Collective action in reforestation

A case study from Malawi

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Preword

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1. Introduction

How does collective action succeed in rural communities? This thesis investigates a forest planting project in the rural south of Malawi. Small scale farmers were ordered to abstain from cultivating their gardens on a mountain, as the whole mountainside land was designated to forest planting. The forest project hence turned into a conflict over land. It can be considered a collective action problem, because each individual farmer would be better off with continued cultivation on his own garden, while the community as a whole suffered from severe soil erosion due to the deforested mountain. In the long term, everybody would be better off with a forested mountain. The results of this collective action problem differed in the villages surrounding the mountain. In some villages, farmers were convinced to cooperate in the forest project, and the communities were rewarded with a valuable forest resource benefiting all inhabitants. Other villages failed, and today suffer from increasing problems of soil erosion. The main question of this thesis is why and how some villages reached the collectively successful results, while others did not. What were the differences between these villages and how may these differences have resulted in completely different outcomes in the forest project?

I analyse the decision faced by individual farmers of whether to contribute their land to the forest project or not. It is assumed that specific circumstances within the villages have affected the individual decisions and thus determined the success or failure of the forest project.

The empirical analysis is based on qualitative data collected during two months of fieldwork in the villages in 2007, with a focus on interviews and observations. The fieldwork revealed two main factors behind successful collective action; (1) a social norm supporting general co-operative behaviour, and (2) formal punishment of defectors, in a case in which the social norm was not strong enough to convince farmers of co-operation. Both regulations increase farmers' incentives to co-operate, and thus contribute to preserve the common pool resource. A shared norm can support collective action by imposing loss of reputation for those breaking it and thus expectations about mutual co-operation. Norms develop continuously in a community and depend on legitimacy among inhabitants. Only one of the research villages had a strong norm supporting co-operational behaviour. Through the forest project and other

village projects, they experienced that co-operative behaviour was beneficial, both because they became convinced that everybody else would co-operate and because the beneficial outcome of village projects was actually distributed fairly in the end. Previous successful experiences with collective action seem to have developed the social norm of co-operative behaviour in this village.

In other villages, there was little cooperation on village level and village resources were to a greater extent captured by a village elite. Villagers had less respect for their leaders and hence did not co-operate in the projects they introduced. Only one of these non-co-operative villages was able to preserve the planted forest, using strict regulation; the forest managers enforced hard punishments on non-co-operating farmers. This method had substantial drawbacks compared to the social norm method. As the punishments were not considered fair and legitimate among farmers, it actually increased the already high level of conflicts and anger towards the village leader. The strict enforcement of rules was crucial in order to preserve the forest, but it probably also gave negative external effects on social capital in the village.

There is a large literature on collective action on common pool resources. Standard economic theory proposes a result in which nobody co-operates, because everybody gains individually from defecting, given the choice of others. Hardin (1968) introduced this depressive result as the tragedy of the commons. His proposal is, however, not applicable in general, because it leans on the assumption that an individual's choices are independent of his expectation about others' choices (Runge, 1981). Common pool resources can be, and often are, regulated by local communities with reasonable degrees of success (Ostrom, 1990). It is these regulations which induce expectations among individuals about the behaviour of others. If individuals expect that everybody else will co-operate, they might benefit from choosing co-operation, because they know that non-co-operative behaviour may spread. Hence, in the long run, the individual might be best off choosing behaviour depending on the behaviour of others. The role of leadership becomes important as the leader will have the possibility to convince individuals to co-operate by inducing expectations about co-operation (Baland & Platteau, 1996). Leaders may also use and develop further the level of trust and trustworthiness in the community, which in itself supports co-operation (Durlauf and Fafchamps, 2004).

1.1.1 Method

The thesis is based on qualitative data collected during a two months stay in the villages in the summer of 2007. Information is obtained through interviews, mainly with only one respondent at the time, but also in small groups. I have tried to speak with as many people as possible, and to choose respondents with alternative views. Interviews were mainly done in six villages, from which all leaders and several villagers are interviewed. Four of these villages were in my main focus, because they represented the villages with the most distinct results in the forest project. This was villages 1 and 9, with a fully forested mountainside, and villages 4 and 5, with a bare and cultivated mountainside. At least five mountainside farmers from each of these four villages were interviewed, in order to get the story as detailed and right as possible. A list of all respondents is found in the appendix. Qualitative data collected by research assistants from the Malawi Land Tenure and Social Capital research project is used in addition to my own.

The main language spoken in the area is Chichewa, and very few speak English in addition, hence nearly all interviews were done through a translator. This made it more difficult to obtain confidential information from respondents. In addition to language barriers, it was problematic to get accurate information about the forest project because of two things; people did not remember in detail what happened in the past, up to seven years earlier, and; people in the villages which lost the forest seemed to be unwilling to tell why the forest was gone, and mountainside farmers seemed to be unwilling to admit that they disobeyed orders to stop cultivate. Village gossiping and personal incentives might also have affected their presentation of the story to me. By speaking with as many different people as possible, and by living in the villages and observing village life and behaviour, I have done my best to obtain an objective picture of the story.

2. Background

2.1 Land scarcity and deforestation

The analysed forest case is taken from Chiradzulu district in the south of Malawi. Chiradzulu district is one of the most populated districts of Malawi, with a population density of 329 inhabitants per square kilometre, of whom 90 % earn their living by farming[1]. An HIV rate estimated between 10 and 25 % contribute to make this district one of the poorest in the country, where totally 65 % of the population live under the national poverty line[2]. High population growth, few income alternatives to subsistence farming and limited access to modern agricultural technologies have resulted in increased and heavy demand for land. Limited private property rights over customary land, in line with African traditional laws, has made it possible for farmers to clear new land in originally forested areas. Today all available land, from roadsides to mountain summits, is cultivated. This trend has decreased forested areas to unsustainable levels, which creates two urgent problems; increased soil erosion on all surrounding land and severe lack of firewood. The latter is of immediate concern when the forest disappears, as rural households depend on firewood for daily cooking, warming and lightning, and timber for house building. The former is just as serious, but of a more long-term concern. Hence it is not so obviously seen as an effect of deforestation, although it is directly related to it.

Only few generations ago, the area was almost covered with forest. During the regime of Banda (1963-1994), all mountains were governmental lands, and hence not allowed for cultivation, including the mountain discussed in this thesis. However, no controls or punishments were enforced on those clearing governmental land during Banda and farmers who needed land established new gardens in the mountainside. These farmers had been cultivating their mountainside gardens for many years when a new land law transferred mountain land from governmental to customary land, which meant the management rights

[1] Estimates from Médecines Sans Frontières Malawi, 2004.

