

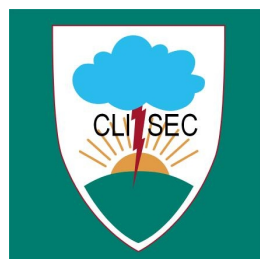


Giovanna Gioli

*Field Trip Report:
Gender and Environmental Migration
in the Karakoram Region*

University of Hamburg
Research Group Climate Change and Security

Working Paper
CLISEC-24



Field Trip Report: Gender and Environmental Migration in the Karakoram Region

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Background

The “Gender and Environmental Migration” (GEM) project is the result of a joint collaboration between the CliSAP’s Research Group “Climate Change and Security” (CLISEC) of the University of Hamburg, and the Islamabad-based think-tank “Sustainable Development Policy Institute” (SDPI), under the MOU recently signed by the SDPI director, Dr. Abid Q. Suleri, and the Dean of the Faculty of Mathematics, Informatics and Natural Sciences, Professor Heinrich Graener.

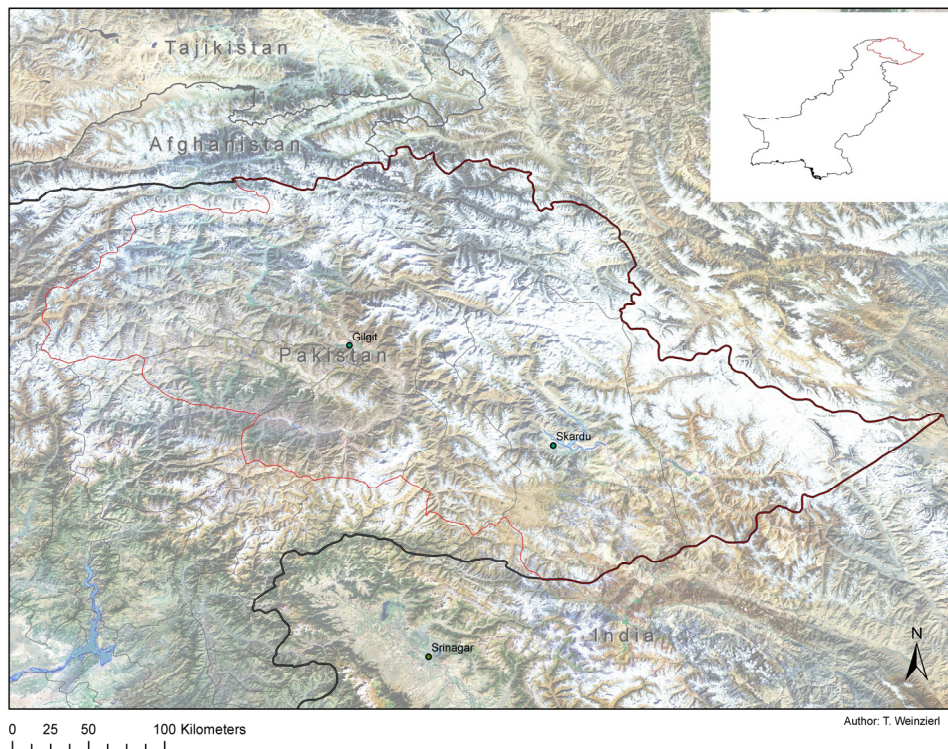
The project aims at collecting gender disaggregated data on local perceptions of climate change and variability, and on adaptation strategies to climate change impacts in the Karakoram region, with a special focus on migration as adaptive strategy and its gendered impacts.

After a preliminary exploratory trip to Pakistan (February 24th-March 11th 2012), aimed at assessing the feasibility of the study, I spent two months in Pakistan (May/June 2012). During the first month I was based at SDPI in Islamabad, developing the research tools and conducting preliminary interviews with key stakeholders. The following people have been interviewed:

Name	Affiliation	Website
Mr. Shazad Hasan Shigri	Director of the Gilgit-Baltistan Environmental Protection Agency (EPA)	http://www.hunzaalps.com/epa/
Mr. Jahanzeb Murad	Manager of ESOHS Laraib Energy Limited	http://www.laraibenergy.com/default.asp
Mr. Babar Khan	Head of WWF office in Gilgit	http://www.wwfpak.org/
Dr. Ejaz Ahmad	Deputy Director General WWF Pakistan	http://www.wwfpak.org/
Mr. Ajmal Bhatte	Deputy Director, National Disaster Management Authority (NDMA)	http://ndma.gov.in/ndma/index.htm
Mr. Haider Raza	Environmental Impact Assessment (EIA) Expert at IUCN/EPA	http://iucn.org/
Mr. Khadim Hussain	Assistant Director of EPA	http://www.hunzaalps.com/epa/

They shared their knowledge and experience of the area, and helped us to identify the most suitable locations for the study. Moreover, they provided valuable inputs for the improvement of the quantitative questionnaires.

After conducting these interviews we were able to select the following locales: The Yasin Valley in the Ghizer District, and lower, central, and upper Hunza in the Hunza-Nagar District, in Gilgit-Baltistan (see Map 1). Since August 2009, Gilgit-Baltistan is the new name of the area formerly known as the “Northern Areas” of Pakistan. With the “Gilgit–Baltistan Empowerment and Self-Governance Order”, the region gained self-rule, and obtained a self-elected Gilgit-Baltistan Legislative Assembly, obtaining a *de-facto* but non-constitutional province status within the country [Khan 2009].



