	Unity principle (<i>tawḥīd</i>)	A B

13.3 Appendix 3: Questionnaires for Climate Resilience Survey 2010

Local Government officials

Data Entered By: _____ Date: _____ / _____ / 2010

ID _____



ACTED

CLIMATE RESILIENCE SURVEY



Questionnaire for Local Government Officials (Jamoat, CoES, Mahalla Comitee, VDPC)

a. Questionnaire №: _____ b. Date of Interview: _____ / _____ / 2010 c. Respondent _____

*Record the name of the interviewee in the Respondent List and check that the corresponding Questionnaire ID is the same.
[If the respondent does not want to participate in the survey, record NR in the respondent list, and move to the next sampled respondent.]*

A. Geographic Information

A. Province	
B. Rayon	
C. Jamoat	
D. Village	

INTRODUCTION AND CONSENT

Hello, my name is _____ I'm working with the international nongovernmental organization ACTED.
We would like to ask you a few questions about the environment and climate change.
Our conversation will stay confidential. All gathered information will be generalized.
You are not obliged to answer all the questions, if you do not feel comfortable.

Would you like to participate in this survey? **YES** **NO**

B. Respondents' characteristics

1.	Sex	Male	1
		Female	2
2.	Age	18-30	1
		31-49	2
		50+	3
3.	Office/Department		
4.	Designation		

C. Here we would like you to assess the extent to which disaster risk reduction, related to climate change and natural hazards, has been a priority, in particular at the local level

5.	Have you ever heard something about climate change?	Yes	1
		No	2
		Don't know	99
	5A If yes: From where did you hear it?	TV	1
		Radio	2
		Newspaper	3
		Other _____	88
6.	Are there institutional capacities for dealing with the effects of the long-term changes in the average weather conditions and resulting disasters at the local level?	Yes	1
		Yes, but with limited extent	2
		No	3
7.	Is disaster risk reduction incorporated into overall planning at the local level in key sectors such as education, health, agriculture, housing, health and environment?	Yes	1
		Yes, but with limited extent	2
		No	3

8.	Is adequate budget allocated to local government and other local institutions to enable them to incorporate the long-term changes in the average weather conditions and disaster risk reduction into planning and actual activities?	Yes Yes, but with limited extent No	1 2 3
9.	Does the government provide training in disaster risk reduction to local officials and community leaders?	Yes Yes, but with limited extent No	1 2 3
D. Here we would like you to assess the progress made by local-level government in monitoring risks and providing information to local communities			
10.	Do you carry out regular hazard / risk assessments with the participation of representatives of all sections of the local communities (including most vulnerable groups)?	Yes Yes, but with limited extent No	1 2 3
11.	Are there effective early warning systems in place, which are able to reach local populations and which take local conditions into account?	Yes Yes, but with limited extent No	1 2 3
12.	Are there risk management systems in place to regularly monitor hazards and risks?	Yes Yes, but with limited extent No	1 2 3
E. Here we would like you to assess how effectively local-level government has used knowledge and education to ensure key stakeholders are well informed to build a culture of safety and resilience			
13.	Is information on changes in the long-term changes in the average weather conditions and disaster risks and how to both reduce and respond to them, readily available and accessible to key stakeholders? <i>Including government officials, general public, private sector and local leaders in affected communities</i>	Yes Yes, but with limited extent No	1 2 3
14.	Are topics related to the long-term changes in the average weather conditions and disaster risk awareness and reduction taught through the formal school / college curricula and through school-based activities and projects?	Yes Yes, but with limited extent No	1 2 3
15.	Are school and college teachers trained on topics related to the long-term changes in the average weather conditions and disaster risk reduction and provided with appropriate educational material?	Yes Yes, but with limited extent No	1 2 3
16.	Is community-based training on disaster risk reduction open to all members of local communities, including the most vulnerable groups?	Yes Yes, but with limited extent No	1 2 3
17.	Are there public education initiatives informing communities about changes in the long-term changes in the average weather conditions and disaster risk, how to reduce exposure, protect themselves from, and respond to disasters?	Yes Yes, but with limited extent No	1 2 3

F. Here we would like you to assess the overall progress toward changing social, economic, environmental conditions and land use at the local level to reduce disaster risks			
18.	Is adequate social protection available to help vulnerable groups such as poor people, women who are pregnant or with young children, the elderly and disabled respond to, and recover from effects the long-term changes in the average weather conditions and resulting disasters?	Yes Yes, but with limited extent No	1 2 3
19.	Does local-level government support communities to adapt to actual or expected long-term changes in the average weather conditions at the local level?	Yes Yes, but with limited extent No	1 2 3
20.	Are key public facilities such as schools and hospitals re-built or strengthened to protect against major hazard threat, especially in areas of high risk?	Yes Yes, but with limited extent No	1 2 3
G. Here we would like you to assess progress toward strengthening disaster preparedness for effective response (in terms of capacity and resources) of local authorities, communities and individuals			
21.	Are there measures to strengthen disaster preparedness and response capacities at the local level?	Yes Yes, but with limited extent No	1 2 3
22.	Are regular training drills and evacuation rehearsals done with local civil society organisations and at-risk communities?	Yes Yes, but with limited extent No	1 2 3
23.	Do local authorities have access to financial reserves and / or contingency funds that can be made available quickly to support a rapid response to disasters?	Yes Yes, but with limited extent No	1 2 3
H. Here we would like you to assess overall progress in addressing important cross-cutting issues that have an impact on overall disaster risk reduction strategies.			
24.	Are villager's rights to participate in disaster response and prevention measures effectively promoted in policies and laws?	Yes Yes, but with limited extent No	1 2 3
25.	Are affected populations, especially vulnerable groups, able to play an equal role in disaster risk reduction decision-making, planning and implementation?	Yes Yes, but with limited extent No	1 2 3
26.	Are there specific activities that support and encourage the voluntary participation of communities in reducing disaster risks?	Yes Yes, but with limited extent No	1 2 3
27.	Are communities and civil society organisations trained to participate in disaster risk reduction?	Yes Yes, but with limited extent No	1 2 3
28.	Are women, particularly at village (<i>grassroots</i>) level, given specific public roles in decision-making and implementation of disaster risk reduction activities?	Yes Yes, but with limited extent No	1 2 3

