

Supporting Collective Action through Community Development Funds: An Institutional Innovation for Herder Poverty Reduction in Sichuan, China

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Abstract

Tibetan herding communities in western Sichuan have a long tradition of migratory livestock grazing on seasonal commons as an adaptation to fluctuating climatic and grassland conditions. After the Household Contract Responsibility System was promoted, many herder communities have continued to graze livestock on seasonal commons as they traditionally did. But there were still some problems with “communal livestock grazing”. Some pastoral villages have begun to experience a “Tragedy of the Commons” and face a complex bundle of problems. One of the most important problems is the community lost their ability for collective action.

Houlonggou, the case village, has experienced a transition from a “Tragedy of the Commons”, to a restoration of self-government and collective action for common property management. With this case we have found that combining Community Development Funds (CDF) with Common Pool Resource (CPR) management is a feasible way to escape from the “the Tragedy of the Commons”. CDF may help in many aspects of forming and strengthening collective actions and improving CPR management abilities, such as enhancing the ability of self-governing and financial sustainability of collective action.

In this paper, we will discuss: (a) the linkages between losing the ability for collective action and “the Tragedy of Commons”; (b) how to escape “the Tragedy of Commons” through rebuilding collective activities capacities; (c) the role of CDF in improving collective management of CPR.

Key words: *Grasslands, China, Tibetan, case-study, Community Development Funds, Collective Action*

1. Introduction

The pastoral areas of Sichuan are located along the eastern-most edge of the Tibetan Plateau, China (Fig.1). Here, local Tibetan herders have a long tradition of migratory livestock grazing on seasonal commons as an adaptation to fluctuating climatic and grassland conditions. Although the Household Contract Responsibility System (HCRS) was promoted in Sichuan during the early 1990s, many herder communities

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³ The Household Contract Responsibility System (HCRS) was an important policy reform in rural China that commenced in the early 1980s. It aimed to allocate user rights to collective land to individual households for independent operation. It was very successfully in the cropping areas and in solving problems of food shortage in China. On this basis, it can be considered an important reform

have continued to graze livestock on seasonal commons as they traditionally did.

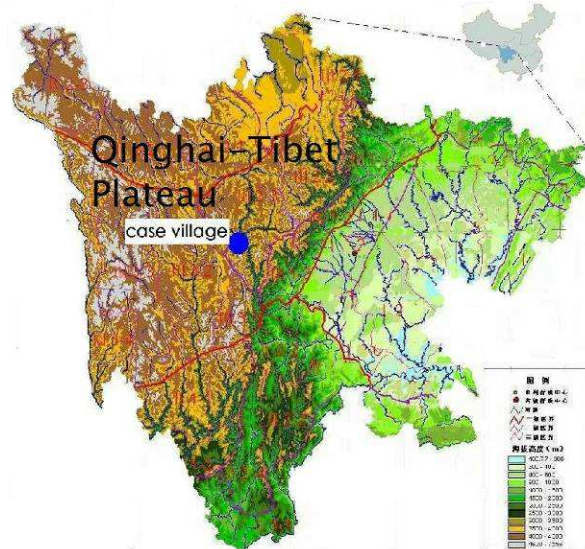
An investigation in five villages in pastoral areas of Sichuan indicated that herders continued to maintain communal rotational grazing practices for the following reasons: “the topography here is too complex to divide lands for grazing by individual households”; “livestock cannot be constrained in small wire-fenced pastures because

yaks need to roam freely or they can easily get ill”; “If the yaks just eat in the

same place all the time it will harm the grassland because it can’t get enough rest”; “it will create more conflicts”, etc. . However, the field survey also found that there were still some problems with “communal livestock grazing”. More and more pastoral villages have begun to experience a “the tragedy of commons”. Increasing population pressure, resource shortage, and penetration of external markets, together with rising conflict, declining respect for herding area leaders, and difficulty in effectively implementing village rules are causing social dis-harmony in many communities. In the surveyed villages herders face a complex bundle of problems and are unable to organize their own collective action for restoring grassland. Some herders worry about their future livelihood and fear becoming Ecological Refugees. The most difficult issue though is that the community has lost its ability to arrange and undertake collective actions. In discussion with herders from these villages, we found everybody was aware of this problem and everybody wanted to change the situation, but nobody wanted to be the “ice-breaker” or to bear the ‘transaction costs’ of changing their practices. So the challenge for these villages is how to restore their capacity for collective action to extricate themselves from their current social and resource management dilemma.