Map 1: The study area is Gilgit-Baltistan, formerly known as “Northern Areas”

GEM Methodology

Quantitative tools: In coordination with the International Center for Integrated Mountain Development (ICIMOD) and SDPI, a 35 pages questionnaire organized in 3 key sections has been developed:

- **Climate Change and Variability:** Local Perceptions;
- **Climate Change and Variability Impacts:** Agriculture; Livestock; Livelihood and Productivity; Water availability and accessibility;
- **Climate Change Adaptation:** Migration and Gender.

Qualitative tools: Interviews with key informants and stakeholders from the communities, and 6 Focus Group Discussions (FGDs) comprising of 8 to 10 people in 3 different villages (3 with males, 3 with females).

Participants to the field trip:

Research staff: Dr. Giovanna Gioli (CLISEC), Talimand Khan (SDPI).
Technical staff: 6 enumerators (4 males and 2 females), 1 driver.

In this field report I will provide a chronological description of our itinerary and activities, sketching a short profile of each village with respect to local perceptions of climate change and variability, and main livelihood strategies, based on qualitative interviews, FGDs, and preliminary observations.

Field Research (June 9th-June 26th)

June	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Gilgit City			Yasin Valley Ghizer District				Lower-Central Hunza			Upper Hunza			Gilgit City					
Training of the enumerators			Hundur: 40 questionnaires 2 FGDs 8 qualitative interviews				Hussainabad: 46 questionnaires 2 FGDs 7 qualitative interviews			Gulmit: 35 questionnaires 7 qualitative interviews			Meeting with WWF Gilgit					
Interview with 2 stakeholders (Mr. Reza, and Mr. Hussain)			Darkut: 29 questionnaires 2 qualitative interviews				Altit: 24 questionnaires 2 qualitative interviews 1 group discussion			Shishkat: 36 questionnaires 2 FGDs 5 qualitative interviews			Meeting with EV-K2- CNR (NGO)					

Figure 1: Overview of the field trip



Map 2: Itinerary of the Field Trip

June 10th

On June 10th Mr. Talimand Khan conducted the training of the enumerators in Gilgit, the capital city of Gilgit-Baltistan. The selected team comprised of six enumerators (4 males and 2 females), all local graduates from Gilgit-Baltistan, Burushaski and Wakhi (local languages) native speakers. An in-depth interview with 2 key stakeholders was conducted, featuring Mr. Hader Reza (IUCN/EPA), and Mr. Hussain (EPA).



Mr. Talimand Khan conducting the training in Gilgit City

June 11th

On the 11th of June, I managed to reach Gilgit by air. Gilgit is a small domestic airport and one of the two major hubs for mountaineering expeditions in the Northern Areas of Pakistan (the other being Skardu, in Baltistan). Travel to Gilgit by air is preferred for both security and time reason, since the road travel between Islamabad and Gilgit on the Karakoram Highway (KKH) takes nearly 15 hours, whereas the air travel takes only about an hour. Yet, flights are subjected to weather, and they are frequently cancelled and overbooked. My flight got cancelled for 8 days in a row.

We left Gilgit upon my arrival, directed towards the Yasin Valley in the Ghizer District (Map 2). The Ghizer District is the westernmost district of Gilgit-Baltistan. It is bound by Pakistan's Khyber Pakhtunkhwa on three sides (North, West, and South), by the Diamar District to the South and South-East, by the Gilgit District to the East, and by the Whakan corridor (Afghanistan) to the North-East. As for 2000, the District population was 120.218, with an annual growth rate of 3.3 % [Population Census Organization, 2000].

The Yasin valley is situated 150 km away from Gilgit city. It is a 3-4 hours drive along the Gilgit river and the Yasin river, both tributaries of the Indus river. The valley's primary language is Burushaski, an isolated idiom, which does not clearly belong to any known language family [Kreutzmann 2006b]. The Indo-Aryan Khowar (or Chitrali) language is also spoken (see Fig. 7). The majority of the people in Yasin belong to the Ismaili sect of Shia Islam. Other sects of Islam (especially Sunni) are also present (see Fig. 3). Despite having lived in harmony in the past, in recent years, unfortunately, there has been an escalation of sectarian violence, resulting not only in repeated killings and bloodshed, but also in a major economical loss, especially for the touristic industry, which was already suffering for the consequences of 11/9. The security situation presented challenges also for our research, as mobility constrains are an issue for foreigners, who are subjected to constant control and asked to provide NOCs (Non Objection Certificate), and can be easily barred from accessing areas considered sensitive and/or at risk.

The villages we have covered in the Yasin valley are Hundur and Darkut, with a total of 69 quantitative questionnaires completed, 2 FGDs (one with females, one with males) in Hundur, and several qualitative interviews in both locations.

