

Regenerating Wastelands Through Cooperatives: Experience of Tree Growers' Cooperatives in Rajasthan, India

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Abstract

Over the past few decades, there has been an upsurge of interest in community-based approaches to simultaneously address environment and development concerns. Within forestry, these are commonly referred to as community-based forest management (CBFM). CBFM grew rapidly in the past couple of decades and by 2004 there were an estimated 370 million hectares of forests under CBFM. Although the area under CBFM has increased steadily, there has also been a growing debate over its efficacy.

This paper assesses the impact of one CBFM model – Tree Growers' Cooperative Society (TGCS) – employed for establishing and managing fuelwood and fodder plantations on village commonlands (revenue wastelands). It is based on fieldwork conducted in three TGCSs in the Ajmer district of the state of Rajasthan in India. The data was collected through household questionnaire survey, semi-structured interviews, and analysis of TGCS records.

The three TGCSs have been operational for over 15 years and have survived for the past 10 years without any external support. The tree plantations raised by the TGCSs over leased commonlands have also survived. This shows that it is possible for the local communities to manage tree resources and regenerate degraded village commonlands through collective effort, provided there is security of tenure. While the economic and ecological impacts of the TGCSs have been positive, these have been rather limited due to degraded condition of the leased lands and lack of adequate rainfall in the past several years. The social impact of the TGCSs has also been positive though there seems to be limited involvement of most members in running their affairs. A number of factors such as security of tenure, institutional framework, choice of species, role played by the facilitating agency, and rapidly changing external environment have shaped the outcomes of the TGCSs. The study also highlights strengths and weaknesses of the cooperative model for managing common pool natural resources such as commonland tree plantations. One of the major contributions of the TGCSs has to been to preserve the village commonlands in an environment where these are being gradually privatised – legally or illegally.

Key words: *community-based forest management, community forestry, tree growers' cooperative societies, commonland plantations, wastelands, India*

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INTRODUCTION

There has been a convergence of environment and development concerns in recent decades (Agrawal and Redford, 2006). At the same time, there has been an upsurge of interest in 'community-based' approaches to address both these concerns following realisation that top-down, bureaucratic, and techno-centric approaches were not working (Leach *et al.*, 1997a). Such approaches actively involve local communities in the design, management, and implementation of environmental and developmental programmes (Mansuri and Rao, 2004).

The essence of such approaches is captured in the term 'primary environmental care' coined by Pretty and Guijt (1992, 22), which is defined as "a process by which local groups or communities organize themselves with varying degrees of outside support so as to apply their skills and knowledge to the care of natural resources and environment while satisfying livelihood needs". The three central elements of such approaches are (1) the meeting of basic livelihood needs; (2) the protection and optimal use of the environment and natural resources; and (3) the empowering of groups and communities for self-development (Pretty and Guijt, 1992).

Over the past few decades, such approaches have become common in a wide range of 'sectors' (Conroy and Litvinoff 1988; Leach *et al.*, 1997a), with forestry being a prominent one (Ostrom, 1999). Within forestry, these are commonly referred to as community forestry or community-based forest management (CBFM), though a number of other terms (e.g. community conservation, collaborative forestry, and joint forest management) are also used. Although these terms refer to a range of forestry programmes with varied objectives, there is an element of community involvement in all (see FAO, 1978).

A range of CBFM programmes have been initiated in a number of countries during the past few decades contributing to 'institutional pluralism' within the forestry sector (Vira *et al.*, 1998). However, there is also a growing debate regarding CBFM's efficacy to address economic, social, and environmental issues. Much of this debate is conducted in very general terms i.e. for or against CBFM. It is of utmost importance to specify the particular meaning of CBFM employed as the term is used for a wide range of initiatives with quite different objectives (Adams and Hulme, 2001). Further, its appropriateness has to be seen in particular contexts. Therefore, the focus has to be on specific CBFM models used in specific contexts rather than on CBFM philosophy in general.

This paper focuses on one such model – Tree Growers' Cooperative Society (TGCS) – employed for establishing and managing fuelwood and fodder plantations on village commonlands (revenue wastelands) with active involvement of the local community. It assesses the local community's perception and ground reality regarding the economic, social, and ecological impact of the model. It is based on primary fieldwork in three TGCSs in Ajmer district of Rajasthan, India. It presents interim results of an ongoing study. The methodology used for carrying out the study is presented in the next section.

METHODOLOGY

The TGCSs (under the National Tree Growers' Cooperative Federation Limited or NTGCF – see section 5) have been organised in seven states of India. One state – Rajasthan – was selected for study due to the following reasons:

- It is the state with the highest proportion of common pool land resources in India (NSSO, 1999, in Vira, 2004).
- A large number of households are dependent on common pool land resources for their livelihoods (Jodha, 2001).
- It was one of the pioneering states to try out the TGCS model. It also has the highest number of TGCSs formed by the NTGCF.

Within Rajasthan, one district – Ajmer – was selected after discussion with the staff members of the Foundation for Ecological Security (FES), a new NGO that emerged out of the NTGCF around a decade back. Ajmer was one of the pioneering districts where the TGCSs were first formed; therefore many TGCSs in the district are mature and are over 15 years old. The presence of older TGCSs provides rich context for assessment of impacts over a longer term. A total of 60 TGCSs were constituted in the district. Out of these three TGCSs were purposively selected based on research questions and discussion with the staff members of FES . The selected TGCSs are (1) Khoda Ganesh, (2) Nathoothala, and (3) Kumhariya. These three TGCSs were formed around the same time but have achieved different levels of resource development (tree plantation status) and institutional development.

The data was collected through the following methods:

- Secondary literature review: A review of literature on CBFM was carried out to place this study within the wider debates on CBFM and management of common pool resources.
- Analysis of TGCS records: Various TGCS records such as proceedings register (meeting minutes), cash book, and audit reports were studied.
- Semi-structured interview: Semi-structured interviews were conducted with six TGCS office bearers, seven FES staff members associated with the TGCS project and one ex-staff member of the NTGCF.
- Questionnaire: Questionnaire-based household survey was conducted in the three selected TGCSs. A total of 382 households were covered in the survey.

The rest of this paper is divided into seven sections. In section 3, major reasons behind the emergence of CBFM are presented. In section 4, debate over the efficacy of CBFM is discussed. In section 5, background of the TGCS project is provided. In section 6, short case studies of the three TGCSs are presented. In section 7, results of the household survey on the local community's perception about the impact of TGCSs are presented. In section 8, broader issues affecting outcomes of the TGCSs are discussed. The overall conclusions of the study are presented in the final section.

CBFM – EMERGENCE AND GROWTH

The CBFM approach is generally considered to have emerged between mid- and late-1970s (Arnold, 2001). Its emergence was related to the growing interest in conservation of forests, especially in the tropics, and well-being of people residing in or near forests (Byron and Arnold, 1999). Apart from interest in conservation, the growing awareness of the link between rural livelihoods and natural resources such as forests also played a part in its emergence (Wunder, 2001). A number of studies indicated that poor people bear disproportionately high costs of natural resource degradation and often end up as 'ecological refugees' in the city slums (see, for example, Guha and Martínez-Alier, 1997). CBFM also got impetus from increasing emphasis on decentralisation (Agrawal and Ribot, 1999; Ribot, 2004) and emergence of the concepts of 'sustainable development' (WCED, 1987) and 'sustainable livelihoods' (Chambers, 1988). The emergence of CBFM reflects an increasing recognition and appreciation of the role of local communities in natural resource stewardship (Poffenberger, 1990; Shiva, 1994, in Woodhouse, 2002; Guha and Martínez-Alier, 1997). The thinking behind CBFM was also endorsed at the United Nations Conference on Environment and Development (UNCED) held at Rio de Janeiro in 1992. In addition to reiterating possibilities of win-win solutions, the conference emphasised the key role of local communities in addressing environment and development problems (Grubb *et al.*, 1993).