From 2007, Sichuan NGO⁴ Shuguang Community Capacity Building Center (hereinafter NGO Shuguang) and its collaborating partners used community development approaches and Ford Foundation⁵ grant funding to work with herders in

Fig.1: The location of the case



experience. In recent years, there has been interest in applying this policy experience to grassland areas and transferring the grassland from collective (common) management to that by individual households. The logic for this policy change is to escape the “the tragedy of the commons”

⁴ Shuguang is a local NGO that aims to help poor rural communities to strengthen their capacity and natural resource management. Most Shuguang members are from the Sichuan Provincial Office for Poverty Alleviation or the Sichuan Academy of Social Sciences

⁵ The trial is supported by granting of Ford Foundation. During the trail and preparation of the paper, Dr. Irene Bain, the program officer of Ford Foundation, gave us a lot of helps. She provided us a lot of information with similar trials, and took a lot of time discussing with us. We appreciate the Ford Foundation and Dr. Irene Bain very much

Huolonggou Village. NGO Shuguang, facilitated a series of discussions and communications, that enabled herders to reach a consensus: grassland degradation must be halted and grassland restored to maintain sustainable livelihoods and avoid “Ecological Resettlement”. Halting grassland degradation required maintaining seasonal rotational grazing through group action, sustaining this action in the long term required a long-term community grassland management organization. After three years, the herders have now built and are managing Community Development Funds (CDF) . They have used these as a basis for undertaking a series of collective actions that aim to restore their grassland, decrease yak numbers, and rebuild the village rules for rotational grazing of the commons. A participatory assessment of changes in grassland condition was conducted in the end of 2009. Village herders reviewed their collective actions, and are satisfied with the collective actions they conducted and also satisfied with the improvement in their grassland.

This paper is a brief introduction to a case-study village and its efforts to recover its environment and community through collective actions. We then discuss the role that CDF played in facilitating this process.

2. Village Case Study: Facing Dilemmas

2.1 Village Profile

Huolonggou Village (hereafter Huolonggou) is a Tibetan herder village located on the southeastern edge of the Qinghai-Tibetan Plateau. It contained four hamlets and 30 herder households of 93 people in 2009. Although the surrounding villages are rGlayrong Tibetans, the residents of Huolonggou are Amdo Tibetans, and speak a different language to their neighbors. Huolonggou is characterized by four natural features; its high elevation (3,800~4,500m above sea level), steep topography, cold climate (the annual average temperature is less than 3°C), low rainfall (an annual average 500~700mm). It is a very isolated village, located about 27 km from the township seat at the much lower altitude of 2700 m. It lacks road access and transport is by horse or foot. The nearest school is about 24 km away in a lower, neighboring village. Residents depend on brushwood for heating and cooking fuel. Drinking water is supplied from valley spring by a plastic pipe. Some herder families own a simple small electric generator for lighting. The village doctor treats both people and livestock, but lacks training as he is busy grazing his own yaks.

⁶ The function of Community Development Funds (trust-funds or CDF for short) can be easily understood from its name. 1) *Community*: the ownership of the CDF belongs to all the community members as a whole. Only community members can borrow its loans or revolving funds; 2) *Development*: the loan should be used to invest in developmental production activities, and not expended on consumption purposes. However, a small portion of CDF loan funds can be used to meet the urgent needs which vulnerable groups can have for treating illness or for meeting school costs etc. The specific decision would be made in a community meeting; 3) *Funds*: Operation of the CDF should ensure that the value of the principal is retained. Simply put, CDF can be considered as a type of micro-fund

Grassland and Livestock

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Huolonggou has 4,400 ha of grassland (Fig.2) that is officially designated as grade 3 quality. The average annual output of fresh forage is about 3,000 kg per ha. This includes 45% of Cyperaceae grass (*Kobresia*), 23.7% of palatable Graminaeae grass, 27.5% of weeds, and 2.6% of toxic species. According to the field survey, there were over 2,000 yaks and 50 horses in 2007. Household have an average of 50~60 yaks and 1~2 horses. However, the range is between 20 and a 100 or so yaks.

Fig.2: Grassland degradation in Houlonggou



Traditional Rotational Grazing System

Historically, Tibetan herders in these pastoral areas of Sichuan were nomadic groups that moved in search of water and grass. It is said that Huolonggou has a history of at least 200 years and was first established by two nomadic herders. In the 1950's, several more herder families settled down and adopted a system of rotational grazing that was suited to the steep and complex topography, and cold climate.