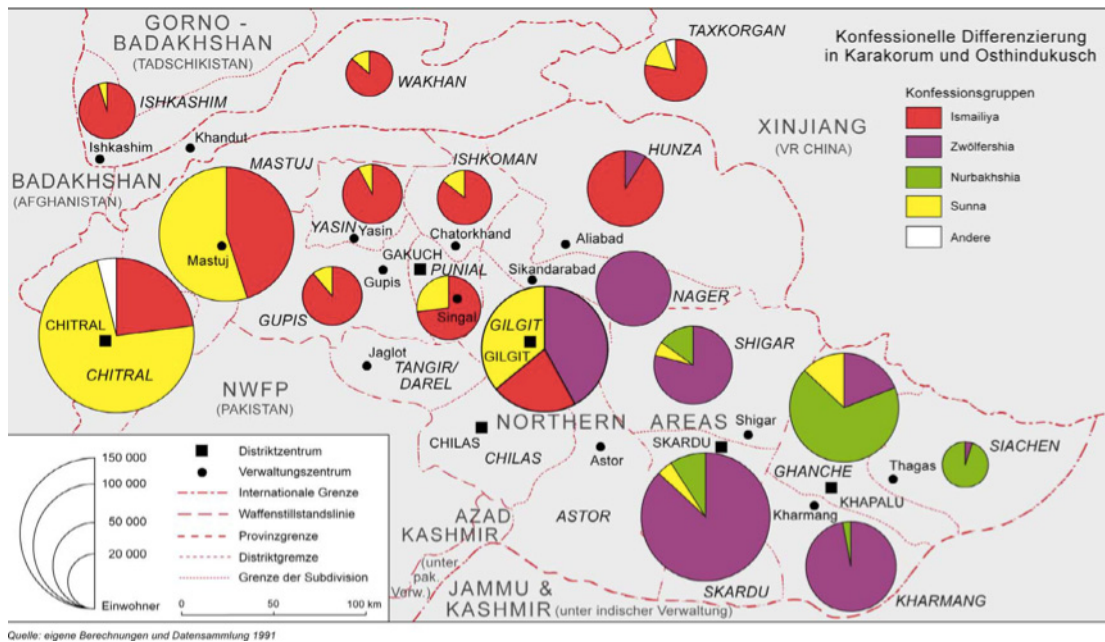


Figure 2: Religious affiliation in the Hindu-Kush and Karakoram region

11-12 June

In **Hundur** a substantial chunk of agricultural land, together with many houses have been washed away by the flash flood of August 2010. Agricultural production was significantly reduced by the lack of land, which was further increased by the necessity of using the remaining land for the construction of new houses. Growing population and its increasing demands for housing and livelihood resources, and particularly, energy requirements, have further degraded the already fragile environment of the valley. This is a common situation in mountainous regions of South Asia, and has been dubbed as the “Himalayan Dilemma”, i.e. the alleged incompatibility of recent socio-economic transformation and sustainable resource use [Ives and Messerli 1989]. The exploitation of scarce forest resource is an issue in the whole Gilgit-Baltistan: less than 1% of Gilgit-Ghizer Forest Division is covered with high coniferous forest [Schickhoff 2006]. Hundur has almost totally depleted its forest to meet its energy requirements for cooking and heating, which rely entirely on firewood.

The degradation of forests, that was functioning as a slope stabilizer and was preventing soil erosion, made the village more vulnerable to potential disasters such as flash floods, as well as to financial stress: currently, the community spends more on firewood for heating and cooking than on any other household requirements.



Male FGD in Hundur

Local people reported that in the last 5 years the duration of summers reduced, and the summers are significantly colder as compared to the past. The snowfall in winters has decreased, whereas rains in summers have increased. These erratic and untimely rains are deeply affecting the yields of fruits and crops. There is a 20 to 25 days delay in the agricultural calendar. However, the community still

follows the traditional calendar for sowing (March 25th-April 10th) and for harvesting (25th July). In the last couple of years the area, which used to produce two crops (a combination of buck-wheat, barley/ maize or wheat), has turned into a mono-crop region (wheat). This is due to the losses after the 2010 flood, and to the fact that the Government of Pakistan subsidizes wheat.

A major source of employment in the area is the Pakistani army. Illiteracy has decreased, yet it is not eradicated and is disproportionately common among women, and employment in the third sector has been increasing. Migration is the most resorted adaptation strategy chosen by the community in response to socio-demographic change and to climate change and environmental hazards. Due to limited job opportunities at home, population growth and environmental pressure, males from the community often migrate seeking employment in urban areas. Although the trend of migration is an old phenomenon in the region, a significant increase in this trend has been observed after the 2000 flood, and especially after the 2010 flood. Migration rates are higher in the disaster-hit areas, and migration is prevalently seasonal.



Women in agriculture in Hundur

Migration is not a gender-neutral phenomenon, as only adult males are opting for this livelihood strategy. Traditionally in these areas, as well as in most of South Asia, women carry out the lion's share of agricultural work. Migration and environmental pressure are increasing the drudgery for mountain women. Most of the local women have experienced increased workload during the migration of male members of their households, and some of them have also denounced decreased mobility, and difficult access to health facilities since, according to the established socio-cultural rules, they have to be accompanied by a male relative and cannot move freely.

If other male members are not present in the household, women are taking care also of the financial

management of the household, and they are entitled to directly

manage the remittances. In such cases, male outmigration could lead to women's empowerment. Male outmigration is also leading to a decrease of livestock, as fewer men are available to go to high altitude pastures. This factor, coupled with the loss of pastures due to environmental degradation and population's growth (which reduced the grazing pastures per capita) is tremendously reducing what was before one of the most important livelihood sources in Hundur.

13-14 June

Darkut is situated at an altitude of 2760 m., and is the last village of the Yasin Valley, moving towards Chitral (Khyber Pakhtunkhwa Province). A glacier separates Darkut from the Boroghil Valley of Chitral. The local people speak Burushaski, and Wakhi (Eastern-Iranian) languages. Despite being only 20 km away from Hundur, because of the very bad condition of the road, severely affected by the 2010 flood, the trip takes around one hour and a half. Darkut comprises of 308 households, and its landscape is dominated by the Dolicish peak, Little Karakoram (ca. 6000m: in Burushaski language Dolicish means, unhappy peak, as “it is always covered by clouds”, as reported by the principal of the elementary school of the village), and by the majestic Darkut glacier.

