UNDERSTANDING MIGRATION AND REMITTANCES TO IMPROVE FOREST MANAGEMENT PROJECTS AND POLICIES

Synthesis Report: Tajikistan

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AKAH Aga Khan Agency for Habitat

AKF` Aga Khan Foundation

CIM Centre for International Migration and Development

GBAO Gorno-Badakhshan Autonomous Region

GDP Gross Domestic Product

INDC Intended Nationally Determined Contribution

IOM International Organization for Migration

JFM Joint Forest Management approach

NBSAP National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity

NDS National Development Strategy

NSLM National Strategy of Labor Migration

NTFP non-timber forest products

PRS Poverty Reduction Strategy

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1. INTRODUCTION

Tajikistan is one of the most remittance-dependent countries in the world. Labor migration has become a crucial national economic strategy and is responsible for pulling much of the population out of extreme poverty (Rubinov 2016). In 2015 the World Bank estimated remittances contributed up to 36.6% of the national GDP. Internal migration (migration within the country) in Tajikistan is also an important dynamic, characterized by circular and multi-local livelihoods. Unfortunately, as is often the case, patterns and impacts of internal migration are underreported as it is largely undocumented (Hecht et al. 2015). Thus there is a need to also understand the other forms of migration that are important livelihood strategies for rural people in Tajikistan but that are often overlooked (Rubinov 2016).

The drivers of migration, whether internal or external, are multifaceted. Yet there is a clear economic push factor in Tajikistan due to inadequate employment options in home locations. Family and education are also, amongst others, important determinants that can influence an individual's choice to migrate. The motivation to migrate, and how, can be related to the characteristics of those individuals such as marital status, gender, age, education levels or occupation (Black et al. 2011).

National trends in Tajikistan indicate that migration is male dominated, with only up to 6.5% of the migrants being women (IOM 2009). It is also mostly the rural population that engages in external (international) migration, with Russia as the most popular destination country. Furthermore, the dominant age group migrating for the first time are those under 30 years, making up to 88% of first-time migrants in 2005 (IOM 2006). Those migrants that are motivated by economic gain, labor migrants, are also the ones most likely to send remittances. Yet despite the nation-wide importance of remittances, the true extent of transfers and expenditure can be hidden by the use of informal channels for transferring money.

1.1. Brief overview on forests and the environment in Tajikistan

Another defining characteristic of Tajikistan is the fragility of its ecosystems and landscapes. It has been argued that the country is highly vulnerable to the effects of climate change due to its unstable socioeconomic and geographical conditions. For instance, Tajikistan's landscapes are dominated by mountains, with glaciers as the main source for rivers (Babagaliyeva et al. 2017). Many natural disaster events have been reported, most common being mudflows and avalanches, resulting in huge economic losses. According to Tajikistan's National Development Strategy (NDS 2016), Tajikistan registered over 3100 natural disaster events in the period 1997–2013, with over 1000 people killed as a result, and total economic damages of around USD 400 million. Further climate change is likely to lead to losses in agricultural productivity, land degradation and forests, with severe impacts on rural livelihoods, especially as most of the population depends on natural resources for both subsistence and commercial needs. An estimated 73.5% of the population in Tajikistan live in rural areas and rely on agriculture and forestry for their livelihoods (Babagaliyeva et al. 2017).

Forests in Tajikistan have already been majorly depleted. An estimated 410,000 ha of forest area remains in Tajikistan, representing only 3% of the total land area (FAO 2010). Forests suffered heavy losses due to the economic crisis following the civil war in the 1990s, with trees felled mainly to meet fuel wood demand (National Environmental Action Plan 2006). Forests provide a multitude of benefits such as climate regulation, water purification and erosion control that in combination serve as mitigating services against natural disaster events. Under the GIZ initiative "Adaptation to climate change through sustainable forest management" that ran from 2013 to 2018, efforts are already underway to raise awareness and to restore forests and trees to the landscapes of Tajikistan. These efforts are linked to the provisioning services that forests provide. In addition to fuel wood, trees and forests are important food sources, diversifying people's livelihoods and commercial opportunities from cultivated tree fruits such as apricots, peaches, apples, pistachios, walnuts and almonds (Republic of Tajikistan 2014). As both food security and malnutrition are widespread and of high concern in Tajikistan, edible non-timber forest products (NTFPs), such as fruits, nuts, honey, and other food supplied from forests and trees, are important safety nets for local people.

1.2. Objectives of the project

But what are the potential connections between migration and remittances on the one side and forests on the other? Remittances provide an opportunity for further investment into sustainable land management such as forests. Equally, the patterns and motivation behind migration will also influence any kind of intervention that requires long-term commitments. In Tajikistan, whilst migration features strongly in national developmental goals, forests are crucial in meeting environmental goals. Forest conservation and restoration underpins biodiversity conservation, climate change mitigation and adaption efforts and is a potential means to alleviate food insecurity and malnutrition. Synergies should be sought between promoting economic development and supporting rural livelihoods, through coherent and coordinated strategies for land management. Thus, we set out in this study to investigate the relationship between migration, remittances and people's livelihoods and forests in Tajikistan, and to identify potential areas for developing those linkages if they are useful.

The project was implemented in close collaboration with the Mountain Societies Research Institute (MSRI) in Khorog. MSRI conducts research for development with the goal to improve the well-being of mountain societies in Central Asia. MSRI conducts trans-disciplinary research to help inform and contribute to the Sustainable Mountain Development agenda in Central Asia. MSRI's integrated approach to research with and for the benefit of mountain societies demands an understanding of both social and ecological factors operating at multiple spatial and temporal scales.

2. POLICY ANALYSIS TO LINK MIGRATION AND REMITTANCES AND TO IMPROVING FOREST MANAGEMENT PROJECTS IN TAJIKISTAN

This first part of the report summarizes the policy analysis of key national policy documents from the Republic of Tajikistan related to migration and remittances, and forest management projects and policies.[1] We seek to identify links between the topics, and when missing, identify possibilities for linkages. First, an overview of migration and remittances in Tajikistan is provided. Second, the main policy documents on migration and remittances and forest management projects and policies are summarized, including: the National Development Strategy up to 2030; Poverty Reduction Strategy of the Republic of Tajikistan for 2010–2012; National Strategy Labour Migration of Citizens of the Republic of Tajikistan Abroad for the Period 2010–2015; the National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity Period of 2016–2020; the National Action Plan for Climate Change Mitigation for 2003; and the Intended Nationally Determined Contribution (INDC) for the period up to 2030.

The German Agency for International Cooperation (GIZ) has supported economic development in Tajikistan since 1996. On forests, key initiatives include the 'adaptation to climate change through sustainable forest management' 2013 to 2018; and the 'sustainable and climate sensitive land use for economic development in Central Asia' 2016 to 2019, which was developed in close collaboration with the former project. In addition, recent reports from the GIZ global project on Biodiversity and Ecosystem Services in Agrarian Landscapes are explored. On migration, GIZ developed an 'analysis of migration strategies in selected countries: Albania, Armenia, Croatia, Kosovo, Kyrgyzstan, Macedonia, Moldova, Montenegro, Serbia and Tajikistan' published in 2012; and the initiative 'supporting reform of the technical and vocational education and training (TVET) system'.

2.1. Overview of migration in Tajikistan

A literature review revealed that Tajikistan has, since the late 1990s, developed a number of polices and strategies related to migration. Most of these documents are not accessible in English. Gulina and Utyasheva (2016) analyzed the development of migration policy and strategies between Russia and Tajikistan. Their article outlines briefly the recent history of migration trends from external Tajik migrants.

Migration became a national trend due to the displacement and forced migration of Tajik citizens during a 5-year civil war after independence from the Soviet Union. Due to unclear citizenship and the ease of border crossings, many citizens reportedly took refuge in neighboring countries for a number of years. No statistics on migrants exist from this period and no national policy focused on migration (Gulina and Utyasheva 2016). Flows of migrants changed, with many leaving to seek employment in Russia during Tajikistan's economic crisis

[1] Note that this does not provide a complete overview of all related policy documents from Tajikistan and GIZ, but focuses on those that are accessible and that hold relevance to the themes of the paper.

after the war. Wage levels had dropped, the average monthly wage in Tajikistan was USD 69 in 2009, compared with USD 689 in Russia (Ryazantsev 2016).

Labor migrant flows have been encouraged to some extent by Russian policies and strategies. Due to Russian demographic trends, characterized by population decreases following falling birth rates, migrants from neighboring countries were welcomed as an opportunity to fill labor gaps. For example, there were estimates that in Russia during 2011–2020, the number of employable citizens would decrease by 9 million, i.e. 8–10% of the total population (Klepach 2013). Therefore, liberal migrant policies were reflected in earlier Russian strategies by simplified processes, offering visa-free status to members of central Asian countries. Russia also offered citizenship to migrants, and this encouraged families from Tajikistan to come and take up permanent residence in Russia. However, after Russia's economic crisis in 2008, the direction of policy changed. Gulina and Utyasheva (2016) argued that Russia's migration policies had become contradictory, both in recognizing the need for labor migrants but also in simultaneously tightening up controls and regulations to restrict migrant flows, thus suggesting the influence of antimigrant sentiments on the revised policy.

The importance of migration and remittances to Tajikistan is unmistakable, with remittances providing the highest GDP contribution of any country, estimated at 30.7% of GDP by the World Bank (2016, 2018), equaling USD 2.2 billion in 2016. Furthermore, official data from the Migration Department of the Republic of Tajikistan seem to suggest that at least 9% of the population was engaged in migration in 2013, with a total of around 744,000 labor migrants. These figures do not include undocumented migrants and remittances, and they do not account for internal migrants (those migrating within Tajikistan). Nor do they account for the in-kind exchange of 'non-monetary remittances' such as food and other goods, and of resources, skills and connections. As with many countries, the data and information available on internal migrants and remittances is limited and or nonexistent (Hecht et al. 2015). Those undocumented exchanges can hugely impact local economies and household well-being.

Gulina and Utyasheva (2016) outlined three key stages of reform and change within the migration strategy of Tajikistan. Tajikistan was one of the first countries in central Asia to put forward a Concept of State Migration Policy aiming to regulate and establish institutions for directing and outlining priorities. This was followed by the Concept for Labour Migration by Tajik Citizens Abroad (Tajikistan's Government Regulation 2001), which aimed to encourage Tajik citizens to seek migration as a livelihood strategy. Later, following the economic crisis in Russia and the tightening restrictions on Tajik migrant flows, the government saw the value of negotiating national political interests to protect migrants abroad. However, a major flaw in those strategies was the lack of any real implementation plans or financing capacity, reflecting a lack of political will to give teeth to any of the plans. This includes a large number of plans and laws developed, such as the National Strategy of Labour Migration of Citizens of the Republic of Tajikistan Abroad for 2011–2015 (Tajikistan's Government Regulation 2011; Law On Combating Human Trafficking (2014), Law on Migration of 2013 (Tajikistan's Government Regulation 2013), Law On Private Employment Agencies, Law on Improvement of Employment (2003), Strategy of National Development until 2015, State Strategy of the Development of the Labour Market until 2020 (Tajikistan's State Strategy 2011), Strategy on

Improving the Wellbeing of the Citizens of Tajikistan for 2013–2015 (2012), and the State Program on the Realization of the Concept on the Development of Legislation in Spheres of Labour, Social Protection and Education for 2012–2015 (Tajikistan's Government Decree 2012) (Gulina and Utyasheva 2016). As already mentioned, migration features largely in the National Development Strategy (NDS) for the period up to 2030 and also in the Poverty Reduction Strategy of the Republic of Tajikistan for 2010–2012 in addition to the National Program on the Enhancement of Employment (2004).

2.2. National policy documents review

2.2.1. National Development Strategy (NDS) of the Republic of Tajikistan for the period up to 2030

The National Development Strategy (NDS) of the Republic of Tajikistan for the period up to 2030 is one of the most recent and important documents that has been developed (Republic of Tajikistan 2016a). It brings into one document countrywide priorities and strategies, including both developmental and environmental goals. The priorities of the NDS are largely focused on improving human capital through economic development by emphasizing the promotion of education, innovation and employment. Migration and remittances are acknowledged and environmental concerns are referred to, albeit less prominently, while forests are rarely mentioned.

a. Migration and remittances

Migration and remittances in the NDS are recognized as both an opportunity for economic development and a risk to progress. The importance of migration through remittances is highlighted as contributing up to 40% of the country's GDP with over 600,000 migrants transiting annually (Republic of Tajikistan 2016a). Remittances are further mentioned as a means to provide investment support into the country.

But concern has been voiced that certain forms of labor migration are 'informal' and 'uncontrolled', and that Tajikistan is overdependent on labor migration. The dependence on remittances is considered risky, especially the reliance on the employment and financial opportunities in neighboring countries and shifts in border control policies (this occurred during the Russian economic crisis, resulting in a reduction of migrants and in remittances and was due to a tightening of border control and regulations). Decreases in remittances have negative impacts on the national economy due to a decrease in public spending. Nationwide social issues related to migration were said to require a strengthening of social protection and legalization both in the source and recipient countries.

The NDS further refers to supporting equal opportunities for migrants and those left behind (Republic of Tajikistan 2016a). It emphasizes equal opportunities, supporting both men and women to be prepared for migration. Further, it discusses the need to support the access to opportunities for men's, women's and the younger generation's involvement in labor migration. It notes the prioritization to develop a *"gender-sensitive system of pre-departure training for migrant workers and their families, including legal and information support, short-term vocational and language training based on resource centers"* (Republic of Tajikistan

2016a). Migration is also linked to 'brain drain' and is seen to 'wash out' the country's skilled workers and specialists. Therefore, the NDS repeatedly emphasizes the need to create 'attractive, stable employment opportunities in the urban and rural areas within the country'.

The gender implications of outward external male migration trends are acknowledged, especially with regard to the abandonment of women and children, particularly in rural areas. Families left behind, in such cases, become most vulnerable to both environmental and economic shock. It seems to be fairly common that male migrants decide to not return to their families back in Tajikistan and instead become permanent residents in the destination country.

The vulnerability of rural women and the unequal access for employment opportunities and insufficient infrastructure and unpaid labor are also cause for concern in the NDS. There is a risk that migrant family members may be unable or even unwilling to send remittances back home, or that the amounts may be low and irregular. The vulnerability of women is further exacerbated due to unequal rights for land ownership – noted in the NDS as an issue that needs addressing. Unequal access for both men and women to land and to financial capital and education, health, etc., are considered constraining factors for societal development and the economy as a whole.

b. Land rights

In the NDS, three scenarios are put forward: (1) inertial (equivalent to a business-as-usual approach), (2) industrial, and (3) industrial–innovative (Republic of Tajikistan 2016a). Two of these scenarios indicate industrial progress, and put an emphasis on the strengthening legislation for 'property rights'. The provision of property rights was emphasized as crucial in the NDS in creating a favorable business climate. Securing land rights strongly encourages both domestic and foreign investments. The report claims that developing the conditions and guarantees in property rights will attract investment and that "effective management of own assets are essential for the development of priority sectors of the economy"'.

The NDS notes the expectation that funding sources will include remittances to support the development of production industries considered an opportunity for investment. This is an important point that highlights the recognition of remittances to the desired developmental progress in the country, referred to in all three scenarios. Although not considered in the NDS, this could also relate to tree planting, as often, secure long-term rights are a precondition for land managers to invest in forest- or tree-based land management strategies.

c. Ecotourism

In the industrial and innovative development scenario, promoting tourism is seen as a, so far largely undeveloped, opportunity. Ecotourism and nature-based tourism are not specifically mentioned in the report but are alluded to in the introductory statement of the NDS. The NDS refers to the 'rich historical and cultural heritage of Tajikistan' as well the "distinct nature with unique lakes, rare animals and plants, as well as the high mountains" as being important to develop the tourism sector, to contribute to the country's GDP. The development of ecotourism could also support both migration and environmental priorities. For instance, it

provides employment opportunities and may thus curb outmigration. A GIZ initiative in Tajikistan reflects these aims under the Support of Tourism Sector/Handicraft Development 2007 – 2015 project. It identifies tourism as a service industry that by nature is job-intensive, requiring low- to medium-level qualifications, allowing those with lower skill sets to find employment opportunities. Similarly, nature-oriented tourism could provide further economic justification to protect and rehabilitate forested areas for 'recreational services', but also link to other environmental goals set by the Tajikistan government.

d. Forests and natural resource management

In terms of environmental priorities, the importance of 'natural capital' is referred to in the NDS as a basis for growth. Utilizing natural capital is identified as a means to boost the development of export-oriented and import-substituting industries. Agriculture features prominently in the NDS alongside references to promoting the 'green economy' and sustainable development. Forests are not mentioned in this context, and overall are very rarely included in the strategy, despite the fact the forestry sectors can play a role in supporting economic development, and that the majority of the Tajikistan population are also rurally based with livelihoods dependent on forests and agriculture.

Where forests are considered in the NDS, it is in reference to forest loss, and other related environmental impacts, and how this is an indicator of unsustainable agricultural practices. However, the link between forests and agriculture is seen as an important one, for instance through the wide range of ecosystems services provided by forests. Yet beyond a couple of side notes about forest loss, the NDS overall lacks recognition of the multiple roles forests provide, their productive capacities and their regulative and supporting ecosystem services. Moreover, the vital role forests can play in supporting resilience against climate change is being overlooked, despite the emphasis in the NDS to address climate change and disaster mitigation.

e. Climate change mitigation and prevention of land degradation

Climate change is referred to in the NDS several times. Tajikistan is considered highly vulnerable to the risk of natural disasters from climate change due to its geographic conditions, in combination with a weak resilience due to a delicate economy. Climate change is considered a threat to sustainable development, due to the impact on people's well-being and the subsequent economic effects. According to the NDS there were reportedly 3169 natural disaster events during the period of 1997–2013, with 1041 people killed as a result, and with economic damage amounting to about 2 billion somoni.[2] It was further estimated that 10% of the country's population live on degraded lands, which suggests that with climate change, these areas are becoming even more vulnerable to disasters. Whilst the NDS does not link the degradation of land with the loss of forests and trees, it is inevitable that any further losses of forests and trees will lead to greater land instability.

A broad 'people-centered' approach in NDS was suggested to tackle these issues of land degradation, and although it is a general remark, it could insinuate an approach that supports

[2] This is equivalent to at least ca. USD 400 million (the exchange rate in 2013 was roughly 0.2 TJS/USD; xe.com).

people's needs and in turn would need people's support to be effective. This could involve mitigation approaches that include restoration of degraded landscapes, particularly through reforestation and planting trees. Restoring the ecological integrity of these areas could reduce the risk of further disasters. This is recognized in the following statement "*Issues of natural disasters risk management system and the effective management of natural resources are also an integral part of this Strategy*". Although not recognized in the NDS, forest protection and restoration are key land management strategies to mitigate against floods and landslides and to restore degraded lands.

f. Food security

Another priority of the NDS is 'national food security and nutrition', where forests also present opportunities. Food insecurity and malnutrition are critical issues in Tajikistan, with a reported 26% of the population affected by chronic malnutrition and 10% of children under 5 years of age by acute malnutrition. Actions prioritized to address food security and malnutrition include:

- improving agrarian and water supply reforms
- providing economic and physical access to food based on the stable growth of the agricultural sector
- diversifying agricultural production
- introducing innovations with minimum impact on the environment and quality of land.

This last action also provides the justification for tree-based livelihood efforts, as the use of mixed agricultural and tree-based systems could provide short- and long-term benefits and minimize environmental impacts of the more intensive farming practices. Food security and nutrition are further shown to have positive links with forests (Sunderland et al. 2013). Forests and agroforestry systems can provide opportunities for both subsistence and commercial needs, supporting nutritional diets, especially through the provision of non-timber forest products, such as honey, nuts, fruits and medicinal plants.

g. Value chains and the green economy

Another important link between agriculture, forests and the socioeconomic benefits is via the provision of value chains to enable markets and to ensure the supply has demand. This fits with the NDS aim to increase *"the attractiveness of the (agricultural) sector, especially for dehkan farms via the development and strengthening the value chains"*, in addition to *"support[ing] and develop[ing] small and medium enterprises in urban and rural areas"* in order to boost employment opportunities and address social issues. The NDS recognizes that a lack of access and options for in-country 'processing' limits the growth of the agricultural sector. For any raw product including timber and NTFPs, a major hurdle will be to improve and strengthen value chains in order to promote forest as an attractive investment option.

Developing the 'green economy or green employment' to expand public support for environmental entrepreneurship and environmental services markets is also high on the agenda of the NDS. Furthermore, the NDS goes on to mention that efforts need to *"ensure employment of rural population through the development of new and fallow land"* which

presents another potential opportunity for forests to meet the aims of the NDS. Forestry and payment for ecosystem service schemes, although not mentioned as part of this green economy, could also fall into this category. Additionally, the development of fallow land with secure ownership rights could encourage land users to utilize the land for forest rehabilitation providing that adequate incentives, such as a finance option to get people started. Such actions are already underway as part of GIZ initiatives that promote reforestation and sustainable forest management for climate change adaptation.

h. Energy security

Energy security is of high concern in Tajikistan. The NDS mentions that energy supply is often insufficient, especially during wintertime, and that access and reliability are issues particularly in remote areas. This has far-reaching social and economic consequences, as acknowledged in the report (whereas environmental impact is not mentioned). In Tajikistan, fuel needs for households are often complemented by fuel wood, the collection of which has been a key driver of forest loss in the country since its independence.