In their early days, most CBFM programmes had a limited objective of meeting fuelwood and fodder needs of the local communities. It was hoped that this would relieve pressure on forests, thereby reversing forest degradation. Major CBFM programmes were launched in different countries with this philosophy, e.g. collective woodlots programme in South Korea, village forestry programme in Thailand, village afforestation programme in Tanzania, community forestry programme in the Nepal mid hills, community-based forestry in the Philippines, and social forestry programme in India. Subsequently, the focus of CBFM shifted to natural forest management including biodiversity conservation and non-ecologically damaging harvesting of non-timber forest products (NTFPs) (Arnold, 2001).

CBFM spread rapidly in the 1980s and 1990s as it got the support from donor agencies, conservation and development NGOs, community rights activists, and many national policy makers. For example, World Bank invested US\$830 million in India in various CBFM projects (Kumar *et al.*, 2000). Overall, it is estimated that the World Bank's lending for community-based projects increased from US\$ 325 million in 1996 to around US\$ 2 billion in 2003 (Mansuri and Rao, 2004).⁴ CBFM got additional support when the Millennium Development Goals (MDGs) were agreed. Under MDGs, both poverty eradication and environmental sustainability were identified as global imperatives. Different estimates indicated that upwards of a billion people may be dependent on forests for their livelihoods and their empowerment was essential to meet the MDGs (Roe and Elliott, 2004; UNDP *et al.*, 2005; also see UN Millennium Project, 2005). The need to focus on natural resources such as forests was further underlined by the fact

⁴ If one includes the lending for an enabling environment, the increase was from US\$ 3 billion (1996) to US\$ 7 billion (2003). These figures are for all community-based projects and not just forestry projects.

that natural capital constituted as much as 26% of the total wealth in low income countries against mere 2% in high income countries (World Bank, 2005).

In recent years, focus on environmental services from forests and potential for market-based instruments to maintain or enhance these services has renewed interest in CBFM. The communities in the global South now have a new commodity (environmental services) to sell to buyers, especially in the global North (UNDP *et al.*, 2005; also see Landell-Mills and Porras, 2002; MEA, 2005). The area under CBFM increased rapidly in the 1990s, and by 2004 there were an estimated 370 million hectares (ha.) of forests under CBFM in the Americas, Africa, and Asia (Molnar *et al.*, 2004).

DEBATE OVER CBFM

Although the area of forests under CBFM has increased steadily over the past few decades, there has also been a growing debate over its efficacy. Several critics have questioned the implicit or explicit assumptions in CBFM about 'community', 'environment', and their inter-relationship including impact on poverty.

The notion that a clearly bounded, homogenous and static 'community' exists and that it lived in harmony with nature until this balance was disrupted by the twin forces of state and market has been challenged by a number of authors (Redford, 1991; Leach *et al.*, 1997b, 1999; Agrawal and Gibson, 1999; Kapoor, 2001). It has been argued that due to this untested assumption, CBFM programmes have generally glossed over the issues of power relations and contestation *within* community groups. They have also ignored the dynamic nature of these groups (Leach *et al.*, 1997b, 1999). The problems of inequitable sharing of costs and benefits within community groups involved in CBFM programmes have been well documented (Sarin, 1996; Malla, 2000; Agarwal, 2001; Post and Snel, 2003; Meshack *et al.*, 2006). Agrawal and Gibson (1999) have questioned several other assumptions made in CBFM programmes. For example, small groups with strong norms are often assumed to be more likely to be better resource managers. However, small groups may be unable to protect the resource from strong external threats, and strongly held norms may support exploitative behaviour and be resistant to outside attempts at their modification. Although some authors have claimed that such idealised representations of consensual communities serve the strategic purpose of countering other dominant narratives (Li, 1996), it is increasingly being seen as highly problematic. The idea that 'participation' is invariably a good thing has also been challenged (Cleaver, 2001; Cooke and Kothari, 2001; Hickey and Mohan, 2004).

Another criticism of CBFM programmes has been that they have tended to take a deterministic view of environment and environment change. It has been argued that most such programmes view natural environment as a stable, balanced, and homeostatically regulated system. Any disturbance is believed to upset the balance of the system, which tends to return to the stable state (e.g. climax vegetation) through a linear, predictable process (e.g. succession) (Leach *et al.*, 1999). However, this thinking is increasingly being challenged by non-equilibrium perspectives (see, for example,

Botkin, 1990; Forsyth, 2003) that view environment to be much more dynamic and variable in time and space, and shaped partly by human action (Leach *et al.*, 1999).

However, the most active debate is on the assumptions in CBFM programmes regarding relations between community and environment. While many CBFM programmes have moved beyond neo-Malthusian analyses of the environmental problems (e.g. Meffe *et al.*, 1993), some authors argue that several untested assumptions remain (Leach *et al.*, 1999). Some have argued that seemingly harmonious relationship between some indigenous communities and forests in the past may have been due to low population densities and asset poverty (e.g. no firearms) rather than any specific conservation ethos (Wunder, 2001). Case studies have shown that local communities may not always be interested in biodiversity conservation (Chicchón, 2000). Some authors have argued that CBFM programmes such as Integrated Conservation-Development Projects (ICDPs) are unsustainable due to conceptual flaws in the thinking behind such projects. They argue that such programmes will lead to neither conservation nor community development (Barrett and Arcese, 1995). Indeed, global reviews of such programmes have shown that progress in this regard has been rather limited (Wells *et al.*, 1992; McShane, 2003; Sunderlin, 2006).

The implicit assumptions regarding links between poverty and forests have also been challenged (Wunder, 2001). Studies have shown that the relatively wealthier are often the heaviest users of forests though the poor usually derive a greater proportion of their overall needs from the forests (Byron and Arnold, 1999; Adhikari, 2005). Due to improvements in agriculture, the importance of forests during stress periods has also reduced (Byron and Arnold, 1999). At the macroeconomic level, forest loss has been shown to be *positively* correlated with both economic growth (81 countries) and poverty reduction (26 countries) – though neither coefficient is significant (Thomas *et al.*, 2000, in Wunder, 2001). At the local level, it has been shown that poverty reduction may not always reduce pressure on forests. Although reduction in poverty increases opportunity cost of labour for deforestation, it may also increase investments in activities that directly or indirectly lead to forest loss. For example, a study found that increase in Brazil nut prices actually increased deforestation as collectors were investing surplus income into cattle ranching (Carpentier *et al.*, 1999, in Wunder, 2001). It has been argued that forestry activities may not always lead to poverty alleviation as many forestry activities such as NTFP extraction have poor economic potential and people undertake these only because of lack of better alternative sources of income. In any case, these activities may be susceptible to changes in market conditions, e.g. replacement of tree resin by synthetic products (Byron and Arnold, 1999). In some cases, deforestation (e.g. for agriculture) may actually be an important avenue for the local communities to reduce their poverty (Wunder, 2001).

It has also been argued that while local communities may have an incentive to maintain locally important forest environmental services (e.g. watershed protection), they may put less emphasis on those services that are important at regional, national, or global levels (e.g. carbon sequestration) (Chomitz *et al.*, 2007). Further, local communities may lack

the capacity to undertake complex management practices and for some resources (e.g. a wild animal population spread over a large area), local community management may not be suitable.