29.	Are resources set aside to build partnerships with women's groups, particularly at village (<i>grassroots</i>) level?	<p style="text-align: right;">Yes 1</p> <p style="text-align: right;">Yes, but with limited extent 2</p> <p style="text-align: right;">No 3</p>
30.	Are traditional practices and local customs (<i>such as indigenous knowledge and traditional leaders' knowledge</i>) recognized in developing disaster risk reduction activities?	<p style="text-align: right;">Yes 1</p> <p style="text-align: right;">Yes, but with limited extent 2</p> <p style="text-align: right;">No 3</p>
<p>Thank you for your time and for sharing your opinion. Are there any questions you would like to ask?</p> <p>Monitor comments:</p>		

Religious Leaders

Data Entered By: _____ Date: ____ / ____ / 2010

ID _____



CLIMATE RESILIENCE SURVEY



Questionnaire for Religious Leaders

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2010 c. Respondent _____

*Record the name of the interviewee in the Respondent List and check that the corresponding Questionnaire ID is the same.
[If the respondent does not want to participate in the survey, record NR in the respondent list, and move to the next sampled respondent.]*

A. Geographic Information

A.	Province	
B.	Rayon	
C.	Jamoat	
D.	Village	

INTRODUCTION AND CONSENT

Hello, my name is _____ I'm working with the international nongovernmental organization ACTED.
We would like to ask you a few questions about the environment and climate change.
Our conversation will stay confidential. All gathered information will be generalized.
You are not obliged to answer all the questions, if you do not feel comfortable.

Would you like to participate in this survey? **YES** **NO**

B. Respondents' characteristics

1.	Sex	Male	1
		Female	2
2.	Age	18-30	1
		31-49	2
		50+	3
3.	How long do you already live in this village?	Less than 10 years	1
		Between 10 and 30 years	2
		30 or more years	3
4.	For how many people are you responsible?		
5.	Is there a mosque in the area of your responsibility?	Yes	1
		No	2

C. CHANGES IN THE CLIMATE AND NATURAL HAZARDS (DISASTERS)

6.	What would you define as the most serious natural hazard in your area? <i>Do not read the answers. Let the interviewee list what he has in his mind.</i>	Flood	1
		Mud flow	2
		Landslide	3
		Avalanche	4
		Drought	5
		Rise of underground waters	6
		Earthquake	7
		Locust raid	8
		Strong wind	9
		Other _____	88
		Don't know	99

7.	How often does _____ occur? <i>Event mentioned in question 6</i>	Very seldom (once in 31-100 years, <i>once in a lifetime</i>) Seldom (once in 16-30 years, <i>once in generation</i>) Sometimes (once in 6-15 years) Often (every one-5 years) Very often (every year) Other _____	1 2 3 4 5 88 99
8.	When did the last _____ occur? <i>Event mentioned in question 6.</i>	This year Last year Years ago	1 2 3
9.	What kind of impacts was caused by the _____? You may choose as many as you like. <i>Event mentioned in question 6. Read the answer options to the interviewee.</i>	Impacts on human life Damage to homes and businesses Damage to electricity, water supply Damage to communication infrastructure Damage to transport system Impacts on health Damage to river systems, irrigation channels Damage to agricultural land Impacts on livestock Other _____	1 2 3 4 5 6 7 8 9 88
10.	What do you think are the causes for natural disasters?	Purely natural causes <i>Manmade causes like:</i> Neglected maintenance (e.g. of channels) Wrong land use (e.g. overgrazing, cutting wood) We are in the wrong location Act of God, divine punishment Don't know	1 2 3 4 5 99
11.	Do you have knowledge about traditional practices and local customs that can help solving the problems of changes in the long-term changes in the average weather conditions and the resulting natural hazards and disasters in your community? <i>Like traditional ecological knowledge, indigenous knowledge, the knowledge of traditional leaders, rural peoples'/farmers' knowledge, etc.</i>	Yes No Don't know	1 2 99
	11A <i>If yes:</i> Can you please give an example of your knowledge.		
12.	Have you ever heard something about "climate change"?	Yes No Don't know	1 2 99

	12A From where did you hear it?	TV Radio Newspaper Other _____	1 2 3 88
13.	Has the number of hot days stayed the same, increased, or declined over the 10-30 years?	Same Increased Declined Don't know	1 2 3 99
14.	Has the number of rainfall days stayed the same, increased, or declined over the 10-30 years?	Same Increased Declined Don't know	1 2 3 99
15.	Have you seen changes in the vegetation cover over the last about 10 to 30 years?	Yes No Don't know	1 2 99
	15A <i>If yes:</i> What changes have you observed?		
16.	Do you feel informed about the long-term changes in the average weather conditions and resulting natural hazards?	Yes Somewhat informed No	1 2 3
	16A <i>If yes or somewhat informed:</i> What do you think are the reasons for the long-term changes in the average weather conditions and the resulting natural hazards?		
17.	How concerned are you about changes in the long-term changes in the average weather conditions and the resulting natural hazards?	Concerned Somewhat concerned Not concerned	1 2 3
	17A <i>If concerned or somewhat concerned:</i> About whom are you concerned?	About me and my family About community members About both	1 2 3
18.	Do you feel responsible for the people of your community in regard to the long-term changes in the average weather conditions and the resulting natural hazards and disasters?	Yes No Don't know	1 2 99
19.	Do people come to you and ask for help?	Yes No Don't know	1 2 99