After the HCRS was extended to grassland areas in the late 1990s, the rotational grazing system was modified as four smaller sub-systems for each of the four hamlets. Two hamlets in the village divided their grasslands into winter, spring, and autumn pastures, while the other two hamlets divided their grassland into winter and spring pastures only. Villagers agreed as a group to adopt rules requiring all herders to move between these seasonal pastures at the same time. However, from around 2005, some herders began to ignore these rules for the sake of "convenience" and remained in the same pasture year-long.

Income Resources

The herders traditionally derived their major income from yaks and digging for medicinal herbs, such as *caterpillar fungus* (*Cordyceps sinensis*) and *Fritillaria*. However, in the late 1980s, some Huolonggou herders who were familiar with both the Amdo and rGlaylrong Tibetan dialects began to buy a few cattle from nearby agricultural villages and sell them in the herding villages. In the late 1990s, some younger herders also began taking occasional work outside the village. By 2007, the annual average net income of village herders was RMB 1,441, or about USD 200, or just over the Chinese national rural poverty line. However, most items of daily life (such as vegetables, rice and salt) were purchased from outside the village and so households needed to sell off about four yaks a year, in addition to their earnings from

⁷ According to "Annals of Danba County" (2005) and "The Principles and Criterion for Grassland Resources Assessment, China" (1979), the grassland can be divided into 5 grades. Grade 1---high quality grass over 60%; Grade 2---good quality grass over 60%; Grade 3---normal quality grass over 60%; Grade 4---low quality grass over 60%; Grade 5---bad grass over 40%

medicinal herbs, to make ends meet. Fortunately, the rising price for Cordyceps has benefited these herders in recent years.

Some Historical Changes

Huolonggou has experienced serious grassland degradation in recent years. Group interviews with herders identified that this is attributable to the number of yaks exceeding 1,200. When there were only 16 households (about 60 people) and less than 1,000 yaks in the 1960s, herders considered the grassland was still in good condition. However, population increase resulted in people extracting more and more from the grassland, including digging up *Saussurea*. By the 1990s, there were 18 households (with about 80 people), and about 1,200~1,300 yaks and the proportion of weeds had greatly increased. Herders began buying fodder to feed their yaks. Conflicts also occurred along the administrative village and hamlet boundaries. Herders responded by erecting stone fences along these border-lines. Around 2004-6, there were about 27 households (with a population of about 90) and over, 2,000 yaks. Weeds and scrubby bushes had rapidly increased and more under-nourished yaks fell to their deaths from the steep slopes or died of winter starvation. Even more stone fences were erected by each hamlet. Herders began to plant grasses near their permanent houses in the winter settlement and several landslides resulted from the spreading desertification on the high slopes. Some herders considered that at least one-third of the grassland was degraded to some degree, and about one-fifth was beyond recovery. They worried about how their descendants could continue to survive here.

External Influences

Herders also considered there were two main external events that affected the quality of local grassland and herder cooperation. 1) Frequency of natural disasters. There is at least one snow disaster or snap-freeze each 4~5 years. In 2007, a snowstorm destroyed about 15,000m of stone fencing. In 2008, the Wenchuan earthquake collapsed 13,000m of stone fences, and caused two rock falls and five landslides. Some houses, bridges, and grassland huts were also damaged; 2) Inappropriate policies and regulations which halted the traditional burning of infiltrating shrubs to maintain grass cover and to improve the quality of forage. This was terminated by policing of the Natural Forest Protection Policy in 1997 to maintain shrub growth. Herders consider that this has reduced the useable grassland area.

2.2 The dilemma of “the tragedy of the commons”

NGO Shuguang helped to facilitate a series of group discussions by herders to explore problems related to grassland management. Herders from all the households in the village ranked the problems they identified and prioritized four:

Some herders don't follow the community regulations for moving between pasture

The reasons given by herders were that the borders between seasonal pastures are not clearly defined; the timing for moving between pastures is not clearly designated; Some herders graze their yaks at will without regard to the regulations or the season and may even remain grazing livestock in the winter pastures all year-long, thereby preventing the grass from recovering.

Herders consider the grassland is degrading because:

Fig.3: A villager said: the more of this grass, the worse of our grassland



Shrubs and weeds are increasing and palatable species are declining (Fig.3); grasshopper numbers in the spring and autumn pastures have increased in recent years; livestock trampling has damaged the grassland and particularly the steep slopes; intruding residents from other villages are damaging the grassland by digging up “coarse herbs” . According to the herders, “one episode of digging herbs followed by livestock trampling kills off the grass for good”.