Due to the above critiques, there have been calls to abandon CBFM altogether. This, in turn, has led to counter critiques on moral and practical grounds. Some authors have documented effectiveness of CBFM in combating resource degradation (Gunther, 1999; Chapela, 2000; Nepstad *et al.*, 2006), while others have documented successful community forestry enterprises (Antinori and Bray, 2005). Others still have argued for CBFM from the perspective of local communities' rights (Colchester, 2000). Some more comprehensive assessments of successful CBFM cases as well as pending issues and challenges have also been carried out (Western *et al.*, 1994). This debate is still ongoing and is far from over.

BACKGROUND OF THE TGCS PROJECT

Against this backdrop, a number of different organisational models ranging from informal user groups to formal elected councils have been tried for CBFM in different contexts. The cooperative is one such model. A cooperative is an organization that is owned by and operated for the benefit of those using its services (Encyclopaedia Britannica, 2005). The International Co-operative Alliance (ICA), representing 220 member organisations in 85 countries, defines cooperative as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ICA, 2007).

India is home to the world's largest cooperative movement. In 2004-05, there were 583,580 cooperatives in the country with a total membership of over 242 million (NCUI, 2006). The cooperatives play an important role in a range of sectors, especially agriculture credit and marketing. The sugar and milk cooperatives are most well-known. Although the cooperative movement in India is over a century old, it has been extended to common pool natural resources relatively recently. It is being tried for management of a range of common pool natural resources such as irrigation water, fisheries, pasture lands, natural salt, and forests (Singh and Ballabh, 1996). In the forestry sector, cooperative model has been tried in both natural forest and plantation areas. The forestry cooperatives are involved in a range of activities such as timber harvesting, collection and marketing of NTFPs, running small forestry enterprises for producing honey, herbal medicines, silk and handicrafts, and ecotourism.

Within the forestry sector, one of the pioneering attempts in community involvement through cooperatives was the establishment of TGCSs to reclaim wastelands by establishing tree plantations. The TGCSs were modelled on the 'Anand Pattern' of cooperatives – the institutional structure developed in the Kaira District Cooperative Milk Union (popularly known by its brand name *Amul*) and widely replicated by the National Dairy Development Board (NDDB) under India's Operation Flood, the world's largest dairy development programme (Shah, 1996; also see George, 1994).

The genesis of the TGCS project can be traced to the growing concern in the 1980s over fuelwood and fodder scarcity on the one hand, and land degradation on the other. After examining the problems of domestic fuel supplies, the Advisory Board on Energy recommended in 1984 that NDDB should prepare a pilot project to replicate Anand pattern cooperatives for rural tree plantations. The NDDB itself had realised that shortage of green fodder was a major constraint in increasing milk production in the country and was thus interested in promoting fodder plantations. Therefore, in 1985 it prepared a proposal for a pilot project to promote fuelwood and fodder plantations by establishing TGCSs.

The government was also concerned about the problem of wastelands. The government estimates suggest that nearly a fifth of the country (63.85 million ha.) is a wasteland.⁵ In 1985, government created the National Wastelands Development Board to tackle the problem of wastelands. Soon after its creation, the board started looking for institutional alternatives for afforestation that were likely to be more effective and sustainable than the existing forest department-led social forestry programme. It also found the Anand pattern cooperatives to be promising (Saxena, 1996; IRMA, 2006).

The NDDB launched its pilot project in 1986 in four states *viz.* Andhra Pradesh, Gujarat, Orissa, and Rajasthan.⁶ Subsequently, it was extended to two more states – Karnataka and Uttar Pradesh. A seventh state – Madhya Pradesh – was also added later on. In 1988, an apex level organization (NTGCF) was created to oversee and guide the activities of the project. In the initial five years, the project was entirely funded by NDDB. Subsequently additional funding was obtained from the Swedish and Canadian development agencies (Saxena, 1996; NTGCF, 1997; IRMA, 2006).

Each tree growers' cooperative had a mandate of establishing a plantation on around 40 ha. of village commonland taken on a long-term lease (15-30 years) from the state government (NTGCF, 1997; IRMA, 2006; Singh, 2007). There was one member per household and each paid INR 11 towards the share and membership fee. The entire cost of plantation was borne by the project, and technical and programmatic support was provided by the field teams of NTGCF based in the project areas.

In 1996, NTGCF undertook a major review of its activities and decided to expand its activities beyond cooperatives to other types of local organizations such as *Van Panchayats*, *Gramya Jungle Committees*, *Forest Protection Committees*, and *Panchayats*. It also decided to work on an ecosystem-based approach by working in blocks in a watershed rather than isolated villages (NTGCF, 1997; NTGCF, 1999). In 2001, a new organization –FES – was established to carry this initiative forward.

By 2007, there were 548 tree growers' cooperatives. In addition, FES was also working with 235 Village Forest Protection Committees, 51 Grazing Land Development Committees, 68 *Panchayati Raj* Institutions, 198 Village Committees, 40 *Gramya Jungle*

⁵ Source: <http://www.nrsa.gov.in/rsgisweb/land/wland1.htm> (accessed 28.11.2006)

⁶ Around the same time, another similar initiative was launched by the Indian Farmers Fertiliser Cooperative Limited (IFFCO) (Govil and Shrotriya, 1993).

Committees, and 64 *Van Panchayats* (FES, 2007). The organisation now raises funds from a variety of sources to support its activities. However, at present there is no specific project to support TGCSs in Rajasthan and elsewhere. The financial support from Swedish and Canadian development agencies ended in 2001 and 2003, respectively (Singh, 2007).

TGCS CASE STUDIES

The case studies of three TGCSs covered under this study are presented in this section. The case studies cover the origin, development of the TGCS in its early years, and current status.

Khoda Ganesh

The Khoda Ganesh TGCS is located at Khoda Ganesh village under the Ajmer *tehsil*⁷, Ajmer district, Rajasthan. The village consists of 82 households⁸. The Raikas and Rajputs are the two major caste groups in the village. The total land area of the village is 671 ha. The broad land classification of the village is given in Table 1.

Table 1: Land classification of Khoda Ganesh village

Land Type	Area (ha.)
Irrigated	106
Unirrigated	158
Culturable waste	33
Area not available for cultivation	349
Forest	25
Total	671

Source: Census 2001 data available online at www.gis.rajasthan.gov.in (accessed 01.03.2008)

Origin

The majority of households in the village (57%) belong to the Raika caste and are traditional nomadic herders. Many Raika families also rear camels. Traditionally, camel herders used to take their camel herds (*to/a*) to grazing areas – a few hundred kilometres away – in Karauli and Bharatpur districts in eastern Rajasthan. However, the camel herders started facing problems due to increasing lawlessness in these areas. They started facing increasing attacks and extortion attempts. The final straw came when one of the young boys from the village was kidnapped and a huge ransom (INR 150,000) was demanded for his release. After this incident, the camel herders decided to stop taking their camels to their traditional grazing sites in eastern Rajasthan. This forced them to think of alternative fodder source for their camels. Therefore, when the NTGCF approached the village to form a TGCS to establish a fuelwood and fodder plantation, they were quite receptive to the idea. Some village elders visited the nearby

⁷ Tehsil is an administrative unit below the district level.

⁸ According to the list prepared by the President of the TGCS. This list excludes the households in the Salon Ki Dhani hamlet, which is also part of the revenue village Khoda but its residents are not members of the TGCS.

village of Khatoli where a TGCS was already functioning. After discussing the pros and cons of forming the TGCS with the people of Khatoli, they conveyed their agreement to the NTGCF.

