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Source: Mountain Research and Development, 35(1) : 57-65

Published By: International Mountain Society

URL: https://doi.org/10.1659/MRD-JOURNAL-D-14-00022.1

Mountain Research and Development (MRD)
An international, peer-reviewed open access journal
published by the International Mountain Society (IMS)
www.mrd-journal.org

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Transhumance Farming in Swiss Mountains: Adaptation to a Changing Environment

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Families living on transhumance farms (Stufenbetriebe) *in the Swiss Alps may move with their cattle up to 12 times a year between as many as 4 altitudinal levels. Transhumance farms have come under increasing political pressure to improve their economic performance, which has been hampered by a number of factors, such as rising infrastructure costs for meeting animal welfare regulations at multiple farm locations, lack of access roads, and restrictions on the creation of new transhumance farms. Little is known about transhumant farming practices and the role they play in mountain regions. In this exploratory anthropological study, we interviewed 39 transhumance farm family members in 7 Swiss cantons about their history, present situation, and visions of the future. A special focus was the risk perceptions upon which decisions and management strategies are based. The semistructured interviews were analyzed according to principles of content analysis and risk network analysis, with a focus on social, cultural, economic, and political risks as well as natural hazards. The results show that many transhumance farms are undergoing a process of adaptation to a changing social, political, economic, environmental, and cultural context. Transhumance farming has allowed individuals to survive as mountain farmers despite often difficult conditions. This study offers important insights into the risk perceptions and strategies of adaptation to ongoing changes developed by the families on these farms.*

Keywords: *Transhumance farming; family farm; risk perception; risk network; adaptation; mountain; Switzerland.*

Peer-reviewed: *November 2014* ***Accepted:*** *December 2014*

Introduction

Transhumance farming is a particular way of farming in which farm families relocate during the course of the year. It is widespread throughout the world and can be found in several alpine countries (Jeschke 2012). Transhumance farming varies in the number of locations and in the cycles followed for production. Little is known about its history (Brändli 1986; Furrer 2012), its practices, or the role it plays in the European Alps (Groier 1990; Jeschke 2012) and even less regarding its role in Switzerland.

This article defines transhumance farms as having at least 2 production centers, each with a separate residential building or a flat in the farm building and 1 or more stables and barns, at 2 or more altitudes (Amt für Landwirtschaft Uri 2012). The different development of the vegetation at different altitudes allows transhumance farmers to enlarge their working area, as peak harvest times can be staggered. The moving cycle differs considerably from farm to farm. In our sample, families on transhumance farms (German: *Stufenbetriebe*) move between 2 to 4 different levels (alp not included), 2–12 times a year, with their cattle and (if possible) the whole family. As a consequence, neither fodder nor dung needs to be transported between locations.

Farms doing transhumance only on pastures categorized as alp were excluded from the study because alp pastures are subject to different legal regulations and are predominately used in summertime. In contrast, the properties of the transhumance farms in this study are used throughout the year, characterizing the farming families' lives in a decisive way and having completely different implications than transhumance on alp pastures only.

The starting point of this study was an earlier study of Swiss farmers' risk perceptions, during which we got to know the way of life of several transhumance farmers. The interviews with them awoke our interest and led to this exploratory study focusing on transhumance farming families.

Recently, transhumance farming has come under pressure. Its financial performance is increasingly being criticized in political discussions as inefficient and too cost intensive. We argue that this has to be understood in the context of the dialectical relationship between the Swiss state and farmers, particularly mountain farmers. Transhumance farming families live and operate their farms in a controversial arena: romanticization of mountain agriculture and support for it on the one hand, economic pressure and legal restrictions on the other.

 http://dx.doi.org/10.1659/MRD-JOURNAL-D-14-00022.1

This article explores that arena from the farmers' point of view, showing what transhumance farming families are concerned with and how they perceive their present situation and the future development of transhumance farming in Switzerland.