	19A <i>If yes:</i> How do you help them?		
20.	Do you discuss the long-term changes in the average weather conditions and the resulting natural hazards and disasters also in the 'religious leaders' community'?	Yes No Don't know	1 2 99
	20A <i>If yes:</i> Do you get support from the national, hukumat or jamoat level to address these issues?	Yes No Don't know	1 2 99
	20B <i>If yes:</i> Can you please tell about the support you get from national, hukumat or jamoat level.		
21.	What other problems/risks (than the long-term changes in the average weather conditions and natural hazards) does your community face in its daily life? <i>Let the interviewee list what he has in his mind. When he is confused and do not know what to say, you can give him some options.</i>	Getting food Getting work Paying the bills Getting necessary financial help Paying for their medications Paying for their children's education Being prepared for a strong winter Political stability and security Other _____	1 2 3 4 5 6 7 8 88
22.	Out of these, what is the biggest problem/risk facing your community?		
23.	Are some people more vulnerable than others?	Yes No Don't know	1 2 99
	23A <i>If yes:</i> Who are the most vulnerable people to the effects of the long-term changes in the average weather conditions and natural disasters in your community?	People with disabilities Women Children Senior citizens Other _____	1 2 3 4 88
24.	Do you help these people?	Yes No Don't know	1 2 99

	24A <i>If yes:</i> How do you help them?		
25.	Are there also people that benefit from problems other people have or from the effects of the long-term changes in the average weather conditions and natural disasters?	Yes No Don't know	1 2 99
	25A <i>If yes:</i> Who do you think will benefit and why?		

Thank you for your time and for sharing your opinion. Are there any questions you would like to ask?

Monitor comments:

Remarks for the interviewer:

All cursive written sentences are for your information!

When there is not another instruction, please read the questions and the possible answers to the interviewee.

Where there are no given answers, let the interviewee narrate and write everything down!

Villagers with leading positions (respected villagers)

Data Entered By: _____ Date: ____ / ____ / 2010

ID _____



CLIMATE RESILIENCE SURVEY



Questionnaire for Respected Villagers

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2010 c. Respondent _____

*Record the name of the interviewee in the Respondent List and check that the corresponding Questionnaire ID is the same.
[If the respondent does not want to participate in the survey, record NR in the respondent list, and move to the next sampled respondent.]*

A. Geographic Information

A.	Province	
B.	Rayon	
C.	Jamoat	
D.	Village	

INTRODUCTION AND CONSENT

Hello, my name is _____. I'm working with the international nongovernmental organization ACTED.
We would like to ask you a few questions about the environment and climate change.
Our conversation will stay confidential. All gathered information will be generalized.
You are not obliged to answer all the questions, if you do not feel comfortable.

Would you like to participate in this survey? **YES** **NO**

B. Respondents' characteristics

1.	Sex	Male	1
		Female	2
2.	Age	31-49	1
		50-69	2
		70+	3
3.	Status / occupation	Respected elderly person	1
		Teacher	2
		Other _____	88
4.	How long do you already live in this village?	Less than 10 years	1
		Between 10 and 30 years	2
		30 or more years	3
5.	Being with strong or medium religious beliefs, which statement most accurately reflects your mindset? <i>Read the answers to the interviewee.</i>	Everything happens because of God's will, we can do nothing	1
		As the vicegerent and servant of God on earth, we have the duty to make good use of what has been entrusted to us	2
		Don't know	99
5A	In the case that the interviewee will say that he does not have religious beliefs.		1

C. CHANGES IN THE CLIMATE AND NATURAL HAZARDS (DISASTERS)

6.	What would you define as the most serious natural hazard in your area?	Flood	1
		Mud flow	2
		Landslide	3
		Avalanche	4
		Drought	5

		Rise of underground waters	6
		Earthquake	7
		Locust raid	8
		Strong wind	9
		Others _____	88
		Don't know	99
7.	How often does _____ occur? <i>Event mentioned in question 6</i>	Very seldom (once in 31-100 years, <i>once in a lifetime</i>)	1
		Seldom (once in 16-30 years, <i>once in generation</i>)	2
		Sometimes (once in 6-15 years)	3
		Often (every one-5 years)	4
		Very often (every year)	8
		Other _____	88
		Don't know	99
8.	When did the last _____ occur? <i>Event mentioned in question 6.</i>	This year	1
		Last year	2
		Years ago	3
9.	What kind of impacts was caused by the _____? You may choose as many as you like. <i>Event mentioned in question 6. Read the answer options to the interviewee.</i>	Impacts on human life	1
		Damage to homes and businesses	2
		Damage to electricity, water supply	3
		Damage to communication infrastructure	4
		Damage to transport system	5
		Impacts on health	6
		Damage to river systems or irrigation channels	7
		Damage to agricultural land	8
		Impacts on livestock	9
		Other _____	88
10.	Have you ever heard something about "climate change"?	Yes	1
		No	2
		Don't know	99
	10A <i>If yes:</i> From where did you hear it?	TV	1
		Radio	2
		Newspaper	3
		Other _____	88
11.	Has the number of hot days stayed the same, increased, or declined over the 10-30 years?	Same	1
		Increased	2
		Declined	3
		Don't know	99
12.	Has the number of rainfall days stayed the same, increased, or declined over the 10-30 years?	Same	1
		Increased	2
		Declined	3
		Don't know	99