The early years

The village people started organising the TGCS in 1990 and several households became members by paying INR 11 (INR 10 share and INR 1 membership fee). The Khoda Ganesh TGCS was registered in February 1991 and it was granted twenty-five year lease by the government for about 40 ha. of Revenue Wasteland in the village in June 1992. There were around 20 illegal stone mines operating at the site that was leased to the TGCS. Most of these mines were allegedly being operated by persons from the neighbouring Bubani village. The TGCS managed to get the mining activity stopped within the leased plot.

The NTGCF provided financial support for establishing the plantation and carrying out soil and moisture conservation works at the site. It also provided the salary of a watchman and honorarium for the TGCS Secretary for five years. A total of 32,375 trees were planted up to March 1996 and a total expenditure of INR 324,143.85 was incurred. The bulk of the trees planted (94%) were *Acacia nilotica*, which provide both fuelwood and fodder. The plantation site was closed for five years to allow trees to grow beyond browsing height. The protection of the site against continuous grazing also allowed several fodder grasses and 'Dasani' bushes (these provide good fodder for goats) to flourish. Initially, people were allowed to cut and carry headloads of fodder grasses after payment of a nominal fee. After five years, the site was opened for grazing. The village livestock used to be allowed in the plantation for a few months after monsoon. The TGCS used to collect grazing fee and initially the rate was kept quite high – INR 75 per animal per season for large animals (camel, buffalo, and cow) and INR 25 for small animals (goat and sheep). As there was ample fodder available in the plantation, most livestock herders agreed to pay the high grazing fee although some sheep owners found it to be unaffordable. Subsequently, the season's grazing fee was lowered to INR 15 (camel), INR 10 (buffalo and cow) and INR 5 (goat and sheep). After the NTGCF stopped paying salary of the watchman and honorarium of the Secretary, the TGCS paid them from the grazing fee collected by it. During the initial years, the watchman was employed throughout the year. However, later on a watchman was kept only for about two months during the monsoon when the plantation area was closed for grazing to allow the fodder grasses to grow.

Current status

According to TGCS records, at present there are 77 TGCS members from the village. In addition, there are eight members from the neighbouring Bubani village taking the total membership of the TGCS to 85. The area has suffered continuous drought for the past several years. It has severely affected the plantation and the survival and growth of the planted trees. The growth of grasses is also poor. Therefore, the practice of closing the plantation area during monsoon has now been abandoned. Consequently, no

watchman is employed by the TGCS and free grazing is permitted throughout the year. However, as there is not much fodder available inside the plantation or other commonlands, many families have been forced to sell off their livestock. For example, it is estimated by some villagers that the number of camels in the village has come down from around 2,000 at the time of formation of the TGCS to about 100 now. Similarly, sheep have been reduced from between 4,000 and 5,000 to around 1,000 during the same time period.

The limited benefits that village people are currently getting from the plantation are (1) fuelwood from *Prosopis juliflora* trees that have come up naturally on the plantation site and (2) small amount of fodder from the leaves and pods of *Acacia nilotica* trees and 'Dasani' bushes. Although harvesting of *Prosopis juliflora* branches is allowed, there are restrictions on felling *Acacia nilotica* trees and 'Dasani' bushes. The TGCS has fixed a fine of INR 501 for illegal felling of these species.

As the TGCS does not have any regular source of income for the past several years, it stopped paying the Secretary's honorarium in 2003. In order to get at least some income to meet expenses such as annual audit fees, the TGCS has started exploring various avenues. It has been auctioning dry trees. In 2006, it also auctioned some *Prosopis juliflora* trees for charcoal making. In 2007, the leaves and pods of a few (5-6) large *Acacia nilotica* trees were auctioned by the TGCS for the first time for a few hundred INR. The TGCS is planning to auction some more trees in 2008 and expects an income of a few thousand INR. The TGCS plans to close the plantation site to allow grasses to come up if there is good rainfall in 2008 or any subsequent year and earn some income through grazing fees.

As there is not much activity related to the TGCS at present, the issues related to TGCS are presently discussed in the village community during the general meeting (*Hatai*) held twice a year around Holi and Diwali festivals. Apart from continuous drought, the major challenges facing the TGCS include illegal harvesting of trees by the people of neighbouring villages of Bubani and Naulakha and dumping of mining waste in the plantation area by people of the neighbouring Bubani village.

Nathoothala

The Nathoothala TGCS is located at Nathoothala village under the Peesangan *tehsil*, Ajmer district, Rajasthan. The village consists of 201 households⁹. The Cheetahs are the dominant caste group in the village. The other important caste groups in the village are Mughals, Regars, and Kumawats. The total land area of the village is 490 ha. The broad land classification of the village is given in Table 2.

⁹ According to a census conducted by the teachers of the village primary school.

Table 2: Land classification of Nathoothala village

Land Type	Area (ha.)
Irrigated	207
Unirrigated	78
Culturable waste	31
Area not available for cultivation	174
Total	490

Source: Census 2001 data available online at www.gis.rajasthan.gov.in (accessed 01.03.2008)

Origin

The origin of the Nathoothala TGCS is related to two earlier commonland plantations in the village raised in late 1970s under the social forestry programme. These plantations were raised through the efforts of the then Sarpanch¹⁰, who had travelled widely in the country as an army man and was aware of environmental challenges facing the country. Although there was resistance to the idea of establishing tree plantations from several people in the village, who feared that the government would take over their village land, he managed to convince them about the importance of these plantations. Subsequently, two plantations were raised with the help of the Forest Department. The village people got the benefit of fuelwood and fodder from these plantations. Therefore, when NTGCF approached the village for forming a TGCS, they readily agreed and the same Sarpanch became the Chairperson of the TGCS. Another reason for their ready agreement was that they were afraid that part of their village's Revenue Wasteland may be allotted to some outsider. They felt that getting the land leased for TGCS would be a good way to avert such an eventuality.

The early years

The village people started organising the TGCS in 1991 and several households became members by paying INR 11 (INR 10 share and INR 1 membership fee). The Nathoothala TGCS was registered in March 1992. After the registration of the TGCS, they applied to the government for getting around 57 ha. of land leased to the TGCS. However, they were leased only around 30.5 ha. in July 1994 (one of the two plots (*khasra*) they had applied for). The allotted land had some encroachment by a person from the neighbouring Bhaonta village, which was vacated by the TGCS.

The NTGCF provided financial support for establishing the plantation and carrying out soil and moisture conservation works at the site. It also provided the salary of a watchman and honorarium for the TGCS Secretary for five years. Although the TGCS was allotted only 30.5 ha. of land, it decided to plant trees over a much larger area due to availability of funds. A total of 45,150 trees were planted, the majority of which were *Acacia tortilis*. The decision to plant *Acacia tortilis* was taken based on earlier good results seen with this tree at the two existing social forestry plantation sites in the village. A number of *Ailanthus excelsa* trees were also planted but these didn't do very well due to unsuitable soil and moisture conditions. The TGCS also seeded dhaman

¹⁰ Head of panchayat or democratically elected local self government body.

(*Cenchrus* spp.) and moonj (*Saccharum munja*) grasses in the plantation area. The area was closed for about five years to allow the plantation to get established and grow beyond browsing height. Afterwards, the TGCS started auctioning grass and tree fodder (leaves and pods).