[2] Data from Human Development Report 2007/2008.

were given to village leaders. According to customary law, nobody has private ownership over land as in western terms, but the user holds user rights as long as he cultivates it. Thus, the mountainside farmers claimed the land as theirs, because they had used it for several years, and hence they were not thrown out of their gardens. However, customary law assigns village leaders the rights to allocate new land. The fact that the mountainside land was never allocated to its users initially, was used against these farmers when the land was designated for the forest project. They were not considered as rightful holders of the land, compared to holders of land in the valley, and hence they were not given any compensation when it was decided that the area should be replanted with forest.

" People who cultivate up mountain are already told to stop, they are just continuing on their own will, so they have nothing to say. They will find their own ways to survive (if forest is planted again), maybe go somewhere else to seek for land, it is up to them. ... They went up there without permission in the first place." (Leader village 5. His village is now deforested again after the tree planting project.)

2.2 Soil erosion

It is especially gully erosion which causes problems on deforested mountains. During rain seasons, heavy rains gather in fast-running streams of water in the mountainside, which again gather in more forceful rivers the further down the mountain they come. These powerful rivers take with them riverbank soil on their way down, decreasing the amount of soil in mountainside and in the land underneath it every year, and dig deep gullies. Hence, every year there is less soil to cultivate on, especially in the mountainside, and the harvests decrease similarly. The yields from the mountainside gardens have decreased severely only in few years. Some areas are just left with bare stones and are not usable for cultivation any longer. But the problem does not only affect the mountainside, it harshly damages the gardens in the valley underneath the mountain too. One year, 10-15 years ago, it rained so much that the streams flooded, creating new gullies in the valley which washed away large parts of people's gardens. This event, in addition to the annual depletion of the soil during rain seasons, was an eye-opener for the people in the villages regarding the problems with soil erosion. A forest would prevent water from gathering in rivers and would spread the

water more evenly all over the mountainside. People in the villages also recognise the preventative effect of forest on soil erosion.

3. The conflict

3.1 The forest project

Due to increasing problems of soil erosion, a well-known Member of Parliament from the area, Patrick Mbewe, initiated a forest planting project in 2000. He convinced MASAF[3] to finance it and together with the District Forest Ministry they organized public meetings where the project implementation was discussed and decided on.

"The whole mountainside was cultivated, except some stony areas with almost no soil. Then MASAF initiated the tree planting, came here and said: "Look, there are no trees in the mountain, we want to plant trees."" (Chief Village 9)

As this chief confirms, neither villagers nor their leaders were actually given a choice of whether to receive the project or not. They were forced to welcome it, as it was meant to benefit their communities. Governmental officers from the District Forest Ministry operated the project in the implementation phase, in co-operation with village leaders and local forest committees. Nursery beds were made for the tree seedlings in July 2000. In November and December, 89.000 seedlings were planted on a 50 hectare area covering the mountainside. The seedlings were all exotic tree species, dominated by blue gum, a fast-growing resistant eucalyptus specie. Weeding was done in January and February 2001, and after this the governmental officers withdrew from the project. Management was left to the local communities, represented by village leaders and forest committees. In March 2001, rules regarding use of the forest were decided for at a public meeting. When the forest matured, the surplus of trees was to be used for development of the villages and otherwise to help poor people and especially orphans in the villages.

There are nine villages surrounding the mountain, all controlling their separate parts of the mountainside. The mountainside land belonging to one village was mostly cultivated by

[3] MASAF (Malawi Social Action Fund) is an organisation financing community development projects, with credit from the World Bank.

inhabitants of the same village, though there were also a few mountainside farmers coming from other villages. In some villages, around 50 % of the inhabitants held pieces of their land in the mountainside, while in other villages the share was much lower. The loss of user rights to the mountainside land was a severe blow for the affected farmers. Their opinion was not heard when the forest project was introduced, and after governmental officers had withdrawn from the management, many of them started to sabotage the project. The sabotage was done by up-rooting or in other ways destroying the planted tree seedlings, in order to take back their gardens for cultivation.

The rest of this chapter analyses the situation faced by representative mountainside farmers at the time when the communities took over the forest management in spring 2001. It is assumed that the farmers at that time had a choice of whether to co-operate or defect in the project. Co-operation refers to a choice of giving up their land to forest planting, while defection refers to choosing continued cultivation. Chapter 3.2 discusses the individual's utility from the two alternatives, and chapter 3.3 models the utility formally.

3.2 A collective action problem on a common pool resource

3.2.1 The forest as a common pool resource

The forest considered in this thesis is defined to be a common pool resource. Ostrom (1990) defines a common pool resource to be "a resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use". The analysed forest has the property of being limitedly excludable. The forest managers have the possibility to prevent everyone to cut trees, but to the cost of hiring guards. The more guards they hire, the more difficult it will be to steal trees. In addition to limited excludability, the forest has the property of being rivalrous. Rivalry refers to a good being consumed at the expense of other agents' consumption of the same good. When one villager cuts and removes a tree, the same tree cannot be logged again by others, hence the forest is a rivalrous resource. In comparison are pure public goods defined to be both non-rivalrous and non-excludable, whereas open-access resources are non-excludable but rivalrous (Perman et al, 2003). The forest as a common pool resource is both rivalrous and

limitedly excludable. In addition it also creates a positive externality of preventing soil erosion on lower located land areas, which in this case is its main intention. The challenge when managing this common pool resource is to preserve the forest as large and thick as possible, in order to obtain as little soil erosion as possible. Logging of trees for timber must therefore be regulated.

3.2.2 The forest project as a collective action problem

Regulating common pool resources often turn into collective action problems, in which agents have to co-operate to reach the best sustainable outcome. The forest project depended on collective action by the mountainside farmers, because each had to sacrifice their individual benefits of cultivating their gardens, in order to obtain greater gains for the whole community in terms of decreased soil erosion and timber. This is also called a social dilemma. Elster (1985) defines a collective action problem as "a conflict in which; (1) each individual derives greater benefits under universal co-operation than under universal non-co-operation, and (2) each derives more benefits if he abstains from co-operation, regardless of what others do". An illustration of the benefits of collective action is given in figure 3-1. The line C(j) gives the net individual benefits for each co-operating agent, depending on how many others who co-operate. ~C(j-1) gives the net individual benefit for each defecting agent, also depending on the share of co-operators. Everyone's payoff increase with the amount of co-operators, but the benefit to defectors is higher than that to co-operators in all cases. If everybody acts individually, meaning nobody co-operates, all agents will receive *x* benefits. In figure 3-1, if more than only one agent co-operate, they all receive higher than *x* benefits. The highest possible payoff by co-operating, G, is reached when everybody co-operates. Incentives for free-riding occur as each individual is best off when everybody co-operates except himself. The Nash equilibrium proposed by standard economic theory is therefore one of zero co-operation, whilst the full co-operation solution gives largest net benefits.

