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**ТҮШТҮК СИНЬЦЗЯН ОАЗИСИНДЕГИ СУУ ЖАНА ЖЕРГИЛИКТҮҮ КООМ -
ЧАРКЛЫК ОКРУГУНДАГЫ К АЙЫЛЫНЫН МИСАЛЫНДА
ВОДА И МЕСТНОЕ ОБЩЕСТВО В ОАЗИСЕ ЮЖНОГО СИНЬЦЗЯНА: НА
ПРИМЕРЕ ДЕРЕВНИ В УЕЗДЕ ЧАРКЛЫК
WATER AND LOCAL SOCIETY IN THE OASIS OF SOUTHERN XINJIANG - THE
CASE OF K VILLAGE IN RUOQIANG COUNTY***

Кыскача мүнөздөмө: Суу адамдын жашоосу үчүн табигый ресурс гана эмес, ошондой эле социалдык интеграция үчүн маанилүү байланыш болуп саналат. Ал өзгөчө жер ресурстары көп, бирок суу ресурстары өтө аз чөлдүү оазистерде байкалат. Синьцзяндын түштүгүндөгү оазис иммигрант кыштагынын талаа изилдөөлөрүнө таянып, автор суу ресурстарын бөлүштүрүү жана пайдалануу боюнча жергиликтүү тургундар "адам – суу" жана "адам – адам" мамилелеринин сүрөтүн айылдын курулушу, жашоо-тиричилик модели, коомдук уюштуруу жагынан жергиликтүү өзгөчөлүктөр менен кургандыгын аныктаган. Суу ресурстарын пайдалануу иммигранттардын ар кандай топторунун социалдык байланышын жана иммигранттардын жамааттарын жана айылдык жамааттарды түзүүнү жана өнүктүрүүнү жеңилдетти.

Аннотация: Вода является не только природным ресурсом для выживания человека, но и важным связующим звеном для социальной интеграции, которая особенно заметна в оазисах пустыни, богатых земельными ресурсами, но бедных водными ресурсами. Основываясь на полевых исследованиях деревни иммигрантов – оазисов на юге Синьцзяна, автор обнаружил, что вокруг распределения и использования водных ресурсов местные жители выстроили отношения по схеме «человек – вода» и «человек – человек» с местной спецификой с точки зрения строительства деревни, модели жизнеобеспечения, социальной организации и социальных отношений. Использование водных ресурсов способствовало

социальной связи разных групп иммигрантов, формированию и развитию иммигрантских сообществ и сельских общин.

Abstract: Water is not only a natural resource for human survival, but also an important link for social integration, especially in desert oasis where land resources are plentiful but water is scarce. In the southern Xinjiang oasis (南疆绿洲), it's found that the local people constructed a picture of water relations and relations among all people with local characteristics in terms of village construction, livelihood patterns, social organisation and social relations around the distribution, use and allocation of water resources. The use of water resources has facilitated the social bonding of heterogeneous migrant groups and advanced the formation and development of village communities.

Негизги сөздөр: Түштүк Синьцзян оазиси; иммигрант айылдары; суу маданияты; социалдык байланыш.

Ключевые слова: оазис Южного Синьцзяна; деревни иммигрантов; водная культура; социальная связь.

Water is not only a natural resource that can be used in the process of human survival, life and development, but also a key element that connects many areas of human society. Southern Xinjiang oases are distributed south of the Tianshan Mountain (天山) in Xinjiang, which belong to the desert oasis, or "oasis with distinct margins", located like a string of pearls on the edge of the Taklamakan Desert (塔克拉玛干沙漠). According to Lattimore (拉铁摩尔), "the lack of rainfall in marginal oases made irrigation essential" [1, p.108], the importance of water to the oasis society of the southern border is evident. The water research on oasis is mainly based on the disciplines of geography, ecology, agriculture, etc., mainly involving the use, protection, changes and management of oasis water resources. There is a relative lack of research on water culture² (水文化) [2, p. 2] in oasis societies, which leaves room for thinking for this study. This article will be based on a long-term field survey, with an immigrant village located in the Ruoqiang Oasis (若羌绿洲) in the southeast edge of the Tarim Basin (塔里木盆地) as the field point. By presenting the interdependence of the local society's water and village space arrangements, livelihood models, and social order, trying to build a picture of human – water relations in the oasis society, which provides a basis for understanding and grasping the development context of the oasis region.