Risk perception and risk networks

Risk perception is a widely studied field of agricultural economics that bases its model on rational assumptions that serve as a basis for farm management with a strong focus on profit maximization (Hardaker and Lien 2010; Van Winsen et al 2013). Risk perceptions play an important role in the development of transhumance farm strategies, but they must be seen in terms of farming families' actions and decision-making as a whole. Family farmers' actions are based on perceptions not only of economic risks but also of cultural, social, political, and natural risks, which have hardly been considered in agricultural risk management research (Van Winsen et al 2013). Families' decisions to continue transhumance farming in a difficult financial and political environment is based on risks they perceive and the possibilities they see for responding to them. Responses to risks can include risk reduction, risk mitigation, and risk coping (OECD 2009).

In order to get a holistic view, this study drew on approaches that go beyond economic risk management and consider risks to be socially constructed. The starting point is the premise of Tulloch and Lupton (2005) that in everyday life people do not think of risks in terms of probabilities but rather understand risks as threats (see also Jurt 2009; Van Winsen et al 2013). Groups do not necessarily perceive the same risks; their risk selection is due to their political, cultural, and social background (Douglas and Wildavsky 1982). This study focuses on the individual experiences (eg Slovic 2000) of family members on transhumance farms, on these farms' historical background (eg Gustafson 1998), and on gender (Kahan et al 2007).

Risks cannot be understood in isolation (OECD 2009), as was a frequent criticism regarding psychometric studies (eg Tansey 2004); they must be understood as interconnected (Marx et al 2007). Not only risks and opportunities but also perceptions of risks and opportunities form interconnected networks (Jurt 2009). We refer to the risks and opportunities in these networks as nodes and argue that the interconnections between them can considerably change the understanding of people's responses to risks and opportunities and so shed light on the practices of transhumance farms. Risk networks are expressed in risk discourses and depend on the context (eg social, political, and economic) as well as on the situation (eg interview or group discussion) in which they are expressed. Within the networks, core risks can be identified, which are central to a specific risk discourse and are characterized by strong interconnections with other risks and opportunities.

Study area, data, and methods

Studies of transhumance farming are scarce for the European Alps (eg Groier 1990; Jeschke 2012) and almost nonexistent for Switzerland. One of the reports is the documentary *Bergauf, Bergab* (Haldimann 2008). There is no official record of how many transhumance farms exist in Switzerland or which land is worked in a transhumance system at the national level (oral communication, 19 June 2012, Swiss Federal Statistical Office) or at the cantonal level. Instead, transhumance farmers have to define one agricultural zone as their principal residence for legal purposes. Only the Canton of Uri was able to provide more specific information: 11–12% of its farms are transhumance farms (oral communication, 3 May 2012, extension service of the Canton of Uri). Transhumance farming does exist in other Swiss mountain cantons as well, although to a lesser extent.

Figure 1 shows the location of the farms of our sample in different cantons in the mountain region of eastern Switzerland (8.1–9.5°E and 46.5–47.1°N). The farms in this region concentrate mainly on animal production, in which dairy and cattle breeding dominate. Diversification is restricted because of climate and topography. The average farm size in Switzerland is 19 hectares (ha); in the study region, however, it ranges from 11.1 ha in Uri to 17.8 ha in Glarus. Only in Grisons are farms significantly larger, with an average of 22.2 ha (BFS 2014). To make a living, mountain farms depend on payments from the state, which provide on average 39% of their total turnover (in contrast to only 18% in valleys and 24% in hilly areas) (BLW 2014: 53). Thus, regulatory changes have a considerable impact on mountain farm incomes. The cantons also vary in economic, social, cultural, and political terms and thus provide different frameworks for the practice of transhumance.

To find transhumance farms in different cantons and compose our sample, we used personal networks and asked participating farmers and experts to recommend additional interviewees (the snowball principle). From these contacts we tried to select the greatest possible variety of transhumance farms and farm members, choosing farms that varied in farm structure and family situation (Table 1).