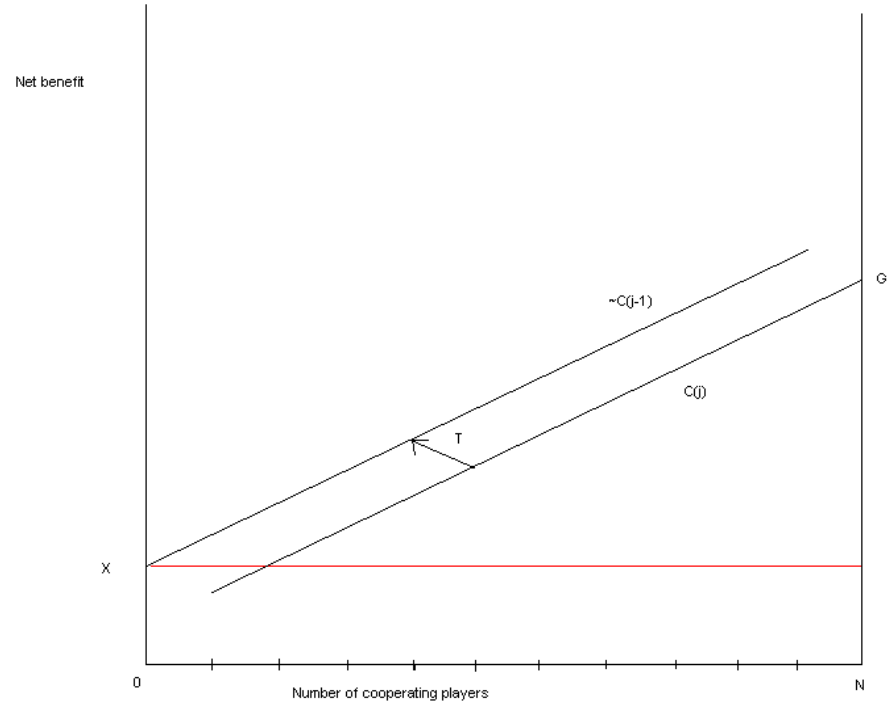

Figure 3-1: The payoff structure of a standard collective action problem. N players choose between co-operating (C) or defecting (~C). When j individuals co-operate, their payoffs are always lower than the j-1 individuals who do not co-operate. The predicted outcome is that no one will co-operate and all players will receive X benefits. The temptation (T) to defect is the increase in benefit any co-operator would receive by switching to defecting. If all co-operate, they all receive G-X more benefits than if all defect. (The figure is copied from Ostrom, 1998, figure 1)

Individual gains from full co-operation

According to Elster's definition of a collective action problem, each individual should derive greater benefits under universal co-operation than under universal non-co-operation. Was this the case for mountainside farmers in the forest project? The mountainside farmers faced a choice of whether to stop cultivating at once and give their lands up to village control (co-operating), or to resist the tree planting by continued cultivation, which implied damaging the trees in their garden (defecting). Co-operation in the project implied loosing their mountainside gardens, which they depended on for their annual harvest. But if everybody co-operated, they all received benefits of decreased soil erosion and access to timber. Nearly all mountainside farmers had access to land in the valley, in addition to their mountainside land, hence they would also benefit from reduced erosion on these plots. This section analyses the situation faced by mountainside farmers and whether the forest project would actually benefit them individually if everybody co-operated.

According to most mountainside farmers, they did not want the project in advance, because they depended too much on their gardens. Afterwards, however, some of them who lived in villages where the forest did mature were happy about it, because they saw how the forest decreased erosion problems and that it benefited the community, including themselves, with timber. I now analyse the variables affecting their individual gains and losses of full co-operation versus full defection from my own outside point of view.

Benefits from status quo

By co-operating, the farmers lost the ability to cultivate their gardens in the mountainside and hence lost a part of their annual harvest. All villagers live mainly from farming and consume their harvest in the household. Annual harvests rarely exceed household consumption needs. It is more often the other way around; harvests are too small to cover the consumption needs of the household. Generally, this relation depends on weather conditions and how much fertilizer the farmer could afford to apply in his gardens. Around year 2000, fertilizer was too expensive for most of these farmers, and hence few could expect that their harvests would be sufficient for household needs. Income sources outside farming are and were very limited, hence the farmers were very dependent on their annual harvest, and thus every piece of land they had, to feed their families. The land was important also in regards of securing next generation, even to the few who had enough available land other places. According to matrilineal custom in the area, land is held by females, and daughters inherit their mothers' land. In 2000-2005, the average Malawian woman had six children (UN Population Division, 2006). The land belonging to one household must therefore, on average, be split in three pieces and feed three households in the next generation. The next generation will thus face even more severe problems of land scarcity than the present generation. With this pessimistic preview of the future, farmers are keen on keeping their land in family hands.

By giving up their land they would loose the possibility to grow crops on the plot, but save a lot of hard work too. Mountainside cultivation gave little output per labour effort, compared to the more fertile plots in the valley. Those who had several other plots could use the freed labour to intensify cultivation other places, and gain benefit from it. Lack of capital would normally prevent them from hiring in this labour otherwise. For most, however, the freed labour would have little alternative use. They were already utilising all their plots to their

full extent, given capital constraint. Employment is nearly impossible to find for these farmers and only occasional, low-profit jobs might be possible to get. Hence, the freed labour would not be valued highly. Though the mountainside land was relatively unproductive, the farmers needed it to feed their families.

Benefits from the forest project

A forest would yield a considerable effect of preventing soil erosion in the valley, where nearly all mountainside farmers had additional gardens. These gardens have been damaged by strong gully erosion the past decade, mainly because of the deforestation in the mountainside. A forest would prevent future erosion on these plots. In addition, a forest would bring a source of timber to the communities. The sustainable outtake of timber per year would be limited, but would suffice for some development work in the village and some poles to people building houses. One mature blue gum tree has an economic value of around 500 MKW[4] in the villages. An approximation of a possible outtake is around 50 such trees a year. If the value would be equally shared within the village, each household would be left with 200-500 MKW per year, depending on the number of households in each village. This is not much. Nevertheless, people could be given four or five trees at a time, when they needed them for house building, which happens only occasional years. This is important, because few are able to buy the same amount of timber at the market at the same time. The forest hence works as a saving source, which can be withdrawn upon in times of need. In addition to prevented soil erosion and access to timber, the forest project would imply a source of grass in the mountainside. If cultivation was stopped, grass would grow besides the trees, which could be used for roofs on houses. Grass is not very difficult to get hold of in the villages anyway, but the mountainside would become the nearest source and make grass fetching easier. In some villages, the previous garden holders held full rights over the grass in their old gardens. Meanwhile in other villages, the previous borders were wiped out after tree planting and initial land holders held no particular rights to the grass on their previous gardens. The forested land was totally transferred to a common resource, with no individual priority. These different results are discussed in chapter 4.1.

[4] 500 MKW (Malawian Kwacha) correspond to ca US$ 3.5.