1. Living by the water: the geo-ecological space of an oasis migrant village

Ruoqiang Oasis is located in Ruoqiang County, Bayingoleng Mongol Autonomous Prefecture, Xinjiang Uygur Autonomous Region (新疆维吾尔自治区巴音郭楞蒙古自治州若羌县), at the southeastern edge of the Taklamakan Desert, which is the largest and the only county in China with three major deserts, the Taklamakan Desert, Kumtag Desert (库姆塔格沙漠) and Kumkuli Desert (库木库里沙漠) sandwiching Ruoqiang County from different directions, so Ruoqiang is an oasis in the desert hinterland. Ruoqiang County belongs to the warm temperate desert arid climate, with an average annual precipitation of 28.5 mm, a maximum of 118 mm and a minimum of 3.3 mm. Precipitation is concentrated in summer. Its annual average evaporation is 2920.2 mm, the maximum evaporation is 3368.1 mm. The rare precipitation and the large evaporation volume make Ruoqiang oasis present the climate characteristics of high temperature,

² Water culture refers to "the cultures related to water that exist in different peoples, regions and countries; in short, water culture is the culture related to the understanding, using and management of water by human beings".

dryness, and rain. It is one of the most arid areas of the world in the world. There are 14 major rivers in the county, which can be divided into the Lop Nor system (罗布泊水系) and the southern mountain system (南部山区水系) according to their geographical location. The most obvious influence on the Ruoqiang Oasis is the Lop Nor system, which flows through the area where the main oases in Ruoqiang are located today. Water resources play a vital role in the existence of the Ruoqiang Oasis and the production, life and development of its inhabitants.

Five kilometres away from Ruoqiang County is a migrant village straddling National Highway 218 (218 国道) – Kurgan Village (库尔干村) (hereinafter referred to as the K village), which is a village committee under the jurisdiction of Teganrik Town (铁干里克镇). "Tieganlik" is Uyghur (维吾尔语), Chinese means "the place where the grass grows". The territory is hot in summer and cold in winter, and precipitation is scarce, with an annual average of 28.5 mm. The K village is located in the northern part of Ruoqiang County, 5 km from the county town and 6 km from the town government. The K village committee (K 村村委) was established in 2008, under the jurisdiction of three village groups, namely village group L (L 村民小组), village group Y (Y 村民小组) and village group X (X 村民小组). For the convenience of differentiation and combining with local expressions, the three village groups are abbreviated as team L (L 队), team Y (Y 队) and team X (X 队) respectively in this paper. The National Highway 218 crosses the K village. Team L is located east of National Highway 218, Team Y and X are located west of National Highway 218. 700 villagers from the K village have either moved here spontaneously since the 1960s from various provinces in the mainland or are the descendants of these immigrants, so the K village said to be a village of immigrants.

The most important natural environment in K village is the Ruoqiang River (若羌河), which originates in Aerjin Mountain (阿尔金山) and flows from south to north through team Y in K village. The K village is located in an oasis on flat terrain, a village sheltered by Jujube and windbreak forests. As shown in Figure 1, the east residential houses in the K village are backed by the Gobi Desert (戈壁滩), and on windy days the sand from the Gobi Desert blows into the village roads and residential compounds on the east wind, becoming an important source of dust and sand in K village. K village is separated to the south by a belt of dJujube and windbreak forests from two other oasis villages spread to the east and west of National Highway 218. The western area is jujube land, adjacent to the Ruoqiang River. The jujube land in the north is connected to the wasteland (荒地), and north of the wasteland is the vast Gobi Desert. The river is coexisting with Gobi, the agriculture and the aquaculture industry are in the same place, the land is distributed along the river, and people live in the river. This is the K village.

An interview with the villagers who moved to the early movement of the K village found that the villagers were undoubtedly full of culture shock (文化震撼) when they first moved to the K village from the mainland. One of the shocks comes from the way of water use. According to the recollections of Wu Zhong Hua (武中花) who came to K village in 1976, the village was surrounded by the Gobi Desert, with no trees or water, so the village people dug a pit in the ground to get underground water for use. The water coming out of the pit was for both human and livestock consumption, which made her want to return to her hometown for a while. This shows that water resources are relatively lacking in Ruoqiang Oasis. The fundamental reality that not only relates to human interaction with nature and other living things, but also affects people's perceptions, attitudes and behaviour.