Because of the scarcity of data and the exploratory character of our study, a purely qualitative approach was adopted. Semistructured interviews ($n = 19$) and group discussions ($n = 2$) were conducted in 2012 and 2013. In the interviews we explored farm history as well as the families' present situation, future expectations, and transhumance practices (omitting the word "risk" to avoid bias). The semistructured form allowed interviewees to

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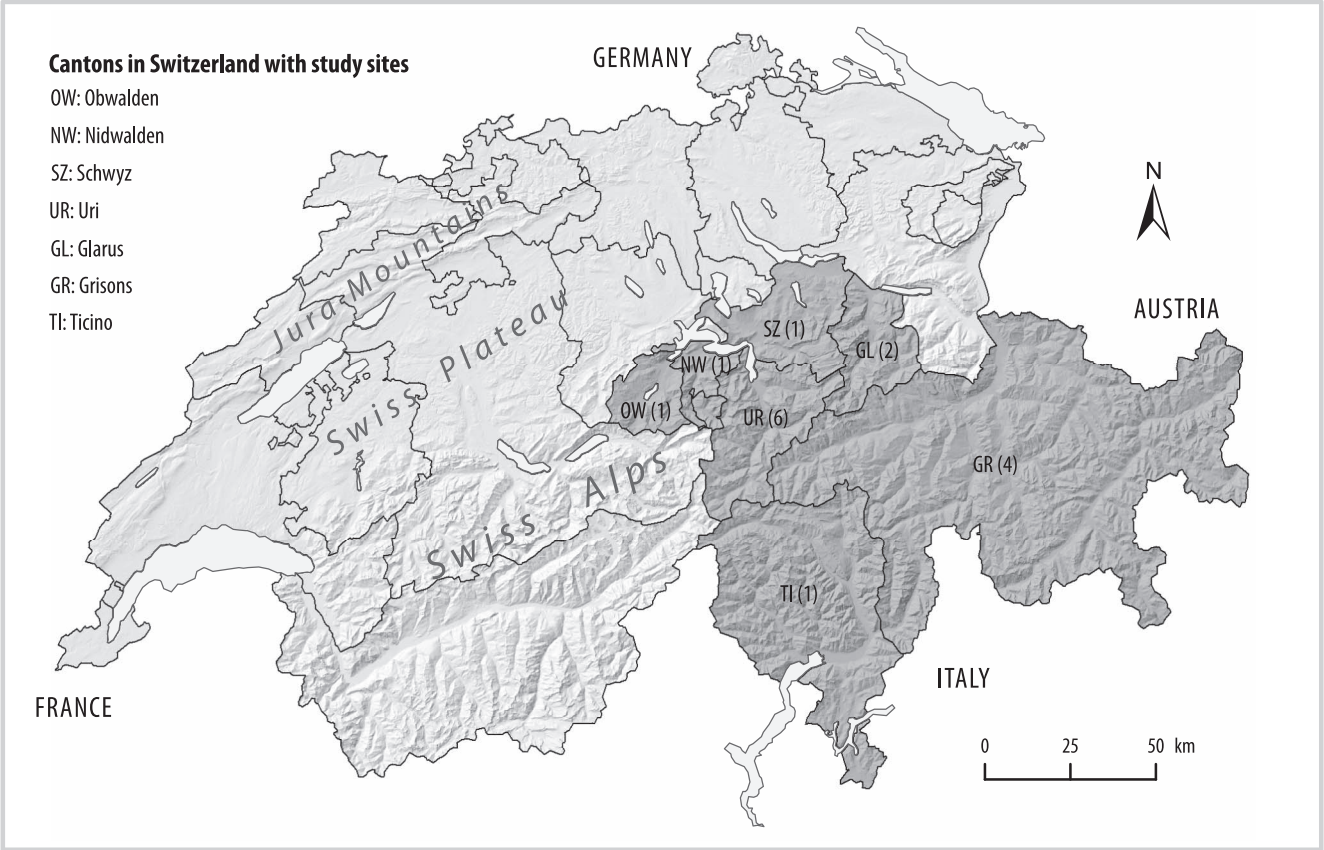
FIGURE 1 Cantonal location of interviews with transhumance farmers, with the number of farms visited per canton. (Map by Ephraim Camenzind and Matthias Fries, based on Swisstopo data)



describe their risk networks, showing the connections between risks and the quality of those connections.