Current status

According to TGCS records, there are at present 224 TGCS members – all from Nathoothala village. The Nathoothala plantation has been established on stabilised sand dunes. In spite of that the plantation is in reasonably good condition. The *Acacia tortilis* trees have especially done well. The people are allowed free grazing in the plantation though due to low rainfall and shade of trees, there is not much grass available in the plantation. The tree fodder, which is available, is not free. In fact, it is the main source of income for the TGCS. The collection rights for tree fodder (leaves and pods) are auctioned. Usually, one person (the highest bidder) is granted collection rights over the entire plantation and he or she subsequently sells the collection rights to individual trees further to the livestock owners. The TGCS also has kept stiff fines for tree felling and for harvesting big branches while lopping trees. In 2007, the tree fodder was auctioned for INR 6,500 but the person who bought the lopping rights cut some large branches. Therefore, the TGCS cancelled the contract and also slapped a fine of INR 4,500. Even village women who had collected these branches for fuelwood purposes were fine INR 100 each. In 2001, the TGCS had fined no less than 41 persons from the village at the same time for unauthorised removal of produce from the plantation.

An interesting feature of this TGCS is that most of its financial transactions are kept outside the cooperative system but are managed through the informal village fund (*Gawai* fund) system. These days the Secretary of the TGCS is no longer paid any honorarium. The money earned from the TGCS plantation (and the other two social forestry plantations) is used for certain common village-level expenses such as payment of electricity bills for the *madrassa* (religious school) and for pumping drinking water in the village. Any surplus amount is used for extending small loans within the village. The accounts of the village fund are discussed twice a year on Holi and Diwali festivals.

Apart from issue of unauthorised felling of trees from the plantation (often by village people), the other major issue confronting the TGCS is encroachment of a part of plantation area (around 0.8 ha.) by a person from the neighbouring Bhaonta village.

Kumhariya

The Kumhariya TGCS is located at Kumhariya village under the Bhinay *tehsil*, Ajmer district, Rajasthan. The village consists of 220 households¹¹. The Gujjars are the

¹¹ According to the list prepared by the President and Secretary of the TGCS. This list excludes the households in the Rajpura majra, which is also part of the revenue village Kumhariya but its residents are not members of the TGCS.

dominant caste group in the village, whose traditional occupation is livestock rearing. The total land area of the village is 1716 ha. The broad land classification of the village is given in Table 3:

Table 3: Land classification of Kumhariya village

Land Type	Area (ha.)
Irrigated	419
Unirrigated	944
Culturable waste	262
Forest	4
Area not available for cultivation	87
Total	1716

Source: Census 2001 data available online at www.gis.rajasthan.gov.in (accessed 01.03.2008)

Origin

The domestic livestock plays a crucial role in the household economy of Gujjars – the numerically dominant caste group in Kumhariya. They were naturally concerned with the gradual encroachment of village commonlands by various individuals from the village and consequent reduction in the area available for grazing their livestock. Therefore, they readily agreed for the tree plantation when NTGCF approached them through the local dairy cooperative. They were also aware of the cooperative system as a dairy cooperative had been working in the village for several years.

The early years

The TGCS members joined by paying INR 11 (INR 10 share and INR 1 membership fee) and the TGCS was registered in April 1991. Like the two cooperatives mentioned earlier, it was also granted twenty-five year lease by the government over 40 ha. of culturable waste land (*Barani III*) in the village. This lease was granted in June 1991. About a quarter of the leased area was already under encroachment by various individuals. The TGCS got these encroachments removed through social pressure and started plantation and soil and moisture conservation work on the site. The NTGCF provided financial and technical support and also paid the salary of a watchman and honorarium for the TGCS Secretary for five years. It is estimated that around 35,000 trees were planted, of which the majority were *Acacia nilotica*. The seeding of dhama grasses (*Cenchrus* spp.) was also carried out.

In October 1996, the TGCS suffered a major setback when a major fire broke out in its plantation. About three-quarters of the plantation was damaged. The TGCS arranged for watering of remaining 19,200 trees to enhance the chances of their survival. In the next few years, TGCS also made efforts to reseed the area with grasses. The TGCS earned some income through auction of the grasses in the plantation area for grazing. The area was usually sold to one person under a contractual agreement with some conditions (e.g. restrictions on animals that can enter the plantation site) and he or she in turn collected grazing fee from individual households. After the NTGCF support ended, the TGCS usually kept the watchman for only about two months during the

monsoon period. During the years when TGCS was earning some income, It also continued to pay the honorarium of the Secretary from its own resources. However, the situation changed when grass production fell due to low rainfall in the area. In 2003, instead of auctioning the grass, all village animals were allowed after payment of grazing fee of INR 5.

Current status

Due to low rainfall during the past five years, the TGCS has become inactive. It does not employ any watchman, nor does it auction any grass as production is very low. It hardly has any income at present. It has stopped the Secretary's honorarium as well (which, in any case, was linked to the income of the TGCS).

It has now permitted grazing in the plantation area throughout the year. The growth of trees is very poor due to a combination of factors such as poor site quality, low rainfall, hard pan, and damage due to the fire in 1996. In fact, many trees have started drying up. A trench was built around the plantation site and *Prosopis juliflora* trees were planted on it. These are still surviving and many *Prosopis juliflora* trees have also come up in the plantation area. These trees are used for making charcoal and many of these trees in the plantation have been felled. The TGCS recently (March 2008) fined one person INR 1,000 for unauthorised removal of *Prosopis juliflora* trees but it is unable to protect the plantation as it is a good 3 kilometres away from the village and there is no watchman. Some stones have also been mined from the area clandestinely and TGCS has not been able to apprehend the culprits so far. The TGCS is presently finding it difficult to pay INR 1,000 lease rent of the site to the government.¹² The TGCS is hopeful that if rainfall improves, the plantation can be revived.

IMPACT OF THE TGCS PROJECT

The impact of the TGCSs in the study villages was assessed through a questionnaire-based household survey. A total of 382 households were covered in the survey – 62 in Khoda Ganesh, 159 in Nathoothala, and 161 in Kumhariya. An attempt was made to cover all households whose members were aware of the TGCS and were willing and available for participation during the survey.

Economic impact – livelihood and income

One of the major objectives of any CBFM programme is improvement in the livelihood opportunities and income of the target community. There are also several explicit or implicit assumptions regarding the local community's linkage to the resource. In the case of the TGCS project, the main problems identified were insufficient fuelwood and fodder to meet the daily needs of the community. Therefore, the project focussed on enhancing their supplies by establishing plantations of appropriate species on village commonlands (revenue wastelands).

¹² It is the only TGCS that pays lease rent in the region as the land it has been allotted is supposedly of a better quality than the land allotted to most other TGCSs.

Although the TGCSs have increased the supply of fuelwood and fodder in the villages to a certain extent, their overall economic impact has been rather limited. In the three study villages, an average household gets only around 7% of its fuelwood supplies from the TGCS plantation area. Contrary to common belief, over half the fuelwood supply of an average household actually comes from their own private land (see Table 4).

Table 4: Different sources of fuelwood at the household level (%)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Fuelwood source				
TGCS area	9.66	11.89	1.09	7.08
Other commonlands	31.85	17.31	28.59	24.15
Private land	40.18	43.61	61.71	50.60
Other sources/ market	18.30	27.19	8.61	18.17

Considering that so little of the fuelwood supply actually comes from the TGCS plantation, it is not surprising that nearly two-thirds of the respondents felt that TGCS has had almost no impact on their household's fuelwood supply (see Table 5).

