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When Bees Travel – Social and Economic Challenges of Chinese Transhumant Beekeepers

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When Bees Travel: Social and Economic Challenges of Chinese Transhumant Beekeepers

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随花夺蜜 (*suí huā duó mì*)

Following the flower to search for honey

(A popular saying to describe transhumant beekeeping)

Bee decline, beekeepers' concerns over the use of pesticides affecting colonies, rising honey prices, and dramatic perspectives on the future of humanity as a direct consequence of food production disturbance are topics frequently portrayed in the international media and social networks. Angry and desperate beekeepers are shown to defend their bees' health, their professional activities and their practices. Amongst the grievances heard in Europe, the unfair competition of imported honey puts even more pressure on an economic sector that struggles to survive under the current ecological upheavals. This is where China appears on stage. As the first producer and first exporter of honey in the world, China reduces other producers' competitiveness by lowering bee products' market prices and increasing many European beekeepers' difficulties in maintaining their activities. This could be seen as a classic scenario of the global economy, if only the quality of the traded products was comparable. Unfortunately for all concerned – local beekeepers, Chinese producers and international consumers – this is not always the case. Exported Chinese honey has become a well-covered and controversial topic that raises many questions. Yet, little is known about the practices of Chinese beekeepers. The beekeepers are assumingly taking responsibility for their production. Yet, their actual role is essentially mixed-up with that of traders of various bee products and conditioning companies.

This absence of knowledge about the producers of bee products is astonishing, considering that honey quality has become a matter of concern in the wake of national scandals. These scandals relate to food security and increasing consumer suspicion of processed food and natural products. While there is a growing body of scientific research on Chinese apiculture, the focus of this research is mainly on beekeeping techniques, bees' diseases, hive productivity and so forth. The work, role and voices of the main actors in this field, that is, the beekeepers themselves, do not receive sufficient attention. The beekeepers are rarely consulted, are absent from scientific discourse and, hence, are invisible.

This begs the question of why beekeepers in China are absent from the public and scientific debate on the quality of their production. In this paper, I address this question by focusing on the beekeepers and their daily life, practices and concerns. I am particularly interested in contributing to the knowledge about various beekeepers' communities in

China. I also examine these communities' position in relation to other Chinese social groups situated in the margins.

In this paper, I present the primary outcomes of my ongoing research on Chinese transhumant beekeepers. In the summer of 2017, I conducted seven weeks of exploratory fieldwork in northeast China provinces (Liaoning, Jilin, Heilongjiang and Inner Mongolia), formerly known as Manchuria, among both sedentary and transhumant beekeepers involved in commercial apiculture (figure 1). Based on discussions during participant observations with twelve experienced beekeepers, and interviews with business intermediaries, cooperative, traders, apitherapists and local dwellers, I draw here the outline of a general picture of beekeepers' organisation and the bee products commodity network in China. Furthermore, this paper offers an overview of the various perspectives for future research on a topic that has so far received little attention from social scientists.[1]

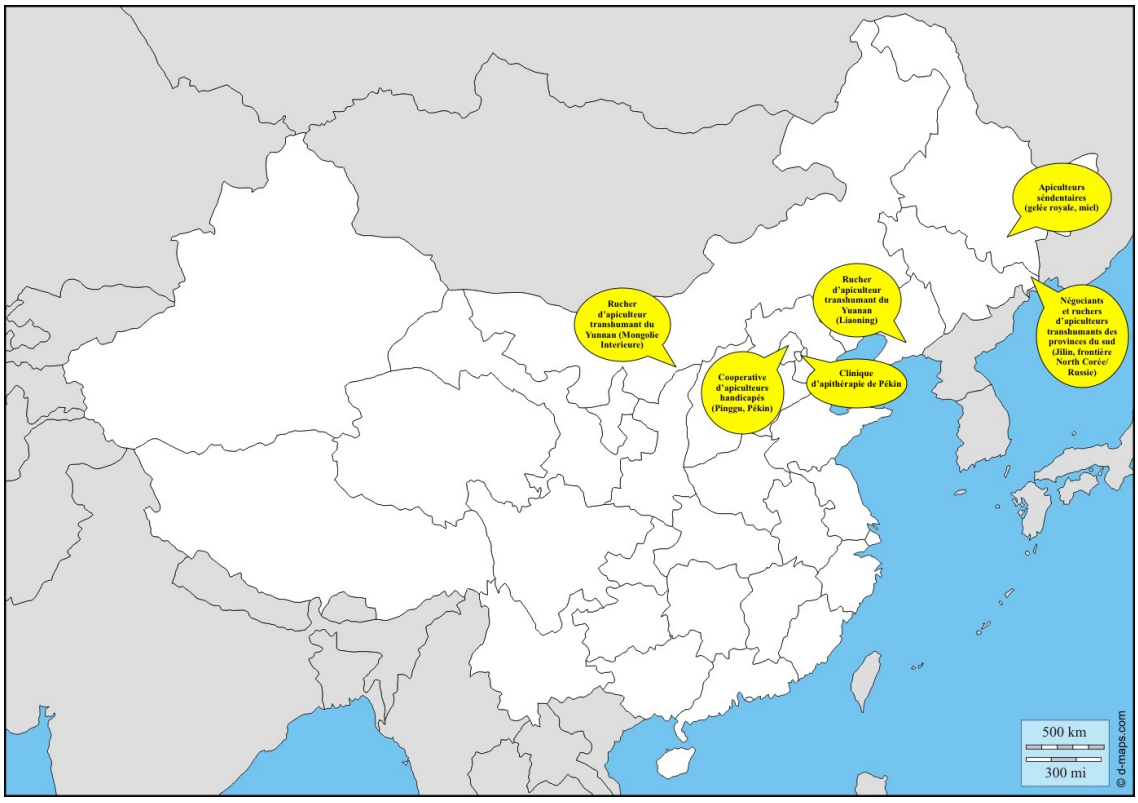

Figure 1: Fieldwork research sites in China

In this paper, I first provide background on beekeeping practices in the context of changing agriculture in post-reform China. I then offer a glance into beekeepers' lives and activities through the portrait of two professional transhumant beekeepers from Yunnan province. Based on these personal accounts and other field observations, I challenge some assumptions on Chinese apiculture and highlight the complexity of production conditions in this branch of agriculture. Finally, I review the main questions raised by beekeeping practices in China in relation to how they are intertwined with ecological concerns, the global

[1] The analysis of fieldwork materials presented in this paper is a work in progress. The arguments developed in this paper do not draw any conclusions on the state of beekeeping in China. This is an entirely new area open to investigation, and I am confident that there are many counter-examples to oppose this overview attempt.

economy and social issues. I argue that Chinese transhumant beekeepers' lives and activities are affected by, and point to, the core contradictions and issues faced by Chinese society. I also provide a rare perspective on the fragility of the link between nature and human societies in a country that faces an intense environmental crisis due to industrial pollution and intensive agriculture.