The local villagers shared that in the last 20-30 years the two glaciers of the village have significantly reduced. They reported that about 30 years ago the area used to receive 1-3 m. of snowfall, whereas nowadays, it hardly reaches 1 m. Changes in the rain patterns have also been observed, with a significant increase of summer rains. Summers (especially the month of June) are reported to be colder. This situation is negatively affecting agriculture, as wheat does not ripe properly and the yield is noticeably reduced, causing both economical and psychological pressure on the local people. For these reasons, villagers chose to deviate from their traditional calendar of sowing shifting from May to the beginning of April. Over the last years, shifts occurred also in crops and cultivation: people are changing the seeds, and increasingly opting for cash-crops (mainly potato).



Dolicish Peak and Darkut glacier in Darkut

The 2010 flood destroyed 55 households and damaged other 200. On top of this, it destroyed irrigation channels, bridges, agroforestry, and roads.

Traditionally, the primary sources of livelihood in Darkut were agriculture and livestock. Yet, in recent years, they have become insufficient to sustain the needs of the community. According to the principal of the Darkut Elementary School, only 25% of the people in the

village produce food from their land that is sufficient for 6 months of household consumption. Such situation has led a substantial part of the adult males to resort to labour migration, mostly to Gilgit and to other cities in the region or in Punjab.

Livestock has decreased, due to population growth, lack of fodder, and migration. The migration trends started to increase 3 decades ago, for deficiency of resources, and the consequent need to engage in market economy.

Similarly to Hundur, migration has a visible impact on women, traditionally involved in agricultural work, resulting in increased workload and responsibilities.

15 June

On the June 15th we left the Ghizer District. After a 4 hours drive we reached Gilgit city where we spent the night, in order to be able to reach our next locale, the Hunza-Nagar District, the following morning (Map 2).

The Hunza-Nagar District is a newly formed district (2009), which was previously part of the Gilgit District. It encompasses the Hunza and the Nagar valleys, separated by the Hunza River. The river is somehow also a cultural border, dividing two formerly separated princely states¹, and currently separating the overwhelmingly Shia population of the Nagar valley from the Hunza people, who are mostly Ismaili (see Fig. 3). Our selected locales were all situated in the Hunza valley.

Hunza was formerly a princely state, ruled by the family known as Mirs of Hunza for 960 years. The state continued to survive until 1974, when Prime Minister Zulfikar Ali Butto ended the ghost governance of "Rajhgee", with a single administrator, known as "Raja", and dissolved it. The Hunza District is bounded by the Wakhan Corridor (Afghanistan) to the North, by Xinjiang (China) to the North and Northeast, by Skardu District to the Southeast, by Gilgit District to the South, and by Ghizer District to the West.

As the whole Northern Areas of Pakistan, Hunza is characterised by a large ethnic and linguistic variety, showing the striking patterns of the populations that have inhabited this crossroad of Central Asia. The most spoken language of the valley is Burushuski, along with Shina and Wakhi (see Fig. 7).

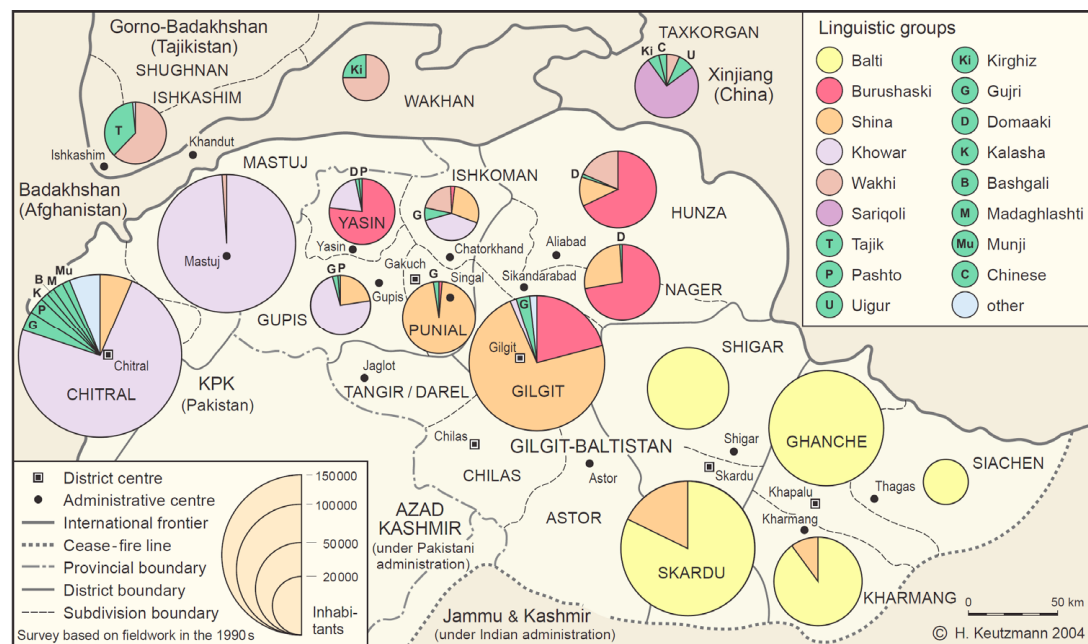


Figure 4: Linguistic groups in Gilgit Baltistan

A fragile high-mountain valley ecosystem, Hunza is characterized by extensive glaciation and has undergone an incredible transformation and development in the last decades, benefitting tremendously from the construction of the Karakoram Highway (KKH) in 1973 [Keutzmann 2009]. Today, as opposed to Yasin Valley of Ghizer, there is one of the highest

¹ The Nagar Princely State, and the Hunza Princely State. Princely states were the 562 nominally sovereign entities of the British Indian Empire, that were not directly governed by the British, but rather ruled by locals under a form of indirect rule, subject to a subsidiary alliance and the suzerainty of the British crown.

literacy rates in Pakistan, and better infrastructure and communication make it less isolated. Yet, many similarities, In terms of climate change impacts and adaptation strategies can be found between the two mountainous areas.