The problem with the mountainside land if cultivated is that its productivity decreases continuously every year, due to soil erosion. A fertile plot at one point of time would be completely unproductive some time in the future, if no forest was planted to protect the soil. The benefits of the status quo situation would hence erode with time, turning out to nothing in the end. Meanwhile, the benefits of a forest would increase in time. If everybody contributed, it would take some years before the forest would mature and the benefits in terms of prevented soil erosion in the valley and access to timber would occur. This time lag is illustrated in figure 3-2.

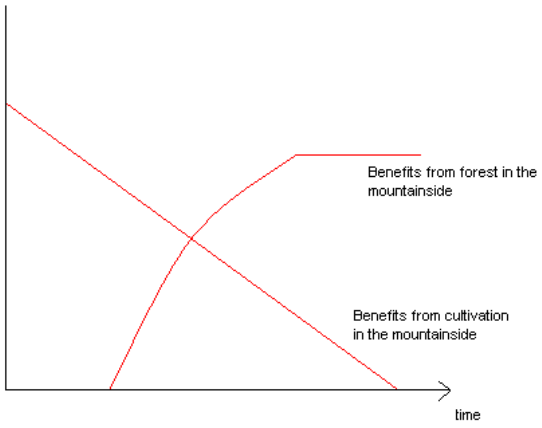

Figure 3-2: How benefits of defection and benefits of full co-operation possibly move with time

It is difficult to estimate exactly how these curves move in time, but it will not take many years with continued cultivation in the mountainside before all fertile soil will be gone and the area will be useless for food production. However, the present value of the project at the time of project start depends on the individual discount factor. Some of these farmers are known to have very low discount factors due to poverty, and especially so by the time of project start in 2001[5], meaning that they value future benefits relatively little compared to present benefits. Still, individual discount factors are empirically found to increase over time (Laibson, 1998). People generally discount values more from the first period to the second,

[5] Poverty was more severe in rural Malawi in 2001 than it is at the moment of writing, in 2008. President Mutharika, who came to power in 2004, managed to improve Malawian economy. Most importantly for rural inhabitants, the government in 2004 introduced fertilizer subsidies, giving a positive shift in agricultural production and lifting many small-scale farmers above the limit to self-subsistence.

than they do from the second period to the third, and so on. If the mountainside farmers follow this pattern, a very low initial discount factor does not necessarily imply a negative present individual value of the forest. I hence argue that the representative mountainside farmer would be better off with universal co-operation than universal non-co-operation. At the same time, the individual mountainside farmer would always be better off by defecting himself, given the choice of others. The marginal effect of his individual contribution to forested land is close to zero, no matter the size of the total forested area. This is because of the small area of each mountainside plot, on average around 0.2 hectare, from which the effect of forest would hardly be noticeable.

3.2.3 A collective action problem on maintaining the forest

The villages which succeeded to turn the cultivated gardens into forested land, then later faced a second problem of collective action; namely to preserve their forest from loggers. The trees are valuable resources if cut down, needed urgently in all households and highly valued at the market. Each individual therefore marginally benefits from cutting a tree and pocketing the sales-sum, compared to leaving the tree for erosion prevention. This is due to the low marginal effect of a tree on soil erosion. However, the total benefits from the standing forest in terms of prevented soil erosion on all villagers land, exceed the benefits from cutting all trees and selling them at the market. Individual incentives hence deviate from common interests. This second collective action problem might be just as hard to solve as the first one.

3.3 Modelling the individual decision

This section develops a model which I believe usefully illustrates important factors behind different results of the analysed forest project. The choice faced by farmers of whether to co-operate or not in this collective action problem is approached through modelling their individual utility. I model the effect of a social norm on personal utility, with inspiration from Nyborg's and Rege's (2003) model on smoking behaviour. I use a tipping model similar to the one developed by Andvig and Moene (1990) on corruption to show that there are only two likely outcomes; either one in which a high share of mountainside farmers co-

operates or one in which everybody defects. These two outcomes are likely because the net utility of co-operation increases with the share of co-operators, through increased reputation loss if defecting. I have not included in this model that the probability of obtaining formal punishment if defecting also increases with the share of co-operators (Kleiman, 1999). However, this fact would only strengthen the predictions of the model.

There are two types of people in each village; mountainside farmers and valley farmers. Mountainside farmers are the ones who initially have at least one garden in the mountainside, in addition to others in the valley. Valley farmers only have gardens in the valley. Only mountainside farmers are decision makers. They have to decide whether to contribute their land to the forest project, referred to as co-operating, or continue cultivating, referred to as defecting. In this simple setup, each mountainside farmer has an initial land holding of two area units, one in the mountainside and one in the valley underneath. The variable g_i refers to the area land contribution to the forest from mountainside farmer *i*. g_i can only take values *1* or *0*, meaning farmer *i* either co-operates by giving his/her[6] whole garden, choosing $g_i=1$, or defects by contributing nothing, choosing $g_i=0$. There is no middle way of scaled co-operation possible. The total forested area is the sum of all contributions, $G = \sum_j g_j$.

Benefits of continued cultivation

The mountainside farmers want to use their gardens for cultivation. If they co-operate in the forest project, they have to stop cultivating, which imposes a cost to each of them. This cost differs between mountainside farmers, because they depend on their mountainside gardens to different degrees, according to the size of their household and other possible sources of income. The cost of stopping cultivation for mountainside farmer *i* is referred to as y_i.

[6] The gender of the mountainside farmers is not specified, as there are both male and female mountainside farmers. In most cases, the mountainside farmer represents a household, in which the husband and wife work together in all their gardens and the harvest is shared within the household. Females are normally the formal holders of land, due to matrilineal land inheritance in the area. However, men usually make household decisions, also concerning land affairs, through their role as household heads. The representative mountainside farmer is thus referred to as a male. Still, note that single mothers make up a large share of the households, in which case the women are the key decision makers.

Benefits of forest

All villagers obtain benefits from the forest, no matter their individual contribution to it. The larger the forested area, the greater are the beneficial effects. The forest creates benefits to villagers mainly in two ways; it prevents soil erosion in the valley and it gives a source of valuable timber. Each mountainside farmer has one area unit of arable land in the valley, which is exposed to soil erosion due to the deforested mountain. Trees in the mountainside prevent soil erosion in the valley, with a positive effect determined as $v(G)$ in every garden. The positive effect of prevented soil erosion increases with the forested area, $v'(G)>0$. In addition to preventing soil erosion, the forest also gives benefits in terms of timber, valuable for use in house building and for firewood. Each villager will receive a share β of the forest in terms of timber, independent of his own contribution. The total benefits of forest to each farmer is thus: $v(G)+\beta G$.