Bees, bee products and beekeeping in China

Honey has been used in Chinese food and traditional medicine for centuries. In ancient China, honey was preferred to cane sugar as a preservative for fruits (Sabban 1988), and, in some parts of the country, it is a common ingredient of local traditional cuisine. Honey, beeswax and bees themselves also have a long history of use in Chinese traditional medicine, having been identified as essential ingredients to cure various diseases (Lau 2012). Nevertheless, the overall consumption of bee products has remained limited, and honey has long been seen as a product with high nutritious and health value, for the consumption of the young and elderly mostly. This thinking has changed considerably over the past decades. Although still associated with precious food for special needs, honey consumption has now reached a broader spectrum of consumers. Improved living conditions in 21st-century China have influenced new food practices, especially in the wealthiest area, leading to rising popularity and demand for sweet and honey-based products and health food supplements. Moreover, Chinese medicine professional bodies and the Ministry of Health have recently recognised apitherapy as a form of acupuncture[2], attesting to its value and importance as an alternative way to treat classic and contemporary illnesses. This recognition by key authorities has resulted in an increasing demand for honey. How have Chinese bees and beekeepers responded to this growing demand, and how did Chinese honey eventually reach the international market?

To answer the question posed above, it is necessary to look at how beekeeping has developed over the past centuries in China, particularly its expansion into a large-scale business during the past two or three decades. As is the case in many countries, beekeeping has a long history in China. The scarce sources documenting the history of apiculture in China in pre-modern times all attest that beekeeping has been part of rural activities since at least the third century (Pattinson 2012; Lau 2012). However, as Pattinson (2012: 237) notes, there is "no way of knowing when bees were first captured and kept in some form in order to collect their honey and beeswax." It seems that, for centuries, beekeeping in China entailed collecting wild honey in the forest or keeping beehives made of hollowed logs in gardens and fields for private consumption – as is still the case in many parts of rural China today.

According to some Chinese sources (Feng 1990; Zheng et al. 2011), modern apiculture in China started with the importing of the European *Apis Mellifera* bee species in the late 19th century and early 20th century. Then, after the 1930s, Guangdong beekeepers adopted movable-frame hives for the endogenic specie *Apis Cerana*, which, in turn, contributed towards changing practices in beekeeping. Other sources provide more details about modern apiculture in China, especially concerning the introduction of the honeybee subspecies *Apis Mellifera Ligustica Spinola*, commonly known as the "Italian bee":

[2] In the year 2007 (Source: https://kknews.cc/health/m2e22x9.html).

> In 1913, China introduced the first batch of Italian bees [the Ligurian bee] to Fujian from Japan. It was introduced in large quantities in the 1920s and 30s. It is usually said that Chinese Italian bees are their descendants.[3]

The historical content of the above quote was confirmed in 2017 by several beekeepers who noted Fujian and Zhejiang province as the original sites where Italian bees (*yifeng*) were domesticated on a larger scale for honey production. This specie is now dominating the apiaries in China, impacting the survival of the main indigenous species, including the *Apis Cerana* described as more docile and resistant to diseases such as *varroa destructor*, but much less productive (Zheng et al. 2011; Yang 2005).

The labour of bees: beekeeping and agricultural transformation

The dominance of Italian bees in China should also be viewed in light of the modernisation and intensification of agriculture under Mao's regime (1949-1976). Bees not only provide valuable food and medicinal ingredients but are also crucial as pollinators in agriculture. Indeed, bees are one of the main and most efficient pollinating insects for crops productivity, meaning that fruit and vegetable harvests largely depend on their number and their well-being. From the 1950s, state farms, farm cooperatives, state-run apiaries and beekeeping cooperatives were well aware of the crucial role of bees. Accordingly, they started to breed colonies of European bees at a large scale (Crane 1960) to serve collective agriculture. The collected bee products were mainly exported, and their earnings were used to buy basic materials for China's construction. As Crane details (1960: 6): "In 1956, the Chinese People's Republic exported 3900 tons of honey and 354 tons of beeswax […] a ton of exported honey can provide 3.5 tons of sheet steel of 6 tons of fertilizer; a ton of beeswax provides enough currency to buy 8.5 tons of sheet steel."

Yet, the intensification of agriculture also required the extensive use of pesticides and fertilisers. These chemicals negatively impacted the natural environment and caused a weakening of the ecological system's balance. This imbalance led to the slow decline of various insect populations, including indispensable pollinators such as wild and domestic bees.

During the Mao era, all aspects of life were under the government's control, including how beekeepers could operate and benefit from their private businesses[4]. This gradually changed with the economic reforms starting in the 1980s and, amongst other matters, the de-collectivisation of land. With the distribution of land, individual farmer households were put in charge of cultivating crops to generate income. This structural transformation of the rural landscape did not solve peasant issues regarding pollination. Here lies the principal contradiction of the current situation: the development of agriculture needs pollinators. This need has increased across time, owing to various forms of intensive cultivation that have been developed to feed a growing population. Yet, at the same time, such intensive cultivation contributes to the extinction of pollinators.

This dilemma directly impacts current forms of beekeeping. New methods of beekeeping, especially mobile and cooperative, have emerged to address the decline of endemic pollinators. In particular, these methods involve "on-demand" beekeeping services that use

[3] https://baike.baidu.com/item/意大利蜂 (translation by the author, last consulted June 21, 2018)
[4] According to Chinese beekeepers and some sources, apiaries were collectivised during that period.

exogenous – efficient and resistant – species of bees. Beekeepers respond to the calls of farmers who seasonally need the pollinating skills of bees and are, in turn, paid for their services. This economic model has also been adopted by American professional beekeepers and has, as Tsing (1995: 126) noted, "intensified the commodification and transferability of bee labour", and transformed the relationship between beekeepers and the bees into a managerial kinship (Tsing 1995). While both farmers and beekeepers may gain from this organised 'natural service' provided by the bees, it is possibly detrimental to the bees themselves as they are likely to be exposed to chemicals used in the fields and greenhouses.

Owing to this negative outcome for bees and productive beekeeping, "on-demand" beekeeping tends to be increasingly less practised by experienced beekeepers. They are aware of the risk of losing their entire bee colonies to pollination and gaining no healthy honey in return. Too costly, too risky "on-demand" pollination is viewed as a method used by those who begin in the beekeeping business and are not well informed, or by those who have not made enough money within the honey trade and are seeking payback on their initial investment (bees swarm, new equipment, bee food supply and so forth). Overall, beekeeping is much more valued in China for its commercial potential than its utility to nature in general and agriculture in particular.

Interested by the commercial potential of beekeeping, sedentary beekeepers, who kept beehives as part of their agricultural activities and who used bee products for their community's consumption, have slowly emerged as professional beekeepers making their living out of their hives' production. The beekeepers optimise honey production by moving the hives from site to site in order to take advantage of the different types and times of blossoms that bees feed on. This practice is also known as transhumant beekeeping. The concept of transhumance refers to a "seasonal movement from one climatic zone to another [which] allows people to use beneficial aspects of their environment while avoiding some of its dangers", which thus serves "to safeguard the well-being of the animals and improve their productivity" (Salzman 2010a: 696).