The interviews were conducted in Swiss German; all quotations in this paper have been translated by the authors. The interviews and the focus group discussions were transcribed and coded with help of software for qualitative analysis (ATLAS.ti). The coding was inductive and organized on the basis of grounded theory (Glaser and Strauss 1967; Kelle 2005; Mey and Mruck 2007). To understand the risks and their importance in the context in which they were brought up in the interviews, participants' risk perceptions were assessed through a continuous process of (re)defining the codes for risks. In a first step, each interview was analyzed separately in terms of the risk networks mentioned: which risks and opportunities were perceived by the interviewees, whether and how they linked to each other, which risks were considered crucial or "core" risks, and what the reasons for and consequences of farm practices were. In a second step, the resulting risk networks were compared, and common tendencies concerning links between the risks were identified and examined by alternating between the single networks, the results, and the literature.

The development of transhumance farming as a special form of alpine farming

Transhumance farming has a long history in Switzerland (Brändli 1986; Furrer 2012). It has increased since the 13th century, because of structural measures for the intensification of agriculture (Brändli 1986). At that time, a transhumance farm was perceived to be much more adapted than the common small extensive livestock farming with partly seminomadic characteristics (Brändli 1986: 63). The vertical structure of the mountain farms had crucial advantages as it allowed optimal use of farm labor, land, livestock, and the different vegetation zones (Niederer 1996; Egli 2014). Moreover, it was often the only way for farmers to survive when adjacent land was scarce. Natural conditions (eg microclimates) as well as political conditions influenced the farms' transhumance structures (Bätzing 2003).

In addition to economic and social development, it is important to take into account ideology, which influences political actions and in this sense has been crucial for the development of the framework in which transhumance farms have operated. Two topics are of particular importance: the image of the mountains (Rudaz and

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TABLE 1 Characteristics of interviewees and their farms.

Interviewees	
Total number	**44**
Women	21
Men	23
Aged 15 to 35	7
Aged 36 to 65	33
Aged 66 and older	4
Previous farmers	4
Current farmers	26
(Potential) future farmers	9
Experts in public administration, politics, extension services, or research	5
Farms	
Total number	16
Farm size	7–40 ha
Number of altitude levels	2–4
Number of houses (accommodations)	2–4
Number of farm buildings	2–8
Number of relocations per year	2–12
Number of household members living on the farm	2–6

Debarbieux 2014) and the dialectical relationship between the state and the farming population (Bardsley and Bardsley 2014).

During the 18th and 19th centuries, the mountains became a central object of romanticism; this led to tourism, which brought new income-generating activities to several parts of the Alps. In Switzerland, in contrast to other countries, the mountains played a crucial role that went far beyond their economic importance: they were the focus of legal questions, political debates, and communication strategies and came to play an important role in the self-conception of the Swiss population (Rudaz and Debarbieux 2014).

Particularly in troublesome times, the mythos of the mountain inhabitants as the founders of the Swiss state was used as a strong unifying element, coming to a peak during World War II (Bardsley and Bardsley 2014; Rudaz and Debarbieux 2014). At that time, mountain farmers were considered particularly important for both food security and the Swiss identity. Following the principle of nationwide solidarity, political interventions were undertaken (eg economic support and infrastructure) to improve mountain farmers' difficult living conditions. A rather paternalistic perception of mountain famers as needing protection and support coexisted with a tendency to glorify them.

Nowadays, however, farmers are not merely considered disadvantaged recipients of financial support. Financial contributions, for example in the form of direct payments or loans, are provided for farm activities that serve a greater good, such as preservation of cultural landscapes, peripheral settlement (ie housing and workplaces in rural regions, located at a considerable distance from larger settlements or centers), and protection from natural hazards (Dudda 2012; Bardsley and Bardsley 2014).

The interplay of these different ideas and images has, however, led to tensions; the particularities of the mountain areas and their inhabitants are increasingly questioned, and the principle of solidarity is opposed with arguments of cost efficiency and competitiveness. Mountain farms, and particularly transhumance farms, produce at high cost (Durgiai et al 2008; Amt für Landwirtschaft Uri 2012). Their potential for optimization through expansion or increased production is small because of limited availability of fodder, land, and labor (Durgiai et al 2008; Egger and Gautschi 2012).