Whilst the country is aware and willing to take action to meet its energy needs, there are environmental implications depending on whether a pathway is embarked on with renewables or one based on fossil fuels. The NDS report refers to utilizing all means, and diversify energy sources, to gain energy security, and it is often emphasized that hydropower would be a central source. Moreover, Tajikistan aims to become a leader in cheap and clean energy production. Thus, indirectly, by achieving progress in energy security through these means, pressure on remaining forest resources as a source of fuel could be reduced. However, one cause for concern would be the vulnerability of hydropower energy supplies to climate change and fluctuating rainfalls. Reportedly, low rainfall in winter has already impacted national energy supplies this season, causing shortfalls (Babagaliyeva 2017).

i. Summary of NDS up to 2030

Overall, the NDS has clear socioeconomic goals that are key priorities (Republic of Tajikistan 2016a). Poverty and inequality are prevalent social issues and migration and remittances provide both a safety net and a risk for individuals and the country's stability. The government seems keen to improve the situation within the country in order to provide the right infrastructure and opportunities needed for it to progress independently. The scenarios presented include a push for industrialization. This approach is understandable as a means to achieve progressive development across the country, but may come at the expense of the environment, which – if ignored – could further exacerbate social issues and inequalities.

Although mentioned in the NDS, the environment is often referred to in very general terms, with little acknowledgment of forests. The lack of recognition of the role of forests could be a threat to development, as further environmental degradation risks may cause further disasters with both direct and indirect economic impacts. Forests play a crucial role in climate change mitigation but also mitigate against disaster events. This link has been made in other national action plan documents (e.g. the National Action Plan for Climate Change Mitigation 2003, and the National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity 2016–2020). Furthermore, extreme environmental events, further exacerbated

by climate change, will also become another driving force for migration and therefore would merit consideration in the development of future scenarios. Tajikistan has both fragile environmental and economic conditions, which severely inhibits its resilience to any shocks. Migration will likely become the main adaption strategy in the absence of other alternatives.

Forests present an alternative livelihood strategy to address socioeconomic issues and risks associated with outward migration holistically, and could suit those who are left behind and/or provide opportunities to encourage migrants to stay. If securing land rights is achieved with equal rights allocation for men and women, as is a key goal of the NDS, this could open up opportunities for investments into land. Forests, plantations and tree systems in general can provide short- and long-term benefits that could support household food security and nutritional needs, and act as a financial safety net (as a buffer against the risks of remittance fluctuations). Finally, as both climate change itself and migration are emphasized in the NDS, links between the two must also be elucidated. Both inward and outward migration can increase the vulnerability of forests to climate shifts and other changes, with impacts to both the economy and the land. The environment in general can affect migration through exposure to hazards and the provision of ecosystem services. Interactions will be based on feedback mechanisms, where land management choices will determine whether that feedback is positive or negative (Black et al. 2011).

2.2.2. Poverty Reduction Strategy of the Republic of Tajikistan for 2010–2012

The Poverty Reduction Strategy (PRS) of the Republic of Tajikistan for the period of 2010–2012 was a provisional document that has been incorporated into the more recent NDS up to 2030. As much of the content is reflected in the current NDS, in this analysis we do not further elaborate on the contents of the PRS beyond the key components and goals of the report and its reference to migrants.

Building from previous strategies, the PRS has three key components: provision of general conditions for development; promotion of sustainable economic growth; and development of human potential. These areas are further reflected in the three main goals of the PRS 2010–2012 (Republic of Tajikistan 2010a), as follows:

I. **Improve public administration** in order to promote transparency, accountability and efficiency of activities of public bodies in combating corruption and ensuring conducive macroeconomic conditions, and institutional and legislative environments for development.
II. **Give support to sustainable economic growth and diversification of the economy** through private sector development and encouragement of investments, especially in the field of energy, transport infrastructure, agriculture, etc. Achievement of these objectives is possible through an expansion of economic freedoms, strengthening property rights toward improving cooperation between state and the private sector.
III. **Build human capital** through availability of social services to poor people, by improving its quality, activating people's participation in the development process, and strengthening social collaborations.

The PRS refers to a survey conducted in 2010 to further understand the links between remittances and poverty. This survey aimed to help understand the amount of remittances being transferred and the impact on household welfare and poverty between migrant- and nonmigrant-sending households. However, the results are not published in this report and can be found in the 'Tajikistan Household Panel Survey: Migration, Remittances and the Labour Market' report by Danzer et al. (2013) (see Box 1).

Migrants are further referred to in respect to protecting the rights and interests of Tajik nationals in foreign countries and refers to the National Strategy of labor migration of Tajik citizens abroad for 2011–2015 as containing more comprehensive action and plans (Republic of Tajikistan 2012b).

Box 1. Summary of the 'Tajikistan Household Panel Survey: Migration, Remittances and the Labour Market' report by Danzer et al. (2013)

The report notes that a total of 1503 households (comprising 9608 household members) were interviewed. The key findings reveal it was mostly men who migrated and most headed to cities in Russia. Two-thirds of all external migrants were moving because they were unemployed before moving. It was found also that nearly all those migrants who had returned home had sent remittances home and 78% of migrants still abroad were sending remittances too. The report also reflects on the number of migrants who suffer discrimination when working abroad. It was estimated that one-fourth of migrants who traveled to Russia suffered some form of discrimination between 1991 and 2011, with 15% considering it a substantial issue.

In relation to land use, the report refers to the cotton industry with those workers considered some of the most vulnerable. This point refers to the risk of cotton price fluctuations to smallholder producers. Thus, the recommendations was to "increase the share of private smallholders in agricultural production and the freedom of crop choice for private farmers" (Danzer et al. 2013).

Another issue raised was household expenditure toward celebratory events. It was stated that the president had introduced a strict law in 2008 banning and monitoring extravagant wedding celebrations. The results indicated that compliance with the law depended on levels of income; poor and rich household were less likely to comply with the law, whereas those with medium income were more likely to comply with it. The level of compliance and income is said to be correlated to migration patterns, for example, middle-income men significantly reduced their migration frequency and duration after the law was introduced.

2.2.3. National Strategy of Labor Migration of Tajik Citizens Abroad for 2011–2015

The National Strategy of Labor Migration (NSLM) of Tajik Citizens Abroad for 2011–2015 is a key document related to migration (Republic of Tajikistan 2010b).[3] This document has also been subsumed into the more recent NDS for the period up to 2030. Nevertheless, the NSLM offers more specific details on migration trends and drivers, current efforts so far, and some of the associated benefits and issues related to migration. The strategy then outlines key objectives along with strategic actions and predicted outcomes.

The NSLM for 2011–2015 begins with a strong statement on how the current socioeconomic conditions of Tajikistan could 'not' have been realized without labor migration abroad. It notes the crucial importance of migration as a 'life-support' system for the majority of Tajik citizens (Republic of Tajikistan 2010b).

There is a brief explanation that the previous strategy, mainly the "medium-term program of labour migration abroad", was neither adequate nor meaningful. Therefore, the NSLM for 2011–2015 was developed with the following four core objectives:

1. Develop new employment markets.
2. Develop social, economic and legal protections for migrant workers.
3. Provide assistance in the form of high-quality vocational and home migration training for migrant workers.
4. Strengthen institutional capacities, dialogues and networks between government and nongovernment agencies.

The issues related to migration include unemployment, informal employment, forced labor, and internal and external labor migration. The country's socioeconomic crisis and civil war were acknowledged as drivers of migration (these issues amongst others were further elaborated on in that document). A compounding issue was the increasing large numbers 'skilled workers and specialists', but an insufficient number of jobs, combined with nationally low wages. The current situation highlighted the imbalance between the increasing proportions of a capable workforce vs the low number of jobs available in the country. National statistics indicated an increase of jobs in certain sectors but not in others. For instance, in the agriculture sector between 2000 and 2008 there was an increase of 314,000 jobs, whilst in the industry sector there was a reduction of 17,000 jobs. The NSLM claimed this trend indicated a de-industrialization of the country (Republic of Tajikistan 2010b).

The NSLM highlights that vocational training and education have also suffered since 1989, with a decrease in vocational and/or professional training and in the quality of education in secondary schools. This point is somewhat in contradiction of the earlier point of an increasingly skilled workforce. The number of unemployed urban youth, who lack vocational training, was seen as being higher for the age range 15–29 years and this was particularly so amongst women. Furthermore, there was a trend of decreasing numbers of students attending primary and secondary schools, whereas a higher number of students sought higher

[3] This document was only available in Russian at the time of writing. Therefore, mistranslations may have occurred in the analysis.

education. The education system was also noted as being still more problematic as it was not being tailored to meet the needs of the current labor market.

In order to provide sufficient jobs for the increasing workforce, the report noted that an annual increase of 7% in new jobs was required; yet the annual growth rate increase of employment was only 1% at the time. The issue of low wages was also emphasized, highlighting that even where jobs are available in the country, they remain unfilled as the salaries are inadequate, i.e. the lowest in the Commonwealth of Independent States (CIS) region. Therefore, labor migration abroad was said to remain an important employment strategy for the country. However, it is also stated that this strategy is viewed as a 'temporary opportunity' to reduce tensions in the domestic labor market.

a. Migration trends

The largest flow of external migrants from Tajikistan is to Russia (84%), whilst most of the rest go to Ukraine, Kazakhstan and other CIS countries; only 5% will go to other foreign countries. Statistics from the migrant registration in Russia indicated that 954,000 citizens of Tajikistan had migrated to Russia. A further statement notes that 90% of all migrants are men and (this may be a mistranslation) but are reported as being the 'most mobile and able-bodied'.

b. Migration regulations

In 1994, the Agreement on the Protection of the Rights of Migrant Workers was signed by Tajikistan and other countries in the CIS region. The establishment of bilateral agreements was seen also as a means to protect migrants. Since 2000 it is reported that the Tajikistan government has made further efforts to regulate migrants; taking measures to allow them to work and also to protect their rights. This included additions made to the Law of the Republic of Tajikistan on Migration. This led to the development and approval of the Concept of Labour Migration of Citizens of the Republic of Tajikistan Abroad. The concept emphasized the importance of labor migration for the employment policy of the country. In 2004, Russia and Tajikistan also signed an intergovernmental agreement on the protection of the rights of migrant workers.

It is claimed that these political provisions made by the Tajikistan government for migrants have so far had the following benefits: accessible network of remittances, almost unlimited opportunities for migration and the availability of transport services, as well as the opportunity to have dual citizenship with the Russian Federation.

c. Migration benefits and problems

A double-edged benefit of migration, claimed in the NSLM for 2011–2015, was related to the transfer of skills gained by external migrants. An increase in the skilled workforce due to the transfer of skills from the destination countries to the home countries was claimed as a key benefit (Republic of Tajikistan 2010b). Although not referred to in the report, this indicates a flow of 'social remittances', which can be described as *"ideas, behaviours, identities and social capital that flow from receiving to sending country communities"* and also vice versa (Levitt 1998, 929). In the NSLM it was claimed that within the construction industry in particular, labor migrants from abroad had acquired professional skills (most often without a certificate).

This was seen as a potential benefit due to the circular nature of migration flows, with most migrants opting to return home due to strong family ties. On the other hand, it was recognized that a negative consequence of migration has been increasing numbers of migrants who choose not to return and will abandon their families in Tajikistan; thus, they also would not apply their new skills to labor needs in the country. An aggravating factor is the lack of opportunities for some of the returning workforce, due to low salaries which are unattractive and deter them from choosing jobs back home.

The burden of the families left behind were seen as also problematic, especially as it put an extra load on women and on those families with children. As negative consequences of migration, migrant families were said to have a higher number of children involved in labor, and in other extreme cases, had led to child abandonment.

Additional issues of undocumented migrants were recognized. It was claimed that only 25–30% of Tajik labor migrants have acquired working status regulated by the Russian Federation. Those 'undocumented' or without registered rights to work in Russia are then vulnerable to discrimination and legal ramifications. Further issues include a lack of social protection including pensions for migrant workers, and health insurance, as well as the problem of linguistic and professional literacy of migrant workers, which puts them at further risk.

d. Strategy objectives and actions

Amongst the four core objectives set out in the strategy, the third, 'Development of the potential of migrant worker' is potentially the most relevant to actions related to forests. This objective included the order for the *"development and implementation of social projects (including microfinance projects, as well as facilitation of access to the banking system, remittances), in order to assist migrant workers and their families in raising living standards and reducing poverty"* (Republic of Tajikistan 2010b). This action can be related to efforts that are already encouraging the sustainable management of forests and is encouraging how remittances and a reliable banking system to help support such 'social' projects. Further, the action '*increasing the participation of migrant workers and their families in the process of national development*' is also promising (Republic of Tajikistan 2010b). Moreover, the aim would be to reintegrate migrants and provide attractive options for them to contribute to the economy, in addition to supporting their families, via the development of social projects developed by donors, NGOs, the private sector, etc..

e. Roles and functions of government

The list of government departments responsible for certain aspects of the strategy were outlined. For example, the Ministry of Education and the Ministry of Labour and Social Protection of the Population are tasked with implementing measures to create a system of home migration and vocational training of potential external labor migrants. Matters relevant to objective 3 and the 'development potential of migrants' are under the responsibility of the Ministry of Economic Development and Trade, the National Bank and the Tax Committee under the Government of the Republic of Tajikistan, which are all tasked with improving the flow of remittances, issuing loans, as well as developing measures to attract remittances to the country's economy.

Another potentially relevant role would be that filled by the Committee for Women and Family Affairs and The Committee for Youth, Sports and Tourism, due to their involvement in the NDS, in addressing issues relating to youth and women participating in external labor migration.

Great emphasis is also put on Monitoring and Evaluation (M&E) and claimed to be one of the most important aspects of the migration strategy. Emphasis on M&E would help provide transparent and reliable information to monitor progress of the strategy and track overall effectiveness. Indicators are referred to in the strategy to monitor impact and results, but these are neither defined nor elaborated upon.

f. Summary of the NSLM

In summary, the NSLM is a useful document that provides insights into the roles and functions and efforts of the Tajikistan government and bodies related to labor migration. Its strengths are that it reflects on both the aspects where migrants can be supported and have provided national benefits to the country. Alternatively, it also highlights the risks related to migration and areas where further development and support are needed. As in the title, the NSLM focuses on the labor migration of Tajik citizens who travel abroad; the strategy itself then does not include the contribution of internal migrants and other forms of migrants, whether motivated by education or for other reasons. Whilst it is assumed that external migrants are those who contribute most substantially to overall remittance transfers and therefore economic development, often internal migrants and their remittances are overlooked as they are frequently undocumented. Therefore, the contribution of internal migrants is ignored. Internal development will have strong links to internal migrants, even if they are not labor migrants. As for those engaged in migration for further learning – and whether that means they migrate externally or internally – they also have potential, under the right incentives, to contribute to national efforts for development.

A further weakness of the report is again the lack of elaboration on the role of women as migrants and/or those left behind, and associated impacts. With an apparent increasing trend of women migrating, this is an area that needs further consideration in such reports, and whilst the risk to women is recognized, it is only briefly touched upon. Further elaboration is required on measures to support and protect women both as migrants and as those left behind. This lack of information on the role of women and other migrants could also reflect the lack of available information and data to further understand their roles, contributions and risks. This could therefore also be part of the M&E efforts to ensure that other forms of migration, beyond the mainstream trends and the impacts, are not missed.

2.2.4. National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (NBSAP) Period of 2016–2020

Tajikistan first developed and adopted a National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (NBSAP) in September 2003. Tajikistan later updated its NBSAP from 2016, to set national targets in line with the Aichi Biodiversity Targets for the period 2011–2020. The updated NBSAP 2016 –2020 itself consists of 5 Strategic and

National Goals and 20 Targets which each have specific activities. The NBSAP for 2016–2020 outlined the five strategic goals as:

1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
2. Reduce the direct pressures on biodiversity and promote sustainable use.
3. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
4. Enhance the benefits to all from biodiversity and ecosystem services.
5. Enhance implementation through participatory planning, knowledge management and capacity building.

The NBSAP is a comprehensive document that provides information on the context and historical trends of biodiversity and habitat conditions in the country. The report outlines key issues and suspected drivers of biodiversity loss and areas of priority. Forests are featured numerous times in the NBSAP as a key priority area, due to the importance of forests for biodiversity and issues of deforestation and degradation, with forest habitats considered as highly threatened due to continued forest losses. Forests are further acknowledged as valuable assets for their multiple service provision including biodiversity hot spots for endemic and rare species, their economic role, and regulation services for both carbon sequestration and water and soil protection. Major drivers of deforestation are recognized as the demand for fuel wood due to national energy insecurity issues, and the attraction of alternative land uses such as grazing pastures for livestock and agriculture.

The NBSAP included data which indicates an increase in productivity of forests in the country between the years 2011 and 2012 (noting that the data are likely to be unreliable[4]). The data further illustrates the multiple production functions of the forest for both timber and non-timber forest products (NTFPs).[5] The report estimates that agriculture and forestry contributions to GDP were 19.6%; this was considered low as agriculture is a key sector within Tajikistan.

a. Targets

The NBSAP 2016 to 2020 contains 20 targets based on the Aichi Biodiversity Targets and these are tailored to domestic needs and priorities. Food security for instance is included in a number of the NBSAP goals due to its national importance, but is not referred to in the actual Aichi targets. Of the 20 targets in the NBSAP, two relate directly to forests, with several targets that can be linked indirectly to forests.

[4] In the report, existing environmental data are recognised as being unreliable, and therefore the need to improve inventory databases and monitoring efforts and to provide reliable indicators is emphasized.

[5] However, the inclusion of potatoes, fodder and grain products have questionable relevance to forest systems unless as features of agroforestry systems.

This section outlines those targets relevant directly and indirectly to forests, and highlights some of the related actions prescribed in the NBSAP 2016 to 2020.[6]

I. **Target 11** is the core action related to forest preservation. This target is aimed at improving and strengthening the preservation and rational use of biodiversity to support ecosystems services of forests. It includes a number of forest habitat types that are to be prioritized for conservation such as the *'xerophyte light forest ecosystems'* and the *'mesophile broad-leaved walnut ecosystem'* and the high and mid-mountainous conifer forests; please see Table 1 for further descriptions. Overall, this target highlights the value of these forests not only for biodiversity conservation of forests for different habitat types but also for the socioeconomic importance of these forests as a source of food (both edible plants and wildlife), medicine and livelihoods (p. 18).

Table 1. Forest types prioritized in Target 11 by the NBSAP (NBSAP 2016 to 2020)

Forest type	Description and location
Xerophyte light forest ecosystems	These ecosystems are characterized by pistachio woodlands are found in mid to high mountain regions and are particularly vulnerable to conversion to pasture lands, a barrier also for regeneration. The mountainous xerophytic light forests provide water regulation benefits and are optimal habitats for wild animals adapted to arid zones. Most of these habitats are predominated by pistachio woodlands (up to 80%) but are now overgrown with bushes. The xerophyte light forest ecosystems cover 4% of the total land area and are located in South and West Tajikistan, with small fragments found in North Tajikistan.
Mesophile broad-leaved walnut ecosystems'	These ecosystems include representations of maple, walnut, willow, poplar, birch forests with sparse mesophytic bushes (Egamberdieva and Öztürk 2018). Within these habitats a number of rare and endemic plants species can be found and a number of fruit-related species such as the apple, plum, cherry plum and hawthorn. It is earlier noted in the report that mesophile forests are highly threatened, mainly from the expansion of agricultural areas. The mid-mountainous mesophile forests are noted for their socioeconomic role (collection of fruits and berries). The largest walnut–maple forests are located in Sarikhosor, Childukhtaron and Dashtidjum reserve forests and cover 1.4% of the total area of the country.

[6] These are not in chronological order but reflect the order of relevance towards forests for the different targets, starting with the most relevant.

Forest type	Description and location
High and mid-mountainous conifer forests	Juniper-dominated forests and open woodlands are estimated to decrease 2–3% annually. It is stated that around 30% of their species diversity is in danger of extinction. Conifer forests are estimated to compose around 50% of the total forest area and 5.59% of the total country area. The conifer forests are widespread in Northern Tajikistan within the Kuraminsky, Turkestan and Zeravshan mountain chains.

II. **Target 15** is another target that relates to forests and seeks to improve resistance of the ecosystems and to increase carbon capture through the preservation and restoration of value natural ecosystems by at least 15%. This target is in reference to mitigating and adapting to climate change and combating desertification and refers directly to promoting preservation, rehabilitation and restoration efforts. The Aichi goals themselves speak strongly to forests and wetlands as focus habitats (CBD 2010).

III. This action point refers more especially to rehabilitation and makes specific reference to forests and reforestation efforts with a target of improving 30,000 ha of land by 2014–2017. Actions include a focus on rehabilitating *Haloxylon* forests,[7] pistachio forests, walnut forests and other wild-growing fruit cultivars in Southern, Central Tajikistan and on the Samgar-Asht massif.

IV. **Target 7** indirectly incorporates forests, as it focuses on *'sustainable land management and also sustaining ecological corridors'.* This contrasts with Target 5, which emphasizes the need for improving protection on key areas of biodiversity conservation especially for valuable species and for the purposes of food security, medicine and selective breeding. As part of the action points, 'forests' are referred to multiple times, stressing the importance for the continuation of forest regeneration efforts, and the collection of genetic resources from forest sites.

In addition, management plans for the collection of forest products in walnut and pistachio forests will be developed and implemented.

V. **Targets 12 to 14** further focus on *gathering evidence and baselines on the biodiversity* status quo of the country, including the establishment of inventories and assessing which habitats and species are under which levels of threat. This will also help identify priority areas that are most vulnerable and in need of protection and/or rehabilitation. Currently, the report acknowledges that whilst decreases in biodiversity have occurred, there currently is no reliable information about the quantitative and qualitative composition of the country's biodiversity.