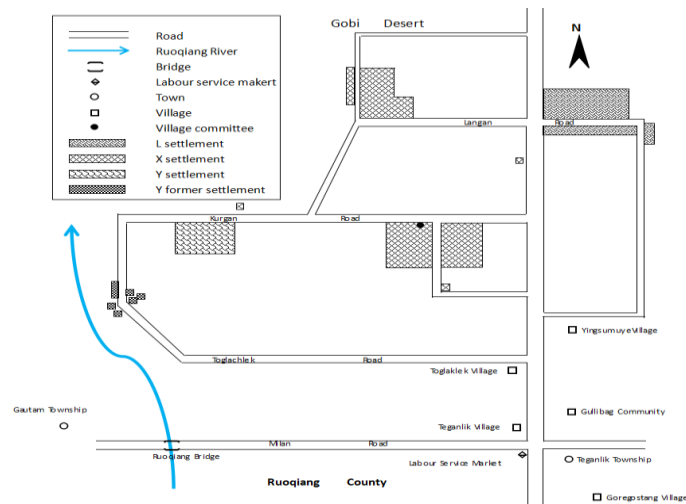


Figure 1. Schematic layout of the K village

2. Identifying the land with water: Cooperation in the construction of water irrigation facilities

Since ancient times, the existence of oases has often depended on water resources. The distribution and exploitation of water resources directly determines the scale of the oasis. Despite its vast land area, Ruoqiang County has a relatively small amount of arable land. In 2018, Ruoqiang County had an arable land area of about 45 square kilometres, accounting for only about 0.02% of its total land area, which shows its scarcity of arable land. Some scholars have traced the changes in the arable land area of Ruoqiang County from 1999 to 2012, and concluded that the "arable land area in Ruoqiang County has undergone a process of decrease – rapid growth – slow decrease" [3, p. 257], in which "hydrological factors have the most obvious influence on the change of land use structure in Ruoqiang Oasis" [3, p. 258], and the arable land area in Ruoqiang County has gradually decreased due to the limitation of water resources. This view is supported by the reduction of the county-wide arable land area in Ruoqiang County from 72.67 square kilometres in 2012 to 45 square kilometres in 2018.

One of the reasons for the improvement of water using is human demand for cultivated land. For the K village, the problem of having too many people and too little land has been highlighted as the incoming population continues to move in. In order to meet the increasing demand for arable land, the villagers of K village started to develop wasteland. Without water, wasteland cannot be a cultivated land, so the construction of the canal is raised. As villager Ma Qingyun (马清云) said, "Many people didn't want wasteland, my family did, so we reclaimed wasteland by ourselves. In about 1984 my family had more than 60 mu³ (亩) of land. At that time, the water supply channel was not good, and the water would run, which caused the land to be very short of water, so we built canals to diverting the snow water that melted on the Aejin Mountain to irrigate it."

2.1. The collective division of labour in the construction of the canal

The construction of irrigation facilities in the Ruoqiang Oasis has a long history, with irrigation facilities having emerged during the Han Dynasty, and a number of water conservation projects have been built since then. "However, the construction of the first irrigation facilities in history is extremely simple. The use of soil, stones and treetops to build a water outlet and river

³ The "mu (亩)" is a Chinese unit of land measurement, 1 mu is approximately 666.67 square metres.

dam. The flood is rushed and blocked. This method continued until 1958 ended." [4, p. 195] It was not until 1965 that Ruoqiang County began actively building water irrigation facilities. The earlier participated in the construction of water canal in K village was Yi Dianzhi (易典志), who was involved in the construction of the Tashisayi aqueduct (塔什萨依渠) in the 1970s. From his words you can get a glimpse of what it was like to build a canal at the time. "The water canal in Tashisayi was a ditch dug in the middle of the stones of the Gobi Desert, using a cross pick to shave the soil in the ditch loose and then using a shovel to throw the soil out of the ditch. When the ditch was dug and then built into a stone canal. The 5 kilometers of channels spend more than a year. Later, we built another stone canal in the place 65 kilometers away from Ruoqiang County, and built until the county town of Ruoqiang. At that time, more than a thousand people could be repaired together and completed for more than a year."