Expected penalty by defecting

Defecting mountainside farmers risk some kind of formal punishment from the leaders if they are caught. Each farmer faces a probability q of receiving a penalty P if he chooses to defect. Their expected penalty is thus qP. It is likely that everybody in the village will know if somebody defects and who that is, because the village is small and everybody sees whether people cultivate their gardens or not. Hence, the leaders will also know which farmers defect. The probability q of receiving a penalty if defecting can be considered as the probability that the leaders will indeed be strong enough impose the penalty on the ones they know defect.

Social disapproval by defecting

Individuals care about their reputation in the village. By defecting in the forest project, the mountainside farmers obtain some loss of reputation, or social disapproval, from the villagers who thought they ought to have co-operated. These people are the ones in the village who agree upon and follow a norm[7], saying that one should co-operate in common

[7]Ostrom (2005) distinguishes a norm from a rule by defining a norm as not including an "or else"-element. That is, the norm implies no commonly known formal sanctions imposed on defectors, though it might imply more informal social sanctions, like loss of reputation. Norms can help reaching a co-operative outcome in collective action games, because they give people a reason to believe that others will co-operate in fear of social sanctions. When people believe that everybody else will co-operate, they do not suspect that they will

village projects organised by the leader[8]. The norm believers in the village will impose social disapproval[9] on defecting mountainside farmers. The share of norm believers in the village is determined as *n*. Hence, each defecting mountainside farmer receives social disapproval *nd*, where *d* is determined as the amount of social disapproval given by each norm believer in the group. The social disapproval can be considered as the feeling of guilt or shame for the norm breaker. This feeling will depend on how many other norm breakers there are in the group. If I am the only one breaking the norm, I am likely to feel more ashamed than if there are several others who do the same around me. The amount of social disapproval imposed by each norm believer, d, thus depends on the share of norm breakers in the village. The share of norm breakers in the forest project is determined as the share of defecting mountainside farmers, *1-x*, where *x* is the share of co-operating mountainside farmers. The total reputation loss for a defecting mountainside farmer is thus: $\frac{nd}{1-x}$. Note that this is a very simplified expression for reputation loss. The relationship between a norm and the share of people following it in a specific situation is in practice correlated. In collective action problems, people tend to co-operate if others co-operate, and defect if others defect. In game theoretical terms this is referred to as a tit-for-tat strategy. If decisions are made simultaneously, like in the forest project, they have to base their decisions on expectations about what others will do. Expectations will partly depend on their experiences with similar collective action problems. Individuals who have experienced previously that others co-operate, might expect that they co-operate this time too, and hence choose co-operation themselves. With time, people don't even consider their net utility of the different strategies, and hence the co-operation behaviour evolves into a habit, or a norm

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end up as suckers if they co-operate too, and hence they co-operate. Such mutual expectations about co-operation from others in turn make everybody co-operate.

[8] The co-operation norm can be considered as a norm of reciprocity for convenience. A reciprocity norm implies that one should co-operate if others do. However, I do not call it a reciprocity norm, because it would logically imply that the norm does not increase individual motivation for co-operation if nobody else co-operates. Hence, existence of the norm would depend on the co-operation level. I assume in this set-up that the time span is too short for norm development, thus that the norm level is exogenously given. In this circumstance it would be wrong to determine it as a reciprocity norm, though it can be thought of as similar.

[9] Norms are supported by their implementation of unpleasant feelings like guilt and shame to the norm breaker (Baland and Platteau, 1996). Hence, the social disapproval need not be due to a deliberate or costly choice from the sanctioner. Only the suspicion that someone dislikes his behaviour, might induce the bad consciousness fest by the norm breaker (Nyborg and Rege, 2003).

of behaviour. In the end, people might not even know why they follow the norm, they just do it (Ostrom, 1990). If circumstances change over time, communities can end up following norms which actually do more harm than benefit. It will take time before they discover the inefficiency and manage to change the norm (Wiig, 2003). This is one of the ways norms develop in societies, and expectations about co-operation thus strongly depend on the existence of such a co-operation norm. However, expectations about co-operation in the specific forest project also depend on the conditions of that very project. The co-operation norm is based on experiences of co-operation in smaller projects, in which the individual sacrifice is relatively small compared to the individual sacrifice in the forest project. Even if people are expected to co-operate in other projects, it might be that the individual sacrifice in the forest project was considered higher and that expectations about co-operation thus decreased. The general legitimacy of the project is also important in this regard. Expectations about co-operation would increase if the project was considered as fair and efficient among the general population. The legitimacy depends on the net utility of the project, a valuation of the costs of lost arable land versus the benefits of forest to the whole community, and how people consider distributional effects of costs and benefits within the community. Assessment of efficiency versus equity is important for the general legitimacy of the project.[10] But the legitimacy also depends on the process in advance of the project. How were people informed? Did they feel included in the management decisions? The information people get in advance creates their expectations about future costs and benefits, which affects their evaluation of the project as legitimate or not. In addition, if people feel they have something to say in the decision making, they might feel also that the project is more legitimate than otherwise. I assume that villagers agree upon the legitimacy of the forest project, and that they base their expectation about how many will co-operate in the same project on this average legitimacy. Hence, I assume that their expectation about x is independent of the general share of norm believers in the village, n. n on the other side, is known to everybody in advance of the forest project, because it is determined as the share of villagers who normally co-operate in common village projects ordered by the leader. Note

[10] Collective efficiency of a project might outweigh negative distributional effects on the common legitimacy. Thomas et al (1986) claims that legitimacy of a social structure can support collective action even if it is only legitimate in terms of efficiency (validity) and not in equity. Through experiments they show that individuals might support a given social structure, although it generates what is collectively defined as inequity to their disadvantage, if they are convinced about its benefits for collective purpose.

that norm believing mountainside farmers are expected to co-operate in the forest project, no matter the legitimacy of it, due to their norm belief. Hence, a share of x is initially determined due to n. This effect is however not taken into account in this simplified model. I justify this simplification by pointing out that this effect would only increase the already positive effect of n on the utility for co-operation, and hence only strengthen the predictions of the model.

The cost of defecting for mountainside farmer *i* is: $qP + \frac{nd}{1-x}$, where *q, P, n* and *d* are exogenously given variables.