According to oral history, commercial beekeepers from Zhejiang province were the first to start experimenting with transhumance beekeeping. In the early 1990s, the transhumant beekeepers moved within their provincial territories only. Later their mobility extended throughout the country – their success inspired and motivated beekeepers from other Chinese provinces to pursue a similar venture. Economic reforms implemented during this period facilitated this initiative because it encouraged entrepreneurship. Besides, new social policies allowed internal migration, allowing Chinese citizens the opportunity to enjoy more mobility and flexibility regarding their professional choices. As a result, an increasing number of beekeepers began to practice transhumance on a larger scale to produce honey and generate new income. This entrepreneurial pursuit contributed to the development of an economic model for commercial beekeeping across China.

Due to the new dynamic instilled into the apiculture sector, China became the first global producer and exporter of honey. To compete in the global market economy, Chinese beekeepers who practice transhumance have continuously learned to adjust their traditional practices. Chinese beekeeping has thus become an important economic matter. In its wake, a range of scientific studies has been conducted to find ways to improve the technical aspects of beekeeping and the performance of honeybees. Research centres have opened, and scientific publications have amply followed. However, despite their important role in the management of pollination, a process to which they contribute in full osmosis with the

rural environment, the beekeepers themselves represent an undocumented professional body in China who are rarely consulted for their views, knowledge, experience and concerns. Yet, the role of professional beekeepers is fundamental for two main reasons. First, the beekeepers' insight into the natural environment's condition, and its impact on honeybees' health, is irreplaceable. Second, how appropriate, efficient or problematic the practices of beekeepers are will directly affect the yield of Chinese crops, vegetables and fruits. Hence, as a marginal but crucial agricultural activity, beekeeping serves a dual role that reveals the dependency between humans and insects.

In light of the historical legacies of the Chinese beekeeping tradition, this paper focuses on contemporary professional beekeepers from various angles, using the following questions as guidance: How do transhumant beekeepers position themselves between beekeeping traditions and new technologies? How do they relate to farmers, villagers and sedentary beekeepers? What is the role of local cooperatives, industries and individuals who buy and process their production? How do they experience their natural environment, considering they live at the edge of fields and forests for an extended period each year?

The practice of transhumance: itineraries and life organisation

Although there are no official statistics on the number of transhumant beekeepers in China, beekeepers generally cite an estimated 40,000, while other sources mention 300,000.[5] Transhumant beekeepers live a nomadic life for most of the year. Usually originating from southern provinces, where wintertime is relatively short, and bee survival is easier to manage, beekeepers begin their early spring activities to coincide with the blossoming of spring flowers. In Yunnan, for instance, rapeseed blossoms symbolise this stage. Once these flowers wilt, others flourish elsewhere, and beekeepers move towards them. This pattern continues until the season changes, and the weather becomes warmer, allowing new species to blossom further north (figure 2).

[5] This figure was provided by a beekeeping instructor who works in a private cooperative in Beijing suburbs, citing official data.

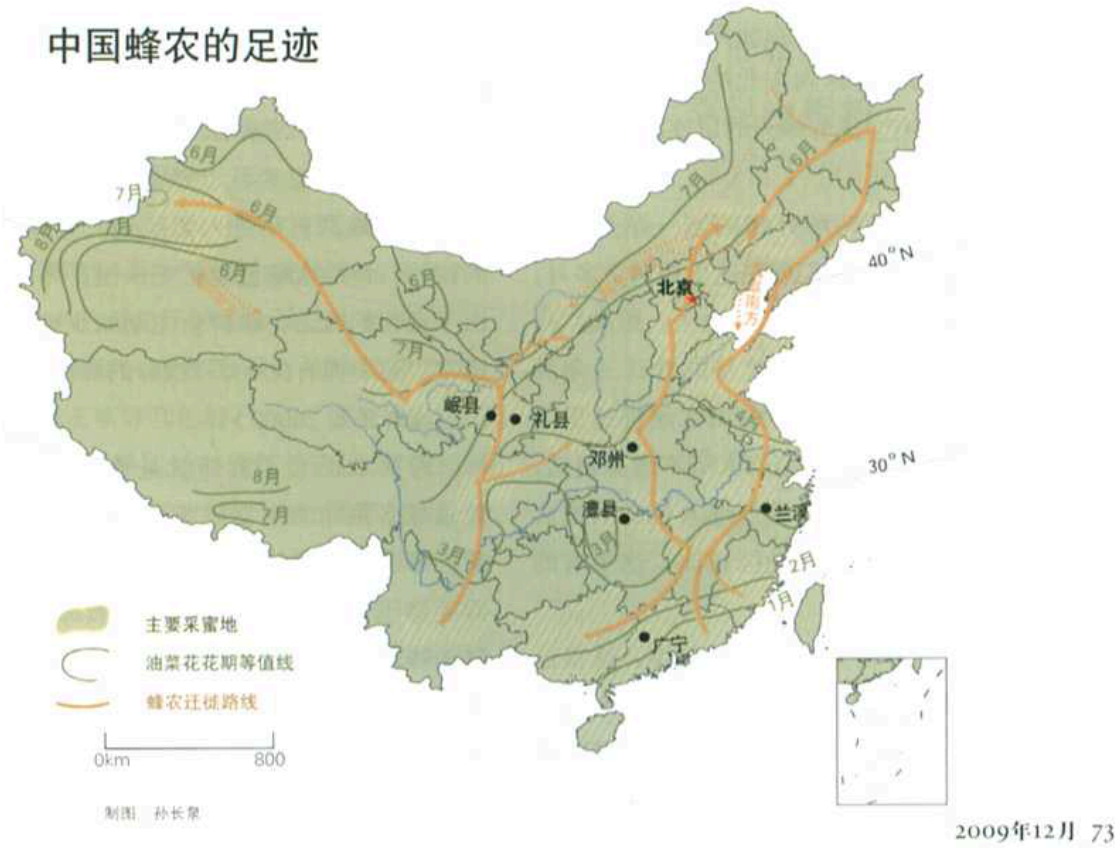

Figure 2: Beekeeping transhumance: some trajectories (Source: Cai (2009) *National Geographic*, Chinese edition)

Each year, several factors determine beekeepers' activities and the decisions they make regarding migratory trajectories. These factors include the state of the natural environment, regular and unusual seasonal changes, and climate contingencies that impact blossoms in an infinite variety of settings. Though most experienced beekeepers predominantly follow the same routes and directions, they must also adjust their schedule according to their colonies' conditions, the amount of provisional stock they can store, the price of certain types of honey on the national market (which regularly changes), their financial means (which, too, can fluctuate) and multiple other factors. In summer, beekeepers tend to gather in the northwest province of Xinjiang, where the variety of landscapes provide abundant resources for the bees, or in the northeast region of Manchuria, including Inner Mongolia, with its extended mountains and steppes. When the weather in these northern regions starts to cool, and when flowers slowly vanish, the beekeepers gradually return south, where their bees can enjoy rich and flourishing spaces. This transhumant movement continues until winter begins – around November-December (albeit depending on the provinces from which the beekeepers originate) – when the beekeepers reach home.