Table 5: Impact of TGCS on household fuelwood availability (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Increased	45.16	43.40	6.83	28.27
No impact	54.84	52.83	90.68	65.45
Decreased	0	3.14	0.62	0.26
Can't say/no response	0	0.63	1.86	6.02

In case of fodder, the situation is slightly better with an estimated 12% of the supply for an average household coming from the TGCS plantation area. Over a third comes from private land (mainly agriculture crop residues) and nearly a third of the fodder is purchased from the market (especially fodder for buffaloes) (see Table 6).

Table 6: Different sources of fodder at the household level (%)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Fodder source				
TGCS area	13.73	14.96	8.22	12.10
Other commonlands	26.88	14.87	21.61	19.60
Private land	24.03	35.60	42.53	36.30
Other sources/ market	35.36	34.56	27.63	31.98

Even in case of fodder, over half (55%) of the respondents felt that the TGCS plantation has had no impact on their household's fodder supply, while around 43% indicated an increase in the availability of fodder (see Table 7).

Table 7: Impact of the TGCS on household fodder availability (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Increased	50.00	52.83	31.06	43.19
No impact	48.39	45.91	67.08	55.24
Decreased	1.61	0	0.62	0.52
Can't say/no response	0	1.26	1.24	1.05

The differential impact on households is due to different composition of their livestock and availability of fodder from their private land. The latter, in turn, is linked to the size of the land holding and availability of irrigation facility. At present, only households with smaller livestock (goats and sheep) are getting some additional fodder from the TGCS area. Due to low rainfall in the region for the past several years, the yield of fodder grasses has fallen sharply and all three TGCS have discontinued the practice of closing the TGCS area during the monsoon period. This has adversely affected the fodder availability for larger animals such as cows and buffaloes. However, some tree fodder (fresh leaves and pods or *loong-papri*) is available in the summer season, which is consumed by goats and sheep. It is interesting to note that small animal holders who were affected most adversely due to closure of the plantation area to allow trees to grow have eventually turned out to be the greatest beneficiaries (see Table 8). They, however, need to make a payment to the TGCS before they are allowed to lop trees to feed *loong-papri* to their animals.

Table 8: Perceived impact of the TGCS on small animal holders (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Positive	62.90	78.62	70.81	72.77
No impact	35.48	18.24	24.22	23.56
Negative	0	0.63	0	0.26
Can't say/no response	1.61	2.52	4.97	3.40

It was hoped at the time of launch of the TGCS project that the TGCSs would be able to generate some cash income from the sale of tree products as well. However, due to poor productivity of the TGCS plantations, TGCSs have not been able to generate much cash income. The TGCSs were generating some income by charging grazing fees and using this money to pay the watchman's salary and honorarium of the TGCS Secretary. However, due to low rainfall in the past few years, the cash income has reduced sharply in the past few years. The Khoda Ganesh and Kumhariya TGCSs have had negligible income in the past few years. Only Nathoothala TGCS (which has a much better plantation) earns some income by auctioning *loong-papri* and fuelwood. But even their

income is not substantial. For example, they auctioned *loong-papri* for INR 6,500 in the 2007 season.

Considering that the benefits of the TGCS in terms of additional fuelwood/ fodder or income have been modest at best, it is not surprising the majority of the respondents felt that TGCS was ‘unimportant’ to their livelihood (see Table 9).

Table 9: Importance of the TGCS to the household’s livelihood (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Very important	14.52	2.52	0	3.40
Important	16.13	43.40	33.54	34.82
Unimportant	69.35	52.20	60.87	58.64
Can't say/no response	0	1.89	5.59	3.14

The study reveals that there are several reasons for the limited economic impact of the TGCS. First, the sites leased to the TGCS were highly degraded. Only hardy xerophytic species such as Acacias could be grown on such sites. These trees have a natural tendency to grow slowly. Further, due to poor quality of sites, their growth was further stunted. Both Khoda Ganesh and Kumhariya TGCS plantation sites are rocky with little top soil. Only in Nathoothala, where the site is sandy, the planted trees have grown well. The persistent drought conditions have further exacerbated the situation and many trees have even died due to water stress. In case of Kumhariya, the site not only has a hard pan but the plantation has also been badly damaged due to a major fire that swept through it in its early years. The major benefit that the TGCS members were getting in the initial years was in the form of fodder grasses after the monsoon. However, even this benefit has now stopped due to low rainfall in the past several years.

Another factor that has affected the economic impact is the distance of the plantation site from the village. All three plantation sites are at some distance from the main village habitation (Khoda Ganesh: 1 km; Nathoothala 2 km; Kumhariya 3 km). All these sites are near the village boundary and were perhaps deliberately chosen to assert the village’s right over the land and prevent its use by the neighbouring villages. The distance makes it difficult for the villagers to collect fuelwood or graze their livestock in the plantation area. Particularly in the case of fuelwood, easy availability of *Prosopis juliflora* (an invasive tree that has spread throughout the region) fuelwood on both private and commonlands has made the distant TGCS plantations less attractive for fuelwood collection purposes.

Another key factor is the high rate of seasonal migration from the villages to large cities in search of employment opportunities. Due to low returns from agriculture, many families have adopted migration as a coping strategy. As many as 27.75% of respondents mentioned that one or more family members stay outside the village for several months or years at a time. Many more travel to nearby towns in search of work daily and return back to the village only at night. Due to this daily and seasonal

migration, the link between village commons and these people has weakened. Many households have been forced to sell off their livestock as they don't have enough time or persons to look after the livestock. Some better off families have started using LPG cooking gas, which has reduced their fuelwood requirement. All these factors have affected the TGCS plantation's importance for the livelihood of many households. However, the situation is likely to change if the rainfall improves and the plantation is revived.

Ecological impact – forest

The preliminary indications from the study are that the TGCSs have had a positive ecological impact in the region. Each TGCS has raised a plantation over approximately 40 ha. of land leased to it by the government. The land leased to the TGCSs was quite degraded and barren and had only limited vegetation cover (some grasses and bushes). In all three cases, the TGCS also got illegal encroachment removed from the area before taking up the plantation activity. The illegal encroachment was mainly for house / yard purposes (*bara*) (Kumhariya and Nathoothala) or mining (Khoda Ganesh).

The TGCSs have put in considerable effort and money (through project assistance) in preparing the site, carrying out soil and moisture conservation works, establishing the plantation, watering tree saplings through water tankers, and protecting the site against illicit grazing and removal of tree products. Most respondents felt that the TGCS plantation sites have considerably better physical condition and vegetation cover as compared to before or remaining commonlands, which have not been leased to the TGCS (See Table 10 and Table 11).

Table 10: Perceptions about the physical condition of the TGCS sites (% respondents)

Village	Khoda Ganesh		Nathoothala		Kumhariya		All villages	
	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands
Improved	91.94	90.32	94.34	94.34	86.96	85.09	90.84	89.79
No impact	0	1.61	1.89	1.89	5.59	6.21	3.14	3.66
Deteriorated	0	0	0	0	0	0.62	0	0.26
Can't say/no response	8.06	8.06	3.77	3.77	7.45	8.07	6.02	6.28

Table 11: Perceptions about the floral diversity of the TGCS sites (% respondents)

Village	Khoda Ganesh		Nathoothala		Kumhariya		All villages	
	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands
Increased	83.87	87.10	93.71	93.08	88.34	78.88	89.01	86.13
No impact	6.45	4.84	2.52	3.14	8.07	12.42	5.50	7.33
Decreased	1.61	0	0	0	0	0	0.26	0
Can't say/no response	8.06	8.06	3.77	3.77	5.59	8.70	5.24	6.54

The respondents felt that there has been some positive impact on faunal diversity as well. However, it is most significant in case of the Nathoothala TGCS where the tree growth has been good (see Table 12). The TGCS plantations provide habitat to a wide range of fauna such as birds, small mammals (e.g. hares) and reptiles. All TGCS sites are home to large herds of *nilgai* antelope (*Boselaphus tragocamelus*) and even endangered Great Indian Bustards (*Ardeotis nigriceps*) have been reported from some TGCS plantation sites (e.g. Kumhariya site).