13.	Have you seen changes in the vegetation cover over the last 10 to 30 years?	Yes No Don't know	1 2 99
	13A <i>If yes:</i> What changes have you seen?		
14.	Do you feel informed about the long-term changes in the average weather conditions and resulting natural hazards?	Yes Somewhat informed No	1 2 3
	14A <i>If yes or somewhat informed:</i> What do you think are the reasons for the long-term changes in the average weather conditions and the resulting natural hazards?		
15.	How concerned are you about changes the long-term changes in the average weather conditions and the resulting natural hazards?	Concerned Somewhat concerned Not concerned	1 2 3
	15A <i>If concerned or somewhat concerned:</i> About whom are you concerned?	About me and my family About community members About both	1 2 3
16.	What do you think are the causes for natural disasters?	Purely natural causes	1
		<i>Manmade causes like:</i> Neglected maintenance (e.g. of channels) Wrong land use (e.g. overgrazing, cutting wood) We are in the wrong location Act of God, divine punishment Don't know	2 3 4 5 99
17.	Do you have knowledge about traditional practices and local customs that can help solving the problems of changes in the long-term changes in the average weather conditions and the resulting natural hazards and disasters in your community? <i>Like traditional ecological knowledge, indigenous knowledge, the knowledge of traditional leaders, rural peoples'/ farmers' knowledge, etc.</i>	Yes No Don't know	1 2 99

	17A <i>If yes:</i> Can you please give an example of your knowledge.		
18.	Do you feel somehow responsible for the people of your community in regard to the long-term changes in the average weather conditions and the resulting natural hazards and disasters?	Yes No Don't know	1 2 99
19.	Do people come to you and ask for help regarding the long-term changes in the average weather conditions and the resulting natural hazards and disasters?	Yes No Don't know	1 2 99
	19A <i>If yes:</i> How do you help them?		
20.	What other problems/risks (than long-term changes in the average weather conditions and natural hazards) does your community face in its daily life? <i>Let the interviewee list what he has in his mind. When he is confused and do not know what to say, you can give him some options.</i>	Getting food Getting work Paying the bills Getting necessary financial help Paying for their medications Paying for their children's education Being prepared for a strong winter Political stability and security Other _____	1 2 3 4 5 6 7 8 88
21.	What is the biggest problem/risk facing your community?		
22.	Are some people more vulnerable than others?	Yes No Don't know	1 2 99
	22A <i>If yes:</i> Who are the most vulnerable in your community?	People with disabilities Women Children Seniors Other _____	1 2 3 4 88
23.	Are there also people that benefit from problems other people have or from the effects of the long-term changes in the average weather conditions and natural disasters?	Yes No Don't know	1 2 99

	<p>23A <i>If yes:</i> Who do you think will benefit and why?</p>		
--	--	--	--

Thank you for your time and for sharing your opinion. Are there any questions you would like to ask?
Monitor comments:

Remarks for the interviewer:

All cursive written sentences are for your information!

When there is not another instruction, please read the questions and the possible answers to the interviewee.

Where there are no given answers, let the interviewee narrate and write everything down!

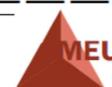
Villagers

Data Entered By: _____ Date: ____ / ____ / 2010

ID _____



CLIMATE RESILIENCE SURVEY



Questionnaire for Villagers

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2010 c. Respondent _____

*Record the name of the interviewee in the Respondent List and check that the corresponding Questionnaire ID is the same.
[If the respondent does not want to participate in the survey, record NR in the respondent list, and move to the next sampled respondent.]*

A. Geographic Information

A.	Province	
B.	Rayon	
C.	Jamoat	
D.	Village	

INTRODUCTION AND CONSENT

Hello, my name is _____. I'm working with the international nongovernmental organization ACTED.
We would like to ask you a few questions about the environment and climate change.
Our conversation will stay confidential. All gathered information will be generalized.
You are not obliged to answer all the questions, if you do not feel comfortable.

Would you like to participate in this survey? **YES** **NO**

B. Respondents' characteristics

1.	Sex	Male	1
		Female	2
2.	Age	18-30	1
		31-49	2
		50+	3
3.	Level of education	Not full secondary education	1
		9 grades	2
		Secondary education/technical	3
		Vocational education	4
		Higher education	5
		No school education	6
4.	What is your occupation?	Farmer	1
		Government servant (including teacher)	2
		Health care worker	3
		Housewife	4
		Unemployed	5
		Other _____	88
4A	<i>If working as a farmer:</i> For how many years do you work as a farmer?	Less than 10 years	1
		Between 10 and 30 years	2
		30 or more years of experience	3
5.	Are you the household head?	Yes	1
		No	2
6.	How long do you already live in this house?	Less than 10 years	1
		Between 10 and 30 years	2

		30 or more years	3
7.	How far from the river do you live?	0-2 km 2-5 km 5-10 km 10+ km	1 2 3 4
8.	If you have strong or medium religious beliefs, which statement most accurately reflects your mindset? <i>Read the options to the interviewee.</i>	Everything happens because of God's will, we can do nothing As the vicegerent and servant of God on earth, we have the duty to make good use of what has been entrusted to us Don't know	1 2 99
	8A In the case that the interviewee will say that he does not have religious beliefs.		1
C. CHANGES IN THE CLIMATE AND NATURAL HAZARDS (DISASTERS)			
9.	What natural hazards do you have in your area? <i>Do not read the answers. Let the interviewee list what he has in his mind.</i>	Flood Mud flow Landslide Avalanche Drought Rise of underground waters Earthquake Locust raid Strong wind Other _____ Don't know	1 2 3 4 5 6 7 8 9 88 99
	9A What is the single most serious one for you?	Flood Mud flow Landslide Avalanche Drought Rise of underground waters Earthquake Locust raid Strong wind Other _____ Don't know	1 2 3 4 5 6 7 8 9 88 99
10.	How often does _____ occur? <i>Event mentioned in question 9A.</i>	Very seldom (once in 31-100 years, <i>once in a lifetime</i>) Seldom (once in 16-30 years, <i>once in generation</i>) Sometimes (once in 6-15 years) Often (every one-5 years) Other _____ Don't know	1 2 3 4 88 99
11.	When did the last _____ occur? <i>Event mentioned in question 9A.</i>	This year Last year Years ago	1 2 3