To ensure optimum conditions for their bees at each stage of migration, which includes sufficient wild or cultivated flowers and appropriate temperatures and weather, beekeepers need to move their apiary every few weeks to new abounding places. They travel thousands of kilometres yearly, carting up to 300 beehives on rented trucks, from one place to the next, together with essential items required to settle and ensure their security and basic comfort in any environment: a tent, a rudimentary bed, two or three boxes for clothes and blankets, kitchenette amenities, a few barrels to carry water and to stock personal

honey[6], beekeeping equipment, a motorcycle to travel to the nearest village to buy fresh food supplies and a dog to protect their apiary. In recent years, most beekeepers have improved their living conditions by investing in electric-solar-generators. These allow beekeepers to enjoy electric light and charge their cell-phone. Some also bought heat-protection tarpaulin to cover their tents, which can heat up to 40°C in summer. However, most beekeepers opt to carry the least equipment possible, due to the recurring nature of transhumance which requires dismantling the tent, packing the camp, preparing the apiary, loading the truck, taking to the road, travelling at night, unloading, unpacking, finding water and food resources, settling again and then leaving once more.

Beekeepers, together with their bees, settle on the side of roads, fields, orchards, and in flowered woods, steppes and valleys. These places are mostly isolated and barely seen from the main roads. Apiaries are often found in spaces linking wild or domesticated nature and human settlements. They are left to beekeepers, 'outsiders' who settle temporarily without getting much involved with either the surrounding environment or local people. Therefore, such spaces may be viewed as sites at the fringes of both Chinese society and territories. Yet, they are carefully chosen by beekeepers for pragmatic reasons that may remain obscure to ordinary people. They meet several criteria in addition to the availability and proximity of flowers and water sources (streams, ponds and lakes). They are mostly pieces of wasteland outside villages. They are routinely far enough from important populated areas to avoid bees' annoyance and maintain safety, yet close enough to villages and small towns to access food and water supply. They are always situated along tracks that are reachable by truck. Meanwhile, beekeepers' camps are inconspicuous to prevent any trouble with local residents and authorities. Places that bring together all of these elements are difficult to find. Only experienced beekeepers manage to sketch the right transhumance map to afford their activities the necessary conditions for success.

Yet, as people who "move around", beekeepers are also confronted with a certain stigma. Although most transhumant beekeepers belong to the Han main ethnic group, their lifestyles share some similarities with those of Tibetan, Tajik, Kazakh, Kirghiz and Mongol people who are traditionally engaged in nomadic pastoralism.[7] Within Chinese society, ethnic minorities, and particularly those involved in pastoralism, nomadism and transhumance, are seen as traditional and exotic, but also as leading a backward way of life that is somewhat out of place in a modern and technological world. Transhumant beekeeping is perceived through this same kind of condescending prism. While it is deemed as hard work, and somehow exotic and worthy of sympathy, transhumant beekeeping is not admired as a noble activity. Outsiders, as well as many beekeepers themselves, see transhumance as a labor dictated by economic pressure, family background or lack of other opportunities for rural inhabitants. Even those who find enjoyment and benefit from this occupation rarely articulate it spontaneously in favourable terms, referring to their work as a breadwinning occupation rather than a passion for 'mother nature', travel or even bees. To illustrate this, I will now focus on the personal and professional trajectories of two transhumant beekeepers.

[6] Beekeepers keep their best honey harvest for their personal use, for friends and for family back home.

[7] Nomadism is defined as a "movement of the residential social group in the course of regular social, economic, and political activities" (Salzman 2010b: 505). The term 'social group' does not apply to beekeepers because they generally move alone. Neither can transhumant beekeeping be seen as a form of seasonal pastoralism, as beekeepers are not "oriented toward producing for their own subsistence" (ibid.: 506), but produce only for the market.

Xiao Lei and Xiao Li: the experienced and the beginner

During my fieldwork in the summer of 2017, I met twelve transhumant beekeepers originating from several Chinese provinces who had followed various itineraries, starting in early spring. Here, I focus on Xiao Lei and Xiao Li because their views of life, beekeeping practices and experiences in transhumance are typical and disclose relevant and recurrent matters that concern most of their fellow transhumant beekeepers.

Xiao Lei

(August 2017, near Chaoyang, Jilin province. I joined his migration to Inner Mongolia.)

Xiao Lei, a short man in his forties, is a professional beekeeper. He has practised this arduous work for more than 20 years. Alone with his beehives, he has travelled all over China searching for the best spots every year to settle his camp and to provide his bees, to the best of his ability, the optimum conditions to produce honey. Xiao Lei comes from China's southwest Yunnan province. He is the second son of a large family. His parents were farmers and had five children to take care of, so he only attended primary school. Once an adult, and unable to find a job without proper professional knowledge or training, Xiao Lei nevertheless had to keep up with the historical upheavals that began to transform China in the early 1990s. China opened up and launched crucial economic reforms that encouraged people's mobility. Millions of Chinese youths travelled to large cities, and their endless construction sites, particularly on the east coast, and its special economic zones. There, the youth sought jobs in the burgeoning factory jungle. Meanwhile, millions of other entrepreneurs, with either the financial means or the spirit of innovation, started their own venture: they opened shops, created companies, invested in trendy market niches and so forth.

Figure 3: Xiao Lei checking his beehives upon his settlement after a 1200-kilometre trip from Chaoyang to Inner Mongolia (Credit: Grillot, August 2017)

In the 1990s, Xiao Lei joined this migratory movement. He combined both mobility and the pursuit of adventure by becoming a beekeeper, first as a sedentary beekeeper, then soon after as a transhumant. Xiao Lei originates from Luoping, a Yunnanese county known for its endless rapeseed fields that transform the landscape into golden scenery for tourists and newlyweds' pictures during early spring. Due to the need for pollinators in the fields, Luoping has many local beekeepers. Once Xiao Lei had acquired basic beekeeping skills with a local master in apiculture, he took his chance by exploring new environments and flowers. He learned how to make his way across the country, assisted by his easy temper and open-minded attitude towards local populations who hosted him in the many spots he temporarily settled. Xiao Lei learned through experience over the years, and, with time, earned his current reputation as an expert. Even though he spent most of his time on the roads, he married, had a first child and travelled with his wife. When his second child was born, Xiao Lei continued his transhumant beekeeping practices alone, leaving his family in Luoping while facing the hard life of providing a yearly income to support them.