16-17 June

On June 16th we left Gilgit city to reach the village of **Hussainabad** (1800 m) in lower Hunza, where we conducted 44 questionnaires, 2 FGDs (one with males, one with females), and 7 qualitative interviews. The trip from Gilgit takes around one hour and a half. Hussainabad has a population of 1428 inhabitants [1998 Census], and a very high migration rate. The village has a high literacy rate (yet very gender unbalanced), so that local people have the chance to get employed in several fields across the country. A significant portion of non-migrant populations is associated with agriculture, which, as already mentioned, according to the customary division of labour in the region, is carried out almost entirely by women. Traditionally, Hussainabad was an agro-pastoral society, yet with the increased literacy rates combined with the opportunities brought by the construction of the KKH (1973), a massive occupational shift occurred in the last 15-20 years. A major role in fostering development was also played by the Aga Khan Development Network, AKDN (<http://www.akdn.org/>), which has been active in the area since the 1960s, playing a pivotal role in fostering development, improving education, and introducing the cultivation of cash crops such as potatoes, and of fruits like cherry and apricots, that allow higher economic returns for the local people.



Rakaposhi Peak (7788 m) as seen from Hussainabad

Historically, limited opportunities at home, and population pressure are to be considered the major drivers for migration. However, climate variability, and environmental pressure have been reported as increasingly relevant, especially after the 2010 flood.

The major portion of the migrant population is working in Gilgit City because it provides them with relatively more

opportunities of livelihood. Other small segments are associated with different jobs in major cities of Pakistan. Higher education rates have also lead to a decline in armed forces jobs. Major limitations and challenges to the job market are reported to be corruption, and the instable politico-economic structure of the country. Local conflicts over sectarian issue all over Gilgit-Baltistan are also perceived as an important threat to occupational opportunities within the region.

During the female FGD held at the Hussainabad Jama'at Khana (Ismaili mosque), we have noticed a higher level of awareness as compared to women in Ghizer District. Local women reported that remittances have significantly improved the quality of life in the region. Negative impacts of migration are the loss of workforce for livestock (and the subsequent

decline of pastoralism), and increased workload for women engaged in agriculture. Women have now to engage in all the activities, even those previously carried out by males, such as land preparation, and woodcutting.

Women generally feel empowered in the context of decision-making and the community is cooperative. Yet, they feel that migration has reduced their mobility, and their access to health care facilities. Women face economic discrimination, and they are allowed to handle remittances only if there are no males in the household. A strong need for the creation of job opportunities at home has been reported, in order to reduce the drudgery of women. Women education and awareness is also felt as necessary to minimize the impact of hazards in the region. Moreover, vocational trainings for women, and their acquaintance to modern media are also perceived as imperative for the economic empowerment of women in the region.



Female FGD in Hussainabad

Coming to the climate change perceptions, a scenario very similar to that of Ghizer was sketched: summers are perceived as colder and more rainy, and erratic rains are reported as increasingly common, resulting in decreased crops and fruit yields. In the past, people used to harvest their first season crops in the last week of June or in the first week of July, by celebrating the *Ginani*, the traditional harvesting festival on the 21st June. Currently, there is a 15 to 20 days delay for the harvest. This heavily affects fruit production (cherries and apricots), which is a paramount source of income. The decrease of temperatures during the summers has resulted also in water shortages. Winters are perceived as longer and drier, with a decline of snowfall.

Hussainabad is a disaster prone area: flash floods, landslides and droughts are usual events. During the last 20 years, Hussainabad was severely hit twice by floods, which damaged infrastructures and destroyed agricultural land. Small-scale landslides, mainly caused by erratic intense rainfalls, are extremely frequent. They mostly hit water channels (the main water source for agriculture), and the only road that connects the village to the KKH, which is often blocked.

18 June

On June 18th, we reached the village of **Altit**, in central Hunza. Altit is one of the most ancient settlements of Hunza, and is dominated by the 900 years old Altit fort. According to the last Census (1998), Altit has a population of 2740, and is situated at 2100 m.

We completed 24 questionnaires, and conducted a group discussion with the council of the elders (*jirga*, traditionally constituted only by males), who gathered that day on the main square to discuss issues related to the irrigation system. In fact, the village was hit by flash

floods in both 2010 and 2011, affecting especially the irrigation system. The community repaired the damages through self-help, which is one of the traditional coping mechanisms.



Women in Altit

Climate change and variability perceptions from Altit villagers are again coherent with those collected in the other villages covered by the study: during the cold season the amount of snowfall has reduced, summers are perceived as colder, causing a decrease in melting water and a subsequent shortage of water for irrigation, and erratic precipitation increased.