Net present value utility

There are two time periods in this model, period 1 and period 2. The decision of whether to co-operate or defect is made in period 1. Costs of defecting due to formal punishment and social sanctions arrive directly after the choice is made, hence the costs are considered to appear in period 1. The cost of lost possibilities to cultivate the mountainside garden also occurs in period 1, as it can be considered the net present value of all future income from cultivation. The net utility for mountainside farmer i is thus:

$$U^1_i = (1-g_i)(y_i - qP - \frac{nd}{1-x}) \qquad \text{s.t. } G = \sum_j g_j$$

It takes some time for the forest to mature. The benefits from the forest therefore appear in period 2. Farmer *i* discounts future payoff with his individual factor δ_i. The farmer's utility in period 2 is:

$$U^2_i = \beta G + v(G) \qquad 0 \leq \beta \leq 1$$

His present value utility seen from period 1 is thus:

$$U_i(g_i,G) = (1-g_i)(y_i - qP - \frac{nd}{1-x}) + \delta_i[\beta G + v(G)] \qquad \text{s.t. } G = \sum_j g_j$$

Farmer i maximises his utility and chooses to co-operate only if it gives him more utility than defecting. His net utility is:

$U_i = U_i(g_i=1,G) - U_i(g_i=0,G) = qP + \frac{nd}{1-x} - y_i + (\delta_i[\beta G + v(G)])'_G$

The marginal effect of each contributed garden on the benefits of forest is so small that the individual mountainside farmer does not consider it in his decision making:

$(\delta_i[\beta G + v(G)])'_G \approx 0$

Hence, everybody disregard the positive effect of their own contribution and their net utility from co-operation is independent of the total forested area. The net utility of co-operation is thus:

$U_i = qP + \frac{nd}{1-x} - y_i$

The utility of co-operation for each farmer is positively dependent on; i) the probability of receiving penalties by defecting, *q*; ii) the penalty itself, *P*; iii) the share of norm followers in the village, *n*; iv) the strength of social disapproval, *d*; and v) the share of co-operating mountainside farmers, *x,* and negatively dependent on vi) the individual valued benefits of cultivating in the mountainside, y_i. The representative farmer thus chooses co-operation if his net utility is positive, hence if:

$qP + \frac{nd}{1-x} - y_i > 0$, that is if $y_i < qP + \frac{nd}{1-x}$

Dynamic share of co-operators

All i mountainside farmers are associated with their individual level of land dependency, y_i, distributed on an interval $[y^l, y^h]$, where y^l refers to the lowest value of *y* and y^h refers to the highest value of *y*. If the sum of the two right hand terms in the inequality above is greater than y^h, everybody will co-operate. Vice versa, everybody will defect if the sum of the two right hand terms is less than y^l. The cumulative density of y_i is F(.), such that $F(y^l)=0$ and $F(y^h)=1$. $F(qP + \frac{nd}{1-x})$ thus determine the fraction of co-operating mountainside farmers.

$F(qP + \frac{nd}{1-x})$ can be seen as the share of co-operating mountainside farmers, hence $x = F(qP + \frac{nd}{1-x})$. When more mountainside farmers co-operate, the net utility from co-operation

increases and hence even more co-operates. This relationship induces that the outcome will tip in one of two directions and end up at either full co-operation or full defection. I assume the distribution of y_i is bell shaped, and then the cumulative distribution $F(qP + \frac{nd}{1-x})$ has a s-shape like illustrated in figure 3-3. The figure illustrates that there are three possible equilibria of x, at the crossing points of $F(qP + \frac{nd}{1-x})$ with the curve $x=x$. These equilibria are due to the assumption that people base their choice of co-operation or defection on the right value of x, which is the basis of the curve $x=x$. However, the same three equilibria will result if we consider this as a dynamic game. Assume that the decisions are made over a limited period of time, in which farmers continuously make decisions which are observable by others. The game can thus be considered as one of several rounds with simultaneous decisions. In the first round, farmers make their decision based solely on their expectation about what others will do. This is when the legitimacy of the forest project plays an important role, in determining the initial expectations about co-operation. However, as the first round is played and the actual co-operation level is revealed, farmers update their expectations, and make their choice again, based on their latest experience. Imagine that everybody makes their decision based on a share of co-operators x=x'. Then, the actual share of co-operators will turn out to be only x'', because only this few would want to co-operate when x is as low as x'. In the second round, farmers base their decision on there being only x'' share of co-operators, thus an even smaller share, x''' will co-operate in the second round. When this even lower level of x is revealed, farmers will again downgrade their belief about x, and the farmers on the margin will stop co-operating because their net utility just tipped to be negative. Thus, the third round will reveal an even lower share of co-operators. In this way, farmers' belief about x and the actual x will continue to move together, until they end up at the same value, which must be at x=0, due to the assumed $F(qP + \frac{nd}{1-x})$ drawn in figure3-3. From figure 3-3 we see that there are only three such equilibriums, of which only the two, x=0 and $x= x^{high}$, are stable. Note that the assumptions behind the distinct zero co-operation equilibrium is that the mountainside farmer with the lowest land dependency, y^l , who is therefore most prone to co-operate, will be exactly on the margin but not willing to co-operate if nobody else co-operate, x=0, hence $y^l = qP + nd$. The intermediate equilibrium is unstable, because only a marginal change in x will push the equilibrium to one of the other equilibrium. Consider a share of co-operating mountainside

farmers at the intermediate equilibrium x=x*. If one of the defecting farmers changed his mind of some reason and decided to co-operate, his single contribution would imply an increase in x which would tip the net utility of the farmers on the margin from negative to positive and induce them to co-operate. Their co-operation would again increase x and induce even more to co-operate, and so on stepwise, until the high co-operation equilibrium is reached.

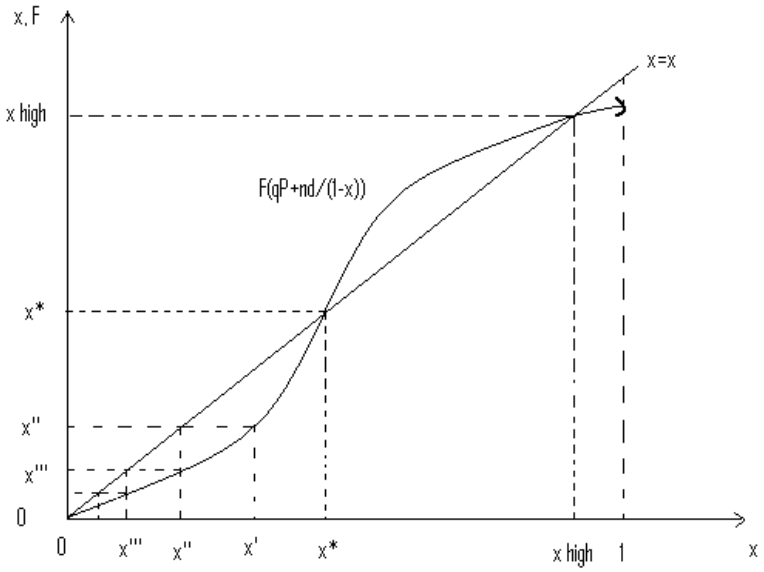

Figure 3-3: Development of the share of co-operating mountainside farmers

Importance of norms

The cumulative distribution function $F(qP + \frac{nd}{1-x})$ determines a co-operation level x for given values of y_i. Now consider two villages with different shares of norm believers. In village 1 (from now V1), the norm is strongly established, $n=n^{high}$, which makes norm breakers feel bad and increases their motivation for co-operation. In village 2 (V2) there are less norm believers, $n= n^{low}$. Figure 3-4 illustrates how a strong difference in norm belief between villages can lead to two distinct outcomes of co-operators. Through the greater norm strength in V1, the individual utility of co-operation is higher for every level of x than in V2, when all other variables are equal. $F1= F(qP + \frac{n^{high}d}{1-x})$ is always higher than $F2 = F(qP + \frac{n^{low}d}{1-x})$. In V1, the large amount of norm believers will impose so strong social