A few years ago, when his third child was still in pre-school, Xiao Lei's wife abandoned the household. He unexpectedly became the sole, responsible parent of three young children living and schooled in Yunnan, while he was transhuming with his bees far afield. Since then, his children have resided with his parents, but as he says: "My parents are old and tired, they only feed my children who live with them, but they don't take over their education or their affective needs. I raise them, once a week, on the phone, we video-chat. They became very autonomous."

However, Xiao Lei takes full responsibility for his situation. Having become quite successful with his honey sales, he began to socialise with local gamers. He has been addicted to gambling for years – one of the reasons his wife left him – and he once lost all his savings in a single night. Years of diligence vanished with a few unlucky cards, forcing him to continue his demanding beekeeping activities at the time when he wished to return home to take care of his children. The economic pressure he previously felt is now worse as Xiao Lei is in debt to those who financially helped him after his card game loss. To help him during his yearly migration, Xiao Lei has now hired a worker, but this adds to his regular business costs. Xiao Lei has become an anxious man over the years, regularly worrying about the uncertain income he generates each season. He must also cope with the constant worry that, in addition to the unreliability of beekeeping, his worker might find being constantly on the move too difficult, and could leave him without support anywhere or anytime during his transhumance.

Despite his hardships being brought on mostly by habits unrelated to beekeeping, Xiao Lei's life account shares several commonalities with those of migrant workers, and particularly those of other beekeepers. Internal migration is the norm for millions of Chinese, particularly married men whose sense of responsibility towards their family requires them to leave and live far away from home whenever the opportunity to make money arises. Leaving their beloved behind, they come home only on rare occasions. However, key differences exist between transhumant beekeepers and migrant workers or entrepreneurs in terms of the direction they take and the uncertainties they face. Bees need blossoming flowers and sunny places to find nectar and pollen to feed themselves and produce the honey they are bred for. Because of this, beekeepers head to the fields, forests, steppes, orchards and other places further inland where rural migrants purposefully leave in order to seek better opportunities elsewhere. Following seasons and plant rhythms can be more hazardous than

being dependant on factory bosses. Suffering from the effects of climate change on the environment can be more challenging than enduring low payment policies and unpredictable unemployment in crowded cities. Beekeepers might spend almost a year in transhumance and return home in winter without any savings because their earnings did not offset the high costs of their transhumant activities. Bad weather, loss of colonies and wrong decisions in terms of techniques or itinerary, lead to the low performance of bees and insufficient honey, in addition to low selling prices on the bee products' market. Unpredictability renders beekeepers more vulnerable than many rural migrants who become workers.

Despite the adversity he faces, Xiao Lei nevertheless knows that he can rely on his network. They are other beekeepers from Yunnan, who occupy spots in the various areas he temporarily settles throughout his months of migratory movement. As a professional with twenty years of experience in the business, Xiao Lei has not only earned respect and a strong reputation for his beekeeping skills, including his intuition for finding good spots in many regions he has previously stayed, but he also inspires a new generation with even more economic ambition and who seek success more quickly.

Xiao Li

(July 2017, near Chaoyang, Jilin province)

Xiao Li represents this new generation of young beekeepers. He is patient with his bees and eager to move fast in life. Born in 1991, he is a motivated beekeeper and owner of 220 beautiful beehives in good shape – unlike Xiao Lei's dark beehives. Xiao Li learned beekeeping from an elder in his hometown near Luoping when he was 16 years old. After a few months of practising on the masters' sedentary apiary, Xiao Li followed him to Hubei for his first transhumance experience before returning to Luoping. A year and a half later (in 2008), and barely an adult, Xiao Li decided to leave his home town by himself, taking his newly bought beehives with him. Although he sometimes feels lonely, his time is occupied by caring for his apiary. He is also regularly joined by Lili, his 24-year-old girlfriend, who visits during her university holidays. The pair have been sweethearts since high school, yet they have different perspectives for the future. First, their relationship was barely accepted by Lili's parents, who view beekeeping as a low status and economically unstable profession. From their viewpoint, Xiao Li will never be able to afford their precious daughter because he owns neither his own car or house (two conditions, together with sufficient income, required to get married in contemporary China). Nevertheless, Lili spends her summers with Xiao Li and experiences life in transhumance with him, helping whenever necessary and learning from this "school of life." She understands Xiao Li's interest in beekeeping and, along with her parents, acknowledges his growing success: he recently managed to buy her a new car. However, she also knows the difficulties of the work and doubts the consistency of Xiao Li's current luck. She knows that marrying him would mean staying home alone for much of the year since she will soon graduate and has already secured a position in a company in Kunming (Yunnan province's capital). She rejects the idea of a future in which they spend much of the year apart. Xiao Li is torn between his determination to improve his beekeeping skills to secure his income, regardless of contingencies, and the prospect of living a 'normal' family life with his partner in Yunnan.[8]

[8] They got married a few months later, in November 2017. Xiao Li is still a transhumant beekeeper. I have not followed up with how the couple has arranged their marriage life.

Figure 4: Xiao Li settled his camp (apiary and tents) in a disused courtyard of a village in Liaoning (Credit: Grillot, July 2017)

Xiao Li pursued the beekeeping profession because he did not believe he could do anything else. He did not know whether he could make money with beekeeping. Although he feels more self-confident about it now, he only plans to remain in this sector up to his forties, at which point he will choose another job. When asked if he would choose another activity were he given the chance, Xiao Li responded that he would not hesitate for a second to trade his current life for a more promising one. Like many other beekeepers I met in China during this project, Xiao Li was not driven by a passion for apiculture but rather a desire for mobility and a taste for autonomy, or 'freedom' as many beekeepers name it. Xiao Li does not want to have a boss or manager. Hence, he would prefer his delicate bees and the uncertainties that the natural environment brings. Despite the challenges, he has learned to enjoy beekeeping, and to interact with his bees; he knows them and can predict their temper. Yet, he is demanding and uses techniques[9] that sufficiently stimulate their activities to allow their honey, under ideal conditions, to be collected every few days.

Xiao Li belongs to a generation born and raised during China's economic and commercial development, under the reign of money and the axiom of success as a standard life ambition. He is lucid and pragmatic, as well as aware of his social position:

> People from poor and disadvantaged places envy us because we make money with our activity; we're seen as successful migrants. But people from richer places despise us for we chose a physically demanding job and live in harsh conditions. People's perspectives

[9] In this paper, I will not describe in detail the various techniques used by transhumant beekeepers in China; I leave this aspect for other publications that will hopefully benefit from additional fieldwork materials.

> depend on their own situation; they compare so to assess whether or not we deserve respect.

Xiao Lei, Xiao Li and their fellow beekeepers from all over China live a rudimentary lifestyle and sometimes endure physical hardship in relative loneliness in order to generate decent incomes and provide for their families' needs. On a daily basis, though, beekeepers' main concerns are making sure that their bees remain healthy, that the queens lay lots of eggs in the honeycombs, and that the working bees collect enough pollen and nectar to produce plenty of honey in the prospect of regular and abundant harvests. This stands as the main purpose of their work: namely, selling the most possible honey to wholesalers who act as their local business partners. Commercial collaboration remains necessary and leads to various forms of pressure and interdependence, a key point rarely mentioned in critical perspectives on Chinese honey production and quality.