According to the local calendar the harvesting festival is celebrated on the 21st of June, and they start the harvesting of barley and wheat during the last week of June, but this year the barley was not yet ripe. The productivity of agriculture improved in the last decades, because several NGOs (especially the Aga Khan Rural Support Program, AKRSP) introduced new seeds and agricultural techniques, and favoured the shift to cash crops (potato and apricots). Currently, the locals grow more often potatoes than barley and wheat. Altit used to depend on agriculture and livestock, however, due to increasing population and the improvement of the KKH, labour migration started towards Gilgit and the main urban areas of the country. Almost from every household male outmigration is reported. The impacts on the community are the same as those sketched above. A positive financial effect of remittances is coupled to increased drudgery for women involved in agro-pastoral activities, and a decline of pastoralism.

According to the local calendar the harvesting

Altit is suffering from serious energy problems too: also here, firewood is the primary source for heating and cooking and, since the local forest is depleted, people depend on agroforestry and on the availability of firewood in the market.

After completing the interviews, we got the chance to visit the impressive Altit Fort. Altit Fort was home to the hereditary rulers of the Hunza state. The structure is more than one thousand years old, and formed, together with the nearby Karimabad's Baltit Fort (Altit means 'left', and Baltit 'right'), the system of defense of the rulers. The Fort structure was in great disrepair, but the Aga Khan Trust for Culture Historic Cities Support Programme has recently restored it, with the help of Norwegian donors.

In 2007, the Altit Fort opened as a museum, a documentation center, and houses the offices of a very successful cooperative, the Women's Social Enterprise. This cooperative has brought a significant improvement in the life of local women. Vocational training is offered to young women who were forced to drop out school. They have created job opportunities for over 90 women, and they plan to double this number in the next three years. Out of 90 women, 50 are working in the carpentry laboratory (they recently contributed to the construction of the new scenic Jama'at Khana of Altit), and 40 are employed at the

documentation center. Also the Kha Basi Cafe, located in the Fort's garden and apricot orchard, is run exclusively by women of the cooperative.

18th June

On June 18th we have been allowed to travel from Karimabad to Gulmit, in upper Hunza. The day before, due to scheduled blasting for the Chinese-engineered construction work along the KKH, the traffic was interrupted for the entire day. As a foreigner, I had to sign a declaration stating that I was travelling in that area on my responsibility, and that the Government of Pakistan was not to be held responsible for my safety.

The village of Attabad is only 15 Km away from Karimabad, yet the conditions of the road are such that the fastest and safest way to reach there is by jeep. It takes around one hour to reach the lower border of the Attabad lake (Annex 1). The vehicles, which are easily rentable (drivers included) in Karimabad, are old-style jeeps with plastic covers functioning as windows. However, due to the strong sun and the high temperatures, it is not possible to keep them closed. This results in being exposed to a lot of dust, hence scarfs or some kind of face protection are highly recommended.

19-20 June

On June 19th we started our work in **Gulmit**, where we completed 35 questionnaires and 7 qualitative interviews. Gulmit is the headquarter of the Upper Hunza (Gojal) *Tehsil* (administrative division common in South Asia), in the Karakoram Mountain Range. Gulmit is a centuries-old historic town, surrounded by the scenic Tupodan peaks and by the massive Gulmit and Ghulkin glaciers. Traditionally a renowned spot for trekkers and tourists, despite the damages suffered by the Attabad disaster (see Annex 1), it still has some good touristic facilities, shops and a cultural museum. Yet, as everywhere in the Northern Areas, the touristic industry is in serious decline. Gulmit's altitude is 2408m, and it is blessed by an incredible natural beauty, as indicated by its own name that means, in the local language (Wakhi) "the place of flowers".

At Gulmit, the Hunza river could be crossed over a traditional suspended bridge, connecting Gulmit to Shishkat. Currently, the only mean of transportation is a dangerous, unpredictable and overcrowded boat service. Before the lake formation, the population of Gulmit was approx. 4000. Out of 350 households, 104 have been submerged by the lake.

The formation of the Attabad lake had huge socio-economical and even psychological effects on the community people. Several INGOs, such as IUCN, WWF, and UNICEF have worked here since the 1980s bringing a considerable development in the area. The introduction of potato as cash crop has strongly enhanced the economical security of the people of Gulmit, enabling them to invest more in education. AKDN also played a pivotal role in fostering development, bringing social awareness, and specifically stressing the key role of education. Thanks to this, community-based schools have been established, resulting in tremendous improvement of the literacy rates.



Destroyed market area in Gulmit. Tupodan peaks in the background

Potatoes and orchards were the major contributor to the local economy, but the high cost of transportation due to the formation of the Attabad lake, made the production unprofitable. The community has thus virtually lost its most important source of income. On top of this, the disaster also affected the other major local business, tourism, and blocked the vital trade route with China.

Additionally, fruit production was reported to have decreased due to changing in the weather patterns. The cold season is perceived as longer, and the month of June as unusually cold and rainy. Precipitation patterns are perceived to have been changing during the last 5 years. Apart from the lake event, landslides are also frequent, causing damages to the irrigation channel system, recently reconstructed through community self-help.

Socio-economic links have decreased due to restricted mobility, and uneasy communication. Psychologically, local people are uncertain about the future and about the fate of the lake, so that they oscillate between a positive and a negative approach to it. It is worthy to mention that the paths to access the boat service in Attabad, Gulmit, and Shishkat are very steep and uncomfortable, and there are no facilities whatsoever (no sunshaders, benches, shelters, shops, etc.). The situation could be easily improved, so we asked the local people why they were keeping things in that way. The answer was very revealing of a deep state of uncertainty: "What's the point in investing time and money for improving something whose future is so fragile and uncertain?"