[7] *Haloxylon* is a genus of shrubs or small trees, belonging to the plant family *Amaranthaceae*.

VI. Some of the broader goals in the NBSAP are more focused on improving local and national regulations, policies, coherence of legislation and strategies, finances, and coordination to further strengthen protection of biodiversity under **Targets 2, 3, 4, 16, 17** and **20**.

Targets 3 and 5 refer to creating 'incentives' mechanisms to support the preservation of natural habitats of biodiversity. This could potentially also include incentive-based mechanisms that could provide benefits to those willing to invest, plant and conserve forests. A successful reforestation and forest conservation pilot project was referred to in the report; a joint project between the Republic of Tajikistan and the Global Environmental Fund (GEF) was established in the Dashtidjum Reserve forest. The project provides fuel to the local population as a reimbursement for planting more than 150,000 trees of wild congeners of fruits (pomegranate, fig, pistachio, *Ziziphus jujuba*[8]) across 12 ha and protecting 90 ha for seed regeneration and growth of genetic resources. This project has been considered so far successful and therefore has been further expanded to another 1500 ha of land.

Target 3 further emphasizes the need to try to *eliminate perverse incentives* that would lead to the destruction and elimination of biodiversity. For example, one action includes the taxation on pasturage on natural grazing per head of cattle which had been introduced with generated funds redirected to forest areas and Special Protected Natural Areas (SPNAs).

VII. *Combating invasive species* is focused on in **Target 9**. Invasive species such as parasites were claimed to be responsible for forest damage of more than 9000 ha and was set to increase. Current methods against parasites include biological and chemical ones.

VIII. **Target 1** speaks to *raising awareness of biodiversity* and how to work towards conservation through education and knowledge sharing. **Target 18** also refers to the value and need to embrace traditional knowledge practices and innovation for the care and maintenance of biodiversity. Furthermore, it refers to the incorporation of traditional knowledge into legal regulative documents to support the continued beneficial practices.

b. Summary of NBSAP for 2016–2020

Migration features in the NBSAP, but only briefly and in reference to perceived negative impacts of internal migrants. The report refers to internal migration patterns to and from mountainous regions linking between environmental degradation and the poverty cycle. It is argued that internal migration and population increases have led to increases in unsustainable land use. Migrants to mountain areas include those who are poorest and have few options other than to occupy already fragile areas that are at high risk of degradation, and which may also have high biodiversity value. Expansions of pasture areas, as a common land use strategy, may have short-lived socioeconomic benefits and the subsequent

[8] This is otherwise known as the red date or Chinese date.

exhaustion of land will then negatively impact livelihoods. For example, as hydrological functionality of the land deteriorates, in turn agricultural practices will also suffer. It is explicitly noted that the loss of shrubs and trees could also cause forced migration to valley areas. In relation to these negative impacts linking migration to natural resource management, the NBSAP claims that this should justify its priority amongst other national plans, due to the dependency of maintaining a healthy natural environment for people's livelihoods.

The reference to forests in the NBSAP 2016–2020 and the level of detail in the report may explain the lack of emphasis on forests within the NDS in the period up to 2030. It may also be that forests are not included in the NDS because forests constitute only a small amount of the total country area, yet equally, this should justify actions to prioritize reforestation and restoration efforts. Under the fourth strategic goal of the NBSAP, and the Aichi goals, the 'enhancement of benefits to all from biodiversity and ecosystem services' also speaks to restoration efforts under Targets 14 –16. The NBSAP itself reports that the mesophile forests are decreasing every year and there have been no efforts so far to restore them. Further statistics indicate that forest restoration efforts had been reducing between 1991 and 2004, with 4000 ha being planted in 1991 compared with 2300 ha in 2004. Further figures showed zero increases in forests and wooded areas between 2010 and 2012.

In the NBSAP, the concerns about forest loss are made explicit; however, while the relationship with land and migration were explored briefly, the link to remittances was not included. As with the NDS, there is a missing link between migration, remittances and forests, with migration only being considered in a narrow and negative context, overlooking the potential opportunities that migration and remittances can provide. The vulnerability of Tajik people is highly correlated to the vulnerability of the land. Therefore, identifying where these locations are and targeting support to communities in those areas are key. Forests and migration both have significant roles to play in stabilizing the environment and mitigating against risks to people's livelihoods.

2.2.5. National Action Plan for Climate Change Mitigation for 2003(NAPCCM)

In 1998, the Republic of Tajikistan joined the UN Framework Convention on Climate Change and accepted its commitments. The National Action Plan for Climate Change Mitigation (NAPCCM) was approved in 2003 and adopted by Governmental Decree No. 259.[9] This is further supported by the recently submitted report by The Republic of Tajikistan (2017) on the Intended Nationally Determined Contribution (INDC) towards the achievement of the global goals of the UNFCCC. The INDC report is analyzed in our subsequent Section 2.8.

The NAPCCM identifies areas and priorities to reduce greenhouse gas (GHG) emissions and directions to adapt national policy to climate change. The report highlights the current country demographic, socioeconomic and environmental status (as in 2003), including

[9] The plan was developed by the Main Administration on Hydrometeorology and Environmental Pollution Monitoring and the Ministry for Nature Protection of the Republic Tajikistan with the support of the Global Environmental Fund (GEF).

subsections on forests, flora and fauna, land use and nature protection. An overview of the main forest habitats and coverage is provided, as are drivers of forest loss and degradation. The importance of forests as carbon sinks is well recognized amongst a range of other important ecosystem services.

The NAPCCM refers to forests numerous times and refers to them as serving a critically important role in mitigating against climate change risks. In Chapter 7, the plan identifies existing national policies and measures that relate to climate change issues such as environmental laws and existing responsible institutions. In Chapter 8 of the report, the Greenhouse Gas Abatement Strategy describes how current national strategies and priorities are aligned with commitments to the UN convention, with several tasks outlined, three of which are relevant to forests:

i) protection and enhancement of natural sinks and reservoirs of greenhouse gases
ii) promotion of sustainable forest management practices, afforestation and reforestation
iii) the promotion of sustainable forms of agriculture in light of climate change considerations.

In Chapters 3, 4 and 5, the report identifies and analyzes in further detail the impacts of various scenarios of climate change.

a. *Forests as carbon sinks*

In the NAPCCM, forests are acknowledged as having a key role as active carbon sinks, and via reforestation their capacity for further sequestration can be increased. It was claimed that due to illegal deforestation in Tajikistan, the absorption of carbon by forests and other woody biomass was estimated to have decreased by 35%: in 1990, 588 Gg was indicated as having been sequestered, which reduced to 447 Gg in 1994. Thus, the action point *"protection and enhancement of natural sinks and reservoirs of GHGs"* pertaining to the promotion of sustainable forest management practices, afforestation and reforestation is particularly pertinent.

b. *Water resource impacts*

Another key issue relating to climate change effects on forests relates to impacts on water resources; these include extreme temperatures, the continued retraction of national glaciers and changes to hydrological cycles. Forests are recognized as a means to mitigate against both excesses and deficiencies in water cycles, for example, by retaining excess rainfall, preventing extreme run-offs, and reducing damage from flooding as well as mitigating the effects of droughts (European Environmental Agency 2018).

As a result of hydrological systems, the agricultural sector (and no doubt the forestry sector) is also considered at high risk from: extreme temperatures and winds; heavy rainfalls; floods and landslides; sandstorms; and agricultural pests and diseases. It is believed that during 1991–2000, such events caused the loss of one-third of agricultural products in the country, also putting forest products at risk. For example, despite the ability of forests to help mitigate against certain climate change impacts, forests themselves are also under threat from

temperature rises. It is predicted that long periods of high temperatures will lead to desertification, particularly in southern and central Tajikistan. Such climatic changes were suspected to impact broad-leaved forests and shift the phenological parameters of forest vegetation.

c. ***Forest use and agriculture***

Measures for action against climate change are further elaborated on, and reference is made to key drivers of deforestation such as the demand for fuel wood. Therefore, one measure for reducing deforestation is to supply rural populations with renewable energies as an alternative to fuel wood. Improving law enforcement to prevent illegal deforestation and promoting reforestation and afforestation are also identified as key measures. Another indirect action point also refers to promoting sustainable agriculture. These measures are further elaborated on to include the implementation of agriculture- and forest-enhancing actions. In addition, they target vulnerable areas that would benefit from reforestation, such as those at risk of droughts, hot winds and wind erosion.

d. ***Building knowledge and research***

In Chapters 9, 10 and 12, actions are centered on building a knowledge/research base to be able to assess, monitor and predict climate change effects and develop options to mitigate against and adapt to impacts. Furthermore, in Chapter 11, a strategy to improve national capacities via education and training, as well as by raising public awareness on climate change problems is outlined. Key implementing government bodies are identified as the Tajik State Forest Authority as the core group responsible over state forests, the Ministry for Nature Protection and, depending on the specific measure, may also include the Ministry of Energy, the Ministry of Agriculture and local governments, amongst others.

e. ***Migration and remittances***

Migration again is not mentioned at all in the report and nor are remittances. The absence of these topics highlights the lack of recognition that climate change could drive both internal and external migration whether as voluntary or forced movement. Migration is an important adaption technique to climate change; thus, identifying what areas are most vulnerable to risks and to target mitigation efforts will be imperative. In addition, adaption efforts should focus on potential destination locations; in the event of forced migration, planning is needed to anticipate and provide for increasing the carrying capacities of such locations.

Furthermore, it is overlooked in the report how labor migration can also leave certain groups of the population even more vulnerable to climate change impacts. As much of the migrant population are characterized as poor and coming from rural backgrounds, it is the families left behind that can constitute those most at risk, including women and children. The fact is that different groups of the populations will experience climate change impacts to a different extent and that efforts need to be targeted towards those most at risk. This could somehow be reflected in aims to target vulnerable landscapes, as land vulnerability could correspond with vulnerable populations.

Another aspect that links migration and remittances to climate change is the possibility for investment towards preventive measures. The investment of remittances in strengthening households as a 'preventive strategy' against natural disasters and livelihood security is another opportunity that was not included in the report. The report recognizes the high risk and increasing likelihood of natural disaster events that can affect arable lands, settlements and other infrastructure, resulting in both the tragic loss of life and large financial losses. Thus, the importance of implementing preventive and adaption climate measures are insinuated with the "*development and implementation of a set of measures on natural disasters management, with special emphasis on local public awareness and local authority's participation"* (Republic of Tajikistan 2003). According to Babagaliyeva et al. (2017), remittances are more likely to be spent on repairing households after disaster events such as flooding or landslides. Thus, there is an opportunity in such strategies to elaborate on efforts to support and build the capacity of local people and also highlight the opportunities in investing in climate-resilient actions as preventive actions, such as forestry and/or tree planting, to protect against hazardous impacts of climate change and to support people's livelihoods.

Migrant financial opportunities for climate action are further explored in a recent research report on titled "*Migration, remittances and climate resilience in Tajikistan"*[10] Babagaliyeva et al. (2017). Although forests are not referred to directly, the importance of supporting investments in climate-resilient enterprises and the provision of reliable financing institutions and mechanisms to promote and guide such investments are emphasized. To ensure sustainability, financing via the support of remittances would be a potential option to secure loans. Some commercial banks in Tajikistan already provide 'green loans' directed to support sustainable land use initiatives, with low interest rates. Yet there are still no existing programs considering migrants' remittances as an investment into the development of adaptation measures. Babagaliyeva et al. (2017) suggest that climate change and migrant-based policy measures and programs could be merged to develop such programs and encourage participation. Furthermore, increasing local awareness and building trust and access in such programs and financing institutions would be critical.

f. *Summary of the NAPCCM*

Overall, lack of knowledge about the missing links between migration and the environment, including forests, needs to be adressed, as migration has inherently deep roots in resource management strategies (Hecht et al. 2015). In Tajikistan, with a population already highly reliant on people's mobility and ability to generate remittances, this is crucial to understand for the environment, and for its direct and indirect impacts on forests. Yet data limitations on migration, remittances and their linkages to natural resource management remain a barrier to effective planning.

Even though the NAPCCM report is rather outdated, the NAPCCM until 2030 (at the time of writing) is still in progress and anticipated to be released soon. One suggested aim of the new

[10] This report was produced by the Regional Environmental Centre for Central Asia (CAREC) in cooperation with the Ministry of Labour, Migration and Employment of Population of the Republic of Tajikistan in 2017.

NAPCCM document will be to link the national level (policies, decision-making) with community-based needs and priorities (Babagaliyeva et al. 2017). There is an overlap in the aims and action points of the NAPCCM with the NBSAP 2016–2020, which could suggest the NAPCCM was incorporated into this more recent report. Furthermore, the recent submission of Tajikistan's INDC report provides a less comprehensive overview, but a more concise summary of the priorities and actions on climate change goals for the period up to 2030 (Republic of Tajikistan 2017).

2.2.6. Intended Nationally Determined Contribution (INDC) for 2030

The Republic of Tajikistan submitted the Intended Nationally Determined Contribution (INDC) goals in 2017, as part of an international climate agreement at the UNFCCC Conference of the Parties (COP21) in Paris in December 2015. The INDC outlines what post–2020 climate actions are intended, including goals and measures.

Tajikistan's submission of the INDC goals document is a five-page summary of climate change goals (Republic of Tajikistan 2017). The report provides a general overview of the country's environmental and economic background in the context of climate change. One of the key messages of the report is that whilst Tajikistan is one of the lowest GHG emitters globally, it is extremely vulnerable to the impacts of climate change. For instance, it states that Tajikistan has *"low per capita GDP, (and) is characterized by the low level of gross and specific GHGs and an extreme vulnerability to climate change, including frequent natural disasters"* (Republic of Tajikistan 2017, 1). Therefore, the report emphasizes that if it is to achieve its most ambitious climate change goals, this will require substantial international financial assistance.

The report notes that Tajikistan is a participating country of the international Pilot Programme for Climate Resilience (PRCR). Consequently, the country has, as part of the PRCR, put efforts towards the following aspects: agriculture and forestry; response to and risk reduction against natural disasters; the hydropower industry; the development of other renewable sources of energy; and measures to raise public awareness. With substantial international funding, it is claimed that Tajikistan has the potential for reducing GHGs with a target of 65–75% of the 1990 level by 2030, which amounts to 1.2–1.7 tons in CO_2 equivalents per capita. With international funds and investment, and technology transfers, it is claimed these would support efforts underway in relation to the PRCR measures, focusing on renewable energy, and agriculture and forestry and water resources management, among others.

In the INDC for Tajikistan, they also refer to a number of related national strategies related to climate change such as the Medium-Term Development Programme of the Republic of Tajikistan for the period 2016–2020; Agriculture Reform Programme of the Republic of Tajikistan for 2012–2020; National Strategy for Disaster Risk Management of the Republic of Tajikistan for 2009–2015, among others. The report further argues that all these strategies fall short of meeting their goals due to the lack of financial resources. This further justifies why external assistance is required.

Forestry and agriculture, as well as biodiversity and land use in general are focus areas for efforts against climate change. Relevant measures outlined include:

- promoting the active role of women and civil society in the issues of climate change and disaster risk reduction
- disseminating knowledge and experience on climate change at various levels
- ensuring food security and improving well-being of the population
- promoting of adaptation of globally significant biological species and natural ecosystems to climate change
- developing projects and programs for 'climate-sensitive' investment.

Summary of the INDC for the period up to 2030

Forests are mentioned multiple times in the INDC report, and it is clear that they are considered as one of many important issues for meeting climate goals. Forests and gardens are noted for their 'critical importance' for the preservation of 'mountain ecosystems and biodiversity'. Furthermore, forests have multiple recognized ecosystem regulatory functions, such as improving state lands by preventing further degradation, and protecting vulnerable infrastructure and water resource and carbon sequestration (Republic of Tajikistan 2017). This highlights that forests and gardens have dual roles both for mitigating the impact of anthropogenic activity on the climate and reducing negative consequences.

Migration is not discussed in the INDC report. Economic development is more generally mentioned. It is also argued that a large portion of the population and branches of the economy are highly reliant on climatic conditions. The report only alludes to the rural populations, whose livelihoods are also dependent on agriculture and natural resources, which could also include forests and trees. Further, the report states that those reliant on climatic conditions are also vulnerable to its effects.

2.3. Conclusion

In summary, the environmental and developmental policy goals in Tajikistan are often disconnected. Moreover, the connection between forest, migration and remittances are mostly absent. In the national policy strategies prioritizing economic development, such as the NDS up to 2030, the PRS for 2010–2012 and the NSLM for 2010–2015, forests are rarely featured. Yet this could be expected due to the small and fragmented proportions of forests in the country. Forests feature more prominently in the NBSAP for the period 2016–2020, the NAPCCM for 2003 and the INDC to 2030. Similarly, in the environmentally oriented policy strategies, migration is unsurprisingly overlooked. However, there is a strong argument to find synergies given the environmental and economic vulnerability of Tajikistan and to assure that policies are neither contradictory nor in conflict with one another.

Development goals, as well as strategies on migration and land use are both major contributors (estimated at almost 50% in combination) to the national GDP of Tajikistan. Likewise, at the local level, the majority of the rural population are said to be dependent on natural resources, mainly agriculture, and migration and remittances, which feature simultaneously in household livelihood strategies (Rubinov 2016). As such, this alone justifies the importance of harmonizing environmental goals including those around forests and tree-based systems, with strategies on migration to ensure coherency.

Relevance of migration in national policy

The NDS for the period up to 2030 makes it clear the ultimate goal is to create employment opportunities within the country and to foster entrepreneurship and businesses. Supporting vulnerable groups such as women and children is also mentioned. Likewise, migration features several times in the NDS and is recognized as an important, yet temporary, contributor to the country's development. The fact that Tajikistan has its own National Strategy labor migration of citizens of the Republic of Tajikistan abroad for the period 2010–2015 solely dedicated to the subject of external labor, emphasizes the importance of migration on the national agenda, but it only deals with a certain type of migration. The focus in the reviewed policy strategies is firmly upon labor migrants. These economically driven migrants are valued as important contributors to the country's development, as is further indicated by the existence of the Ministry of Labor, Migration and Employment Population as a government body.

Other forms of migration remain largely invisible in the current government strategies, such as internal migration or migration motivated by other reasons, such as education. In addition, consideration should be given to migration as an adaption strategy for environmental migrants, who may be driven by land and climatic changes. Whether it is promoting, protecting or preparing, consideration for the various types of migration is an important but missing element within any effective and inclusive strategy on migration.

In both the NDS and the NLMS, there is an emphasis on harnessing remittances, which could come from both external and internal sources, to invest into Tajikistan's own development. This is one area for bridging between developmental and environmental goals; here, 'green' economic strategies as encouraged in the NDS could include forest and tree-based land use investments. Environmental sustainability efforts could complement development initiatives linking opportunities between remittance investment strategies and sustainable resource management.

Relevance of forests in national policy

The main national environmental priorities in Tajikistan appear to be climate change mitigation and adaptation, biodiversity conservation and the promotion of green growth business initiatives. Forests are rarely mentioned in the NDS but feature, in various extents, in the other environmentally oriented strategies such as the National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (NBSAP) Period of 2016–2020 and the National Action Plan for Climate Change Mitigation (NAPCCM) for 2003. In all of the policy documents reviewed, forests were most frequently referred to in the NBSAP.

As forests represent only 3% of the total land area in Tajikistan, it can be expected that they are seen as relatively unimportant ecosystems with little relevance for livelihoods from a country-level perspective (FAO 2010). That said, the majority of the Tajik population are still dependent on natural resources for subsistence and commercial needs. Arguably, forests, and moreover tree-based land systems, hold more importance at the local level and in supporting subsistence needs. Similar to undocumented and internal migration patterns, the importance of forests and NTFPs for local subsistence needs in the country can be overlooked as these

dependencies are more difficult to capture in national databases. We also highlight that trees themselves hold many benefits outside of forests, for instance, within agroforestry systems, and in garden plots for fuel, food, fodder and timber production.

Forest preservation and restoration have an important role to play in the NBSAP and NAPCCM, alongside international commitments, whether or not this is fully recognized in the other strategic documents. From an environmental point of view, forests have high potential to contribute to ecosystem resilience, biodiversity and carbon stocks; thus the justification for their enhancement. This would be in line with international agreements, commitments and specified actions with the UNFCCC to meet climate change goals, as well as the CBD and related Aichi goals.

Climate change, biodiversity and forests

The rising recognition of the risk and impacts of climate change and the need for mitigation and adaption efforts is largely due to Tajikistan's vulnerability to natural disasters. Forests and trees can play a critical role for ecosystem services such as biodiversity conservation, climate change mitigation and adaption, and for the productive capacities of trees, amongst other benefits. Forests and trees can be considered mutually beneficial to agriculture, especially in the context of multifunctional landscapes. Trees can also be incorporated into agrarian landscapes, through reforestation and restoration efforts and agroforestry, which are all viable options to enhance landscape resilience. That said, it must be also recognized that some land use can seem to compete with forests, such as pasture lands. For example, while the NBSAP recognized pasture lands for their economic importance in local livelihoods, many of the practices were seen as being unsuitable, not only for biodiversity but also for sustaining fodder supplies. It was stated that even remoted areas experiences full transformation of the composition of plant formation (Republic of Tajikistan 2016b). Yet with less intensive practices and the promotion of agrosilvopastoral practices, further land degradation could be prevented and fodder demands maintained.