Logistics of transhumance: communications and networks

Thousands of Chinese beekeepers travel thousands of kilometres every year to offer their honeybees the finest flowers and the perfect weather conditions, and to seek the best commercial deals for their 'yellow gold'. Despite the hardships and difficulties, beekeepers claim to enjoy the freedom and autonomy that no other work would provide them, particularly given their low qualifications. However, despite being far from urban chaos, do transhumant beekeepers really enjoy the freedom and autonomy that they claim? A closer look at their actual working organisation, and the logistics they implement to run their activities and transhumance, challenges the relevance and accuracy of the terms 'free' and 'autonomous' to best describe transhumant beekeepers in rural China. Indeed, their life and activities are very much intertwined with those of various partners and associates.

As mentioned above, beekeepers heavily rely on their network. The network's assistance is required to find good spots, negotiate with local authorities and villagers the right to occupy a given site, sell honey production, rent trucks and hire workers to load and download beehives and camp equipment every few weeks. As outsiders in the many places they temporarily stay, beekeepers cannot properly organise their transhumance without the assistance and security of local middlemen. These middlemen have the necessary connections and can, on behalf of beekeepers, efficiently deal with all logistical matters against the payment of a service fee. Based on mutual trust, the relationship between these commercial partners is nevertheless sometimes tense. The relationship needs to be continuously maintained, reassured and reinforced to sustain long-term collaboration so that beekeepers can make a living. Yet, their mutual dependency is generally at the advantage of services providers, intermediaries and honey wholesalers who set prices, delivery conditions and determine timeframes. Furthermore, since local collaborators bring personal connections, they have the power to assist and hinder beekeepers' agendas in the event of issues in respecting original commercial arrangements.

Figure 5: A beekeeper (on the right) gets ready to dismantle his settlement while buyers, intermediaries and workers deal with his honey barrels (Credit: Grillot, July 2017)

Even when relationships with wholesalers and middlemen are smooth and productive when solving logistical matters, beekeepers must nonetheless rely on their professional network for other non-wholesaler specific aspects of their work. As is the case for most professions in China, beekeeping necessitates informal belongingness to a network. Such belongingness, in the context of internal migration, is strongly related to people's regional identity. For instance, during his transhumant endeavours, Xiao Lei is connected with other beekeepers from Yunnan who stay in the same area as him at the same time. These people are his *lǎoxiāng* (native fellows). Living a life of isolation in unfamiliar places is compensated with the existence of beekeepers' networks, particularly those that are regionally connected. Here, the smartphone's role has become central to beekeepers and their way of life: they are constantly and mutually forwarding, receiving and checking the latest news, which sustains their activities and social life. They may ask their fellows, who arrived earlier in a given area, about the conditions (weather, flowers, settlements and so forth), or they may reconfirm the information their local partners have provided to ensure that their journey will be worth the effort. This claimed solidarity takes concrete effect when two persons (a beekeeper and his wife or assistant) need help to perform a specific task. For instance, moving involves hours of hard work that can be done more efficiently with other beekeepers. When one beekeeper sets off and then settles in a new location, he will call his fellows on duty rather than asking locals for help, hence avoiding the cost and risk of hiring inexperienced workers. While daily routines of beekeeping can be handled alone, other crucial steps may require external workers, such as for treating the bees, visiting hives upon arrival and conducting large honey extraction. Gathering for an specific purpose also offers the opportunity to strengthen existing relationships between beekeepers and create new links. During gatherings, beekeepers share a large meal and delicacies they have brought from their hometown. They also exchange the latest news, seek advice, make decisions or take

actions, inform each other about "good spots" or "bad luck", recommend commercial partners, lend or borrow money or tools, and so forth.

To conduct their activities beekeepers, like other migrant workers, pay a heavy price: scattered families, reliance on faraway siblings and parents, extended absences, boredom, emotional loneliness, frugality and debt. Most of the time, they must also cope with potential adversity at the local level without legal back-up or professional protection.[10] In this particular context, social networks, both virtual and tangible, provide beekeepers the insurance that their 'freedom' includes the safety net of a community linked by common interests.

Honey's production: from honeycomb to supermarket containers

Since most honey production is intended for wholesale, beekeepers need to cooperate with professional traders who buy and deal their honey at each step of the transhumance. Usually, the process starts with the beekeeper calling a wholesaler from the region he plans to visit next and whom he may already know or has been introduced to by another beekeeper or business associate, before leaving his camp. He informs the trader about his arrival date and the spot where he will establish his apiary – his next camp. Upon the beekeeper's arrival, the wholesaler will meet him, negotiate the amount of honey he expects to receive and sell, inform him of the current market price, and bring him the relevant number of empty barrels (90 kilograms capacity each) for honey storage. Once the specific blossom season comes to an end, the beekeeper informs the wholesaler (who may also regularly visit the apiary) of the size of his harvest and states his intention to leave. The trader then visits the beekeeper, checks the quality of honey that has been produced (its taste and humidity level) and its quantity, and pays the due amount to the beekeeper according to their original agreement. The wholesaler then takes the full (and the remaining empty) barrels to his factory for storage, treatment, packaging and so forth. As soon as the wholesaler and his truck leave the beekeeper and his camp, the beekeeper is no longer in control of what happens with the honey.

Indeed, this next step, invisible to the eye of beekeepers and honey consumers, is the most secretive part of the production chain. At this stage, honey may be altered by various factors that might change its quality in terms of taste, nutrition and hygiene. Such factors include: storage conditions before the honey is processed, dehumidification, the possible addition of substances, the blending of different types of honey, shipping conditions to retailers and the quality of packaging, on which precise information of the honey's origin might not be provided to national consumers or foreign traders. Consequently, foreign traders might, in turn, process the honey bought in China, blend it with other stocks and distribute it in their own market. Hence, given the number of intermediary steps and persons involved, it is difficult to trace the precise origin of the honey, and the full process of production, before it arrives as 'pure' honey in consumers' hands or industrial processed-food ingredients.

When I spoke with Chinese beekeepers about transparency in the honey supply chain, they tended to abrogate their responsibility for the final product consumed in China, except when it was bought directly from their apiary site. Most expressed some suspicion over the

[10] When the Chinese central government creates measures to protect beekeepers and help their activities, through the State Forestry and Grassland Administration that manages their profession, corruption at the top-down scale complicates their implementation.

honey sold in supermarkets and noted they would not consume it themselves. To understand the beekeepers' detachment from the final product, despite their hardships and efforts in producing it, it is necessary to examine the actual process of honey production, from the honeycomb of the beehive to the –ready to buy– plastic container.