Houlonggou herders graze too many yaks

There is no rule limiting the number of permissible yaks per household. Moreover, yaks from neighboring pastoral villages also intrude into the village pasture, as do some cattle and pigs from the agricultural villages on the lower slopes, and so forage is insufficient. Some village herders also earned income from raising livestock for external farmers and this worsened the winter forage shortage;

Poor breed of yaks

Herders have lacked income to introduce new livestock in recent years and forage quality has also declined. As a result yak quality has decreased and the grow-out period has lengthened. Consequently, a six year-old yak now resembles a three year-old of past years. Moreover, the lactation period has reduced from 4-4.5 months to 1 month, and commencement of the milking season is now June instead of April.

The herders attributed these changes to over-grazing and associated (a) increase in the herder population relying on the grassland; (b) Decline in supportive actions and effective censure for breaking community grassland management rules. Transgressions have increased as fodder shortage has worsened and timely punishment is lacking. Border disputes with neighboring villages remain unsolved and some herders lost confidence in future directions, and have abandoned efforts to

⁸ Local herders divide the medicinal herbs into two categories: “fine herbs” which command a high price, but result in little damage to the grassland from harvesting; and “coarse herbs”, are low-priced but their harvesting causes significant grassland damage

improve the grassland. All of these factors have resulted in collapse of the village rules. As the head of Houlonggou village said: “Forage is much scarcer and some of the offending grassland users were too strong. The Village Committee lacked any effective forms of censure...so we failed to stop the offenders. Everyone kept silent when I argued with those violators and nobody came to my aid. So I just withdrew at last. Why? Because the grassland belongs to everyone, not just to me”. It was in this way that Houlonggou came to represent a “tragedy of commons”. The challenge Houlonggou now faces is how to address this complex bundle of dilemmas: grassland degradation, unsustainable livelihoods, and lost collective action for future development.

3. Efforts to Escape the Dilemma

Houlonggou herders drew on their analysis of problems to agree on their goal for future development: to build a self-governing institution for sustainable grassland management. Over the past three years, they have undertaken a series of activities, summarized here and described in more detail below: (a) establishing and electing the Community Grassland Management Group (GMG, Fig.4); (b) reaching a consensus on collective activities; (c) managing and operating the CDF; (d) restoring the village social contract for grassland management; (e) cooperating on group activities to replant and protect vegetation, and (f) developing their own indicators and participatory assessments of grassland status and change.

Establishing and electing and the Community Grassland Management Group

Villagers recognized that grassland recovery and management is a long-term task and that the Village Committee could not be the sole source of sanctions for

Fig.4: GMG members make the promise



non-compliance with community-agreed social contract for grassland management. The herders therefore elected a self-governing community organization of seven herders (Grassland Management Group or GMG) with designated responsibilities through open voting. Following further discussions with local government, it was agreed that the GMG would operate independently under the support and supervision of the Village Committee, and that NGO Shuguang would provide initial capacity building for

the GMG.

⁹ Village social contract is the informal regulations for village self-management. Normally, it created and enforced by the administrative Village Committee in China. Now some efforts is try to promote on: creating and enforcing the village social contract by community members with the supports from the Village Committee

Reaching consensus on collective activities

The GMG built a solid foundation for future collective action and institutional change, by strengthening the internal communication and establishing common understanding among all the herders about their own community, grassland, and reasons for grassland degradation. This included discussing: (a) what kinds of grass are the best forage and how should its quality be assessed; (b) what types of grassland are considered to be good and what criteria are involved in that assessment; (c) what kinds of grassland management are most suitable and desirable; and what criteria should be used to evaluate the degree to which it has been achieved. Herders also analyzed common problems they faced in grassland management, and potential methods for improvement. Through this series of discussions and analysis, the Huolonggou herders reached a consensus that individual efforts or just relying on the Village Committee alone would be insufficient to improve grassland quality and herder compliance - collective activities were also necessary if they were to avoid becoming "ecological refugees".

Managing and operating the Community Development Fund

A key issue for the herders became how to ensure that the GMG could be energized and sustained. Past collective activities had already collapsed and some herders argued that forming grassland management groups was easy, but sustaining them was hard. This long-term work could not be sustained through GMG volunteerism. Herders suggested that the GMG could also operate a non-profit enterprise to balance their management costs. Herders proposed that the GMG manage a Community Development Fund (CDF), and that the interest generated from the CDF be used to cover GNG operating costs, fund maintenance, labor subsidies, and collective activities for grassland improvement.

The CDF is owned collectively by all the herders of Houlonggou. The herders have established CDF management social contract and principles for provision of revolving credit and revise these through herder meetings. Only the herders who: a) comply with the agreed village social contract for grassland management; and b) take part in collective grassland improving activities, are eligible for CDF loans. These are used towards grassland recovery, livestock improvement, and alternative livelihood activities to compensate for income loss through reduction in livestock numbers.