12.	<p>What kind of impacts was caused by the _____? You may choose as many as you like.</p> <p><i>Event mentioned in question 9A. Read the answer options to the interviewee.</i></p>	<p>Damage to:</p> <p>Human life 1</p> <p>Homes and businesses 2</p> <p>Electricity, water supply 3</p> <p>Communication infrastructure 4</p> <p>Transport 5</p> <p>Health 6</p> <p>River systems and irrigation channels 7</p> <p>Agricultural land 8</p> <p>Livestock 9</p> <p>Other _____ 88</p>
13.	<p>Have you ever heard something about climate change</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 9</p>
	<p>13A <i>If yes:</i> From where did you hear it?</p>	<p>TV 1</p> <p>Radio 2</p> <p>Newspaper 3</p> <p>Other _____ 88</p>
14.	<p>Has the number of hot days stayed the same, increased, or declined over the last 10-30 years?</p>	<p>Same 1</p> <p>Increased 2</p> <p>Declined 3</p> <p>Don't know 99</p>
15.	<p>Has the number of rainfall days stayed the same, increased, or declined over the last 10-30 years?</p>	<p>Same 1</p> <p>Increased 2</p> <p>Declined 3</p> <p>Don't know 99</p>
16.	<p>Have you seen changes in the vegetation cover over the last 10 – 30 years?</p> <p><i>Like for example disappearing or new growing plants.</i></p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>
17.	<p>Have you made adjustments in your farming because of these long-term shifts in temperature and rainfall?</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>

	<p>17A <i>If yes:</i> What adjustments have you made?</p> <p><i>Let the interviewee list what he has in his mind. When he is confused and do not know what to say, you can give him some options.</i></p>	<p>Change crop variety 1</p> <p>Build a water-harvesting scheme 2</p> <p>Implement soil conservations techniques 3</p> <p>Buy insurance 4</p> <p>Put trees for shading 5</p> <p>Irrigate more 6</p> <p>Change from crop to livestock 7</p> <p>Reduce number of livestock 8</p> <p>Migrate to urban area 9</p> <p>Find off-farm job 10</p> <p>Lease land 11</p> <p>Other _____ 88</p>
	<p>17B <i>If no:</i> Why did you not try to adjust?</p>	<p>Lack of money 1</p> <p>Lack of information 2</p> <p>Shortage of labour 3</p> <p>Others _____ 88</p>
18.	<p>Do you have knowledge of traditional practices and local customs that helps you to prevent disasters and adapt to the changing circumstances?</p> <p><i>Like traditional ecological knowledge, indigenous knowledge, the knowledge of traditional leaders, rural peoples'/farmers' knowledge, etc.</i></p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>
	<p>18A <i>If yes:</i> Can you please tell us about your knowledge.</p>	
19.	<p>Do you feel informed about the long-term changes in the average weather conditions and resulting natural hazards?</p>	<p>Yes 1</p> <p>Somewhat informed 2</p> <p>No 3</p>
	<p>19A <i>If yes or somewhat informed:</i> What do you think are the reasons for the long-term changes in the average weather conditions and the resulting natural hazards?</p>	<p>Purely natural causes 1</p> <p>Manmade causes 2</p> <p>Combination of natural causes and manmade causes 3</p> <p>Act of God 4</p>
	<p>19B <i>If no:</i> Do you want to be informed?</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>
20.	<p>How concerned are you about the long-term changes in the average weather conditions and the resulting natural hazards?</p>	<p>Concerned 1</p> <p>Somewhat concerned 2</p> <p>Not concerned 3</p>

	<p>21C And what actions do you want them to take for you?</p> <p><i>Read the answer options to the interviewee.</i></p>	<p>Finding those who may be trapped under debris 1</p> <p>Providing medical care 2</p> <p>Procuring and distributing food, shelter and clothing 3</p> <p>Providing emotional support, like counseling and reuniting separated families 4</p> <p>Transporting people and equipment 5</p> <p>Providing affected people with information 6</p> <p>Rebuilding of roads, water pipelines, electricity and telephone networks 7</p> <p>Rebuilding of house 8</p> <p>Obtaining money 9</p> <p>Other _____ 10</p> <p>88</p>
22.	<p>Do you think somebody or something is responsible for the disasters?</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>
	<p>22A <i>If yes:</i> What are the causes?</p>	<p>Purely natural causes 1</p> <p><i>Manmade causes like:</i></p> <p>Neglected maintenance (e.g. of channels) 2</p> <p>Wrong land use (e.g. overgrazing, cutting wood) 3</p> <p>We are in the wrong location 4</p> <p>Act of God, divine punishment 5</p> <p>Don't know 99</p>
23.	<p>Do you feel somehow also responsible for the disasters that happen?</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't know 99</p>
	<p>23A <i>If yes:</i> Can you explain why you feel responsible.</p>	
24.	<p>What other problems/risks (than the long-term changes in the average weather conditions and natural hazards) do you and your family face in your daily life?</p> <p><i>Let the interviewee list what he has in his mind. When he is confused and do not know what to say, you can give him some options.</i></p>	<p>Getting food 1</p> <p>Getting work 2</p> <p>Paying the bills 3</p> <p>Getting necessary financial help 4</p> <p>Paying for their medications 5</p> <p>Paying for their children's education 6</p> <p>Being prepared for a strong winter 7</p> <p>Political stability and security 8</p> <p>Others _____ 88</p>
25.	<p>What is the biggest problem/risk (including the long-term changes in the average weather conditions and natural hazards) for you and your family?</p>	