Another aspect where climate change, migration and forests can be interlinked is on drivers of migration due to environmental change. For instance, climate change and natural disasters may also trigger, directly and indirectly, people's motivation to migrate, and this could release or increase resource pressures accordingly. This was a missing aspect in all the policy documents reviewed. Inward and outward migration can increase the vulnerability of forests to climate shifts and other changes, with impacts both to the economy and the land (Hecht et al. 2015). The reverse is also true. Changes in the environment in general can affect migration through increased exposure to hazards and degradation around ecosystem services. These relationships between environmental change and the factors around migration need to be considered in national planning and policy.

Gender inequality

The vulnerability of certain groups of people to the effects of climate change needs also to be a consideration. Families left behind, although of course not all of them, are some of the most vulnerable members of the country's population to both environmental and economic shocks. This would refer to rural family members left behind, in the absence of remittances,

with absentee household members and already living in poverty. On the other hand, remittances could enhance the resilience of households to cope with natural disasters. However, the vulnerability of women is further exacerbated due to unequal access to land rights, financial capital, and education, amongst other things, as noted in the NDS (Republic of Tajikistan 2016a).

Inequality and the risks to women are acknowledged in the NDS and there are numerous references to protecting and supporting women and their rights in regard to employment, education and land rights. This is further recognized by outlined measures to support women to migrate. A gender-sensitive system designed for pre-departure that includes legal and information support, short-term vocational and language training is hoped to encourage equal opportunities, and to support the preparation of both men and women to migrate (Republic of Tajikistan 2016a). Tajikistan's INDC report also recognizes the need for gender equality in regard to climate change efforts, and has the 'active role of women and civil society on the issues of climate change and disaster risk reduction' as one its key goals (Republic of Tajikistan 2017). Existing gender inequalities are constraining factors for societal development and the economy as a whole. Therefore, efforts to empower women and open up opportunities for them in relation to those who migrate and those who remain are both of equal importance, and can directly and indirectly impact choices on land management.

Food security

Given country-wide food insecurity and malnutrition issues, forests and agroforestry offer a resilient land use alternative that could help address these issues. Valued commodities such as nuts, fruit-bearing trees and honey are products found naturally in Tajikistan forests. Promoting endemic tree species that can provide economic benefits and support food security objectives meets a number of goals set by the Tajikistan government. These benefits are also already recognized in the NBSAP, with the importance of the economic benefits of timber and NTFPs identified, albeit with (in their own words) 'unreliable data'. Named forest products included walnuts, pistachios, almonds; and fruits such as crab apples, pears, apricots, plums, and cherry plums. It was claimed that these forest products are major contributors to the country's GDP (Republic of Tajikistan 2016b).

A gap in the document, however, was identifying the importance of forest-related products for subsistence use. In another review by Babagaliyeva et al. (2017), it was argued that the majority of the Tajik population are heavily dependent on natural resources for both subsistence and commercial needs. It was estimated, for instance, that 73.5% of the rural population rely on agricultural and forestry products for their livelihoods. This figure could, however, arguably skew the importance of forests when data from forest use are subsumed into household data on agricultural use. That said, while the ambiguity of forests and trees as providing for households needs should be clarified through further research, their importance also lies in their contribution to future land use strategies.

Data limitations

Data gaps and erroneous assumptions on broad trends related to forests, migration and remittances risk misinforming policy. The NBSAP itself highlights the major data gaps when it

comes to biodiversity and forests, and thus improving research and data was one of the core goals listed, i.e. the goal that aims to improve the monitoring and inventory data for forests. Similarly, for migration and remittances, the data are limited and therefore this remains as a barrier to effective policy planning and implementation.

Unfortunately, data on migrants and remittances are often missing and/or unreliable. This includes data on 'all' forms of migrants, including internal migrants and those undocumented, to understand the push and pull factors and the economic and environmental consequences of decisions to move. To this end, data need to go further so as: to understand the link with people's livelihoods, mobility and forests; and to understand the relationship with and particularly the level of dependency on forests and forest products. This is a core component of the current research conducted by CIFOR and partners and supported by GIZ.

Investing remittances into forests

For forests, migration can offer opportunities as much as it offers risks. Whether it is one or the other depends on what support mechanisms, information, incentives and disincentives are in place to guide sustainable land use choices. Securing land rights is well-known as being a prerequisite for sustainable forest and land management and/or investments into forest rehabilitation. Securing equal land rights for men and women was emphasized in the development scenarios of the NDS to encourage land investments.

Likewise, migration can open up opportunities to invest in sustainable land management practices via investments of remittances and/or social remittances, i.e. the transfer of ideas and skills. This was also noted in the National Strategy on labor migration, as a component of its key objectives. Outward migration could leave land open for further options, either for those who stay behind or for inward migrants. Coordinated policies are critical to ensuring that sustainable choices over land take into account both the short- and long-term benefits and consequences. In addition, overly simplistic notions and assumptions over migrants' needs and choices can also lead to unsuitable policies and actions, such as if they are based on overly simplistic perceptions of the impact of internal migrants as being only detrimental to land use.

Another example of how priorities for development and the environment can be aligned is through investments in land to mitigate against natural disasters. Currently, investments via remittances are spent mostly on household goods and construction, or to pay for damages caused by natural disasters. The absence of clear coordinated policies to guide and support remittance-receiving families to invest in a strategic way is a clear policy gap. With the right incentive mechanisms, households could be encouraged to invest in land use, such as forestry, agroforestry and other tree-based land use systems, which would benefit them economically, but also protect against natural disasters and food shortages. This is crucial in areas at high risk from natural disaster events, as these events can further drive unsustainable forest use, such as harvesting timber for rebuilding homes, causing further detriment to the land.

Acknowledging that trees are a long-term land investment option, in which there is often a time lag before benefits can be realized, if promotion is going to work it will require advisory

support, incentives and awareness raising. Incentives are needed if people are really going to invest their time and effort in forests and trees and could take the form, for example, of credit, land rights, subsidies and tax relief.

Reliable financial institutions are still lacking; yet rectifying this is also part of government objectives to then offer people financial support, along with remittance investments, into greener land use practices. The NDS recognizes that a lack of access and options for in-country product 'processing' can also limit growth of the agricultural sector. For any raw product, including timber and NTFPs, a big hurdle will be improving and strengthening value chains in order to promote forests as an attractive investment option.

In summary, encouraging forests and tree-based land uses supports the government's goals of green growth. Yet more importantly, the vulnerability of Tajik people is highly correlated to the vulnerability of the land, and therefore identifying where these locations are and targeting support to communities in those areas is key. Forests and migration both have significant roles to play in stabilizing the environment and mitigating against risks to people's livelihoods. This needs to be further recognized in policy goals and in country-wide interventions.

3. ANALYZING MIGRATION AND REMITTANCE PATTERNS IN TWO CASE STUDIES IN THE PAMIR (GORNO-BADAKHSHAN AUTONOMOUS REGION (GBAO) AND PENJIKENT

This part of the study aims to understand remittance patterns in the rural context by using two case studies in two different migration and forest cover contexts in Tajikistan and to understand possible linkages to land-based activities, forests and trees.

3.1. Study site selection and methods

In Tajikistan, two study areas (Penjikent and Bartang) were selected (Figure 1). One study area includes the district a) Penjikent found in the northwestern region of Sughd, bordering Uzbekistan. The second study district was b) Rushon, in the Pamir mountains, bordering Afghanistan, is found in the Gorno-Badakhshan Autonomous (GBAO) region, in the east of Tajikistan

From the two districts 10 villages were selected. In Rushon, within the Jamoat Bartang (a core study area), the four selected villages Basid, Anjirkh, Darjomj, Siponj were chosen. For Penjikent, within the Jamoat Sarazm, the villages Chubot and Chilarcha were selected; and for the Jamoat Rudaki the villages Zimtud, Voru, Tojik and Tojikkishlok were selected.

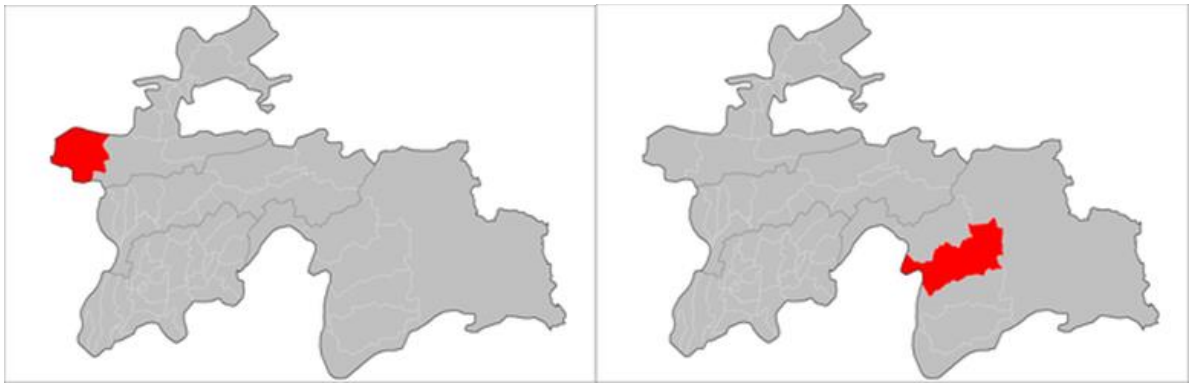

Figure 1. Location of selection study regions in Tajikistan: Penjikent (left) and Rushon (right)

The selection criteria for the villages were based on the following:

1. the presence of GIZ-prioritized intervention zones[11]
2. the presence of forest
3. the existence of different migration patterns (internal and external)

[11] The initial idea was to extend the research area outside GIZ intervention zones. However, due to extremely complex administrative procedures, and long waiting times for our partners to get research permits, which never happened, we focused on those initial areas.

4. Penjikent has a high proportion of Uzbek-speaking households (as the region borders Uzbekistan); therefore, villages were selected to include an equal number of Uzbek- and Tajik-speaking households in the survey in order to ensure representation across villages.

A mixed method approach was adopted for the study, including: i) household structured surveys (2 × versions[12]) and ii) focus group discussions (FGDs). The methods and sampling strategy for each method are described below.

i) Household structured surveys (2 × versions)

For the interviews, households (HH) were randomly selected from the villages. Respondents had to be either the primary female or male adult in the household.[13] No children, hired laborers or others would be selected as informants. A total of 879 HH were interviewed (including 4169 individuals). Figure 2 illustrates the number of interviewed households per village, per study site (Bartang and Penjikent). Overall, there was a high completion rate (89%) for the household interviews.

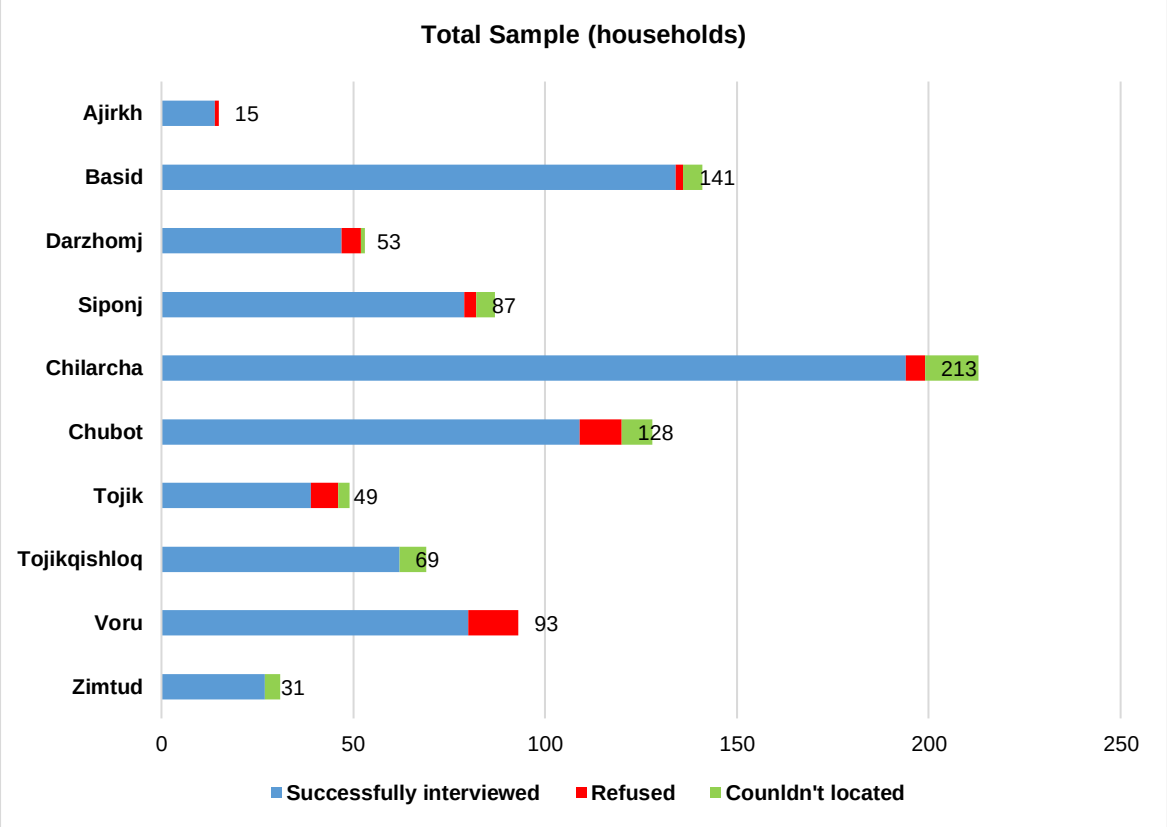

Figure 2. Total number of interviewed households per village and the number of households that could not be located or refused to be interviewed.

[12] Two version were used, as it was necessary to adapt questions to the local context.
[13] No children, hired labourers or others would be selected as informants.

ii) Focus group discussions (FGDs)

The FGDs were conducted with three core groups from each of the regions in all selected villages in Bartang and Penjikent: a) farmers' group, (b) women's group and (c) youth group. Group sizes ranged from 3 to 13 participants. In the farmers' group, participants were only men, and in the youth group they were predominantly men. The majority of women in the women's group were aged above 50 years of age and had either daughters or daughters-in-law at home. Table 2 Illustrates the number of participants from each of the FGDs held in Bartang and Penjikent.

Table 2. Number of participants for each FGD group in each region.

	Farmers' group	Women's group	Youth group	Total participants
Bartang	14	24	9	47
Penjikent	26	33	25	84

Participants for the FGDs were randomly selected with the support of key informants; i.e. the village head or the school director in a couple cases. All FGDs were recorded and transcribed in the original language for analysis. The FGDs explored several key topics: migration trends; current and past land and forest use practices; natural disaster events; livelihoods and income including remittances; and future plans.

To better understand livelihoods, the women's and the youth groups, as part of the FGDs, were asked to draw a profile of their livelihoods by ranking the importance of each aspect (1 most important to 3 least important); and to demonstrate how long they had been conducting that activity; and whether and how it changed during extreme events.

3.2. Results

3.2.1. Reasons for migration

From 1339 respondents,[14] a total of 324 people (24% of interviewees) identified themselves as migrants. When respondents were asked if they had other members of the household who had migrated or were migrating, the results revealed almost half the households (44%) have a migrant member[15] (389 out of a total of 879 HH). Regional differences were found between the number of households with migrant members and also motivations to migrate.

In Bartang, there was a higher number of households (53%) that had a migrant family member compared with Penjikent (40%); see Figure 3. Across the regions, the predominant reason to migrate was for employment purposes (74%), next was for educational purposes (21%) and then thirdly, but much less commonly, for family reasons (4%); see Figure 3. Between regions,

[14] 879 Households were interviewed.

[15] This refers to members who are currently away and/or who currently live in the household, but have lived away for at least 3 months outside the house in the last 5 years.

the reasons for migration were in the same order but with varying proportions; as in Penjikent, the majority of migrants (94%) were migrating to find work, and only a few were migrating for educational purposes (5%) and even fewer did it for family reasons (1%). In Bartang, whilst the majority left for employment reasons (59%), a higher proportion relative to Penjikent left for educational purposes (35%) and for family reasons (6%). This indicates that, in Bartang, employment and education were principal reasons for migrating

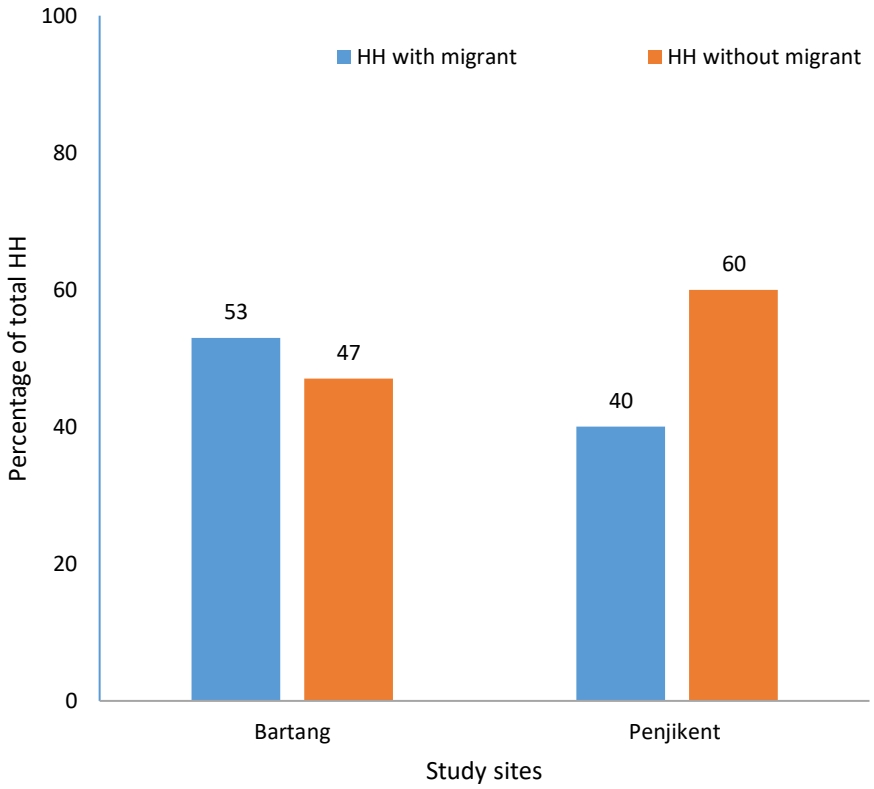

Figure 3. Percentage of households with and without migrant family members in Bartang and Penjikent.

When interviewees were asked about destination locations, whether external (international) or internal (migrating within Tajikistan), the largest proportion of labor migrants (those traveling for employment purposes) were said to be engaged in international migration (87%) and the rest as internal migrants (13%) as shown in Figure 4. Patterns were similar at the regional level, with a larger proportion of labor migrants from Bartang engaged in international migration (71%) and an even higher number of internal migrants (29%). On the other hand, in Penjikent, almost all migrants were external (98%) and only a few migrated internally (2%).

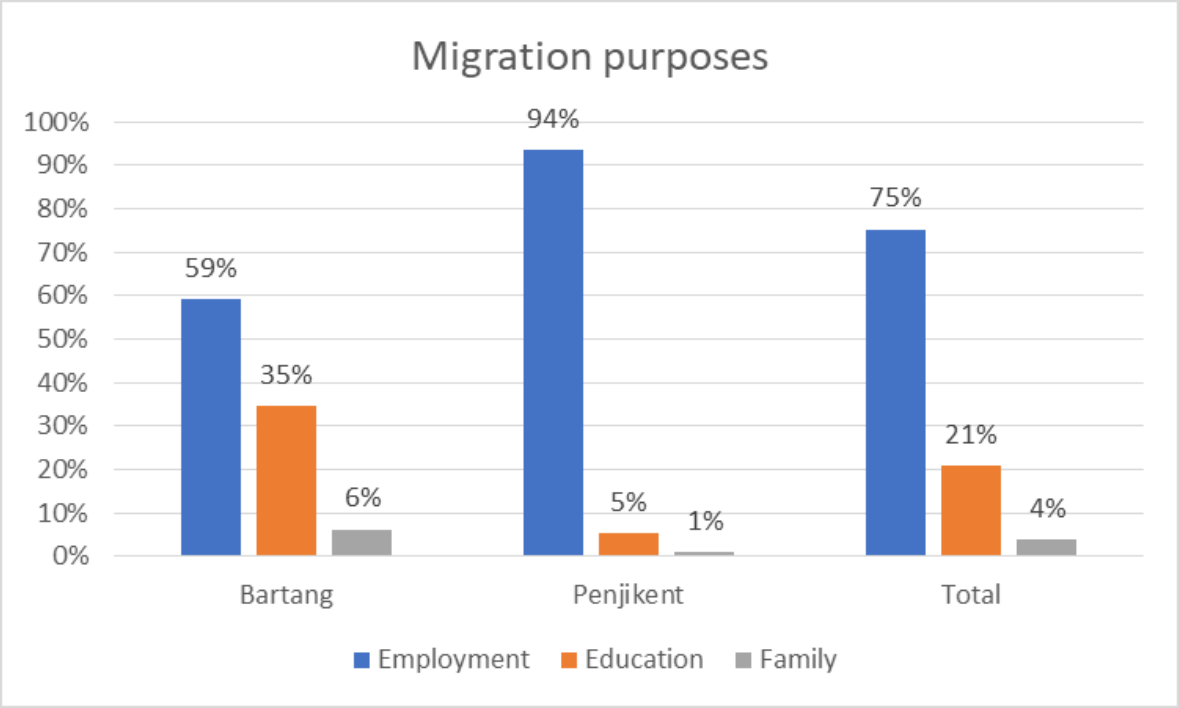

Figure 4. Percentage of household members who have migrated because of employment, education or family reasons in Bartang and Penjikent.