The lack of access to social services, and particularly to health facilities (there are neither hospitals nor doctors in the villages, but only two dispensaries), further jeopardizes the life of the population, especially women, who have been the principal victims of such a situation. Cases have been reported of women delivering their babies on the boat on their way to hospital, and related fatalities have been registered. After these accidents, pregnant women are shifted to Karimabad around one month ahead of foreseen delivery.

The Government of Pakistan, (I)NGOs, and AKDN are providing relief. Especially the Chinese Government has been very helpful in providing food and coal. However, the relief schemes have the side effect of creating a dependency syndrome in the community. In the face of climate change and environmental pressure, virtually every household has resorted to labour migration in order to cope with the decreased productivity of agriculture and with the increased lack of local job due to population growth. Environmental pressure is certainly one of the factors triggering migration, which is mostly internal or seasonal, and rarely international. Remittances are now one of the major sources of income for the community, and they are bulwarks in time of disaster. The energy sources for cooking and heating in the region is firewood from the village forest, a private holding regulated under customary laws.

However, it is not enough to meet the energy needs of the entire community. No alternative energy sources have been explored as yet.

21-22 June

Commuting by boat from Gulmit, we have covered also the nearby village of **Shishkat**, completing 36 questionnaires, 2 FGDs, and 5 qualitative interviews. Despite being on the main trade route, along the KKH, and very close to the Gojal's main village, Gulmit, Shishkat has always remained somehow at the peripheries of development. The village belongs geographically to Upper Hunza, which is a Wakhi speaking belt, yet Shishkat's inhabitants are predominantly Burushaski speaking.



The Attabad lake, from Gulmit to Shishkat by boat

The literacy rate in Shishkat is comparatively lower than the rest of the region, so it is more common for people here to rely on subsistence agriculture. In the last 10 years Shishkat has witnessed a rise in education rates and an occupational shift towards third sector jobs, yet this trend was interrupted by the Attabad disaster. The main source of income in Shishkat came from agriculture and horticulture, with potatoes and apricots as major marketable agro-

products. Today, the Attabad Lake has both directly and indirectly affected this income source. A significant portion of agricultural land and orchards are under the water, (lower Shishkat was completely submerged), and people are abandoning the cultivation of cash crops like potatoes, because transportation cost via water is making it unprofitable. They now rely on the cultivation of wheat and buck-wheat.

In the past, the income from potatoes and fruits was invested to educate children, in order to provide a more secure future, but today, the majority of people cannot afford higher education. This jeopardizes the future development of the area. Moreover, most of the people have given-up livestock because it is hard to feed livestock with very limited available land.

Since the Attabad disaster took place, the micro-weather of the area has been reported to have significantly changed. The temperatures have decreased noticeably in summers, and the amount of summer rainfall has increased. Winters are perceived as drier and colder, and frost is common. A change in the timing (onset and termination) of the seasons has been observed, quantified in a delay of at least one month.

The public infrastructures were destroyed, including parts of the KKH, bridges, two Jama'at Khana and other communication links. Mobility, and access to health and education have significantly decreased after the Attabad disaster.

The local communities used to cope with natural hazards by collective actions. In the past, Shishkat was celebrated for its solidarity and social cohesion. Today, after the 2010 disaster, the inhabitants draw a different picture: local feuds are common and frequency of domestic dispute/violence is increasing. The adult males of Shishkat are divided into groups along the major division Internally Displaced Persons (IDPs)/Non IDPs, and they often fight on the distribution of relief goods.

There are very limited opportunities for jobs left *in situ*. Migration is one of the major adaptation measures taken by the people of Shishkat as the resources and opportunities had considerably declined in the region after the disaster. Although migration is not new to Shishkat, where people used to shift to urban areas for education and employment, there has been a massive increase in migration after the disaster. People move both to urban and rural areas. A few families have migrated permanently from the village, and trends of seasonal migrations are higher. The people often go to the Hussaini and the Attabad spillways for loading and unloading of boats. Some of the people previously engaged in transportation along the KKH are now buying boats.

A significant number of people go to Sost dry-port (the major hub of trade with China) in summers looking for daily wage jobs. Migration for white-collar jobs in urban areas is relatively low in Shishkat, but present. Some better off people have established new businesses in Gilgit city and shifted their families.

The impacts of such migrations on a community hit by disasters are overall perceived as positive. The remittances sent by these migrants are often the only source of income in the home community. In absence of job opportunities at home this migration helps the affected households. However, the migrant sending households faces problems like shortage of labor for household works, social insecurity and extra-social pressure (especially if all the males are absent), and increased drudgery for women.

23-25 June

In Gilgit we had the chance to get in contact with the local WWF office, that provided some technical support for this study. We have shared information and experience, and interviewed some officers working on the impacts of climate change in Gilgit-Baltistan

Not far from the Karakorum International University (KIA), established in 2002, is the office of the Italian NGO EV-K2- CNR, currently engaged in the SEED (Social Economic Environment Development) project. SEED is an umbrella project aimed at fostering integrated development in the Central Karakorum National Park. We were briefed on their activities and we exchanged information on the region.

26 June

Our flight to Islamabad was cancelled for two days in a row due to bad weather. As the weather forecasting was announcing the beginning of the pre-monsoon rains, we decided to reach Islamabad by road (Map 3). Despite being 583 km, the trip to Islamabad takes nearly 15 hours due to the condition of the road, and to construction works along the KKH.