Restoring the village social contract for grassland management

Herders revised their existing village social contract for grassland management on the basis of their analysis of grassland management problems. The village social contract now includes agreed stipulations about: (a) limiting the number of yaks that an individual household may own (eg. a three-person household can raise up to 60 yaks; and for each additional person, ten more yaks can be raised); (b) herders in a hamlet should move as a group from one seasonal pasture to another within a five-day period; (c) herders can only raise yaks and horses. sheep, goats or pigs are not allowed to raise; (d) renting the pasture to outsiders and earning income from raising livestock for

external farmers are not allowed; forbid digging coarse herbs, etc.. The village social contract got the supports from the local township government, and the township government printed out, stamped, and published it forwardly.

Cooperating on group activities to replant and protect vegetation

Herders also undertake a range of collective activities for restoring their seriously degraded grassland. These included (a) building or restoring stone fences on some village borders to re-enforce the boundary between village-level grasslands and reduce conflicts; (b) building or restoring the stone fences between hamlets to clearly demarcate the seasonal pastures and support the requirements of the social contract for rotational grazing; (c) erect wire fences around mudslide damaged areas to prevent grazing for 3~5 years and promote their recovery; (d) erect stone fences around seriously degraded areas and prevent grazing for at least six months each year and oversow these areas with grass seed; (e) erect sow small 0.13 ha household hay-fields to reduce winter forage pressure and protect these from livestock damage with stone fencing; and (f) experiment with different grasses to identify species for sowing in different local conditions.

Developing indicators and participatory assessments of grassland status and change

The GMG conducted its first participatory assessment in late 2009 on the basis of their own criteria and indicators. The herders considered that grassland degradation appears to have slowed. The number of yaks decreased (from 2,000 to 1,300), winter forage is adequate, the number of boundary conflicts and of yaks lost has declined and more young herders have free time to earn off-farm income outside the village. One hamlet even suggested increasing the number of permissible yaks per household on the basis of improved grassland condition. Herders considered that three factors had contributed to this improvement in their grassland: (a) effective control of livestock grazing and numbers through their own actions; (b) restoration of the rotational grazing system; (c) a group-enforced ban on digging “coarse herbs”. The head of the GMG said in the occasion of that contravened the village social contract faced censure from villagers as a whole and not just from the administrative village committee. For example, when one herder refused to join the group move to spring pasture in 2009 most other herders argued with him and he acceded. This increased their confidence in their capacity to create and enforce collective action.

Herders refined their monitoring indicators in August 2010 and developed a plan to conduct monitoring of long-term grassland changes to inform their long-term collective activities for grassland management. They propose to conduct a participatory assessment each year and develop the collective action plan for the following year according to their own agreed monitoring data. They identified six categories and a total of 60 indicators, including : (a) *enforcement of the village social contract* including the number of households grazing more than their allocated maximum amount of yaks; the number of households renting pasture to outsiders; the number of households deriving income from raising livestock for external graziers / farmers; the number of

violations to rotational grazing rules; (b) *CDF operation* including the amount of capital, loans and repayments, interest and uses of interest; (c) *yak health* including the total number and trend in village yaks; the grow-out rate of yaks based on different observed households; Milk yield from the yaks of these observed households, and the estrus of female yaks; (d) *grassland status* including sample site photo-monitoring, weight of fresh and dried grass from these sample sites, and adequacy of winter forage; (e) *grassland maintenance activities* including length of fences damaged, erected and rebuilt; and the area of oversown grass and fields; (f) *overall satisfaction* including with annual collective activities, CDF operation and GMG performance .

4. Discussion: the Role of CDF in supporting CPR management:

Houlonggou has experienced a transition from CPR management through “a “Tragedy of the Commons”, to a restoration of self-government and collective action for common property management. We want to highlight three points from this experience: a) the linkages between losing the ability for collective cooperation and emergence of a “Tragedy of the Commons”; b) how can community capacity for cooperation and collective activities contribute to escaping from the dilemma; c) what role did the CDF play in the process of enhancing community cooperation and collective activities.

4.1 Linkages between losing the ability for collective action and “the Tragedy of Commons”

When Ostrom’s eight design principles (Ostrom, 1990), are applied to the situation in Houlonggou Village it is easy to see that the situation existing by the mid 2000s was unsustainable. (1) Boundary conflicts existed within the village and with neighboring villages; (2) grassland management rules were not revised to adapt to emerging resource shortage, e.g. there was no limitation amount on household livestock grazing; (3) only the Village Committee was responsible for enforcing the village social contract. (4) a graduated arrangement of sanctions was lacking; (5) enforcement of the village social contract relied on administrative orders instead of community-based supervision; (6) the Village Committee had abandoned its responsibility for disciplining non-conformance with the grassland management rules. In general, six of the eight design principals were unsatisfied to some extent.