Transhumance farms have to conform with the same legal regulations (eg regarding animal welfare) and conditions for participation in government programs as other farms, but at multiple farming sites (eg Das

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Schweizer Parlament 2009). This can be a considerable financial challenge. Under the new agricultural policy for 2014–2017, there has been a shift from basing government assistance (entitled "direct payments" in Switzerland) on production to basing it on land area (Mann and Lanz 2013; Straub 2014). Therefore, mountain farms receive less payment because of their often small area. At the same time, however, the working of remote, often steep land that cannot be farmed with machines is valued and recompensed even more than previously (BLW 2013).

Infrastructure projects, particularly road construction, can conflict with values related to the conservation of nature (see Alpinforum 2012). From a conservationist point of view, roads may disrupt a beautiful landscape, whereas for transhumance farmers, they represent progress and production.

A view from inside: farm histories and perceptions of risks

Transhumance farm families' narratives offer insights into past and current risk perceptions and responses to them. In the section below, general observations are illustrated with quotations from transhumant farmers who participated in the study.

Stories of adaptation

Analysis of the farm histories reveals how the transhumance farms in our sample have developed. These farm histories were not necessarily characterized by a long tradition within the family but showed a high diversity in property patterns. Land tenure was shaped by the scarcity of land, which has been a common phenomenon across generations. The starting point was often a rather remote farm and a farmer who sought to improve its structure. By acquiring land as close as possible to a village, farmers sought access to better opportunities for their children:

> *And this land here, my grandfather bought it for a good reason, so that when the new generation needed to go to work down in the valley, they would not need to come back up to 1200 m [at night]* (female farmer).

Transhumance farmers bought land when it was available and affordable, keeping in mind the needs of the next generation, and sold it when necessary to meet financial needs or help relatives. It was mostly land that was difficult to work on, steep, and without access to roads. When farmers had too much land to work on themselves or land that was situated unfavorably, they sometimes leased it out. Availability of land and the building up of new transhumance farms has also been influenced by inheritance and family history. Some family members could not inherit land because of their position in the line of heirs (depending on the region, the oldest or the youngest generally inherited the farm):

> *Seven boys, and all of them were interested in working on the farm … We had a lot of leasehold and not much property … I went to work as a carpenter for four and a half years. But I always wanted to farm. That is where my roots are. I was not happy as a carpenter.* (male farmer)

Others inherited, for example, an uncle's mountain farm and enlarged it with land and farm buildings at another altitude, leading to a new (mostly transhumance) farm. Buying land, regardless of whether it adjoined an existing property, was a chance to make a living on a farm.

> *I think a transhumance farm was thought to be economical for a long time; you moved, you lived there, you lived with animals, and somehow there was a payoff. If you would have seen another way of farming economically, you would have done it differently* (female farmer).

The interviewees stated clearly that their commitment was to farming in general, not necessarily to transhumance farming. They were proud of what they were able to build up over time and of their living standard, which improved little by little at each altitude level, including adoption of technological innovations (eg washing machines and hay blowers). Transhumance was an opportunity to farm despite the prevailing land tenure and heritage system.

Three core risks

Each interviewee described a different network of risks, opportunities, and the links between them. Comparing these individual networks, we found 3 frequently occurring core risks: lack of family members to do the farm work, heavy workloads, and changing social and cultural values. These core risks are linked to each other and also show strong links to other nodes in the risk networks (Figure 2). Thus, a change in one of them might lead to crucial changes in other risks and opportunities. It is beyond the scope of this paper to explain the full risk network in detail. Therefore, the following discussion focuses on the 3 core risks and the most important interconnections.

Lack of family labor: In the interviewees' eyes, collaboration among extended-family members and friends is particularly important on transhumance farms for the following reasons: (1) family members and friends are generally not paid with money, (2) access to workplaces is often difficult (eg when there is no road), and (3) the (often manual) work requires experience on the terrain and is too hard for many people who are not used to it.