Temporality in honey production

Time is a key element in honey production. In optimum conditions, honeybees produce their precious gold within weeks. It takes days to process each step: to first collect pollen and nectar, to store the honey (nectar and enzymes) into comb cells, to then ventilate the cells to reduce the moisture level through evaporation, and to eventually cap the cells with wax once they reach the perfect temperature and humidity level. It takes considerable time to find enough of these capped cells on the honeycombs of each beehive of an apiary, which indicate the appropriate time for extraction. A beekeeper must regularly inspect the hives and ensure that the bees are slowly filling up the cells, representing their food reserves. Once the reserves of ripened honey reach an appropriate quantity, the beekeeper proceeds with the harvest. First, he lifts each heavy frame from a hive and takes them to a laboratory where he proceed with extraction, away from the bees: he removes the capped cells with a special uncapping knife, and extracts the precious liquid from the now opened cells using an extractor. After putting back the frames into the hive, the beekeeper then moves on to the next hive, and so on, all the while ensuring that the bees are not overly disturbed by his presence. Hours later, the beekeeper allows the bees to carry on with their various activities. Slowly, depending on flower abundance, outside temperature and climate conditions, bees will fill the frames once more with new honey. However, Chinese beekeeper practices show that beekeeper time management differ from this 'natural rhythm' of bee honey production.

Although humans cannot accelerate the honey production process, they can decide when to interrupt it. Making a living is the main concern for Chinese beekeepers, and this requires selling as much honey as possible. The beekeepers also sell wax and propolis, but this represents a tiny proportion of their income. Some also engage in producing royal jelly, but this is a very demanding task that requires them to stay in one place long enough to justify the additional effort. Therefore, the number of barrels they will sell will determine their economic survival. This is the first reason why waiting weeks for the bees to prepare a proper harvest is not possible; natural temporality contradicts the necessity to fill as many barrels as possible in a short time. The second reason relates to a logistical constraint; beekeepers must harvest and sell their honey production *before* moving to another location. They cannot leave with full barrels, because previously agreed arrangements with local wholesalers dictate that they sell their seasonal production before their departure. Furthermore, they cannot transport beehives full of honey either, because they are too heavy and because each honey harvest must remain monofloral to be sold at a fair price. Moving to another location with full honey reserves inside the hives would mean that once the bees arrived, they would gather pollen from a different type of flower and produce blended honey with little market value.

On the other hand, flower seasons cannot be controlled. Once a specific flower flourishes in a particular area, beekeepers must immediately travel to that place to provide their honeybees with the best blossoms. Hence, beekeepers are caught between blossom cycles, and the constraining need to sell their production before departure. Acting according to "timeless irrelevance in bee-labour management plans," as Tsing (1995: 126) articulates,

beekeepers have no choice but to extract honey from the hives as soon as the liquid is stored in the cells, even if this means the honey has not reached its maturity. Thus, in the high seasons (spring and summer), beekeepers carry on the harvest operation once every few days, creating a discrepancy between 'natural' and 'production' temporalities.

Besides the possibility to circumvent beekeepers' logistical constraints, the other advantage of operating in such a way is to save work force. Harvesting mature honey implies cutting the cells' wax first. This is a very time-consuming task especially when one person repeats the same movements on each of 4-6 honeycombs in the two to three hundred beehives. In addition, because there is no closed space for honey harvesting within the apiary area, a transhumant beekeeper must use a mobile manual extractor right at the foot of each hive. This way of honey extraction saves movement and time, but also entails the risk of being surrounded by agitated bees.[11] The beekeeper must move fast but calm in order to avoid becoming too much of a disturbance to the colony. The result of this human temporality-based routine is that a large proportion of the honey produced on migrating apiaries is not fully ripened and does not fulfil the scientific standards of 'proper' honey. This 'honey' is generally too high in moisture and, hence, its consistency is too liquid. Further, it does not contain nutritional elements, encourages fermentation and is consistent with syrup's quality.[12] Chinese beekeepers, although aware of the low quality of such product, explain that most Chinese wholesalers offer the same price per kilo whether the honey is ripe (*chéngshú mì*) or not (*shuǐ mì*), as long as it qualifies as monofloral. "So why the bother?" questions Master Wang, who has been practising beekeeping for nearly thirty years.

Professional ethics

The "temporal interactions of bees and keepers – efforts to negotiate, manage, coordinate as part of keepers' aims to find resonance," (Phillips 2020: 9) seems to be very much pragmatised here. Embarking on their quest for productivity, Chinese commercial beekeepers seem to minimise the special connection they have with their bees. Honeybees are their labour force. The queen bees must be highly fertile. Once inseminated, a healthy queen can live and continuously lay larvae for more than two years, her fertility rate slowly decreasing as she ages. According to Chinese beekeepers' accounts, queens are often replaced after two to three months when they start to show signs of weakness. Performance remains the priority for queen bees and is the deciding factor in their life duration. Similar discourse emerges when beekeepers are questioned about the loss of thousands of bees during the journey from one spot to another. Bees either escape into the wild during occasional truck stops or die from heat and are found in the thousands on truck floors and in the bottom boards of hives upon arrival. "It doesn't matter, most were old bees, workers who made the honey in the previous place. The new generation in the broods will replace them!" commented Xiao Lei, who I accompanied during a 21 hour-long drive. As with factory workers, bees are replaceable and exploitable and are only of value while they are efficient.

In good years, transhumant beekeepers can sell enormous amounts of honey and generate substantial income, given buyer demand and profitable deals. But as described above, beekeepers do not always comply with the biological temporalities of colonies and their natural honey production process, and intrinsic ethical standards. Drawing on field

[11] Chinese beekeepers also use smoke to confuse their bees and avoid attacks.

[12] Geophysicist and beekeeper Ron Miksha thoroughly describes the whole process in his blog: https://bad-beekeepingblog.com/2017/01/19/one-more-thing-about-chinese-honey/

observations and conversations,[13] I have identified several principles underlying beekeeping activities These principles reveal still further focus on time management as being at the core of beekeeping practices under the current economic conditions in China. When commenting on their actions, decisions and motivations, beekeepers often use the expressions 'approximately' (*chàbùduō*), 'no waste' (*bùyào làngfèi*) and 'simplify matters (*shěngshì*), all of which refer to the need to rationalise and manage their time. Beekeeping is an intensive and competitive profession, and speed and efficiency are viewed as two essential qualities needed to guarantee business success. However, these two qualities are not always compatible. Demonstrating the incompatibility of speed and efficiency in beekeeping is *shěngshì Shěngshì* refers to the extraction of honey from uncapped cells. As described earlier, this allows the beekeeper to avoid a troublesome and time-consuming process and, thereby, gain time to invest in other tasks. *Chàbùduō* is a colloquial expression that, when applied to an action, generally means "good enough". Here it qualifies the basic filtering of the harvested honey before it is stored. In this way, honey goes directly from the manual extractor (not necessarily properly cleaned beforehand) to the barrels through a simple sieve (similar to those used in kitchens). Leaving the painstaking task of ridding the honey of its impurities to the retailers and packagers also allows beekeepers to concentrate on the well-being and activities of their colonies, rather than the raw product resulting from their work. However, this practice also reveals the lack of concern for standard hygienic measures and the conditions in which honey is stored before being delivered and then processed for its final packaging. *Bùyào làngfèi*, another colloquial expression, points to the rationalisation of capitalising on all efforts made in producing honey and selling all matters of product possible. This includes recycling the extra pieces of empty honeycomb – that bees often build out of the frames – and melting them to produce a bloc of wax, or keeping the larvae that are taken out of the queen's cells when collecting royal jelly and creating a nutritious meal with the addition of scrambled eggs.