Table 12: Perceptions about the faunal diversity of the TGCS sites (% respondents)

Village	Khoda Ganesh		Nathoothala		Kumhariya		All villages	
Impact	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands	As compared to before	As compared to other commonlands
Increased	45.16	46.77	90.57	87.42	62.73	62.11	71.47	70.16
No impact	37.10	37.10	4.40	7.55	28.57	29.81	19.90	21.73
Decreased	9.68	8.06	0	0	0	0	1.57	1.31
Can't say/no response	8.06	8.06	5.03	5.03	8.70	8.07	7.07	6.81

The TGCSs have also undertaken a number of soil and moisture conservation measures inside their plantations such as construction of contour bunds and trenches. However, the impact of such measures has been limited. Only in Nathoothala – where the soil is sandy and prone to erosion and the plantation has come up well – the majority of respondents felt that the plantation has reduced soil erosion significantly. They felt that the plantation has not only reduced wind erosion, and now less soil blows from plantation area into the fields and the village, it has also reduced water erosion and the existing gullies have now stabilised. Regarding the impact on the ground water table, most respondents felt that the plantation has not had much impact (see Table 13 and Table 14).

Table 13: Perceived impact of the TGCS on soil conservation (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Positive	38.71	56.60	32.92	43.72
No impact	50	37.74	59.63	48.95
Negative	3.23	0	0	0.52
Can't say/no response	8.06	5.66	7.45	6.81

Table 14: Perceived impact of the TGCS on water table (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Positive	37.10	39.62	13.66	28.27
No impact	53.23	55.35	78.88	64.92
Negative	1.61	0.63	0	0.52
Can't say/no response	8.06	4.40	7.45	6.28

Overall, it seems that while the ecological impact of the TGCS plantations has been positive, it could have much more had there been regular rainfall in the region. There is a huge water shortage in the area and as a result many farmers have not been able to grow even *khariif* (rainy season) crop for the past few years. The drought has severely affected the plantations and people are hardly getting any benefits from the TGCSs at the moment. In this context, proper selection of species after matching them to the site conditions has proved to be critical for the success of the plantations. There is wide variation in soil conditions even within the district. For example, while *Acacia tortilis* trees have done well in Nathoothala, these have remained stunted in Kumhariya and its adjoining Rasoolpura village. This has highlighted the problems with environmental determinism and simplistic projections regarding the future ecological trajectory.

Social impact – equity

The TGCS has a well-defined membership with each member holding a share in the cooperative. Considering that the TGCSs have been leased a part of the village commonlands – which belong to the entire village and not just to the TGCS members – one obvious equity issue is the impact on those households who did not or could not become a member of the TGCS.

Although the TGCSs have elaborate bylaws regarding membership etc., in reality there seemed to be no distinction between members or non-members regarding collection of produce from their plantation. In fact, a majority of people were not even sure if they are members of the TGCS or not. In the minds of most people membership of the TGCS had no special meaning except whether they had paid INR 11 at the time of creation of the TGCS. Obviously, after over 15 years most people had difficulty in remembering whether they had paid this amount or not.

More significantly, all users – members or non members – are required to pay a use fee to access products in the TGCS plantation. Although the TGCSs need this money for their operational and other expenses, it does seem that absence of any special concessions for the poor excludes the most marginalised sections from enjoying the benefits of the TGCS. Further, TGCSs have increasingly adopted the practice of auctioning the produce to the highest bidder. The purchaser, in turn, resells the produce in smaller lots to other individuals. This practice, no doubt, reduces the transaction costs for the TGCS, but it leaves less scope for having any special concessions for the poor and needy households in the community. However, most respondents felt that the TGCS was functioning in a transparent and democratic manner and that the costs and benefits were being equitably shared (see Table 15 and Table 16).

Table 15: Respondents' views about the functioning of the TGCS (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Is the TGCS functioning in a transparent and democratic manner?				
Yes	64.52	81.13	42.86	62.30
No	6.45	3.14	2.48	3.40
Can't say/no response	34.29	34.29	34.29	34.29

Table 16: Respondents' views about the sharing of costs and benefits of the TGCS (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Are the costs and the benefits of the TGCS equitably shared by all?				
Yes	62.90	83.02	43.48	63.09
No	9.68	3.77	2.48	4.19
Can't say/no response	27.42	13.21	54.04	32.72

Although most respondents felt that the TGCS is functioning fine, the involvement of ordinary members does not seem to be very high. For example, while 69.63% of the respondents were aware of the rules for accessing and using the TGCS plantation only 41.62% said that their household members were involved in the decision making process. Just under half of the respondents (49.74%) said that their household members regularly attend the TGCS related meetings. Similarly, while over two-thirds (67.02%) of the respondents were aware of the current TGCS office bearers, very few were aware of the quantum of funds available with the TGCS (5.76%) or expenses incurred by the TGCS in the previous year (6.81%). However, this seems more due to lack of interest on the part of the members rather than any attempt by the TGCS to hide information. This lack of interest probably stems from the low importance of the TGCS in most households' overall livelihood strategy.

The TGCSs generally have one member per household. Due to prevalence of male-dominated society in Ajmer, mostly male 'household head' have been enlisted as TGCS members. Although some attempts have been made to enrol more women, the TGCSs are mostly male-dominated organisations. However, this problem is not limited to the TGCSs alone. The prevailing social system does not encourage women to actively participate in the village's public affairs. Although there is very little participation of women in the TGCSs, majority of the respondents were, however, of the view the TGCSs have had either neutral (53.93%) or positive (42.41%) impact on the local women.

The TGCSs have had several indirect social impacts – mostly positive – as well. Many members, especially TGCS office bearers have attended training programmes and exposure visits organised by the NTGCF. This has promoted networking and cross-learning between the villages. The TGCSs – with financial support of the NTGCF – have

also promoted use of fuel saving devices such as biogas and pressure cookers. Many members have got these at highly subsidised rates. In some cases, the TGCSs have used their resources for general village development. For example, in Nathoothala the TGCS funds are used to pay for electricity to run the local drinking water supply system. The TGCS also supports local *madrassa* (religious school). The TGCS members also got an encroachment from an old social forestry plantation site in the village (*Gawain Van*) and got the area allotted for a government school. In Kumhariya, the TGCS recently donated fuelwood to the local school for preparing the mid-day meal for the students. This fuelwood had been illicitly collected from the TGCS plantation site and therefore it had been confiscated by the TGCS.

On the negative side, many respondents did mention that the TGCSs are dominated by particular caste groups *viz.* Raikas and Rajputs in Khoda Ganesh, Cheetahs in Nathoothala, and Gujjars in Kumhariya. Due to strong caste identity, it is difficult to consider entire village population as one undifferentiated 'community'. For example, Salon-ki-Dhani hamlet of Khoda Ganesh, which has majority of Rawats identifies itself more closely with the neighbouring Rawat-dominated Bubani village rather than the main Khoda Ganesh village. However, most people felt that the TGCS has helped in bringing different caste and class groups together. Nearly two-thirds of the respondents felt that TGCS has contributed positively to build social cohesiveness and strengthen social capital in the village (see Table 17).