Intergenerational interdependencies play a key role: the interviewed farmers expressed respect for the previous

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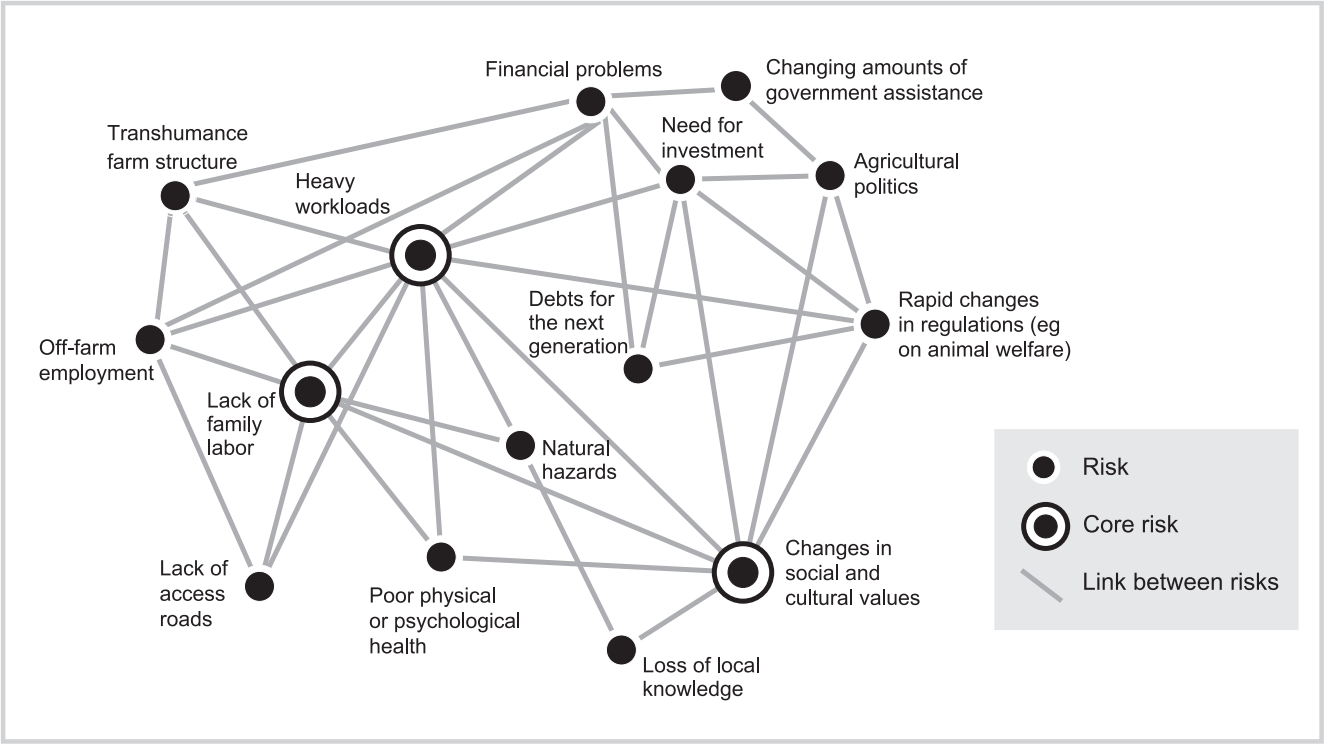
FIGURE 2 A typical transhumance farm risk network. (Figure by Christine Jurt)



farmers' work on the farm and the money that the latter had put into the farm in the past; the current farmers also acknowledged the previous ones' help after the latter had transferred the farm to them. Nevertheless, the current famers' wish to live their own lives and make their own decisions, which might not be in line with those of the previous farmers, can lead to conflicts. The previous farmers feel obliged to keep helping their successors as much as they can, particularly if they have an agreement in terms of a lifelong right to live on the farm (life estate). What can be a win–win situation can also be a very difficult situation, particularly when multiple generations live in the same household. Several interviewees, mostly women, said that the situation improved for everybody when different household factions lived apart, at different altitudes, even temporarily.