Many other Chinese sayings reveal the importance of time management when it is within the control of humans. This contrasts with natural temporalities such as bees' biological clock, the seasonal calendar and plant growth cycles, all of which impose limits on the human manipulation of nature for personal gain. Nevertheless, for beekeepers, time is money. Therefore, a combination of two contradicting working attitudes exists: *rigour*, due to respect for biological rhythm, and a *lack of rigour* in collecting the outcome of such a complex routine. The latter suggests that beekeepers avoid responsibility for the final products resulting from their collaboration with the bees.

Socioeconomic struggles in the margins

Beekeepers speeding up the process to increase the chance to make a profit, regardless of the professional, ethical values challenged in doing so, is an attitude and logic shared by most workers in China who struggle for a living in the country's fierce and competitive economic environment. Still, even though they also share many commercial values with other Chinese involved in trade, transhumant beekeepers' professional choice and lifestyle, position them on the fringe of Chinese society. In a way, they go against the grain. Unlike other

[13] In July 2017, I worked together with Master Wang, his wife and assistant for a week during the season of royal jelly production and honey harvest in Heilongjiang province. This experience resonates with observations in different apiaries later that summer and confirms some practices widely used among transhumant Chinese beekeepers.

migrant workers, transhumant beekeepers move to flowering areas, plains or mountains rather than to lively urban centres, factories, mining sites or marketplaces that symbolise modernity and progress. They lead their colonies towards abundance, and still, they remain modest themselves. They alternate travel and temporary settling, and yet they do not articulate their experience as a form of enjoyment, nor do they perceive their lifestyle as part of their cultural identity. They are not nomadic people, but they also transcend the official ethnic classification that defines Han as sedentary *versus* several minority ethnic groups as nomadic. Beekeepers' practices unsettle the general discourse on frontiers between ethnic groups, and between class groups in Chinese social hierarchy. They do not fit into specific categorisation, and, by constantly crossing China's geographical and social borders, they live in an ambiguous and, to a certain extent, uncontrolled state.

Indeed, beekeepers already have to face multi-layered and time-consuming difficulties in their daily life and organisation. As with others in most places in the world, Chinese beekeepers face significant challenges that the natural environment inflicts (disease, insect pests and predators), which puts their bees' health and the success of the transhumance at risk. Today, the impact on the environment caused by human industrial activities (such as heavy pollution) and ecological disruptions resulting from global climate change (such as storms, drought, flood and heavy wind) amplifies this environmental predicament for beekeepers.

Other sorts of adversities also confront migrating beekeepers in the contemporary Chinese socioeconomic context. To settle a camp and apiary demands not only connections but also patience and endurance. As migrants, transhumant beekeepers share the plight of being outsiders and speakers of regional dialects, who practice a risky profession and are suspiciously independent as unsupervised workers. Hence, in the human settlements near temporary beekeeper camps, local attitudes towards beekeepers include curiosity, empathy and sometimes sympathy, as well as discrimination, hostility and exploitation. Several beekeepers spoke of local officers, such as Village Committee members, frequently using their status and privilege to request free jars of honey or royal jelly in exchange for land occupation tolerance, regardless of the price beekeepers may have already paid to landowners. Some malicious individuals use tricks to request honey or money. Stories abound of those who purposely get stung by honeybees and then claim financial compensation to get treated at a hospital[14] (pretending they are allergic), or request free jars of honey to solve the argument. In some shady areas – Guangdong province was often mentioned – beekeepers recall enduring money extortion and threats of property (beehive) damage by drug addicts or gang members, who believe that beekeepers always carry cash in their tent.[15] Beekeepers also report beehive robberies. All of the above explains why so many beekeepers keep dogs.

As incongruous as it may sound, several beekeepers also spoke unfavourably of peasants who force them to decamp from their field surroundings and are unaware of the importance of bees. "Some farmers think that because our bees are collecting flower nectar, the flowers would die, and there would be no fruits or crops to harvest!" an old beekeeper said. Presumably, knowledge on the pollinating role of bees, or on pollination itself, is not apparent for all peasants. When beekeepers attempt to report their troubles to the local

[14] In China, medical service costs in public and private hospitals can be high and patients are generally requested to pay in advance for their treatment.

[15] While this used to be the case, recent technology such as internet banks and WeChat Pay, is widely replacing cash payment, bringing security to migrant people.

police or authorities, they receive little attention. "The police protect locals, they don't want scandals, and they don't want to deal with outsiders like us," recalled one of the many victims of harassment. In sum, despite a supportive network – that can be far away – transhumant beekeepers are marginalised migrants, who live alone, dangerously and 'freely', while producing a precious product under harsh working conditions. They embody the very features that attract attention as well as suspicions in a Chinese society that values community, security and modernity.

Concluding remarks and research perspectives

Can there be beekeeping without beekeepers? Can we apprehend what is at stake in the global beekeeping crisis without listening to beekeepers' understanding of the environment they live in, and the challenging global context they must adjust to? In the Chinese context, transhumant beekeepers are at the heart of the problems that apiculture encounters. Like most other sectors of China's economy, apiculture has little choice but to comply with the capitalist logic. Productivity, bee colony exploitation, money-driven agenda and exploitative forms of social interaction all feed into this capitalist logic. Positioned between profitability and professional ethics, and between technical inheritance from their masters' generation and contemporary business norms, Chinese transhumant beekeepers must adjust their practices for their own best outcome.

As professionals struggling with the transformation of Chinese rural spaces, agricultural policies and ecological challenges, transhumant beekeepers offer relevant perspectives on the exploration of boundaries. Their activities encompass social, economic, environmental and moral dimensions that are worth researching. In a country where migration associated with poverty (at least external signs of) leads to invisibility, this group on the fringes of society raises relevant questions about the consequences of the current model of development – a model that is uniformly implemented in most areas of Chinese life.

Finally, and from a broader perspective, it is tempting to see a symbolic dimension in this topic. Solitary and nomadic, beekeepers live in permanent interaction with organised and structured, laborious and productive bee colonies. It is a metaphor for the ideological functioning of Chinese society as a whole, in which the transhumant beekeepers themselves represent an active although dissonant fringe.

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