In Houlonggou Village, this “tragedy of the commons” had come about through the violation of social norms i.e. population pressure resulted in resource shortage that then increased the community conflicts. Community members were dissatisfied with the absence of internal conflict-resolution mechanisms and inappropriate policies (such as the ban on burning scrub), and the un-resolved problems of boundary conflicts. People gradually lost patience, and more and more people violated the village social contract, and some people began to despair about their future. The

village leader could not deal with offenders through the former approaches and also lacked new measures. Gradually, the authority of the Village Committee decreased, and most people did not attend community meetings held by the Village Committee, and the social norms collapsed. After then the grassland lost protection from the village social contract, more violations occurred and the people only cared for their short-time benefit, rather than the base of their long-term livelihood.

4.2 How to Escape “the Tragedy of Commons” through Rebuilding Collective Activities Capacities

In Houlonggou Village, the community made efforts in the following areas to increase capacity for collective activities (Fig. 5):

Community cohesion

The GMG facilitated the herders to undertake field study and discussion about their own community and its grasses, grassland, and grassland management and to analyze the linkages between abandoning some collective activities and falling into their present dilemma. This helped herders to strengthen their sense of a physical and social ‘community’ and of belonging and reach an understanding that “we all depend on the same grassland”. Open voting for the GMG itself for herders to choose the people they trust for self-organization was also an important part of increasing self-management. The CDF was set up to strengthen the sense of collective property rights and to help strengthen responsibility for collective actions.

Community member acceptance of group rules

The community members prepared their own village social contract by themselves, and this strengthened their conformity. The emphasis was put on open, fair, equitable, transparent and accountable behaviors. Members were also encouraged to cooperate and solve their problems by coordination.

Mechanism for collective decision-making

The GMG only manages daily affairs relating to the grasslands and CDF. It is the community meeting as a collective that retains overall decision-making authority and the GMG is only in charge of enforcing the decisions made by the village member meeting.

Sustainable community organization (the GMG)

To undertake the long term tasks for which it has responsibility, the GMG must overcome some obstacles, such as its long-term financial viability and methods for regulating GMG member behavior. The GMG responsibilities including expenditure, financial reimbursement approval and open information, etc; and its division of labor also need to be clear and decided by the community as a whole. The community also meets to set the labor subsidy for GMG members.

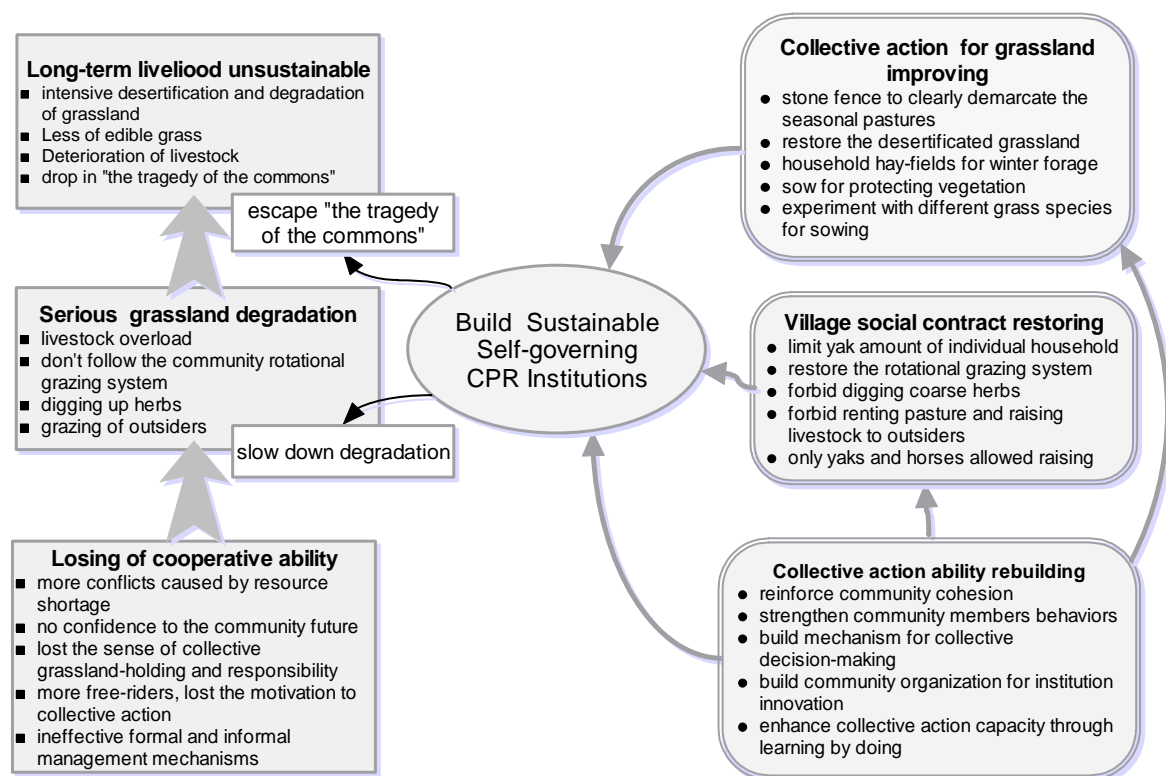
Appropriate and effective village social contract