Despite such difficulties, there is a consciousness that mutual need is strong, and the collaboration within the family is linked to many expectations:

> *What causes concern for us … we have a lot of manual labor—how do we deal with the situation when our children start their apprenticeships or if they cut their own path? And then, [my husband's] parents and his sister get old, and this is what we have to think of, this is what frightens us.* (female farmer)

Many interviewees said they worried about a future lack of essential farm labor. They linked this risk to several further risks. Within the core family, reasons for not being able to help out were mainly advanced age, illness (including both physical and psychological illnesses, eg depression), and organizational aspects like education and employment. In this context, the link to another core risk, changes in social and cultural values (discussed further below), was crucial.

Heavy workloads: The farms participating in the study follow a rather traditional gender-based division of labor. Men's major area of responsibility is the stable, including taking care of livestock (mainly cows, sheep, and goats), and labor in the fields, whereas women are mostly responsible for housework, child and elder care, and the administrative work of the farm, and provide additional help on the farm (eg stable, field labor) whenever needed. During relocations, women face a particularly heavy workload: they organize the relocation, pack and unpack household and personal effects, clean the house after leaving, and arrange the household at the new site. Relocations are very time consuming:

> *There is more work on a transhumance farm, for sure … On Wednesday and Thursday we prepared the lower stable … On Friday we left; for at least 1 if not 2 days you go up again to clean the stable and the house. And so you have already lost 5 days for 1 relocation.* (female farmer)

Interviewees stated clearly that they have experienced an increase in workload during the last decades, including

administrative work, construction work to meet legal requirements, off-farm employment, and efforts to find additional workers during peak work times. Thinking of the future, they particularly fear further consequences of changing legal requirements, for example construction requirements to ensure animal welfare:

> *I must say, in fact, we are always at the limit. I think it is OK as long as the federal government doesn't disturb us with new laws* (female farmer).

The regulations must be fulfilled at the different altitude levels, which increases the financial burden. One way to keep the costs as low as possible is to do the work oneself, often with the support of friends:

> *I could do many things myself. Otherwise we would not have dared to attempt it [construction of a stable and renovation of the house at the upper level]. I would not have been able to pay for it. Never, and this was decisive for us. Otherwise, no, it would not have been possible.* (male farmer)

Organizing and feeding friends who help out increases the workload for women. Women are also the most likely to have off-farm jobs, because of their higher education levels and other practical issues:

> *He [the farmer] can't get away so much … If I go to work, I get a better salary and things are done really properly in the cowshed. He is the expert in the cowshed, not me. We have to face facts, he is the farmer* (female farmer).

Having an off-farm job or going to school means more time away from the farm. In earlier times, farmers bought land at lower levels thinking of facilitating such activities and improving the family's integration into the village and the wider society. Nowadays, though, the absence of family members can also bring serious risks for family relations, particularly marriages:

> *I think the problems start when one of the partners has to work off the farm … If the woman goes she may think that, well, maybe at least he did the dishes at home … she takes it for a certain amount of time … and then one day she has just had enough.* (female farmer)

The increasing workload is particularly perceived by the women. Their multiple responsibilities on a day-to-day basis as well as during relocations can become a big burden. Moreover, women tried to take over as much work from their partners as they could when they recognized the first signs of an excessive workload. Several interviewees mentioned hard work as particularly important for transhumance farms, but there was a strong tendency to see it as linked to the risk of both physical and mental illnesses. Farm histories have shown that many farm crises are due to physical and/or mental illness or occur after an accident or the death of a family member. Apart from the emotional challenge caused by such events, the remaining family members also have to deal with the sudden lack of work force and are often too burdened with their own heavy workloads to be able to replace the missing worker.

The strong tendency among interviewees to cite heavy workloads as a core risk was not due to structural reasons alone. Rather, they linked this problem to a third core risk, changing social and cultural values.

Changing social and cultural values: The fear of future changes in social and cultural values was expressed in many discussions of transhumance farms. Many interviewees saw a link between this issue and the lack of family labor. They emphasized that the people in their network were not at fault but that circumstances impeded spontaneous absences from work or other compromises to help on the farm. Some farm families with emergencies receive help from volunteers organized by nongovernmental organizations; in more than 70% of these cases, the volunteers support the women on the farm. Although this arrangement might help ease the workload, it also requires openness and work to host the volunteers and make them comfortable. Transhumance farming families have recognized that the volunteers are often seeking values that they believe have been lost because of social and cultural change and see a way of compensating for their help with nonmaterial values.