When the data are further disaggregated to reveal how women are engaged in internal or external migration, the numbers also differ regionally as shown in Figure 5. In Bartang, a greater number of women are engaged in external migration (60%) but with a higher proportion engaged in internal migration (40%). In Penjikent, the number of external women migrants was higher (75%) than internal (25%). These numbers differ from the aggregated total of men and women migrants who migrate externally or internally, highlighting that proportionally, more women than men from Bartang are engaged in internal migration (Figure 6).

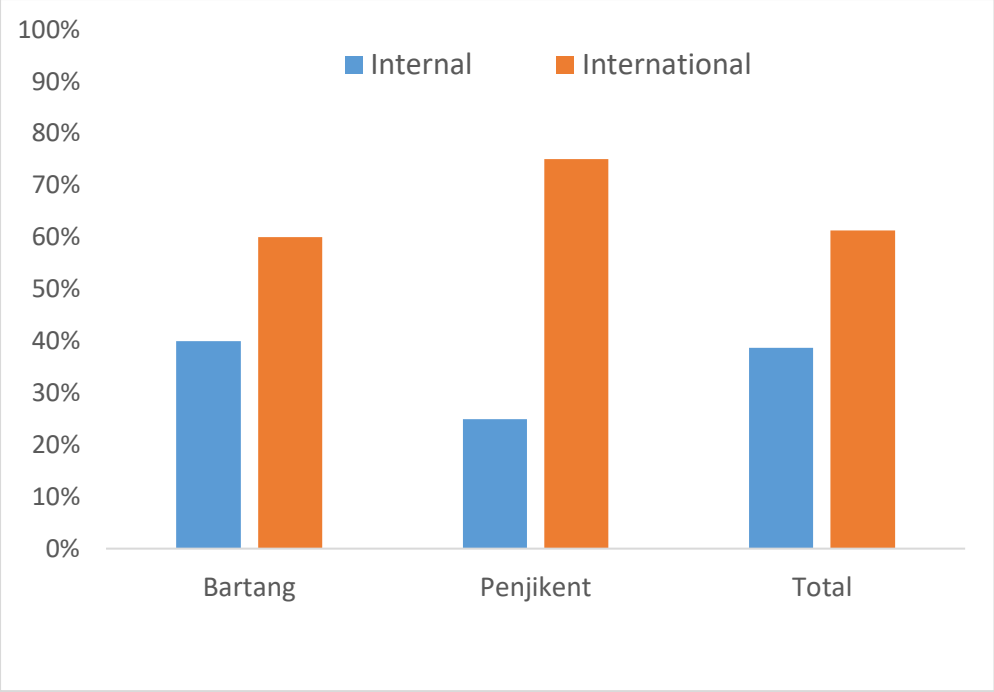

Figure 5. Total number of HH with labor migrants engaged in external (outside the country) or internal (within Tajikistan) migration from Bartang and Penjikent and the overall total.

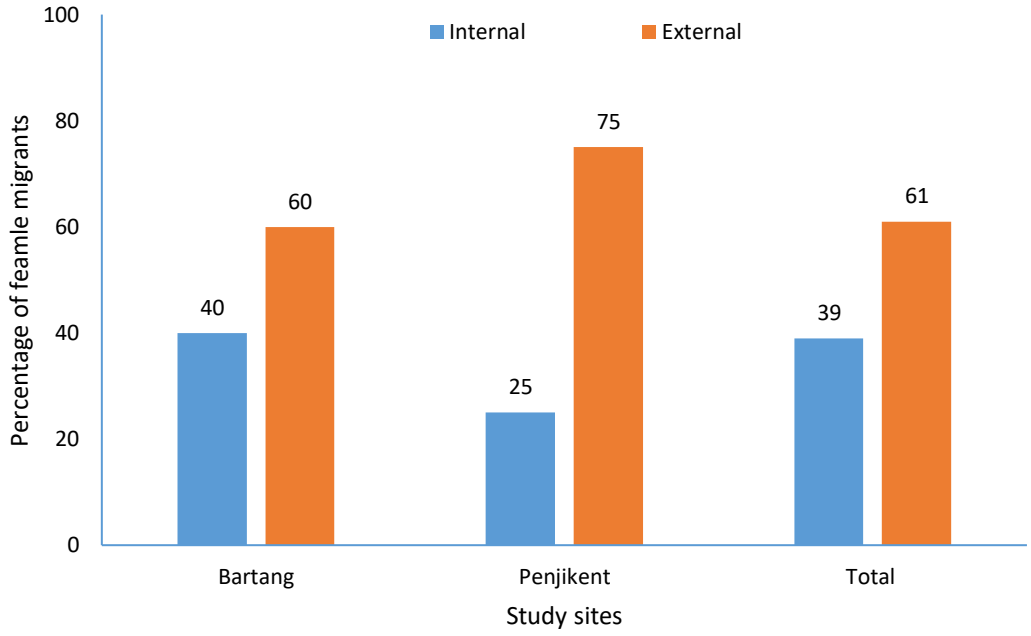

Figure 6. Percentage of female migrants whose destination is external (outside the country) or internal (within Tajikistan) from Bartang and Penjikent and overall total.

3.2.2. Migrant characteristics

In the study, we compared the characteristics of labor migrants who did not send remittances vs labor migrants who send remittances. Overall, the demographic characteristics between the two migrant types were similar according to the combined regional results. For instance, the age range of both types was between 19 and 71 years old, and with a median age of 34–35 years. We also wanted to identify the level of education of the labor migrants before they left, and also the proportion that would send remittances, see Figures 7 a & b. For labor migrants, the majority were said to have a lower-secondary education (73%) compared with those with a higher education (24%) and only a small number migrated with no or primary-level education (3%). The numbers were similar for those who sent remittances.

When examining the results regionally, there is still little difference when comparing the education level of labor migrants who do (Figure 7a) or do not send remittances (Figure 7b). Nevertheless, within the migrant types, the numbers do indicate variations in education levels when comparing the regions. In Penjikent, a higher number of migrants had secondary education (88%) but fewer labor migrants had a higher education (10%) compared with Bartang. In Bartang, there is a similar proportion of migrants with higher education (46%) and secondary education (51%). These results reveal that migrants from Bartang are overall more likely to be highly educated than are those from Penjikent. This could be as a result of the relative lack of employment opportunities found locally and due to local trends to migrate internally. The results for those who send remittances according to education level are also very similar proportionally to those who do not send remittances, see Figures 7 a & b.

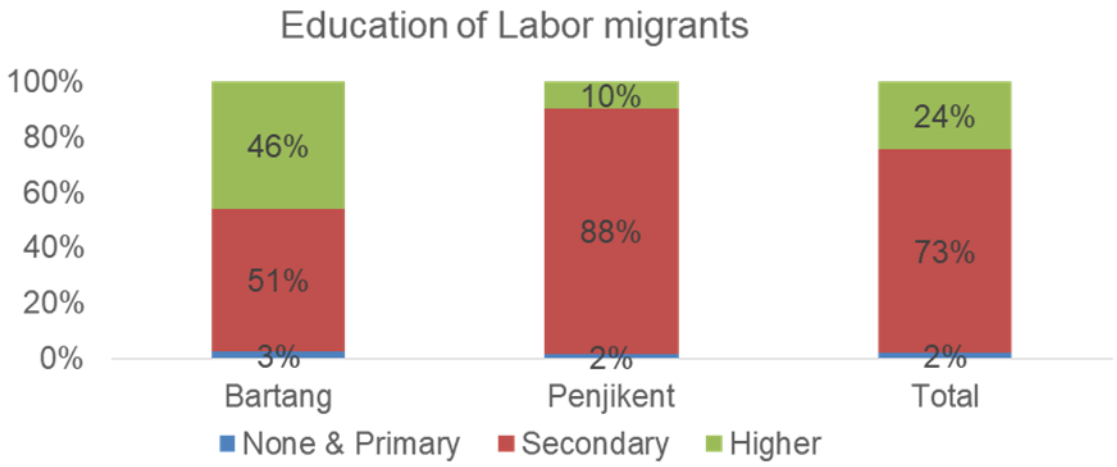

Figure 7(a). Percentage of labor migrants with no or primary-level education, secondary education, and higher education.

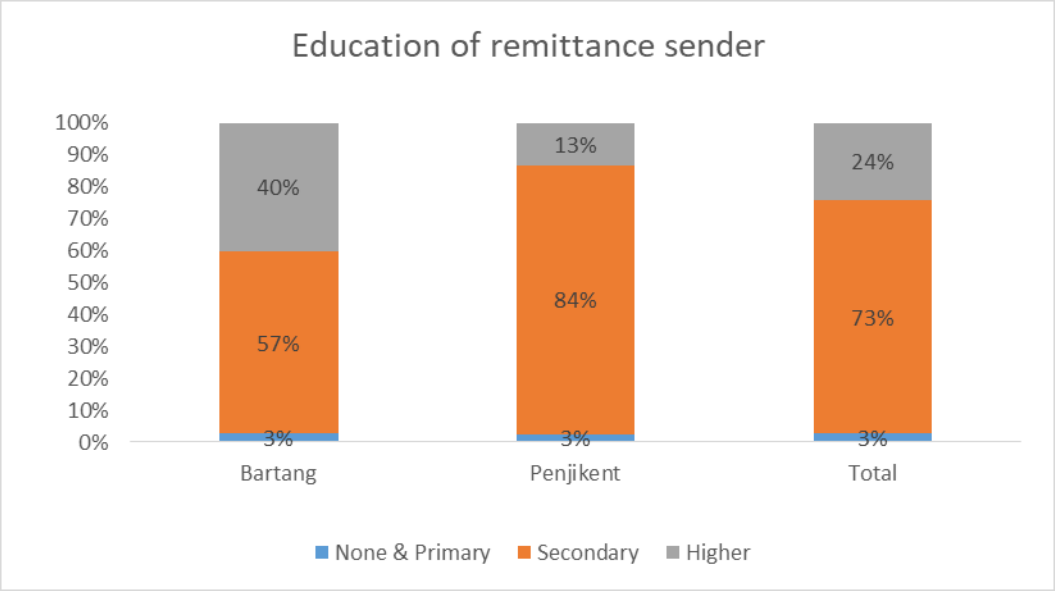

Figure 7 (b). Percentage of remittance-sending labor migrants with no or primary-level education, secondary education, and higher education

Respondents were also asked about the status of the migrants before they left, for example, if they were unemployed, or had previous employment, or as regards education. As expected, because the majority of those migrating went as labor migrants, in both regions the larger proportion of migrants were unemployed before they left (44–45%), see Figure 8. Regionally, there was variation within the other status categories. In Bartang, the larger proportion of migrants were undertaking education before they left (46%) and the rest had other types of employment (10%). Alternatively, in Penjikent, 35% of migrants were also farmers, whereas no migrants reported being farmers before migrating from Bartang.

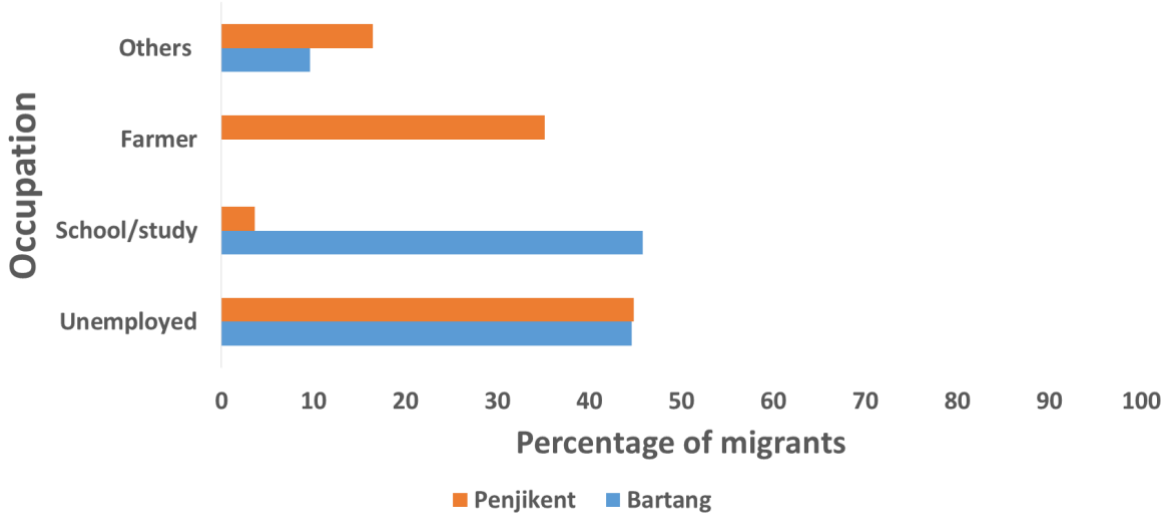

Figure 8. Percentage of migrants and their status before migration; unemployed, undertaking education, farmer or other in the study sites of Bartang and Penjikent.

We also identified within households who it was that migrated, i.e. whether it was the children or grandchildren, or the household head or spouse, or other. The results showed that the majority of HH receiving remittances had children migrating (71%), compared with labor migrant households without remittances (64%). Regionally, there are differences too between the numbers of households with children migrating compared with household heads and spouses, see (Figure (9). For instance, in Bartang, the proportion of households with migrant children is 82%, with 17% as HH heads or spouses. There are fewer migrating children in Penjikent at 55% and higher numbers of migrants as HH heads/spouses at 43%. These regional results were similar for remittance-sending migrants. These findings also fit well with earlier findings that in Bartang education was an important motivation for migrating, as it could be assumed that younger family members would be migrating to seek education, whether internally or externally, whereas in Penjikent, most migrants left for employment reasons

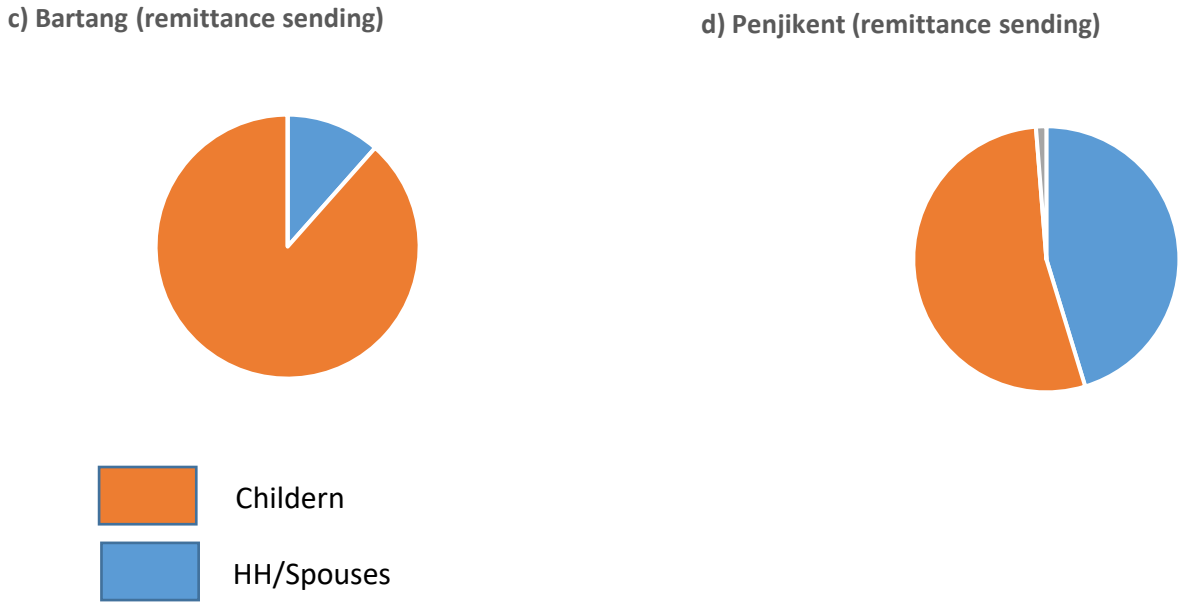

Figure 9. Percentage of labor migrants with remittance-sending status; children migrating in the household or household head/spouse migrating or other in c) Bartang and d) Penjikent.

When it comes to gender, the interview results also supported results that came from the FGDs, that it was mostly men who were engaged in labor migration (82%) compared with female labor migrants (18%). The migrant numbers differed slightly for those sending remittances (a total of 299) comprised of mostly men (75%) compared with a quarter of women (25%).

When the data are examined at a regional level, there are distinct differences between the numbers of male and female migrants as shown in Figure 10. In Penjikent for instance, almost all migrants are male (96%) and only a small proportion are women (4%). Similarly, the percentage of labor migrants who are women who send remittances is very low (6%) when compared with male labor migrants (94%).

In contrast, in Bartang, the gender balance of migrants is more even, with 40% of women as labor migrants while 60% are men. Likewise, the women labor migrants who send remittances are also of a slightly higher proportion (43%) compared with the non-remittance-sending female migrants. The results highlight that whilst in one region migrants are predominately male, this was not necessarily the case for the other region with women comprising a large proportion of that total migrant population, and also responsible for contributing remittances.

Respondents were asked if those female migrant household members traveled alone or traveled with family members, see Figure 9. In Bartang and Penjikent, the majority in both regions showed that women migrants traveled with family members (78% Penjikent and 55% in Bartang), whilst fewer traveled alone. However, more women were inclined to travel alone in Bartang (45%) than in Penjikent (22%).

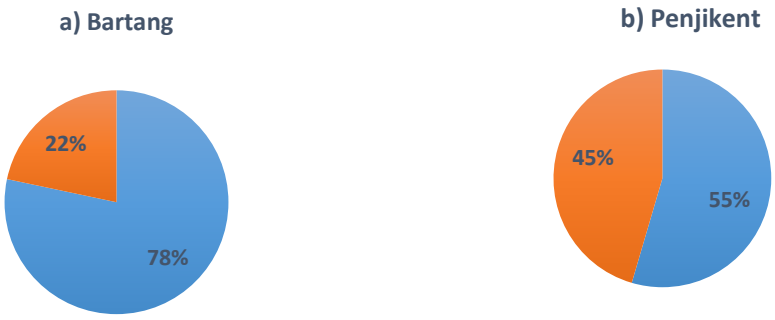

Figure 10. Percentage of females migrating with other family members or alone in the study sites; a) Bartang or b) Penjikent.

When observing the number of women who are household heads in migrant-sending households vs nonmigrant-sending households, the results showed expected and unexpected outcomes. For instance, in all cases, as expected, males are the most common household head across the regions among both migrant-sending and nonmigrant-sending households (>77%). Meanwhile, when looking at the results between women, it could be assumed that migrant-sending households would have a higher proportion of women women as household head compared with nonmigrant-sending households. This would be assumed as it is mostly the male members who are migrating, and often to another country, leaving the women (spouses) as the household head by default. Thus, the stay-behind spouses, the wives, would become the key decision-makers of the household. However, the study reveals, when combining results from both regions, that the percentage of women as household heads in migrant-sending households is almost the same (16%) as in nonmigrant-sending households (17%), see Figure 11. Thus, this indicates that migration does not play a role in empowering women to become lead decision-makers in the household. These results are in contrast to the FGDs where women described a key benefit of migration as the ability to have decision-making power over the household.

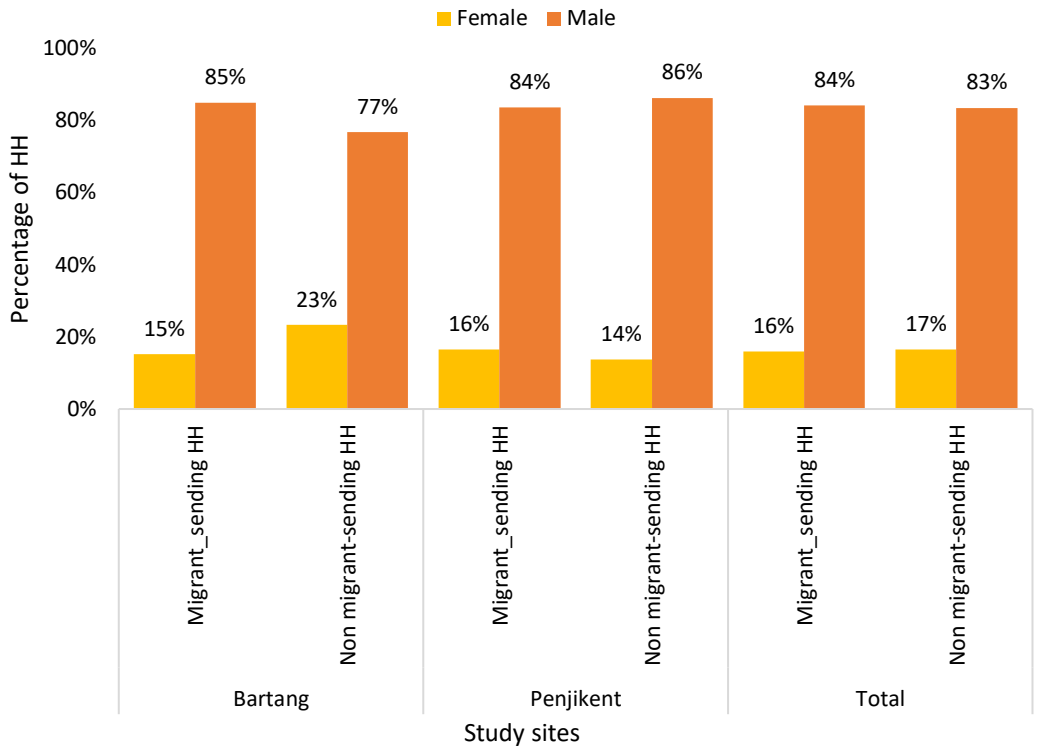

Figure 11 Percentage of male and female household heads in migrant-sending households and nonmigrant-sending households in the study sites; Bartang and Penjikent.