The trip presents also some security challenges, yet it is of incredible interest and natural beauty.

Conclusion

Back in Islamabad, a database of the quantitative data has been created in coordination with the data analysis unit of SDPI. Data analysis is currently under way. I left Islamabad on July 1st, 2012.



Source: based on map "Northern Pakistan" published by Culture Area Karakorum Research Project 1999

Map 3: Itinerary of the road trip from Gilgit to Islamabad

Annex 1: The ATTABAD LAKE

On the 4th of January 2010, a tens of million of cubic meters rock slide occurred in the Hunza gorge, at the village of Attabad (ca. 550 inhabitants). As a consequence of the Attabad event, a huge debris deposit in the valley blocked and dammed the Hunza River and impounded a lake within the blockage drainage, whose fate, more than 2 years and a half after, is far from being decided.

DATA:

Total length of the barrier = 3000 m
Total length of the main deposit = 550 m
Total width of the barrier at the apex = 184 m
Height of the barrier at possible outlet = 121 m
Volume of the slide mass = 23×10^6 cubic meter
Source: ICIMOD 2010 ;

As an immediate result, in Attabad, some 20 people lost their lives, 141 houses (Attabad and Sarat villages) were completely destroyed, and more than 1500 people have been displaced [NDMA 2010]. Nearly 3 Km of the Karakoram Highway (KKH), where

Chinese-engineered work was taking place, were damaged and left covered by debris. Other roads and bridges were submerged in Upper Hunza, including around 40% of the village of Gulmit. In the meanwhile, the lake level continued to rise. The village of Ainabad was completely submerged, and major portions of another village, Shishkat, underwent the same fate. The surging lake also submerged significant portions of land in the Hussain and Ghulkin villages [Kreutzmann 2010b].

240 houses from 5 villages were inundated, 25.000 people were negatively affected in economic terms as well as in terms of ability to access items of daily sustenance, and 23 Km of the KKH were destroyed as a result of the flooding upstream the dam [Schneider et al. 2011; NDMA 2010].

A crack in the slope of Attabad was discovered more than a decade ago in 1998, after the Astore earthquake. Back then, humanitarian organizations such as Focus, an Aga Khan-funded NGO, warned villagers to begin moving their homes, declaring the area as highly unstable and prone to hazards [Kreutzmann, 2010a]. Moreover, the recurrence and the impacts of such landslides and the related risks are documented at least since 1841. Geomorphologic processes such as landslides are a common phenomenon in the Hunza and Indus valleys of Northern Pakistan, deeply incised and seismically active [Kreutzmann 2010a]. These valleys have a particular history of landslide-dammed lakes, with specific cases in 1841, 1858, 1962 and 1974 [Schneider et al. 2011; Shroder 1989]. The 2010 landslide is just the last of a long list. Yet, up to date, there are no means to prevent the formation of landslide dams, even if reducing adverse impacts by risk mitigation is possible [Schneider et al. 2011].

After the landslide, the National Disaster Management Authority (NDMA) constructed a narrow channel with a bottom width of about 1 m and a depth of 14 m [Schneider et al 2011] in order to reduce the amount of water stored in the lake and to have the possibility of regulating the future flow over the dam. Thanks to this intervention, on June 5th 2010, when the lake level read 115.21 m above the valley bottom, the inflow and the outflow of the lake reached a balance. By May 2011, the erosion at the outflow of the lake was still controlled by large boulders in the dam, with no apparent impacts of the various blasting efforts.

More than 2 years later, the villagers are still in a deep state of uncertainty. A ferry service consisting of small boats was introduced, allowing some commuting and transportation of goods, and it is still going on without significant improvements. Few local people run the service, as they obviously do not have any experience of boating. Pathan people, previously working on the Indus River in Khyber Pakhtunkhwa are predominantly running the boat business and providing some occupational opportunity also for the villagers of Upper Hunza, engaged mostly in the loading and unloading of boats.



The KKH here was vital for trade with China: trucks were transporting goods to and from Sost Dry Port, the hub of China-Pakistan trade across the Khunjerab Pass. Since 2010, the International trade along this pivotal trade corridor between Central and South Asia has been stuck. This affected the lives of the local people to the point of developing a conspiracy theory, according to which the disaster would be the result of the international game going on in this area: allegedly, an American-Indian laser would have caused the landslide in order to prevent China-Pakistan trade.

Satellite view of the Attabad Lake

to get benefits from the lake water either for power generation and/or for tourism purposes. To a certain extent, shy touristic approaches to the lake have been adopted. Postcards and posters are sent all over Hunza, and local hotels are trying to advertise the undeniable natural beauty of the lacustrine landscape.

Many scenarios have been proposed for the future: Some suggested to try

Even if experts do not find an agreement on the stability of the dam, and the prediction of possible dam failure remains a challenge, there is a substantive risk of catastrophic breach of the landslide dam [Khattak et al. 2010]. If such an event happens, there is a potential of large flood wave as far as Tarbela dam. The Tarbela Dam on the Indus, which claims to be the world's largest earth-filled dam, is the major regulator for Punjab province's irrigation, and houses the country's prime hydroelectric power-generation station. Above Tarbela, the Diamer-Basha Dam is currently under construction [Bakshi et al. 2011]. Considering the scope of the settlement, flooding resulting from the Attabad landslide would be a disaster of massive proportions, damaging both people and infrastructures [Khattak et al. 2010].

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