sanctions on defectors that the farmers with the lowest land dependency will co-operate, no matter how many others who co-operate. The dynamic development of x imposes that the share of co-operators will always be increasing, no matter how low the co-operation level starts at. When V1 reach a co-operation level higher than x^{limit}, everybody will co-operate. This is a stable equilibrium because $y^h < qP + \frac{n^{high} d}{1 - x^{\lim it}}$. Hence, everybody will co-operate in V1. For the same distribution of y_i and the same levels of qP and d in V2, the fact that only few believe in the norm implies that the reputation loss when defecting is smaller. According to the movement of $F(qP + \frac{n^{low} d}{1 - x})$ illustrated in figure 3-4, V2 has the possibility of reaching both a high level co-operation and a zero co-operation equilibrium, while V1 is sure to reach a high level of co-operation. In this manner, the initial share of norm believers in a village can determine whether the village reaches a high or low level of co-operation. The different norm believes in the analysed villages partly explain the different outcomes reached in the forest project.

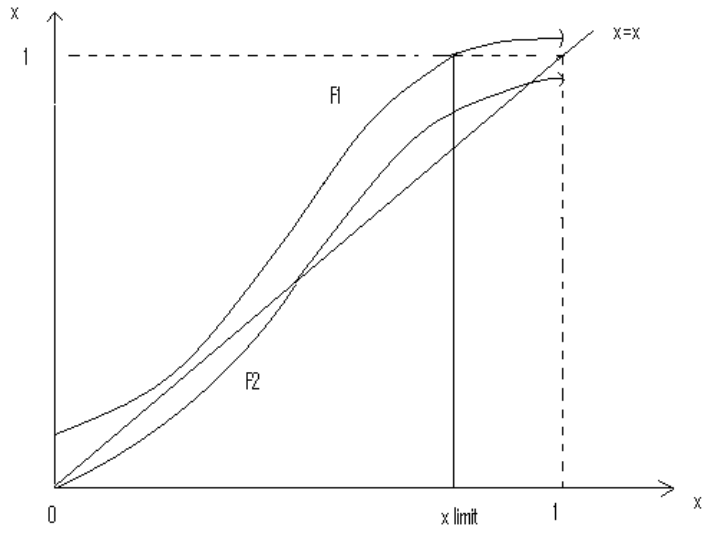

Figure 3-4: How an increased share of norm believers can push the equilibrium from low co-operation to full co-operation

Importance of formal punishment

We have seen that an exogenous shift in n can push the outcome of the forest project in the one or the other direction. In the same manner, an exogenous shift in the expected formal punishment, qP, can determine the outcome. For a higher level of expected punishment, the share of co-operating mountainside farmers should be increased, because the net utility of

co-operating increases. Now consider another village, village 9 (V9), which is at the zero co-operation equilibrium in the first rounds of the game. Suddenly, the forest managers in V9 decide to increase the punishment for defecting, in order to convince farmers to co-operate. Two defecting farmers are chosen randomly and sent to prison, and the managers by this signal that other defectors can expect a similar treatment if they continue defecting. The punishment increases, from P^{low} to P^{high}, and farmers upgrade their expected punishment. Thus their net utility of co-operation increases. The cumulative distribution function moves from Old F9 = $F(qP^{low} + \frac{nd}{1-x})$ to New F9 = $F(qP^{high} + \frac{nd}{1-x})$, as illustrated in figure 3-5. If the positive shift in $F(qP + \frac{nd}{1-x})$ is large enough, so that New F9 is always to the left of the curve x=x in figure 3-5, the increased punishment will induce more and more farmers to co-operate so that V9 will end up in an equilibrium in which everybody co-operates, x=1. This is also what actually happened in V9, which resulted in the same outcome of full co-operation as V1 got with their high share of norm believers. V9 did not have the same share of norm believers, so they had to use the method of increased formal sanctioning in order to shift the net utility of co-operation for mountainside farmers. Two of the defecting farmers were heavily punished at the start of the project. Other defectors started co-operating in fear of obtaining the same punishment. Thus, managers actually only had to sanction two of the defectors, which set an example for all others, in order to reach the high co-operation equilibrium.

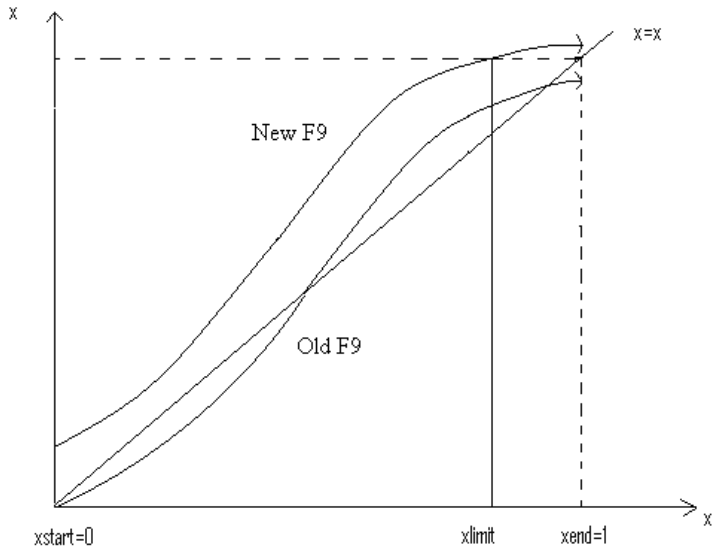

Figure 3-5: How an increase in expected penalty induces a move from the low co-operation equilibrium to the high co-operation equilibrium in V9

4. Explaining the different results

4.1 Describing the results

In 2007, six years after tree plantings, the south side of the mountain was forested, while the north side was completely deforested again. Picture 4-1 is taken from the top of the mountain and shows the great differences between the two sides. The trees on the north sides disappeared in two manners; farmers destroyed tree seedlings while young in order to continue cultivation, and the trees which were left to mature were cut and stolen by thieves. This happened differently in every village, so I will give a short survey of the process and result in each of the six villages in focus. The map of the area in figure 4-2 illustrates the location of the villages and to what degree their mountainside area is forested today.

Picture 4-1: View from the top of the mountain, looking westwards. The forested village 9 of the south side to the left, and the deforested village 6 of the north side to the right.