When we look at the results regionally, a slightly different pattern emerges in Penjikent, where the numbers are slightly higher for the percentage of women as HH head in migrant-sending households (16%), compared with nonmigrant-sending households (14%). Yet in Bartang, there were more women as HH heads in nonmigrant-sending households (23%) than in migrant-sending HH (15%). These results could be explained by the fact that a large proportion of migrants, in both regions, are the children of the household, and therefore their migration would not necessarily impact the status of the HH head.

3.2.3. Remittances

The results revealed as expected that the majority of labor migrants were sending remittances back to their households in Tajikistan (284 households at 63%). Additionally, for those sending remittances the majority came from external migrants (80%) and a fewer households received remittances from internal migrants (23%). This is to be expected considering the higher proportion of international migrants overall, in addition to higher salaries in foreign countries relative to Tajikistan's salaries. This was also confirmed in the FGDs were the main reasons to migrate were due to poor salaries or insufficient employment opportunities at their home locations. In addition, the household survey results for Penjikent revealed that most labor migrants would send half or more than half their income as remittances (80%), with the remainder sending less than half of their income (20%). In Bartang the majority of labor migrants sent remittances once every few months (79%) i.e. on an irregular basis, while the rest of the migrants sent them on a monthly basis (21%).

How remittances are transferred by migrants to the receiving households indicates the extent that remittances can be documented officially and also reflect the reliability and accessibility of the financial institutions, such as banks, within the country. Overall the combined results reveal the largest portion of remittances are transferred via banks (72%), the second most popular transfer option was via friends, and thirdly by the migrant themselves (8%), see Figure 12. When comparing between the regions remittance transfer choices differed, with Penjikent results revealing that 'all' remittances were being transferred via banks. Whilst in Bartang banks were still the most popular choice for transferring remittances (48%), but friends were second most common option (38%) and thirdly by migrants themselves (13%).

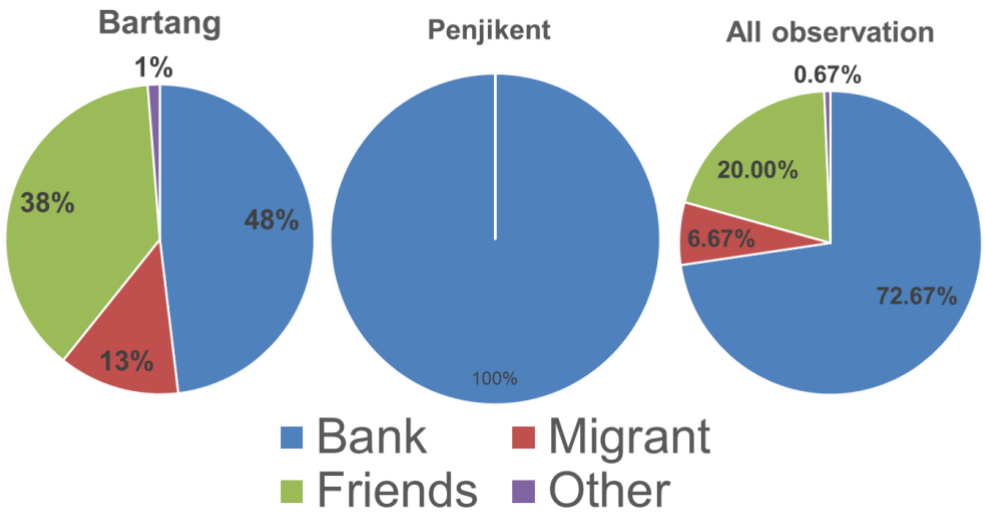

Figure 12. Percentage of households that receive remittances via the bank, from the migrant themselves, or via friends or by other means in the study sites Bartang and Penjikent.

Over half of all the respondents from remittance receiving households ranked remittances as the most important income source (51%), 28% claimed remittance as the second most important income source and 14% claimed remittance as the third most important income source. Correspondingly the majority of remittance receiving households also claimed that remittances had been an important income source for at least the last 5 years (78%) further agreeing it had only 'become' an important income source within the last 5 years (22%). Almost all respondents, that received remittances, believed that remittances would remain an important source of income over the next five years (98%). Remittances were considered a necessary source of income for up to 7% because there were no jobs in the village/country, 8% mentioned because of the poverty, 13% claimed that they have to meet the expenses, and 2% as they have no other choice.

Remittance expenditure

In migrant-sending households it is those who receive a remittance who get to decide how to use the remittance. For instance, if the migrants are still living with their parents (dependent households) then it will be the parents of the migrants who receive the money. For married couples (who do not live with parents), the spouse is the receiver if the migrant is the head of household (independent households).

When it comes to spending the remittance, the results reveal that the majority of households chose to spend it on food (87%), then on health care (74%), housing (70%), and then education (77%). Less common expenditures include social/cultural events (35%), savings (27%) and agricultural investment (40%). There was barely any known expenditure on forests, see Figure 13.

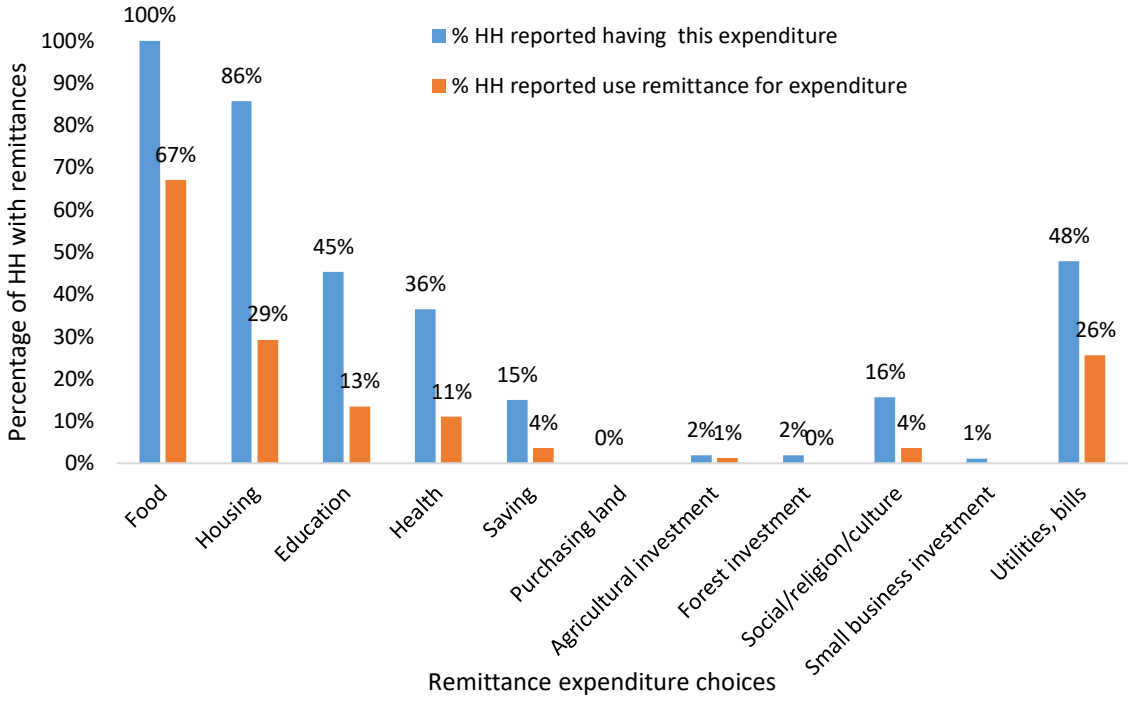

Figure 13. Percentage of households with expenditure on agricultural activities and number of households that also contribute remittances to those expenses in Bartang.

3.2.4. Household forest use

A key aim of the study is to compare forest use between households with and without remittances to understand the link between migration and forests. The results indicated a significant difference between the number of land plots owned by remittance-receiving households and households without remittances in Penjikent, see Table 2. While those with remittances had a higher number of plots in both regions, this was only statistically significant in Penjikent and not in Bartang.

The results also highlighted that, in Penjikent, forests were not used by households in either remittance-receiving or non-remittance-receiving households. In contrast, in Bartang, forests are used by all households in both remittance-receiving HH (100%) and those without remittances (98%). Fuel wood is the most common forest use for both types of households. Timber and fodder collection are the second-most common uses. For timber, there was a higher number of HH (54%) that do not have remittances compared with 42% that receive

remittances. In contrast, a higher number of remittance-receiving HH were found to collect fodder (52%) compared with those without remittances (42%). The collection of non-timber forest products (NTFPs) and fruit was only conducted by a small number of households in Bartang. There was a higher number of HH without remittances in Bartang that collected fruits (4%) than was the case for remittance-receiving households (1%).

3.2.5. Fuel sources

Fuel sources are directly linked to pressures on forests. Nationally, people have been dependent on forests in Tajikistan as a core source of fuel. To assess what fuels are used and to reveal any change over time, households were asked what fuel source they used 5 years ago and what fuel source they were currently using. The results indicated that 5 years ago households were far more reliant on firewood (502 HH) as the largest source of fuel compared with other alternatives. The second-most important source was electricity (165 HH), and then improved cooking stoves (91 HH) and only a minority used gas (27 HH). These numbers contrast with the current household sources of fuel, with gas becoming the major source (281 HH) and electricity as a close second (262 HH). The third source of fuel was the improved cooking stove and fuel wood had become the least important out of the four (with 105 HH).

When comparing results between the regions and also between migrant and nonmigrant-sending households, we also find distinctions. The regional results for Penjikent revealed a similar picture to the overall results. Gas is the main fuel source for 142 HH without migrants compared with 120 HH with migrants. This also contrasted with the fuel sources used 5 years ago where the majority, in both cases, relied mostly on firewood. Overall, there are only small differences between migrant and nonmigrant households, but the main change has been over time with cooking fuel preferences showing a move away from firewood towards alternative sources.

In Bartang, the cooking fuel sources between the years revealed a more drastic change, with fuel wood as the major source 5 years ago and only a few households using electricity and only two relying on gas, see Figures 14 and 15. In contrast to Penjikent, Bartang HH currently use mostly electricity instead of gas as the major source of fuel (185 HH), with fuel wood as the second-most used fuel source and lastly gas. This also fitted with the results from the FGDs which claimed that overall reliance on fuel wood was reduced due to improved electricity, particularly in Bartang. However, fuel wood was still needed when there were problems with electricity supplies. Fuel wood is currently used less often by migrant-sending households compared with nonmigrant-sending households. This could suggest that HH with migrants and that receive remittances have more financial resources to access alternative energy sources.

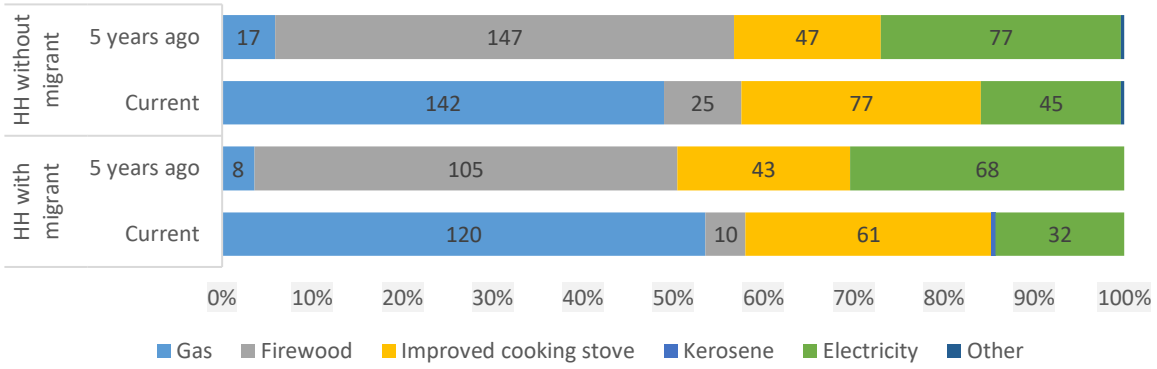

Figure 14. Total number and percentage of households with or without migrant members and their cooking fuel sources from 5 years ago vs current sources in Penjikent.

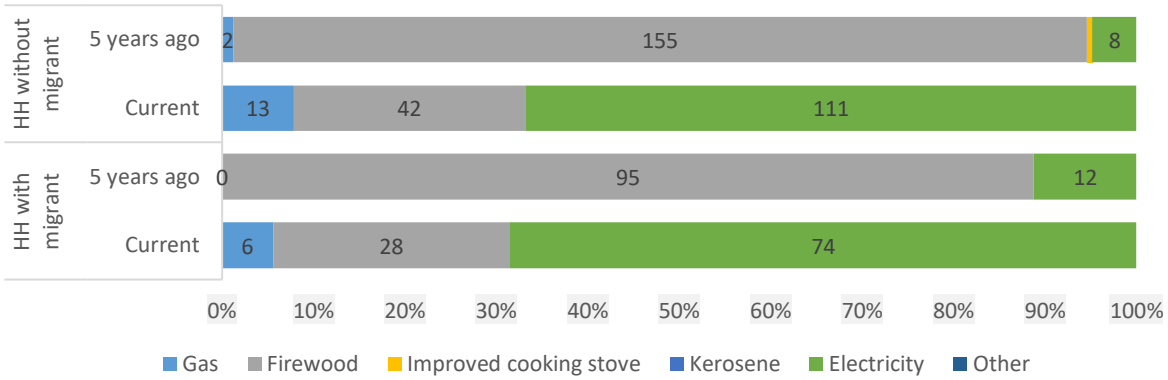

Figure 15. Total number and percentage of households with or without migrant members and their cooking fuel sources from 5 years ago vs current sources in Bartang.

3.2.6. Expenditure on agriculture and forests

In the survey, it was also of interest to understand how local people are engaged in agriculture and forest use and what their expenditures are towards these two types of activities; and further, how remittances also featured in their expenditure on these activities. The results highlights that hiring agricultural laborers is uncommon in Penjikent (7%) and that in Bartang none of the HH interviewed hired laborers. These results could be explained by the lack of available financial resources to hire extra support with farming, but also by differences in livelihood preferences. For instance, in the FGDs, it was claimed that in Bartang, locals were more likely to be engaged in livestock raising rather than commercial farming, in contrast to Penjikent where farming was a primary livelihood activity.

When looking at expenditure of 514 HH towards agriculture by far the most common expenditure using remittances includes buying fertilizer (43%), see Figure 16. The next most popular remittance expenditure for agriculture included irrigation systems (19%), buying pesticides (12%), buying livestock (10%), cultivating new varieties (9%), and planting fruit and nut trees (5%). With a small number of households (>5%) spending money on buying or

renting land, planting fast growing trees, planting deciduous and conifers, paying wage work and investing in agricultural businesses.

In relation to tree based agricultural system results indicated 11% of HH spent money on planting fruit and nut trees. While only a smaller number of HH planted fast growing species or planted deciduous and conifers trees. These result fit with the FGDs that also found villages would cultivate fruit and nut trees on their land plots and gardens. The results from the HH interviews further indicate that remittances contributed too many of these expenditures. For the planting of fruit and nut trees 39% of the total households who spend money on this activity, used remittances. For the majority of agricultural related expenditures remittances were used by at least 33 –66% of the total households.

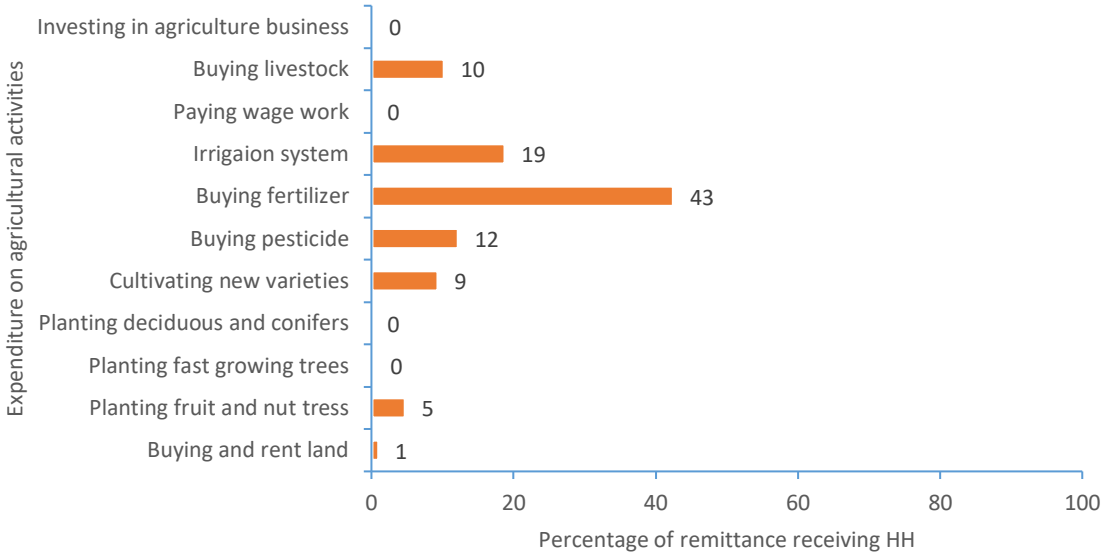

Figure 16. Percentage of households that spend remittances on different agricultural activities in Bartang and Penjikent.

For forest expenditure, the results indicate that only a small number of households (>2) have spent money on planting new trees, buying timber products or paying others to get timber for housing. However, payments for alternative energy sources were the main forest-related expenditure (Figure 17), done by 18% of HH (total 92 HH). From this number, a third of households (35%) claim to use remittances towards paying for alternative fuel sources (32 HH).

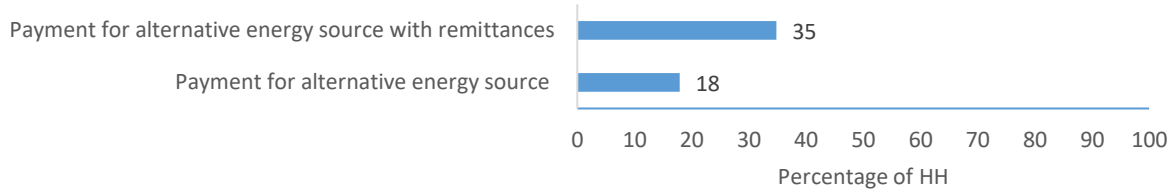

Figure 17 Percentage of households that spend money on alternative energy sources and the percentage of households that spend money on alternative fuel sources and use remittances to do so.

Notably with these results, it is also important to consider that spending patterns can be shifted with additional incomes. Direct spending of remittances might be recognized as going mostly towards household expenditures, but this also reduces the pressure of those costs from other income sources which then could be used on alternative expenditures. These results also somehow fit with the FGD outcomes, as it was claimed that no planting (or perhaps even any kind of forest management) was done in forests as these were state owned and the local people lacked management/use rights.

4. ANALYSIS OF TREE COVER CHANGES IN THE STUDY SITES

The objective of this analysis is to identify patterns of change in tree cover in the study sites and to identify changes that might show some linkages to demographic changes and shifts in mobility and migration. The sites considered are described in Table 3.

Table 3. List of study sites in the Gorno-Badakhshan Autonomous region (GBAO) and Penjikent

District	Region	Jamoat	Village	GPS
GBAO	Rushon	Bartang	Basid	38.107900 72.163780
GBAO	Rushon	Bartang	Anjirkh	38.117030 72.043330
GBAO	Rushon	Bartang	Dajomj	38.125960 71.941310
GBAO	Rushon	Bartang	Siponj	38.062630 71.875920
Sughd	Penjikent	Sarazm	Chubot	67.43668 39.51755
Sughd	Penjikent	Sarazm	Chilarcha	67.498633 39.418869
Sughd	Penjikent	Rudaki	Zimtud	68.051183 39.289574
Sughd	Penjikent	Rudaki	Tojikkishlok	67.450165 39.508617

4.1. Method

We used all available precision terrain-corrected Landsat TM, ETM+, OLI Tier 1 products with less than 80% cloud coverage to map tree cover percentage for four years: 1991, 1998, 2008 and 2018. For each period, we calculated spectral–temporal metrics using all available imagery (Yin et al. 2017). First, we masked out cloud/shadow/snow using the QA band in each

Landsat image. Second, we calculated the normalized difference vegetation index (NDVI) and Tasseled-cap Transformation for each image (Crist 1985). Third, we calculated five metrics for each reflectance band, NDVI and the Tasseled-cap Transformation: the mean, median, standard deviation, 20th percentile and 70th percentile. We calculated the spectral-temporal metrics on Google Earth Engine (Gorelick et al. 2017).

For this study, trees were defined as all vegetation taller than 5 m in height. To estimate tree cover percentage at Landsat pixel level, we used high-resolution imagery on Google Earth and Bing Ariel to train a regression model. First, we randomly created 500 polygons of 30×30 m that spatially matched Landsat pixels. Each polygon was further divided into 100 sub-polygons of 3×3 m. Second, we estimated per-polygon the tree cover percentage based on visual interpretation of all available high-resolution imagery on Google Earth. Third, we eliminated polygons that experienced changes over time using Landsat imagery. Overall, we acquired 348 training samples, with 58 labeled as tree cover more than zero.

We used the random forest (RF) regression tree algorithm to predict tree cover percentage from the spectral–temporal metrics in each period. The number of variables randomly sampled as candidates at each split was set to the square root of the number of input variables, and the minimum sizes of the terminal nodes and the number of the trees were set to 10 and 1000, respectively. The package 'randomForest' implemented in the statistical software CRAN R was employed to conduct the analysis.

4.2. Result

We used the Out-of-Bag error estimate in the RF model to validate our models. The results showed that the models in the periods 1990–1992, 1997–1999, 2007–2009 and 2017–2018 explained 69%, 81%, 78% and 75% of variances, respectively.