At the same time, the interviewed farmers stated that the changes in social and cultural values also have an impact on the (potential) future farming generations. There was a strong tendency to perceive young people as less willing to take over transhumance farms under present workloads and financial returns. Members of the younger generation are also exposed to other strong influences and might not wish to come back to the farm once they have seen other realities:

> *Today he has to go away for a farmer's apprenticeship or to take another profession … Then, the scales from the young people's eyes are removed. Here I work for only 5 days, and I get a good salary, and at home, the father moans that there is not more money to be made … Then the young farmer might not come back any more.* (female farmer)

At the same time, fear also exists concerning forthcoming farmers' futures if the latter decide to take over the farm:

> *Today, times have changed. In the earlier times there was nothing else. They used to be there and had always been there. And our generation, we are in between, a mixture … And what is coming, is different again* (male farmer).

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Changing social and cultural values are perceived to have a rather strong influence on other nodes in the risk network, including the behavior of different actors in politics and society but also in the families' social networks.

Conclusions

Transhumance farming is based on the concept of bringing the animals to the fodder and hence living and working at different altitudes. It represents a way of life that has developed and changed over generations. Even so, transhumant farmers' main objective is to make a living as a farmer. Transhumance farming in Switzerland has a history of adaptability. As early as the Middle Ages, it existed in different alpine valleys, and it has persisted and continued to develop to this day.

Many farms have adopted transhumance not just to continue with a traditional mode of production but rather as a strategy to adapt to changing circumstances. Getting access to land has always been very difficult, and land was bought at any altitude where it was available and affordable. This was not only a strategy for growth, but was always linked to thinking ahead for the following generation. Nowadays access to farm land is still very difficult, and the realignment of agricultural boundaries in small areas where structures have evolved over decades or even centuries is extremely complicated. Many people have shown a great attachment to their farms and their lifestyles, but many would rather reduce the number of relocations per year if easy access to the upper levels was given. Most of them also adapt the practice of transhumance to their family situation and emphasize their flexibility.

Transhumance farms have been more adaptive to the changing political, economic, and environmental conditions than other, more common types of farms. But because of this adaptability and their characteristics, they are increasingly pressured. As the analysis of the development of transhumance farming has shown, the formerly strong romanticization of mountain agriculture and mountain regions' perceived need for support is increasingly being questioned. Political discussions often focus on the precarious financial situation of transhumance farms. This argument is crucial in many cases and cannot be trivialized. At the same time, it has to be taken into account that the financial situations of the farms in this survey were as different as their structures. Also, the farmers' own interpretation of how much money is required for a good living might differ from that of outsiders. Formerly, transhumance was considered to be part of an optimization strategy and an opportunity in terms of production, labor force, and access to land and social life. Thus the practice of transhumance was economically as well as socially reasonable for mountain farmers within the field of controversial perceptions and images about mountains and agriculture.

Three core risks were perceived by transhumance farming families interviewed for this study: (1) lack of family labor, (2) heavy workloads, and (3) changes in social and cultural values. These core risks are strongly intertwined and influence transhumance farming families' practices and adaptation strategies. Focusing on these risk perceptions allows for in-depth knowledge of the challenges that transhumance farms have faced in the past and present, their coping and adaptation strategies, and their visions of the future.

Further studies are needed to evaluate the role transhumance farms play for society, for example maintaining the landscape and/or protecting it from natural hazards. This would contribute to acknowledging the families' work and to opening a public discussion about the development of mountain areas that goes beyond economic questions. This also emphasizes the need to systematically collect data on the land worked within a system of transhumance and its size and interconnectedness. Finally, it is necessary to discuss what transhumance farms are able and ready to do and under what economic, social, cultural, ecological, and political circumstances—taking into account the risks and opportunities that transhumance farmers perceive.

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