Since the 1980s, the construction of water irrigation facilities in villages has often been carried out in a cooperative manner. The first large-scale collective construction of canal in K village was in 1989. It was a stone canal. The workload was distributed according to the number of land each family had. The length of the ditch each family is responsible for depends on the total amount of work, which is usually divided into one section first and then another section after it has been repaired. After the villagers excavated the soil canal, in order to avoid leakage, the water canal was built with stones, and the gap between the stones was supplemented with soil. In 1997, the K village started the second large-scale collective construction of the canal, which took three years to complete. The main canal now used by team L was built on this occasion. The main task is replacing the stone canal with an impermeable one. It usually took 15-20 days to build the canals, usually in September after the water stops flowing, and then they can be used to divert water for winter wheat. Or in March. In any case, the canals must be built at a time that staggers with the water use of the crop. Different from the large-scale repair canal for many years, the small-scale repair canal has never been interrupted. The construction of canals in K village has progressed from soil to stone and then to impermeable. The history of the replacement of the canals and the gradual increase in their impermeability requirements also reflect the scarcity and preciousness of water resources in the K village. In the process of building the canal, collective cooperation was achieved and the oasis village achieved social integration.

2.2. Family cooperation in drilling wells in the wasteland

In addition to the renovation of canals, the K village saw a significant use of groundwater harvesting for irrigation of arable land after the year 2000. According to villager Li Changde (李长德), "The wasteland used to have its own soil canals, but leaked badly. To prevent leakage, some people buried underground pipes in the wasteland to divert the water from the collective land canals to the ground for irrigating." However, this is less common and is only suitable for wastelands adjacent to canals. Most wastelands are too far away to be irrigated with canal water and can only be irrigated by obtaining groundwater. In 1981, Ruoqiang County began using drilling machines to extract groundwater to irrigate farmland. The data shows that 295 wells were drilled in Ruoqiang County before 2000 and 1,587 wells were drilled after 2000.

The choice of form of drilling wells is often related to the amount of wasteland. For people with small amounts of wasteland, wells are usually drilled multi-family joint. For example, eight families in team L worked together to drill a well which is 150 metres deep in 2015. The well was located behind the team L's settlement. The cost of drilling the well was calculated on the basis of metres (about 200 yuan per metre), plus pumps, water pipes, well houses, transformers, etc., costing

over 100,000 yuan in total. The well irrigated a total of 105 mu of wasteland. On average, the cost of drilling a well for one mu of land was about 1,000 yuan. 8 families paid for it according to the number of mu of land. So those with more mu of wasteland paid more and those with fewer mu paid less. For families with a large amount of wasteland, the tendency is for two families joint or alone to drill a well. For example, two families in K village also jointly drilled a well because they had jointly reclaimed 100 mu of wasteland. They drilled their first well in 1997, and when the well collapsed, they drilled a new one. Another villager had reclaimed 130 mu of wasteland, so he chose to drill his own well. The well at first was more than 50 metres deep, but now is more than 100 metres deep. A thick water pipe was buried from the well house to the wasteland, which was connected directly to each family's land, so that when the land needed irrigating, they went to the well house to open the main gate and the groundwater flowed down the pipe to the wasteland. In this way, the families cooperate with each other and are connected as a group.

3. Depending on the water to act: Rotational use of water resources

The allocation of water resources also provides a glimpse into the local social order and networks of relationships. Water has thus become a cultural representation of local significance. The practice of rotational "release water" (放水⁴) in the use of water resources in the Ruoqiang Oasis therefore provides an insight into the local social construction.

3.1. The triple cycles of rotating "release water"

"The more water is scarce, the more people need to treat it well and distribute it properly." [5, p. 22]. This is well demonstrated in the Ruoqiang Oasis. The rotational release of water in Ruoqiang County occurs mainly in the context of irrigating the land with snow water (also known as canal water) from the Aerjin Mountain. All collective lands in Ruoqiang County are irrigated with canal water. A few wastelands adjacent to the collective land with canals are also irrigated with canal water, but the majority of wastelands are irrigated by pumping groundwater through wells. Each of the three main oases in Ruoqiang County, Teganrik Town, Wutamu Town (吾塔木乡) and Washixia Town (瓦石峡乡), have a main canal. Each town builded branch canals according to the actual situation. Taking the town of Teganrik as an example, there are diversion gates at the main canal to divert water from the canal to two branch canals, which are separated right down the middle of the main canal to ensure that the two branch canals share the same amount of water. The timing and arrangement for drainage from each branch canal are independent and the drainage is allocated by the Tiganrik town water management station.