4.3. The GBAO (Pamir) region

Tree cover gradually increased in Siponj between 1991 (3.2%) and 2018 (6.4%) (Table 4, Figure 18). We observed tree cover expansions in the areas closer to Siponj (Figure 18). However, tree cover in Anjirkh declined (4.8% and 3.1% in 1991 and 2018, respectively). Basid showed tree cover loss between 1991 (5.7%) and 1998 (2.2%), followed by a gradual tree cover increase (Figures 18 and 19). On the contrary, Dajomj exhibited an increase in tree cover between 1991 (7.9%) and 1998 (8.7%), followed by tree cover decline (Figures 18 and 19).

Table 4. Tree cover (%) in the Pamir region between 1991 and 2018.

	1991	1998	2008	2018
Basid	5.7	2.2	3.7	3.9
Siponj	3.2	4.8	5.9	6.4
Dajomj	7.9	8.7	8.2	5.6
Anjirkh	4.8	3.5	3.9	3.1

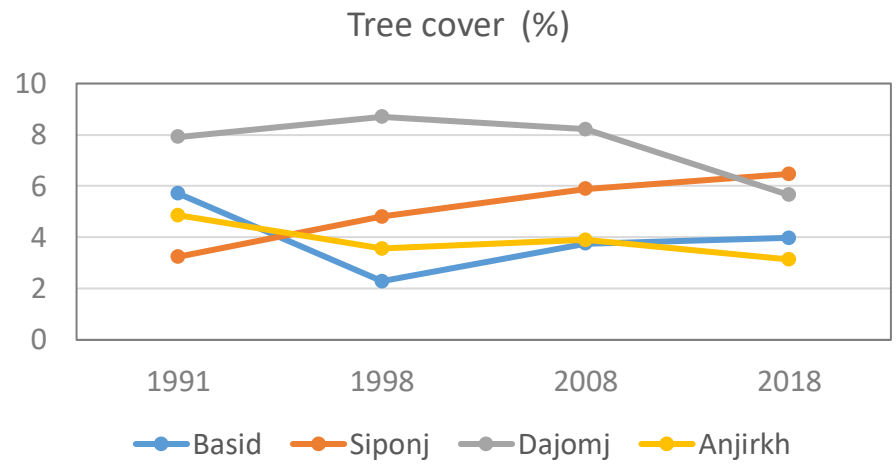

Figure 18. Tree cover trajectory in the Pamir region.

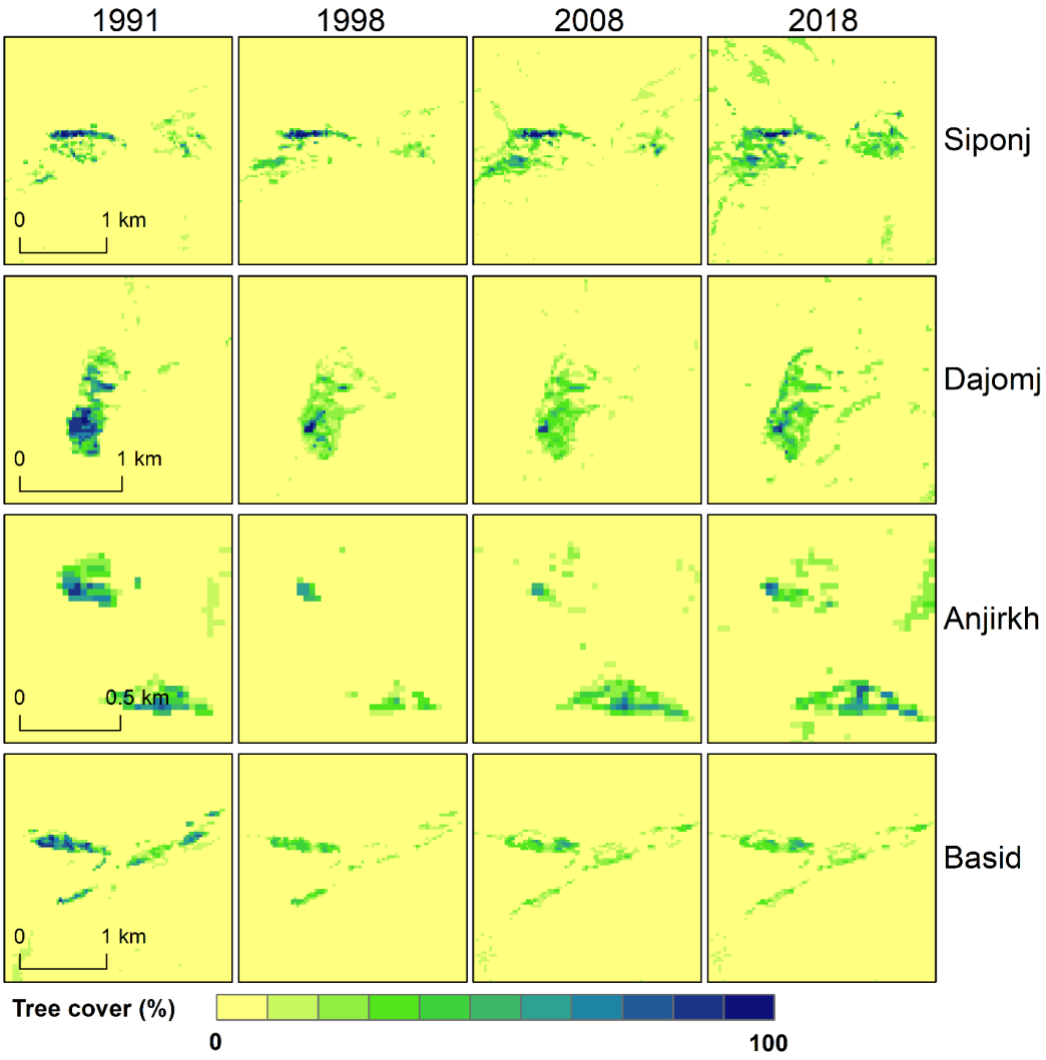

Figure 19. Spatial distribution of tree cover in four study sites in the Pamir region.

4.4. Penjikent region

Different from the Pamir region, the Penjikent region showed a tree cover increase between 1991 and 2018, although different trajectories were observed in four villages (Table 5, Figure 20). Of all the villages, Zimtud and Chilarcha had the most significant tree cover increase.

Tree cover in Zimtud increased from 15.4% in 1991 to 38.1% in 2018. Tree cover in Chilarcha increased dramatically between 1991 (0.7%) and 1998 (4.9%) while little increase was found after 1998. Two villages, Chubot and Tojikkishlok, showed a very similar tree cover change pattern (Figure 20, Figure 21). For example, tree cover in Chubot increased between 1991 (3.2%) and 1998 (16.0%), followed by a gradual decline.

Table 5. Tree cover (%) in the Penjikent region between 1991 and 2018.

Village	1991	1998	2008	2018
Chubot	3.2	16.0	12.9	9.7
Tojikkishlok	1.9	13.1	9.3	6.6
Chilarcha	0.7	4.9	4.7	5.2
Zimtud	15.4	21.4	28.5	38.1

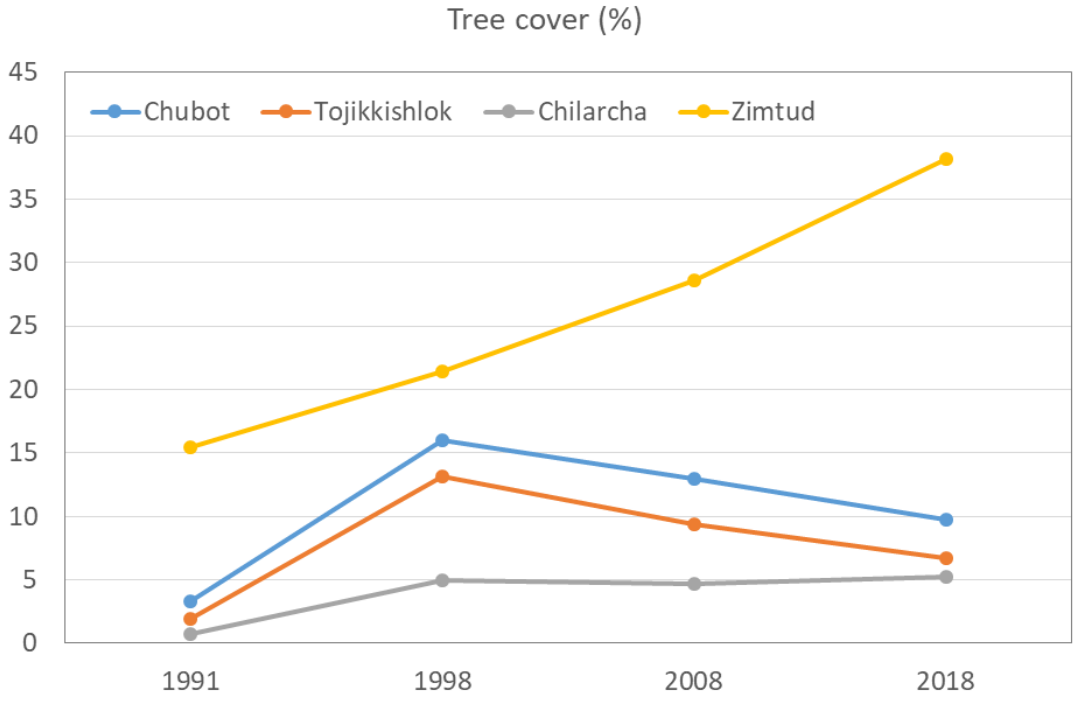

Figure 20. Tree cover trajectory in the Penjikent region.

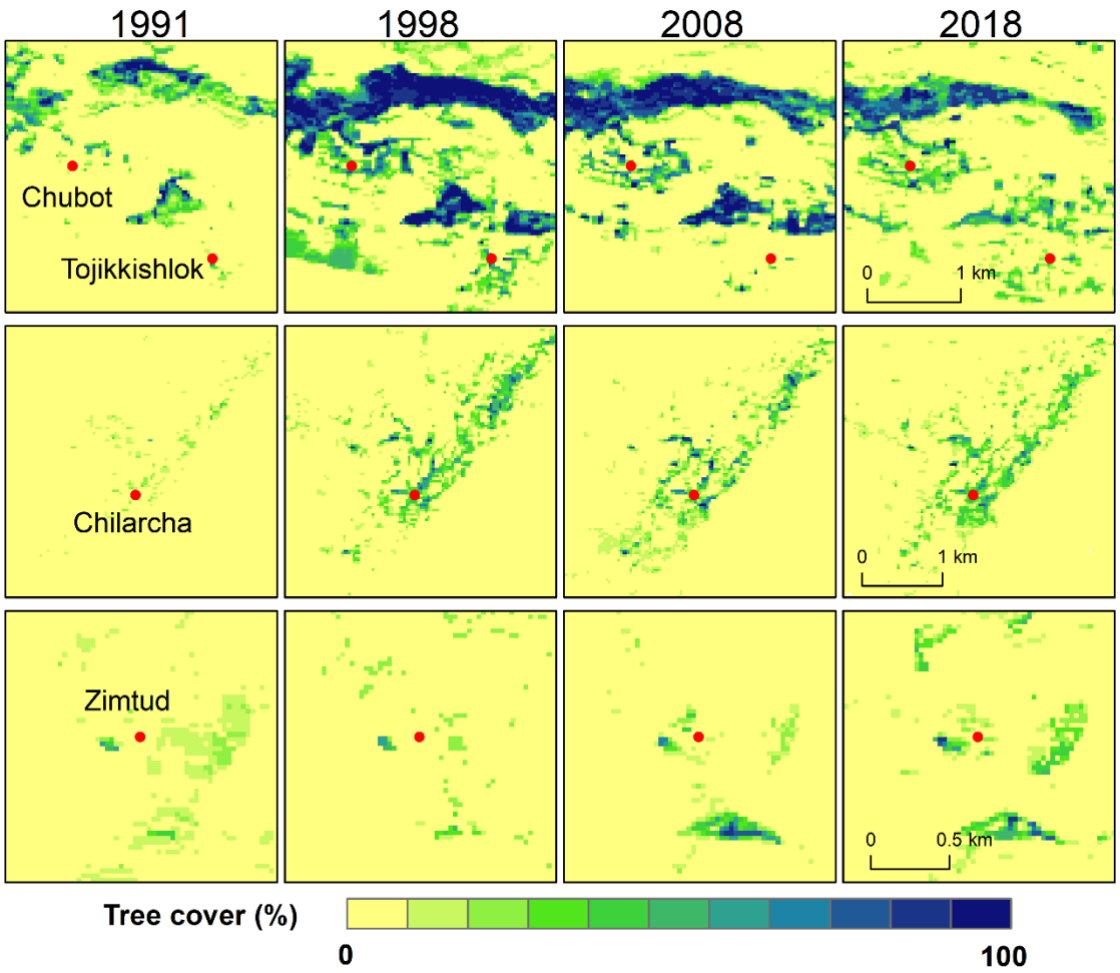

Figure 21. Spatial distribution of tree cover in four study sites in the Penjikent region.

5. CONCLUSIONS

The results illustrate a number of differences between the regions regarding migration and remittances and forest dependencies. In most cases, the household survey results and the FGDs results were aligned, but in some cases the results revealed divergences. This could be due to how the questions were asked and/or the representativeness amongst the household survey respondents and those who attended the FGDs. Nevertheless, the overall results are strengthened by triangulating the results from the two methods, and where differences are identified, it further supports our overall understanding.

The findings in this report highlight the importance of understanding migration and remittances beyond assumed nationwide trends. When the results were aggregated, the nuances between the two regions were hidden. When the results were disaggregated between the regions, assumed patterns – such as the majority of migrants being external labor migrants – were still identified; however, distinct differences between them were also found. There was regional variation in the status of migrants prior to migrating, motivations for migration, remittance transfer options, proportion of migrants engaged in internal and external migration, and gender dynamics. Equally, for natural resource management use and risk, results also varied regionally. These nuances highlight the importance of having context-dependent forest policies and programs to enhance their effectiveness in promoting sustainable forest management and improved livelihoods that fit to the needs and interests of differing regions.

The environmental and socioeconomic conditions of each region are indicated to influence the livelihood choices made by the local people. In Bartang, the mountainous nature of the area affects accessibility and its vulnerability to natural disaster events. The biophysical conditions of the region limit the availability of productive land suitable for agriculture; thus, in the FGDs, participants indicated a preference for raising livestock. In contrast, the people from Penjikent report having agriculturally based livelihoods, because of the wider availability of productive land. The linkages between natural resource uses, including forest use, and migration and remittances relate to the resilience of the local people. Migration is a core income strategy in both regions, and remittances were said to be one of the most important sources of household income. When natural disasters occurred, forests and remittances were seen as safety nets to support household needs, particularly in Bartang. In addition, the findings also indicate the importance of farming and livestock for subsistence and commercial purposes, with trees and forests being of varying importance, yet with a solid majority of households involved in tree-planting activities.

The following sections offer conclusions on the combined findings from the household survey and FGDs related to the core themes: mitigation and adaption against climate change; energy security; livelihood links with forest and trees; remittance transfers; and gender dynamics.

5.1. Mitigation against and adaptation to climate change

The results revealed that natural disaster events such as flooding and landslides were prone to occur in both regions, which also fits with the national picture. These events impacted local

people's livelihoods directly and indirectly, and are also linked to forest use. Yet the difference between study regions was the frequency and severity of these events. In Bartang, natural disasters were found to be more common, and severe but yearly events in Penjikent were also said to occur. In Penjikent, productive land was reportedly destroyed and sometimes, homes and roads were damaged. Impacts to energy supplies were a further problem in Bartang, where energy cuts would drive people to the forest for fuel wood. Timber was also required for rebuilding following the impact of an earthquake. A lack of road access was another major issue in Bartang during the winter, and as a result, remittances or pensions could not be accessed.

Forest degradation and deforestation are linked directly to natural disasters. It is likely that as further forest and land degradation occurs, the probability of further disasters may increase. Overexploitation of forest and trees will destabilize the lands further; important ecosystems services beyond the productive capacity of forests are at risk, further impacting soil and water regulatory functions.

The impact of people on natural resource under the current land use trajectories could lead to further deterioration, exacerbated by climate change. Tajikistan is recognized as one of the countries most vulnerable to climate change, and therefore precautions against further natural disasters are critical. The FGD results indicate that households only take action in 'reaction' to events, such as spending money on housing repairs. Thus, so far, efforts to combat climate change or natural disasters are purely reactionary and not yet aimed towards adaption, prevention and precaution.

Consequently, there is strong justification for advocating forest protection and forest restoration in both regions. For Bartang in particular, people and forests are at risk and thus tree-based land management strategies would be a viable adaption and mitigation strategy against natural disasters and climate change. These households and communities as a whole would benefit strongly from knowledge and support, including financial guidance on practices that could help them adapt to and protect them from future disaster events.

Both individual and community-based adaptive strategies could be promoted using existing support systems. For example, there is evidence that individuals may also contribute remittances to community goods, as demonstrated in Penjikent where local people claimed to contribute remittance money towards the maintenance of the local dam. This could serve as a model for a community support system for forests, where pooling resources, including remittances, may also support the scaling-up of forest restoration efforts.

It was also indicated that the communities would provide support systems for affected community members. Such groups could also be transformed into more formal institutions and lend support and guidance on how to mitigate against and adapt to disaster events. Further, they could target efforts and financial resources to invest in collective actions that could have the widest benefit, such as rehabilitating exposed lands with trees for those lands that pose the most risk to the community.

5.2. Energy security

The household survey and FGDs results illustrated a key link between forest, migration and remittances in relation to energy supplies. The main fuel source for energy supplies had shifted in both regions and with it came a reduced demand for fuel wood. As other alternative energy sources have become available, the dependency on forests for fuel wood was reduced. Currently in Penjikent, the major fuel source was indicated to be gas, and in Bartang, the major source was electricity, whereas 5 years ago, in both places, households relied heavily on fuel wood. Reductions in fuel wood dependency are said to be because of the availability of other fuel sources, but survey results also indicate that remittances are responsible for providing alternative options for fuel. Whilst the results do not reveal if forest overexploitation has occurred, nor provide information on the status of the forest, given the vulnerability of the people from Bartang, forests are claimed to be used as a security net when there are energy supply deficiencies.

Overall, recognizing the role of forests as a safety net is important. In areas and regions where remoteness and access are particularly difficult, even more so in winter months, there will be implications for forest use. Ascertaining the sustainability of these forest use peaks following natural disasters and winter periods is an area for further study. Yet, given the lack of enforcement in certain regions, particularly in Bartang, these forest areas are at risk of becoming overexploited. These findings highlight the importance of having sustainable forest management strategies in place. Furthermore, recommendations would be to ensure that reliable alternative energy sources such as electricity or gas are available in Tajikistan to avoid further forest loss. This also relates to having year-round access to financial institutions so remittances can be retrieved.

5.3. Livelihood links with forests and trees

Overall, linkages between forest use and remittances were weak, but when examining households in general, it was indicated that tree planting was common. In Penjikent, it was indicated that fruit and nut trees were planted in home gardens and land plots for both subsistence and commercial purposes, and a majority of households used remittances for this. In Bartang, it was claimed that trees were grown for subsistence purposes to supply fruit and timber. The survey and FGD results were contradictory in that forests in Penjikent were said to be used, even if rarely in the FGD, but this was not indicated in the survey results. In Bartang, both the household survey and FGD results indicated that forests were used by all households for some purpose or another. The collection of fire wood was the most common use (by 100%) of households, followed by timber and fodder collections.

These results imply that forests and/or trees are important livelihood strategies for most people in the Bartang region. As such, this also highlights the importance of sustainable management and forest governance for the remaining forests in the region. For instance, in Penjikent, it was said that access and use were limited due to strict controls, whereas this was not indicated to be the case in Bartang. The FGDs supported findings that people were not motivated to plant trees in the forests due to the strict state controls and a lack of use and management rights for community members. This is one area that requires policy changes to

help support allocating forest use rights to local people to incentivize sustainable management. For example, it was claimed in Penjikent that the controls on forest use were rather strict, whereas forest use and resource extraction were still seen as fairly common in Bartang. Therefore, the balance between supporting access and use rights also needs to be improved, with regulations and enforcement that will also protect forests from overexploitation. This supports justifications to provide people with regulated access to forest resources and motivates sustainable use through the allocation of tenure/use rights. Further, by encouraging people to plant and grow trees on their own land for subsistence needs would also be beneficial and could serve to reduce pressure on the remaining forests.

5.4. Remittance transfers

How remittances are transferred is also an important element of how they can be managed and utilized by households for their livelihoods. If there are reliable and available financial institutes, which is not always the case, migrants will feel more confident to transfer money and also consider other financing options if they are available. The household surveys revealed differences between the regions in the methods used by migrants for transferring remittances to their family households. In Penjikent, all remittances were sent via banks. This is to be expected as the majority of the labor migrants are external; yet this also indicates that migrants trust that banks in the region will reliably deliver transfers. In contrast, while some Bartang remittances were also sent via banks, a large proportion of migrants from there also sent remittances via friends or rather brought the remittances with them on their return home. This could be due to there being a larger number of internal migrants from Bartang, which would justify transferring the money themselves or via people they know. In addition, the remittance amounts may also not be as large relative to those from external migrants. But these results could also indicate that the banking systems in the Bartang region was not as widely used or trusted.