An “appropriate” and “effective” village social contract can only be established by the community itself. It needs to include monitoring mechanisms, conflict-resolution mechanisms, awards and sanctions mechanisms.

Community cooperation through collective activities

Self-governing and cooperation for CPR are the outcomes of long-term practices and Huolonggou residents began to build these through a series collective of activities for learning by doing eg. selection of appropriate grass species and revising the village social contract.

Fig 5: Improving CPR Management through Rebuilding Collective Action



4.3 The Role of CDF in improving collective management of CPR

In Huolonggou Village, both the CDF and the common property resources (CPR) are managed by the community itself. The community not only takes charge of organizing long-term collective actions for grassland use, but also directs the CDF towards strengthening this sustainable management and use. After analyzing the situation, we have found that CDF is playing a manifest role in strengthening CPR management institution (Fig. 6).

Firstly, the CDF reinforces a sense of collective grassland-holding and its purpose. The CDF principal belongs to the whole community as a collective asset to which members have both rights and responsibilities. It also provides an immediate and very practical representation of those rights, responsibilities, and the benefits that can become apparent, if used well.

Secondly, CDF strengthens the sustainability of the collective actions for managing CPR. The financial interest derived from the CDF can be used to cover the cost of operating the community organization and undertaking monitoring, and this helps ensure that people are willing to join and work conscientiously in community self-management body. The financial interest can also be used for future collective actions, to some degree decreasing the financial pressure of taking those collective actions. Therefore, CDF that can be operated for a long period of time is contributive to promoting long-term collective actions, helping the community in forming the habit of long-term collective actions.

Thirdly, CDF encourages community members to participate more actively in collective actions, rather than merely being a 'free-rider'. Indeed, the costs of free-riding are raised by the complementary functions of the village social contract stipulate standards for conformance.

Fourthly, CDF encourages the probity and contractual commitment of community members. As a financial-loan activity, the CDF emphasizes the importance of a written and recognized contract covering borrowing and repayment, and also reinforces commitment to self-management the CPR. Community members who lack good social recognition will not be able to get loans or guarantees for others. This motivates community members to value and seek to improve this form of credit. For example, now the villagers are willing to attend the community meetings, different from the past.

Fifthly, CDF promotes institutional changes in CPR management. The CDF can be seen as one kind of additional and external compensations for the cost of CPR institutional innovation, so the community will not hesitate to undertake their institutional innovation.

Sixthly, building community self-organizing around the launch of the CDF was a win-win for the community and local government. Local government recognized CDF as a mechanism for funding poverty alleviation that would yield obvious economic outcomes and recognition for local government. From the community's perspective, CDF was also welcomed as a long-term asset owned and operated by the community.