The K village shares a branch canal with three other villages along National Highway 218. The four villages take turn to drainage in the order of south to north. The water discharge time calculated according to the number of mu of land, which means the villager with more land has a longer discharge time, while the village with less land has a shorter discharge time. In 2017, K village will get a turn of water every 4 days and the irrigation of the canal will rotate between the 3 village groups. Once all the water had been released in village K, the water mains station transferred the water to the south and allowed the three village council to the south to release the water in turn, and then transferred the water back to K village when it was finished.

Within the village, the water discharge time for each village group is sometimes during the day and sometimes at night, usually alternating between schedules. For the same village group,

⁴ "放水" is the local expression, which means to open the sluice gates so that the water in the canal can flow into the land.

there is a difference in the length of time the water is released during the day and at night, generally longer at night than during the day. Each village group also takes turn to release water. For example, after the team L has finished releasing water, the water manager (usually served by the deputy head of the village group) has to go to the sub-gate to close the gates of the canal, while the water manager of the team X opens the gates of the team X to take over the water from the canal. After the team X has finished releasing water and then the team Y. When the team Y has released the water, the K village has been finished a whole cycle of "release water".

In addition to the cycles of "release water" that exist between village committees and between village groups of village committees, cycles also exist within village groups, as shown in Figure 2. The order of "release water" within the village group is arranged according to the location of the plots. Taking team L as an example, there are over 600 mu of collective land in team L which would take 3 "release water" cycles to irrigate all of the land. Together with the 200 mu of wasteland that is irrigated with groundwater, it would take 4 "release water" cycles to irrigate all of the land, and then another cycle would be carried out.

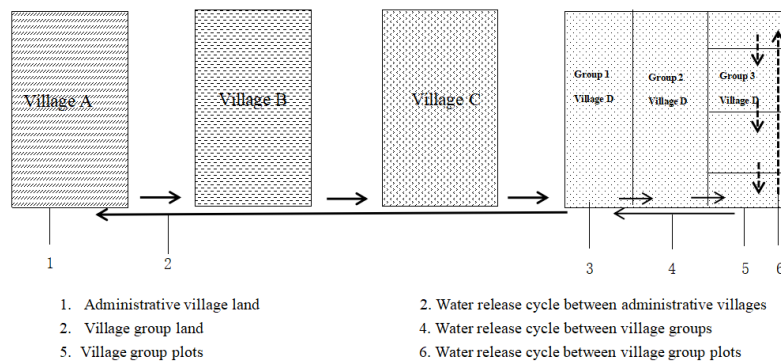


Figure 2. The K Village canal irrigation circulation system

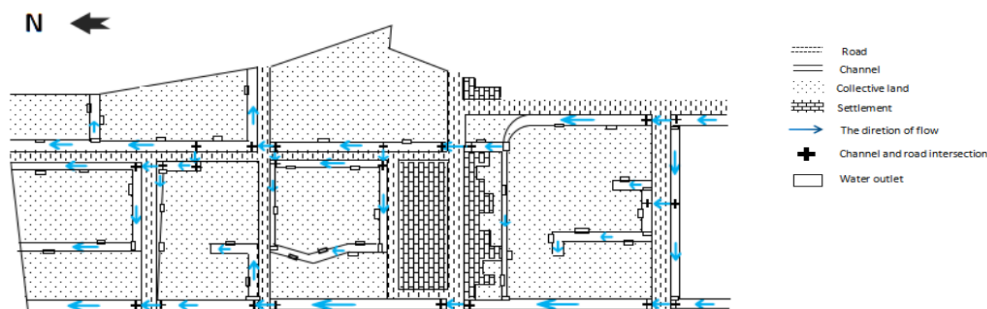


Figure 3. Diagram of the distribution of team L canals

Although there are cycles in the "release water" sequence, it's not required that every cycle is complete. The villagers or village groups can decide whether water needs to be released according to the actual situation. In 2017, due to the large volume of water in the canal and the fast circulation rate, as well as the lack of strict restrictions on the length of water releasing time, there was sufficient water in the jujube fields. Sometimes it was the turn to release water again before the agricultural work in the jujube fields was finished. In this case, the villagers can choose not to release water, thus ensuring the consistency between individual wishes, family needs, and village order.

3.2. The construction of the order of "release water"

The release of water within the village group is done by the managers in collaboration with

the villagers. This is because a strip of land is divided into different plots, each plot belonging to different family. These plots share a single canal, which has an inlet in each plot, and the villagers have to draw water into the land in turn according to the location of the plot when releasing water. When the water is released, the canal is blocked at the downstream end so that the water can flow into the field. When enough water has been released, the inlet of the field is blocked and the canal is opened to allow it to flow again, thus until the last field is irrigated.