Table 17: Perceived impact of the TGCS on social cohesiveness (% respondents)

Village	Khoda Ganesh	Nathoothala	Kumhariya	All villages
Impact				
Positive	66.13	74.21	57.14	65.71
No impact	27.42	20.13	37.89	28.80
Negative	3.23	1.26	1.24	1.57
Can't say/no response	3.23	4.40	3.73	3.93

DISCUSSION

The impact of the TGCSs was discussed in the previous section. Some specific factors that have affected the economic, ecological, or social impact were also discussed. There are, however, some broader issues that have influenced the entire TGCS programme. These are discussed in this section.

Tenure

The tenure has played an important role in shaping the outcome of the programme. The TGCSs have been leased a portion of the village commonland (usually 40 ha.) for 25 years. This relative security of tenure has encouraged the TGCSs to invest in the land and to protect the plantations even after external support was withdrawn after five years. All three TGCSs kept their own plantation watchmen even after the project stopped paying for their watchmen. The TGCSs are keen to get the lease renewed to

keep the allotted land under village control. The lease can be renewed by the government – 10 years at a time – provided that land has been used for the purpose it was allotted for and there has not been any violation of the lease conditions. Thus, the TGCSs are keen to maintain their plantations and it is one of the reasons why these plantations have survived for over 10 years without any external support – financial, material, or technical. It is due to this security of tenure that the TGCS has been able to keep the allotted areas as village commonland whereas the rest of the commonlands are being slowly privatised – legally or illegally.

A survey undertaken in two of the study villages – Khoda Ganesh and Kumhariya – with the help of the local people revealed that there are 57 encroachments on commonlands in Khoda Ganesh and 29 in Kumhariya.¹³ The total estimated encroached area is between 24 and 27 ha. in Khoda Ganesh and between 8 and 9 ha. in Kumhariya. Interestingly, only 5.8% of the encroachments are for agriculture. Most (63.9%) are for making houses (*bara*) and 30.3% are for stone mining (all in Khoda Ganesh).

Institutional structure

The TGCSs are registered cooperative societies, which are autonomous bodies governed by the state cooperative law and their own bylaws. The cooperative model has several strengths such as (1) clear objectives, (2) well-defined membership, (2) regular elections, (3) written rules and procedures, (4) good record keeping, and (5) external oversight through annual audits. However, it also suffers from several shortcomings such as excessive bureaucratic control and rigid procedures. The TGCS model is primarily based on dairy cooperatives. Like in the case of dairy, it was envisaged that members will produce individually and sell their forest products through the TGCS.¹⁴ However, in actual practice the trees were planted on village commonlands. This created a fundamental problem in the TGCS approach, which ultimately led to shift in focus beyond cooperatives and creation of FES.

Although TGCSs follow many procedures of the cooperatives, in reality many traditional systems have also been incorporated into their functioning. For example, the general body meeting of the TGCS is combined with traditional village meeting (*Hatai*) that is held six-monthly on the occasion of Holi and Diwali festivals. As there are several restrictions on the use of funds under the cooperative law (e.g. a TGCS is not allowed to loan money to its members), some TGCSs have evolved a parallel system. For example, the Nathoohala TGCS does not keep its income from the plantation in the TGCS account but in the village fund (*Gawain* fund), which is used to meet common village expenses and also to give loans to the needy villagers. A decision has been taken to create a similar fund in the Khoda Ganesh TGCS also. The system of imposing fines followed by the TGCSs is more aligned to the traditional village systems than cooperative bylaws.

¹³ The survey in Nathoohala is yet to be completed.

¹⁴ The bylaws of TGCSs make this focus very clear. For example, it is stated in the bylaws that a member's membership could be cancelled if he or she does not do a minimum amount of business with the TGCS in a year.

Resource

The nature of the resource has also shaped the outcome. Most lands leased to the TGCSs are of poor quality and thus their production potential is low. This has affected the quantum of benefit that people can get, and consequently their interest in the programme. In areas where site quality is better, production as well as members' interest in the TGCS is much higher. Apart from quality of land, species selection has also affected the outcome of the programme. In many cases only some of the planted species have done well while others have withered away. Of the three TGCSs, Nathoothala has the best tree survival rate (56%), followed by Khoda Ganesh (45%) and Kumhariya (28%). The relatively better site quality and good matching of species (*Acacia tortilis*) to site conditions has helped the Nathoothala TGCS in maintaining a good tree cover as well getting some income even during drought years.¹⁵ In cases where site quality is good (e.g. in Picholiya TGCS where pooled private land has been leased to the TGCS), the TGCSs have been even more successful. The Picholiya TGCS – one of the most successful TGCSs in Rajasthan – has planted *Ailanthus* trees that have done very well. In 2007, the TGCS generated INR 90,000 from sale of just leaves of *Ailanthus* trees.

Outside support

During the early stages, the facilitating agency – NTGCF – played a critical role in shaping the programme. They conceptualised the programme, approached villages, and provided financial, material, and technical assistance to the TGCSs. The TGCSs would not simply be there but for the NTGCF. It is commendable that NTGCF was able to withdraw from the TGCSs after a few years and most TGCSs are still functioning. Although periodic meetings are held, most TGCSs are on their own for the past decade or so. It is unfortunate that after NTGCF withdrew, many TGCSs have come under severe stress due to poor rainfall. One TGCS Secretary lamented “when NTGCF withdrew support, the nature also stopped supporting us”. Due to negligible production and income over the past several years, the interest levels in TGCSs have started waning. There is already one encroachment in the Nathoothala TGCS area. In Kumhariya TGCS, some people have started illegally mining stones. In Khoda Ganesh TGCS, mining waste is being dumped by the nearby mine operators. Almost all TGCS office bearers and members want some outside support – legal, financial, and moral – to fight these negative forces and to rejuvenate the TGCSs.

External environment

The external environment of the TGCSs is changing rapidly. In many areas, the value of land has increased many fold due to growing urbanisation and industrialisation. The Khoda Ganesh village, which is near an industrial area, has already got two large factories. This has pushed up the price of land and led to widespread encroachment of village commonlands. Many persons encroach the land in the hope of getting it allotted

¹⁵ The same species performed very poorly at some other sites e.g. in Rasoolpura TGCS near Kumhariya. Therefore, matching of the species to site conditions emerged as an important condition for the success of the TGCSs.

subsequently and selling it on for profit. There is also widespread mining – mostly illegal – on the village commonlands. The TGCSs are holding on for the moment but their job is going to be more difficult in the coming years as others eye their plantation land for alternative uses. They will need to come much closer together in order to be able to fight these larger forces.

CONCLUSION

The experience of TGCSs in Ajmer district has shown that it is possible for the rural communities to regenerate degraded village commonlands by establishing tree plantations, if tenure security is provided by law. The tree plantations raised over 15 years ago are still present and the TGCSs have continued to operate without any external support for the past 10 years. It indicates that it is possible for the local communities to manage tree and forest resources through collective effort.

The experience also highlights the strengths and weaknesses of the cooperative model for managing common pool forest resources. Although the economic, ecological and social impacts of the TGCSs have been positive, these have been rather limited due to a number of reasons such as poor site quality and continuous drought over the past several years.

Apart from direct impacts, one important indirect impact of the TGCSs has been to preserve the village commonland. In all three study villages, the TGCSs removed encroachment from the leased sites and have also largely prevented their further encroachment. However, the remaining village commonlands are slowly being privatized legally (through lease/allotment) or illegally (through encroachment). The preservation of village commonlands benefits the entire community, especially poor and marginalised households, who do not have large private holding and depend on the commonlands for meeting their fuel and fodder needs.

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