Findings from the FGDs further indicated that households from both regions were keen to not rely on migration and remittances for their future. There was a consensus that they were keen to find opportunities within their villages and home country and to incentivize their children to stay. Respondents concurred that support is needed to guide strategic investments into their own businesses. This insight and willingness to embrace business opportunities under the right incentive mechanisms also provides an opportunity to encourage investments into sustainable land management practices that can also benefit them financially and provide resilience against environmental change.

These overall results on transfer strategies, and the willingness of households to invest their remittances, provide a further possibility to strengthen options for smallholders to invest in sustainable land practices. National policy goals on climate change action and economic development include encouraging business start-ups as key priorities. Providing business and financial advice via institutions that process remittances holds potential for supporting start-up businesses. These efforts could be directed towards ‘green economy’ business options as one aim of the National Development Strategy of Tajikistan. However, what business options are encouraged as ‘green’ is not fully defined; arguably, forest and tree planting could fit into that category, as well as actions under the national climate change strategy. The possibility of

public and private financial institutions that support the need to develop a system that can attract resources, such as remittances, to support the rural population to invest in climate-smart agriculture and forestry practices fits with both national and local needs. As recommended by Babagaliyeva et al. (2017) "*in order to assure the sustainability of the program, one should envisage the regular co-sharing contribution from the loaners. Remittances or incomes acquired from migrants and their families can play an important role in setting up such a mechanism".* They also note that there are existing examples where migrant remittances have already been used as a contributing factor, in existing financial schemes from the Tajik banks. Such existing schemes could be built upon and provide further awareness and support for guiding people on forest and tree-based management strategies that meet national as well as individual interests.

5.5. Gender dynamics

It is crucial to understand gender differences related to migration and remittances as these dynamics also influence natural resource use (Hecht et al. 2015). Across the regions, results indicated contrasting patterns in how men and women engaged in migration and what those impacts were on the remaining household members. These differences include both the proportions of men and women who choose to migrate, the reasons for migrating, where they migrate to, who they migrate with, and whether they send remittances. The gender impacts are also felt by the families left behind, often the female spouses. Both the benefits and disadvantages were outlined in the results, ranging from the importance of remittances to household incomes to the empowerment of women to make decisions over the finances. The disadvantages were outlined as: the burden of extra work loads, uncertainty and conflicts over land use, and links to divorce. The differences between the regions highlight the need to look at the local contexts to understand the impacts of migration and remittances for both those migrating and those left behind.

Understanding gender also relates to how intra-household decision-making is undertaken and whether women have been empowered to do so. In this respect, the results were conflicting in that the women's groups in the FGDs claimed that they did feel empowered to make household decisions in the absence of their husbands, while in the household survey, the number of identified female household heads was no different between migrant-sending and nonmigrant-sending households. In fact, in both cases, women were household heads only in about a quarter of the interviewed households for both regions. This could have been due to representation bias in the FGDs, as there was a higher number of women aged 50 years or more present in the FGDs who were possibly parents of the migrant who attended the discussions. The fact that women also were not household head may also dispel notions that women become empowered when men are absent; rather, the physical absence does not impact the imbedded patriarchal cultures, and other male family members may take the role of 'interims' household head. Alternatively, it may be that while the household head 'title' is still with the husband, in reality, decision-making will be conducted by those left behind.

As for gender differences been male and female migrants, more women in Bartang were engaged in migration compared with those in Penjikent and 43% of remittance senders were women. This indicates that these women were also labor migrants and important

contributors to the household members left behind. The majority of women migrants were also external migrants, with higher numbers from Penjikent; there was still over a third of women from Bartang who also migrated internally.

In summary, the findings on gender help to identify how much migration has empowered women and this will vary from household to household. This is relevant for forestry, as those women left behind are also potentially the household member responsible for managing land whether farms, livestock or trees, in addition to making choices about fuel sources. Therefore, any initiative that wants to target sustainable land use will need to understand these dynamics in order to plan effectively. For agriculture and forestry, this also means ensuring that access to advisory bodies and to information is equal for both men and women. Equal access to training and information is crucial to avoid the conflicts that were identified in Penjikent surrounding the use of fertilizer and pesticide. In addition, when it comes to support and advice for efforts to be gender inclusive, they should not only target household heads, as the reality could be that other members of the household will be the ones who can in reality sustain any long-term schemes.

6. Policy engagement, expert meetings and knowledge-sharing workshops

6.1. Knowledge-sharing, interinstitutional and multistakeholder workshop

Beside the importance of migration in Tajikistan, the linkages and impact of migration on landscapes is not acknowledged in the political arena. The CIFOR team organized a series of workshops (April 2016, Annexe 1) with policy makers and subject area specialists supporting the Tajik government, working on migration, agriculture and forest issues at the national and regional levels. Meetings were held with individual agencies and all relevant actors and culminated with a two-day interinstitutional and multistakeholder workshop. This included policy and research stakeholders in Dushanbe, the capital, and Penjikent, a province capital in the NE of the country. We also met communities including Uzbek-speaking villagers where GIZ maintains some activities under its Joint Forest Management program, in the Penjikent area. The interinstitutional and multistakeholder workshop (8 and 9 November 2016, annexe 1) organized by CIFOR and GIZ had the objective to fill the gaps in knowledge about migration and remittances and to introduce the research project. It was intended to create debate between policy makers, civil society and national researchers about the way migration and remittances are linked to changes in the landscape and forest and tree resources and how remittances can be channeled to improve the sustainability of interventions and actions in the agriculture and forest sectors. Participants were representatives from governmental and nongovernmental organizations, policy makers, civil society actors and research. This included the Ministry of Labour, Migration and Employment, State Forestry Agency (SFA) Research Institute, Research Center “Sharq”, SFE Penjikent “Women east”, representatives from Chubot/Tojikkishlok villages, and the Deputy Country Director of GIZ (Annex 2 and 3).

6.2. Validation and discussion of the first research results with GIZ, the Ministry of Labour, Migration and Employment and with the CIM Integrated Expert at the Ministry of Labour, Migration and

After the first results from Pamir were available and shared with the GIZ team, (May 2018) the team expressed an interest to share them with the Ministry of Labour, Migration and Employment of Population and particularly with the CIM integrated expert working with the ministry on migration issues. A face-to-face meeting was organized by GIZ with the Ministry of Labour, Migration and Employment of Population and the CIM expert to report back results and receive feedback. After this meeting, specific additional questions raised by the CIM expert and the GIZ team were integrated in the questionnaires..

6.3. Dissemination and policy engagement workshops

Once all data collection and preliminary analysis was completed, national and regional workshops were organized. The national workshop took place in Dushanbe on 21 December 2018. This workshop also included representatives of two regions involved in the study, particularly from Penjikent, which was represented by main national partners from the government, Forest Enterprise Agency and local NGOs. (Annexe 5).

The national workshop was attended by 26 participants, including representatives from the Migration Service Department of the Ministry of Labour, Migration and Employment of Population, Institute of Agricultural Economics, Committee of Environmental Protection, State Forest Enterprises of Penjikent and GBAO, government representatives of Penjikent, local NGOs working in Penjikent and GBAO, and international organizations, such as GIZ, AKF (Aga Khan Foundation), and AKAH (The Aga Khan Agency for Habitat (AKAH).

The workshop in GBAO had 17 participants, including representatives from government, local NGOs and international organizations, such as MSDSP (Mountain Society Development Support Program), WFP (World Food Program) and others. The workshop in Khorog took place on 26 December 2018. (Annexe 4)

The objective of the dissemination workshops was to: (a) share the results of the first round of quantitative data collection in Penjikent and Bartang; (b) create debate on the importance of migration and remittances; (c) identify potential partnerships and networks to enhance research in the area; and (d) develop recommendations on integrating migration and remittances in policies and interventions within sustainable natural resource management.

6.4. Expert meetings with the GIZ team to use the results to inform new projects and initiatives

In collaboration with the Ministry of Labour, Migration and Employment of Population GIZ is planning a new project on migration. The GIZ and CIFOR/MSRI team organized two meeting to discuss how to use the research project results for implementation. The first meeting was a person-to-person meeting in 28 February 2019 and the second one was a Skype presentation to the migration project the appraisal mission (lead by Oliver Kainrad and Stefanie Gömann) in May 2019.

During the first face-to-face meeting, the CIFOR researchers presented the results of this study to the GIZ team and the CIM representatives working with the Ministry of Labour, Migration and Employment of Population. During this meeting, the following aspects came out as lessons learned from the project to be integrated into new project, programs or initiatives:

a. Diversity of migration patterns

A regional comparison revealed diverse motivations, characteristics of migrants, use of remittances, forests and trees, and also very interesting gender and age-related findings. Overly simplistic notions on migration and remittances and forest use can be misleading.

c. Remittances and forests/tree-based landscapes are important for enhancing communities' abilities to absorb shocks

We find direct links between remittances and the capacity to rebuild assets after disasters. While most investment is targeting rebuilding physical assets and increasing agriculture input, very little is done to protect those assets and investments against the next potential natural disaster, which jeopardizes the long-term sustainability of those investments. Nature-based solutions, or ecosystem-based adaptation, and their role in protecting assets, while delivering valuable provisioning services, are approaches not yet well mainstreamed at the policy level.

d. Adaptive and maladaptive patterns in the use of remittances

Being an important income source, remittances seem to be still the most important means of income generation for the future. Investment of remittances offers opportunities for development and the environment if used to preserve natural capital or protect against climate-induced risks. However, remittances could exacerbate income inequality and support passive, nonproductive communities that use this income source for consumption rather than investment. There is a crucial need to better link remittances to adaptation and restoration. Local people need to be supported in their efforts to mitigate and adapt. Building upon existing local models of collaboration and institutional support would be an advantage. For instance, we see that traditional timber-based construction patterns are highly resistant to earthquakes. Unfortunately, traditional approaches to home construction are being gradually replaced by "modern" architectural styles.

e. Restoration is key, but in order to be strongly adopted at the local and national policy levels, it needs to be strongly linked to its direct role in disaster reduction

The role of restoration and nature-based solutions in general for mitigation and adaptation to climate change needs to be more mainstreamed, as it is not really integrated across sectors and scales.

f. Energy transitions

Trees and also valuable shrubs from rangelands are major sources of household energy consumption. In our sample, we see that remittances provide an opportunity to access fuel

alternatives and this has shifted pressure from forests and trees. Forests remain as safety nets when other sources and remittances cannot be accessed.

g. Rangelands

Free grazing is a critical issue, as big players are involved in the gains from livestock. 'Absentees' (animal owners who buy livestock and put local herders in charge) seem to be very current, increasing the pressure on forests, trees and plantations. With the increase in natural disasters, in particular, livestock became part of a coping strategy for people. Our results show for instance that people spend more remittances in buying livestock than in planting trees.

h. Migration-induced demographic changes

Any program or intervention in Tajikistan needs to take into account the migration-induced demographic and social changes. The migration in Tajikistan is very gender and age specific. Most migrants are between 20 and 40 years and male (even though the trend of migrating women is increasing, particularly related to internal migration). Knowing that, traditionally, men are the ones taking care of rangelands and plantations, it is important to take into account those trends in any land-based activity to avoid worsening gender imbalances by increasing women's workload. We discussed, for instance, that even though a great amount of remittances are invested in agriculture, only 3% of households invested in hiring labor to replace the migrant members. The remaining household members (mostly women) need to manage more tasks, without necessarily having a better position in the decision-making process about how the remittances are to be used.

i. Vision and perspective of migration

Besides the fact that in the last years work availability decreased in the construction sector in Russia, where most migrants currently find work, our household data show that a majority of young men are still planning to migrate in the next 5 years. Furthermore, all households that have remittances as their first source of income (we find that this applies to 50 to 60% of households in our sample area) are not expecting any change to their income in the future. We saw also that some initiatives in the land sector failed because they did not sufficiently take migration into account in their planning.

j. Engaging the diaspora

The Tajik diaspora in the Russian Federation should be a very important partner in any restoration program in the country. The diaspora is very active and ready to contribute to long-term solutions for their home regions. However, there is a need to develop financial instruments and specific measures and engagement in using the diaspora's resources. For instance, restoring ecosystem services as a part of ecotourism investment was mentioned as being of interest.

6.5. Dissemination of results at the global level:

The results of the study were presented in following global workshops:

- Transformative approaches for adaptation and migration in 3 case studies from Africa and Central Asia (H. Djoudi and B.Locatelli). The Transformative Adaptation Research Alliance (TARA) 5th workshop, October 10-12, 2018 University of the Basque Country, Bilbao, Spain. https://research.csiro.au/tara/
- Migration as transformation? Interacting adaptation and migration pathways and their impacts on ecosystems and people (H. Djoudi and B.Locatelli, Global Land Programme (GLP), 4th Open Science Meeting, April 24 - 26, 2019 Bern, https://glp.earth/osm/osm-2019/about-os

Other documents:

- The project created a dedicated website for Migration-forest nexus, which is the outlet of all outputs of produced by CIFOR scientists within the topic of migration. All publications, PPT, Videos, Blogs, and Events in which CIFOR Scientist participated are presented in the website. As part of the website, the project also produce a database Migration-forest nexus literatures.

- The project prepared an overview flyer to publicize the project. It is available in English, and Spanish. The project also produce flyer to recruit master student for capacity building program.
- The project has produced 2 videos. The first one is the *Discussion Forum 16: Managing migration and remittances for environmentally sustainable*. *Global landscape Forum 18, Bonn December 1 – 2, 2019 and also presentation of the research findings on CIFOR Annual Meeting 2018.*
- The project produced a blog (1)"Remittances and reforestation: Why returning migrants plant trees in Tajikistan"

Several publications are in preparation:

- Bakhtibekova, Z., Djoudi, H., and C.Martius (forthcoming**): Gendered landscapes, migration and vulnerability in mountainous socio ecological systems of Tajikistan** (draft in preparation).
- Yang A., Djoudi, H., and C. Martius (Forthcoming): **Understanding challenges and opportunities for integrating migration in natural resource management policies. A case study from Tajikistan** (in final internal review process).
- Djoudi H, Bakhtibekova, Z., A. Yang, C. Martius, K.S. Juniwati, M. Sanjaya (forthcoming): **Pattern of internal and external migration and remittances and their impact on natural resource management in Tajikistan** (draft in final preparation).
- Djoudi, H., Locatelli B. Cronkleton,P., et al. (Forthcoming): **Migration as transformation? Interacting adaptation and migration pathways and their impacts on ecosystems and people** (draft in preparation).

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8. ANNEXES

Annex 1: Key stakeholder meetings (April 2016)

Activity	Dates	Location
Meeting with GIZ forestry team	**April 21**	**GIZ office**
Meeting with the director and deputy director of the migration department	April 21	Migration department office
Meeting with Ismatzoda Azizullo, director of State Forestry Agency (SFA), and his deputy	April 22	SFA
Meeting with Rustam Muratov, Research Institute, and his deputy	April 22	Dushanbe
Meeting with Muzaffar Olimov, direc tor of Research Center “Sharq”	April 22	Research center office
Meeting with Pulod Zervarshov from an NGO called “Centre for supporting migrant before and after migration”	April 22	GIZ office
Meeting with Mr. Mahkamov/ Adham Asrorov, director/deputy director SFE Penjikent	April 23	SFE office
Meeting with Fotima Sharipova, director of PO “Women east”, and other people	April 23	PO “Women east” office
Visit JFM area in Chubot/Tojikkishlok villages and meeting with Community groups, including Uzbek-speaking villagers	April 23	Dushanbe
Meeting Dr. Tanzila Ergasheva	April 24	Dushanbe
Meeting Dr, Thomas Lux, deputy country director GIZ	April 24	Dushanbe
Meeting with Dr. Dietrich Schmidt-Vogt, University of Central Asia Aga Khan Foundation	April 25	Dushanbe

Annex 2: List of participants in the Knowledge-sharing, interinstitutional and multistakeholder workshop

Name, Affiliation	Type of organization	Contact details
Christopher Martius, CIFOR	Research/international	CIFOR
Houria Djoudi, CIFOR	Research/international	CIFOR
Christine Padoch, CIFOR	Research/international	CIFOR
Igor Rubinov, Princeton/CIFOR	Research/international	CIFOR
Benedikt Ibele, GIZ TJ	Development agency	GIZ
BehruzI lnazarov, GIZ TJ	Development agency	GIZ
Aslam Munakov GIZ TJ	Development agency	GIZ
Sorbon Kholiknazarov	Development agency	GIZ
Nicole Pfefferle	Development agency	GIZ
Nodirshoev Aslisho, Ministry of Labour, Migration and Employment of Population	State	Mob: 931144462; phone: 2250595 Migration service, main department: 2250725
Kalandarov Jamshed, Ministry of Labour, Migration and Employment of Population	State	kalandarov63@list.ru
Dr. Tanzila Ergasheva, Institute of Agricultural Economics	Research/national	Tanzila.e@gmail.com
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Fotima Sharipova, PO “Women east”, Director	Civil society/NGO	92 713 54 00; nfotima@mail.ru
Kholikov Hafiz, PO “Women east”, Facilitator	Local NGO	92 713 54 00; nfotima@mail.ru
Prof. Abdulkhamid Kayumov	Research	abdkaumov@mail.ru

Name, Affiliation	Type of organization	Contact details
Tajik Branch of the Regional Environmental Centre for Central Asia (CAREC)		
Ulan Kasymov, Humboldt University	University	kasymovu@agrar.hu-berlin.de
Dr. Dietrich Schmidt-Vogt, University of Central Asia Aga Khan Foundation	University	
Rajabali Sharipov Forestry Research Institute under SFA	Research national	
Mahkamov Hokimboy/ Adham Asrorov, director/Deputy Director SFE Penjikent	State/regional services	Adham Asrorov– 907447303; Mahkamov – 927073050
Abdulnzar Abdulnazarov, State Forest Enterprise GBAO, Director	State/regional services	
Dr. Lira Saguynbekova, University of Central Asia	University	
Suhrob Abdulloev Ministry of Agriculture	State	International department afa.moa@gmail.com
Muzaffar Olimov, director of Research Center “Sharq”	Research/national	907-72-82-25; olimov@tajik.net
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Shahlo Azizbekova CEP	State	Contact person shahlo.azizbekova@mail.ru
CAREC Naiyla Mustaeva Zhanna Babagaliyeva	Development agency	

Annex 3: Knowledge-sharing, interinstitutional and multistakeholder workshop

Day 1: Tuesday, 8 November 2016

Time	Activity
8:30	Arrival and morning coffee
9:00-9:30	Official opening, presentation of the agenda, and brief introductions of the participants
9:30-10:15	Introduction of GIZ work on forestry and climate change adaptation in Tajikistan
	Introduction to CIFOR's work on linkages between migration, forests and natural resource management
10:15-10:30	Coffee break
10:30-11:15	Presentation of background paper: "Rooting mobility: The impact of migration and remittances on natural resources in Tajikistan"
	Introduction to the project "Understanding migration and remittances to improve forest management projects and policies"
11: 15 - 12:00	Discussion
12:00 - 13:00	Lunch
13:00-14:30	Presentation from the State Forestry Agency (SFA)
	Presentations from the Ministry of Agriculture
	Presentation from the Committee for Environmental Protection
	Presentation from the Ministry of Labour, Migration and Employment of Population
	Presentation from the regions State Forest Enterprise GBAO, or SFE Penjikent
14:30-14:45	Coffee break
14:45-16:30	NGO "Center for supporting migrants before and after migration"
	Forestry Research Institute under SFA
	International Organization for Migration (IOM)
	University of Central Asia
16:30-17:30	Plenary discussion guided by key questions related to how to link migration and natural resources management in Tajikistan?

Day 2: Wednesday, 9 November 2016

Time	Activity	Responsible
8:30-12:00 (coffee and tea will be served)	• Short presentation on objectives, basic questions, components, approaches and phases of the project • Discussion of component 1: Significance of migration and remittances to livelihoods, forests and trees • Discussion of component 2: The influence of migration and remittances on forest management practices • Discussion of component 3: Improved understanding of migration and remittances to support forest policies and programs • General questions, next steps and discussion	Christine Padoch Houria Djoudi Christopher Martius
12:00-13:00	Lunch	
13:00-17:00 (coffee and tea will be served)	• Existing projects, data and options for synergies and collaboration • Site selection • Approaches to dissemination of results • Planning and timelines • Next steps	Christine Padoch Houria Djoudi Christopher Martius

Annex 4: Regional workshop, Khorog, December 25, 2018

Participants	Organization	Contact details
1. Yodgor Qonunov	MSDSP (Mountain Society Development Support Program)	935000111
2. Aslam Qadamov	PBI (Pamir Biological institute)	
3.		
4. Nabot Dodikhudoeva	NGO Madina	
5. Shaftolu Saidmirzoev	LLC “Panjob” (Limited liability company)	935882301
6. Parpisho Shonazarov	Agriculture Department	934002363
7. Mutribsho Ismoilov	PBI (Pamir Biological Institute)	935146667
8. Mulkamon Kaniev	Migration service	935009902
9. Farod Mamadnazarbekov	Committee on Environmental protection (regional)	
10. Gulazor Mamadrizokhonova	WFP (World food program)	
11. Tahmina Sodatqadamova	Khorog state University (Biology faculty)	
12. Sultonsho Guliev	AKAH (Aga Khan Agency for Habitat)	
13. Safina Shabdolova	Committee on Environmental protection (city)	
14. Qumriya Vafodorova	CAMP Tabiat	
15. Bahronov	SFE (state forest enterprise)	
16. Pulod Zevarshoev,	NGO “Center for supporting migrants before and after migration”	
17. Kamchibek	Village Head, Bartang	
18. Dilshodov Fahriddin	SFE (state forest enterprise)	

Annex 5: List of participants in the national workshop, Dushanbe, December 21, 2018

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