The villagers are aware of the date of the "release water". The canal manager will go door-to-door or inform the specific "release water" time and plot in the WeChat exchange group as well. For example, in the afternoon of 25 April 2019, the water manager of the team L issued a "release water" notice in the villagers' WeChat group. The content is "The release of water on the evening of the 27th. Please prepare for the south straight canal and the side of the national road. The middle canal gate has not been repaired and cannot be irrigated, irrigating until it is repaired. Please prepare in advance when you receive it". The notice issued on the afternoon of May 11 is "Water will be picked up tomorrow morning at 8:00 ". The notice continued on the morning of May 12 shows "Water will be picked up at 10:00. The water in the canals now is other people's. Don't drainage the water yet." Villagers decide whether or not to release the water depending on whether or not their land is within the area which the water is releasing. Families who turn to "release water" will estimate the specific time for "releasing water" based on the relative distance between their land and the water channell, or ask the water manager so that they can go to their land in advance.

This "release water" order has been internalised over time and tested in practice. It has become a common rule for the local people to follow. The rotating "release water" method facilitates the exchange and interaction of villagers in the K village. It's conducive to the effective connection of the relationship between immigrant villages, promotes the reproduction and social integration of the village society in the oasis region, and ultimately contributes to the prosperity of the village community.

4. Harmony brought by water: The connecting role of scarce resources in immigrant villages

Scarcity means that the available quantity cannot meet all the demand. Scarce resource refer to resource that is limited in quantity and cannot be regenerated or replaced to meet people's infinite needs. In the vast land area of Ruoqiang Oasis, water resource is very limited and difficult to utilise, so it can be said that water is the scarce resource in Ruoqiang Oasis. Oases are more dependent on water resources than other geographical areas. The acquisition and utilization of water resources have a profound impact on the production, life, and development of oasis areas. This also highlights the irreplaceable value of material resources to human society.

The K Village is a migrant village composed of Han, Tibetan and Tu ethnic groups. It's villagers come from many provinces in China, including Sichuan, Chongqing, Gansu, Ningxia, Qinghai, Henan and Shanxi, etc. This diversity of places of migration has contributed to the strong heterogeneity of people after they have moved to K Village. Firstly, the settlement pattern is compartmentalised. The feature of K village is that villagers in the same residential area almost come from the same household registration. For example, the majority of villagers in team L are from Sichuan and Chongqing, and the majority of villagers in team X are from Gansu. The second aspect is the independence of production. As the spread of the jujube crop since 2000 has resulted in people working at the same time. Jujube planting is a labour-intensive industry, traditional

cooperative labour is less common in K village. As some scholars have said, "The essence of ethnic interaction remains the complementarity of needs and the integration of exchanges based on the differences in the social division of labour between different groups within a common territory of existence." [6, p. 25] The similar social division of labour has led to a strong household independence characteristic of labour in K village. Once again, this is manifested in the limited nature of daily communication. Hegel once said, "That natural connection which helps to give rise to the national spirit is the basis of geography." [7, p. 85] The villagers of K village are all immigrants from all over the country, with no kinship ties, weak local ties and limited business ties. The traditional social network does not work well in the daily association of the villagers. There is little daily communication among the immigrants, and if there is, it is limited to a few people who know each other well.

This state of residential isolation, independent work and limited communication makes it difficult for the villagers of K Village to unite as a whole in terms of spirituality and identity, even though they share a common production and living area. Because of the need to make use of scarce water resources, the villagers of K village have to some extent formed a whole with a common goal and common action. Whether it was the shared difficulties of accessing water in the early days, the cooperative division of labour in the construction of water facilities, or the rotating distribution of water resources, the villagers of K Village found a point of connection outside of their core production and life, and a whole was formed. As Zimmel puts it. "Exchange is the purest and most fully developed interaction. When it seeks to obtain material and content, it regulates people's lives." [8, p. 23] The acquisition and use of water resources have connected oasis immigrants living in vast geographical spaces. People engage in division of labor and cooperation with a shared destiny due to limited resources. This social connection and resource integration provide security and shelter for immigrants in oases, enhance people's sense of regional identity and social belonging, and provide assistance for further promoting the development of oasis areas.

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