26.	What is the biggest problem/risk (including the long-term changes in the average weather conditions and natural hazards) for your community?		
27.	Are some people more vulnerable than others?	Yes No Don't know	1 2 99
	27A <i>If yes:</i> Who are the most vulnerable in your community?	People with disabilities Women Children Senior citizens Other _____	1 2 3 4 88
28.	Are there also people that benefit from problems other people have or the effects of the long-term changes in the average weather conditions and natural disasters?	Yes No Don't know	1 2 99
	28A <i>If yes:</i> Who do you think will benefit and why?		
<p>Thank you for your time and for sharing your opinion. Are there any questions you would like to ask?</p> <p>Monitor comments:</p>			

Remarks for the interviewer:

All cursive written sentences are for your information!

When there is not another instruction, please read the questions and the possible answers to the interviewee.

Where there are no given answers, let the interviewee narrate and write everything down!

Schoolchildren

Data Entered By: _____ Date: ____ / ____ / 2010

ID _____



CLIMATE RESILIENCE SURVEY



Questionnaire for Students (Groups of four students)

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2010 c. Respondent _____

*Record the name of the interviewee in the Respondent List and check that the corresponding Questionnaire ID is the same.
[If the respondent does not want to participate in the survey, record NR in the respondent list, and move to the next sampled respondent.]*

A. Geographic Information

A.	Province	
B.	Rayon	
C.	Jamoat	
D.	Village	

INTRODUCTION AND CONSENT

Hello, my name is _____ I'm working with the international nongovernmental organization ACTED.
We would like to ask you a few questions about the environment and climate change.
Our conversation will stay confidential. All gathered information will be generalized.
You are not obliged to answer all the questions, if you do not feel comfortable.

Would you like to participate in this survey? **YES** **NO**

B. Respondents' characteristics

1.	Sex	Male _____ Female _____
2.	Grade	6 _____ 7 _____ 8 _____ 9 _____

C. OBSERVATION AND EXPERIENCE OF NATURAL HAZARDS (DISASTERS)

3.	What type of natural hazards do you know? <i>Do not read the answers. Let the interviewees list what they have in their mind</i>	Flood _____ 1 Mud flow _____ 2 Landslide _____ 3 Avalanche _____ 4 Drought _____ 5 Rise of underground waters _____ 6 Earthquake _____ 7 Locust raid _____ 8 Strong wind _____ 9 Other _____ 88 Don't know _____ 99
4.	Can you remember the last natural disaster you had in your village?	Yes _____ 1 No _____ 2 Don't know _____ 99

4A	<p><i>If yes:</i> What was it?</p> <p><i>Do not read the answers. Let the interviewees list what they have in their mind</i></p>	<p>Flood _____ 1</p> <p>Mud flow _____ 2</p> <p>Landslide _____ 3</p> <p>Avalanche _____ 4</p> <p>Drought _____ 5</p> <p>Rise of underground waters _____ 6</p> <p>Earthquake _____ 7</p> <p>Locust raid _____ 8</p> <p>Strong wind _____ 9</p> <p>Other _____ 88</p> <p>Don't know _____ 99</p>
5.	<p>Where did you stay when this disaster occurred?</p> <p><i>Read the answers to the students and fill in how many mentioned what.</i></p>	<p>At home _____ 1</p> <p>At school _____ 2</p> <p>On the fields _____ 3</p> <p>In the house of friends or neighbors _____ 4</p> <p>Not in the village _____ 5</p> <p>Don't know _____ 99</p>
6.	<p>Have you ever talked about natural disasters such as flood, landslides, earthquakes etc with your family before the last disaster happened?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
7.	<p>Have you talked about natural disasters such as flood, landslides, earthquakes etc with your family after the last disaster happened?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
8.	<p>Have you ever studied natural disasters such as floods, landslides, and earthquakes at school before?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
9.	<p>Would you like to study about natural disasters such as floods, landslides, and earthquakes at school in the future?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
10.	<p>Have you ever heard something about climate change?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
11.	<p>Do you know the cause of a flood?</p>	<p>Yes _____ 1</p> <p>No _____ 2</p> <p>Don't know _____ 99</p>
12.	<p>Who do you think is responsible for floods and other disasters?</p> <p><i>Do not read the answers. Let the interviewees list what they have in their mind. Only help when they do not know what to say.</i></p>	<p>Nobody, this is nature _____ 1</p> <p>Government _____ 2</p> <p>Any other person/agency _____ 3</p> <p>God _____ 4</p> <p>Don't know _____ 99</p>

13.	What will you do in an event of a sudden big flood?	Continue to play _____ Escape from the site _____ Go home and look for help _____ Don't know _____	1 2 3 99
14.	Have you studied how to escape from a natural disaster either at school or home?	Yes _____ No _____ Don't know _____	1 2 99
15.	Do you know measures to avoid/prevent disasters?	Yes _____ No _____ Don't know _____	1 2 99
16.	Which following items are available at your home? <i>Read the answers to the students and fill in how many mentioned what.</i>	First aid kit _____ Complete change of clothes and a pair of sturdy shoes or boots _____ Blankets or sleeping bags _____ Water in plastic containers _____ A three-day supply of non-perishable food _____ Tools and supplies (flash light, toilet paper, soap etc) _____	1 2 3 4 5 6
17.	Do you discuss what you have learnt in the school with your family at home?	Yes _____ No _____ Don't know _____	1 2 99
Thank you for your time and for sharing your opinion. Are there any questions you would like to ask?			
Monitor comments:			

Remarks for the interviewer:

All cursive written sentences are for your information!