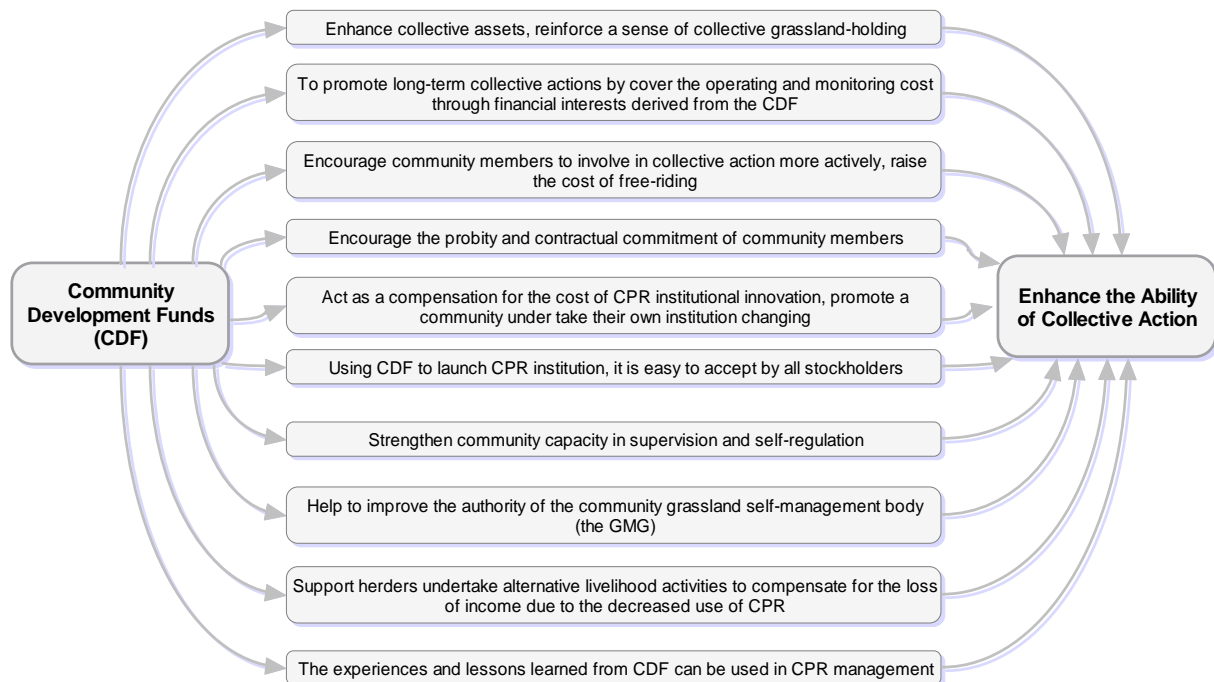
Seventhly, CDF is strengthening community capacity in supervision and self-regulation. As the asset is owned by all, everyone keeps a close eye on it, for fear of loss. It is likely that the operation of effective monitoring and sanctioning

mechanisms through CDF will also begin to influence the CPR management, compliance, and monitoring.

Eighth, CDF helps to improve the authority of the community grassland self-management body (the GMG) and earn trust from others. CDF management and operation is actually providing common goods and services to the community, and is therefore welcomed. The GMG can increase its authority in the process of providing services and earn the trust, and further strengthen its opportunities for organizing collective actions for CPR management;

Ninth, CDF encourages herders to also undertake alternative livelihood activities to compensate for the loss of income due to the decreased use of CPR as an interim or longer-term measure;

Fig.6: The Role of CDF in Improving Collective Management of CPR



Tenth, the experiences of operating the CDF, such as self-governing, collective decision-making, designing monitoring mechanisms, and a rewards and sanction system, etc., can also be used in the institutional design of CPR activities. So the operation of the CDF can act as a process for building capacity to undertake collective activities for CPR management.

From this and similar case-projects we have undertaken, we have found that combining CDF with CPR management is a feasible way to escape from the “the tragedy of the commons”. CDF may help in many aspects of forming and strengthening collective actions and improving CPR management abilities. Most importantly, CDF contributes to the sustainability of community organization and

collective actions and increases the feasibility of sustained operation of community self-management bodies without support from outside or with a different way of working with outside funding.

Conclusion

China hopes that a sustainable livestock carrying capacity can be established in grassland areas to protect or restore grassland condition and maintain herder livelihood and well-being. However, the natural and social conditions in China's vast grassland areas (41.7 per cent or so of its national landmass) are diverse, the current condition of the grasslands is different, and many arid and upland areas are non-equilibrium environments. This means that setting grassland management criteria externally and then enforcing them by external means alone is very costly and difficult. The government has recently announced a new policy to encourage herder households to achieve grassland-livestock balance. There is an opportunity, in at least some herding communities, to develop different localized ways of managing and monitoring a livestock-grassland balance. This could involve herders in collective action to maintain or restore their collective grassland resources and management rules. Our paper seeks to show that these Two Collectivities (collective resources and collectively agreed rules and actions) are mutually reinforcing and necessary for good resource management in, and by, the herder communities where we work. It is not the case that dividing grasslands to individual household operation will better protect the grasslands if this form of grassland management is inappropriate to grassland conditions. Conversely, collective grassland commons without respected local grazing rules can also be easily eroded. Appropriate scales of management and of management rules are both necessary for rangeland health.

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