When there is not another instruction, please read the questions and the possible answers to the interviewees.

The lines are for the number of students that give the same answer.

13.4 Appendix 4: Questionnaire for Khatlon District 2012

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2012 c. Respondent _____					
A. Geographic Information					
Province					
Rayon					
Jamoat					
Village					
Introduction and Consent					
Hello, my name is Beatrice. I'm writing my PhD research at a Swiss university in collaboration with the work of ACTED Tajikistan. I would like to ask you questions about your environment, climate change, and natural disasters and how you see these issues. You can give me your first name, if you want. You are not obliged to answer all the questions. When you feel uncomfortable, we stop the interview.					
Would you like to participate in this survey? YES NO					
B. Respondents' characteristics					
	Sex		Female	1	
			Male	2	
	Age		18-30	1	
			31-49	2	
			50+	3	
	Level of education		No school education	1	
			Not full secondary education	2	
			9 grades	3	
			Secondary education/technical	4	
			Vocational education	5	
			Higher education	6	
			No answer	99	
	What is your occupation		Farmer	1	
			Government servant (including teacher)	2	
			Health care worker	3	
			Housewife	4	
			Unemployed	5	
			Others _____	6	
	If working as a farmer: For how many years do you work as a farmer?		Less than 5 years	1	
			Between 5 and 10 years	2	
			Between 10 and 20 years	3	
			More than 20 years of experience	4	
C. Questionnaire					
1	What do you think is the most important issue (the second important issue and the third important issue) for Tajikistan today?				
		Most important	Second important	Third important	
	Health care				1
	Education				2

	Crime / Security					3
	Environmental changes (<i>like soil and groundwater salinization, soil erosion etc.</i>)					4
	Emigration					5
	The economy (<i>All aspects, also unemployment</i>)					6
	Poverty					7
	Climate change and resulting hazards					8
	Others _____					97
	Cannot choose					98
2. Please indicate which statement below comes closest to your opinion.						
a.	The government' has the duty to solve Tajikistan's pressing problems					1
b.	The citizens of Tajikistan have to solve Tajikistan's pressing problems					2
c.	The government and all citizen of Tajikistan <i>together</i> have the duty to solve Tajikistan's pressing problems					3
3. How much confidence do you have in ...						
		No confidence	Little confidence	Pretty much confidence	Complete confidence	Cannot choose
		1	2	3	4	98
	Government					
	Business and industry					
	Mosques and religious leaders					
	Courts and the legal system					
	Schools and educational system					
4. Generally speaking, how concerned are you about environmental changes, climate change and natural disasters?						
	<i>Please tick one box only</i>			Not at all concerned		1
				Little concerned		2
				Concerned		3
				Very concerned		4
				Cannot choose		98
5. Here is a list of environmental problems. Which problem, if any, do you think affects your family and your village the most?						
		Air pollution				1
		Chemicals and pesticides				2
		Water shortage				3
		Water pollution				4
		Soil erosion (overgrazing/deforestation)				5

	<i>Like temperature increase, extreme weather conditions</i>	Climate change	6
	<i>Like earthquake, flood, drought, landslide</i>	Natural disasters	7
	<i>Includes non-renewable sources such as coal or oil as well as other natural resources as wood or water</i>	Using up our natural resources	8
		We are not affected	9
		Others _____	97
		Cannot choose	98
6a. How much do you feel you know about the causes of environmental problems mentioned under question 5?			
		Know nothing at all	1
		Know something little	2
		Know something	3
		Know a great deal	4
		Cannot choose	98
b. And how much do you feel you know about solutions for environmental problems mentioned under question 5?			
		Know nothing at all	1
		Know something little	2
		Know something	3
		Know a great deal	4
		Cannot choose	98
7. Please indicate which statement below comes closest to your opinion.			
	Climate change is caused mostly by human activity such as burning fossil fuels.		1
	Climate change is natural		2
	Climate change does not exist		3
	Do not know		98
8. Please indicate which statement below comes closest to your opinion.			
	Modern science and technology will solve our environmental problems with little change to our way of life.		1
	We trust too much in science and not enough in our religious faith.		2
	There is no solution concerning environmental problems and climate change.		3
	I do not know		98
	No answer		99
9. Please indicate which statement below comes closest to your opinion.			
	As human beings we have the task of living <i>responsibly</i> with the animals, plants, and the resources of the planet, which are not just for human benefit.		1

	As human beings we have <i>the right to use</i> animals, plants, and all the resources of the planet for human benefit.		2
	I do not know		98
	No answer		99
10.	Are environmental issues, climate change and natural disasters addressed in your works on ethics (<i>akhloqs</i>)?		
		Yes	1
		No	2
		I do not know	98
	<i>If yes, please tell us an example:</i>		
11a	Please remember the last natural disaster you had in your village. What was it and when was it?		
	<i>Last disaster:</i>		
b.	“Why did the disaster occur?”		
	It happened because of the geography and nature of the region.		1
	It was because people failed to fulfil the demands of the laws of nature. For example, building their house in the wrong place		2
	Administrative negligence of the authorities who have to protect us.		3
	It was an act of God		4
c.	Do you think that villagers can actively contribute to prevent disasters from occurring? (Explanation for interviewer: <i>For example, an earthquake cannot be prevented, but you can build your houses in a way they are earthquake proof</i>)		
		Yes	1
		No	2
	<i>If yes, how can disasters be prevented?</i>		
	<i>If no, why disasters cannot be prevented?</i>		

13.5 Appendix 5: Questionnaire for Kuhistoni Badakhshon 2013

a. Questionnaire №: _____ b. Date of Interview: ____ / ____ / 2013 c. Respondent _____					
A. Geographic Information					
Province					
Rayon					
Jamoat					
Village					
Introduction and Consent					
Hello, my name is Beatrice. I'm writing my PhD research at a Swiss university. I would like to ask you questions about your environment, climate change and natural disasters and how you see these issues. You can give me your first name, if you want. You are not obliged to answer all the questions. When you feel uncomfortable, we stop the interview.					
Would you like to participate in this survey? YES NO					
B. Respondents' characteristics					
	Sex		Female	1	
			Male	2	
	Age		18-30	1	
			31-49	2	
			50+	3	
	Level of education		No school education	1	
			Not full secondary education	2	
			9 grades	3	
			Secondary education/technical	4	
			Vocational education	5	
			Higher education	6	
			No answer	99	
	What is your occupation		Farmer	1	
			Government servant (including teacher)	2	
			Health care worker	3	
			Housewife	4	
			Unemployed	5	
			Others _____	6	
	Do you have a kitchen garden?		Yes	1	
			No	2	
C. Questionnaire					
1	What do you think is the most important issue (the second important issue and the third important issue) for Tajikistan today?				
		Most important	Second important	Third important	
	Health care				1
	Education				2
	Crime / Security				3
	Environmental changes (<i>like soil and groundwater</i>)				4

	<i>salinization, soil erosion etc.)</i>					
	Labour migration					5
	The economy (<i>All aspects, also unemployment</i>)					6
	Poverty					7
	Climate change and resulting hazards					8
	Others _____					97
	Cannot choose					98
2. Please indicate which statement below comes closest to your opinion.						
a.	The government' has the duty to solve Tajikistan's pressing problems					1
b.	The citizens of Tajikistan have to solve Tajikistan's pressing problems					2
c.	The government and all citizen of Tajikistan <i>together</i> have the duty to solve Tajikistan's pressing problems					3
3. How much confidence do you have in ...						
		No confidence	Little confidence	Pretty much confidence	Complete confidence	Cannot choose
		1	2	3	4	98
	Government					
	Business and industry					
	<i>Jamoat khonas</i> and religious leaders					
	Why do you have / have not confidence in <i>jamoat khonas</i> and religious leaders?					
	Courts and the legal system					
	Schools and educational system					
4. Generally speaking, how concerned are you about environmental changes, climate change and natural disasters?						
	<i>Please tick one box only</i>			Not at all concerned		1
				Little concerned		2
				Concerned		3
				Very concerned		4
				Cannot choose		98
5. Here is a list of environmental problems. Which problem, if any, do you think affects your family and your village the most?						
	Air pollution					1
	Chemicals and pesticides					2
	Water shortage					3
	Water pollution					4

		Soil erosion (overgrazing/deforestation)	5
	<i>Like temperature increase, extreme weather conditions</i>	Climate change	6
	<i>Like earthquake, flood, drought, landslide</i>	Natural disasters	7
	<i>Includes non-renewable sources such as coal or oil as well as other natural resources as wood or water</i>	Using up our natural resources	8
		We are not affected	9
		Others _____	97
		Cannot choose	98
6a. How much do you feel you know about the causes of environmental problems mentioned under question 5?			
		Know nothing at all	1
		Know something little	2
		Know something	3
		Know a great deal	4
		Cannot choose	98
b. And how much do you feel you know about solutions for environmental problems mentioned under question 5?			
		Know nothing at all	1
		Know something little	2
		Know something	3
		Know a great deal	4
		Cannot choose	98
7. Please indicate which statement below comes closest to your opinion.			
	Climate change is caused mostly by human activity such as burning fossil fuels.		1
	Climate change is natural		2
	Climate change does not exist		3
	Do not know		98
8. Please indicate which statement below comes closest to your opinion.			
	Modern science and technology will solve our environmental problems with little change to our way of life.		1
	We trust too much in science and not enough in our religious faith.		2
	There is no solution concerning environmental problems and climate change.		3
	I do not know		98
	No answer		99
9. Please indicate which statement below comes closest to your opinion.			
	As human beings we have the task of living <i>responsibly</i> with the animals, plants, and the		1

	resources of the planet, which are not just for human benefit.		
	As human beings we have <i>the right to use</i> animals, plants, and all the resources of the planet for human benefit.		2
	I do not know		98
	No answer		99
10. Are environmental issues, climate change and natural disasters addressed in your works on ethics (<i>akhloqs</i>)?			
		Yes	1
		No	2
		I do not know	98
	<i>If yes, please tell us an example:</i>		
11a Please remember the last natural disaster you had in your village. What was it and when was it?			
	<i>Last disaster:</i>		
b. "Why did the disaster occur?"			
	It happened because of the geography and nature of the region.		1
	It was because people failed to fulfil the demands of the laws of nature. For example, building their house in the wrong place		2
	Administrative negligence of the authorities who have to protect us.		3
	It was an act of God		4
c. Do you think that villagers can actively contribute to prevent disasters from occurring? (Explanation for interviewer: <i>For example, an earthquake cannot be prevented, but you can build your houses in a way they are earthquake proof</i>)			
		Yes	1
		No	2
	<i>If yes, how disasters can be prevented?</i>		
	<i>If no, why disasters cannot be prevented?</i>		