Villages (V) are organised in groups. One village in each group is the leading village (the group village). The village leader (VL) of the group village is the group village leader (GVL). The villages surrounding the mountain belong to three different groups. Group A = V1 + seven other villages located south of it, in which V1 is the group village. Group B = V2, V3, V4, V5 + two other villages located east of V2, in which V2 is the group village. Group C = V6, V7, V8, V9, in which V8 is the group village. I have mainly focused on six of the nine villages; two of them with thick vigorous forest today, V1 and V9; two of them

completely deforested again, V4 and V5; and two of them left with a few scarcely spread thin trees, V2 and V3.

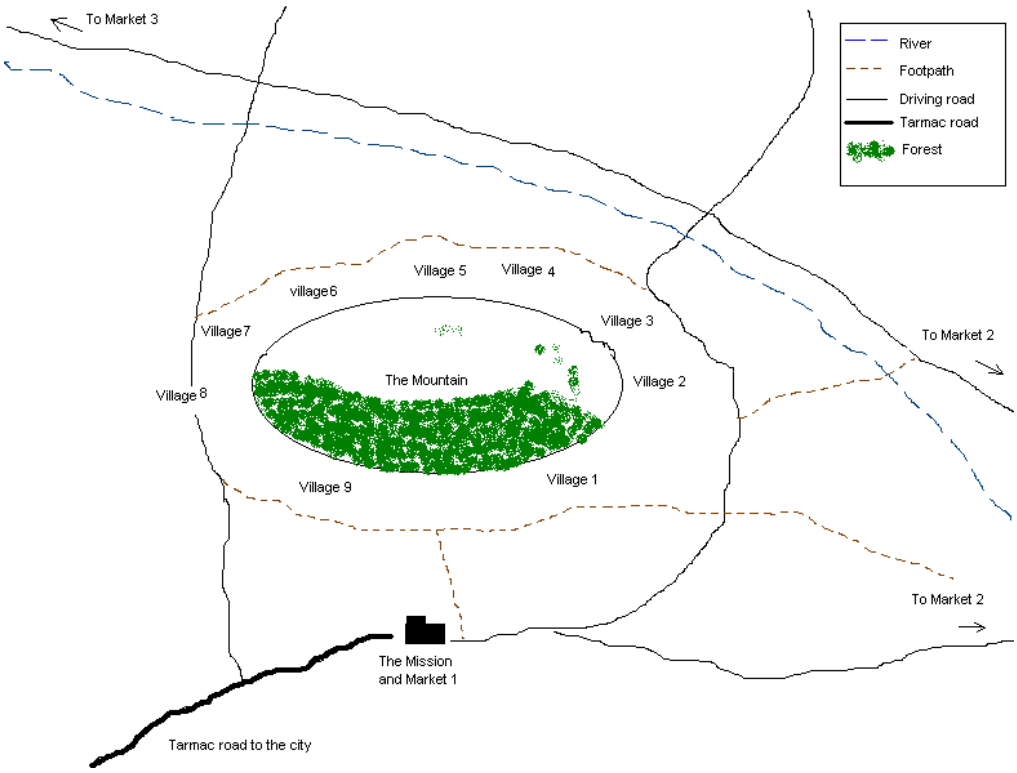

Figure 4-1: Map of the mountain and the villages surrounding it. The villages (V) surrounding the mountain belong to three different groups; (1) group A = V1 + seven other villages located more south; GVA = V1, (2) group B = V2, V3, V4, V5 + two other villages located east; GVB = V2, and (3) group C = V6, V7, V8, V9; GVC = V8.

Group A: Village 1

Village 1 has a powerful leader and co-operative inhabitants. This eased conflicts and convinced mountainside farmers to co-operate in the forest project from start. This village hardly experienced sabotage by mountainside farmers, nearly all stopped cultivating when the trees grew up. Today, the forest stands thick and mature, and villagers within the whole group can be allowed to cut trees for house building once a while or for village development. Mountainside farmers lost all rights to their previous gardens; the whole forest is a common pool resource for the group, where everybody can cut grass growing between the trees, no matter if they initially held gardens there or not.

Group B

The leaders in group B are less respected and inhabitants are generally less co-operative. Many mountainside farmers sabotaged the forest project by destroying tree seedlings at the start of the project.

: Village 2 and 3

These two villages are today left with sparsely spread young trees. According to some sources, the mountainside land in V2 and V3 was more eroded than in other villages before the forest project was introduced, hence many mountainside farmers had already stopped cultivating. Others were forced to stop when trees were planted, while a few still cultivate in the mountainside. Farmers still seem to have the rights to cut grass in their old gardens. The mountainside is only sparsely forested because trees are continuously cut before they mature. The main challenge in V2 and V3 is thus to prevent tree logging, not to stop cultivation.

: Village 4 and 5

Village 4 and 5 are located further away from the GVL in village 2 and are hence less controlled by her. In village 5, all trees were destroyed and nobody ever stopped to cultivate. In village 4, most mountainside farmers seem to have stopped cultivating at start, partly making room for the forest a few years. Later, nearly all have gradually gone back to their gardens, as trees have been cut by thieves or destroyed mountainside farmers themselves. Only a small area in village 4 still has scarce young trees, which can be seen in picture 4-2.

Picture 4-2: The mountain seen from village 4. The forest project initially planted trees in this mountainside. Now only a few thin spots of green can be seen in the previously planted area.

Group C: Village 9

Village 9 has its own forest history. The leader is weak and people are disunited. Mountainside farmers were initially fiercely sabotaging the forest project, but a strong forest committee took early action and punished resisting farmers heavily. Hard penalties scared other mountainside farmers from defecting and saved the forest, but did seem to increase conflict levels in the village. Village 9 might have paid an unnecessarily high price, in terms of increased social conflict, for keeping their forest. Previous owners of the mountainside gardens still seem to hold sole rights to cut grass on their plots, but nothing else. Timber is not distributed to villagers in need and have only one time been cut for development of the village. Trees are however stolen continuously to a large extent. Thieves are caught once in a while, and receive fines of 500 MKW.

Picture 4-3: The forest in village 9 seen from the top of the mountain

The rest of this chapter analyses the factors which I found to have affected the differing result of the forest project in the villages. Bear in mind that the analysed villages are relatively similar in most aspects. In the following sections I only *emphasise the differences* between villages, which I have found important in regards to the forest project result.

4.2 Leadership

Leadership is essential in order to reach a co-operative outcome in collective action problems. A good leader may induce collective action by fostering concern for the common good, making free-riders feel guilty and encouraging mimicry of good behaviour through

role models (Durlauf and Fafchamps, 2004). By fostering concern for the common good, leaders increase the legitimacy of the project, which I assumed in the theoretical model in chapter 3.3 to increase farmers' expectations of co-operation from others, which again increase the actual co-operation. Making free-riders feel guilty and encouraging good behaviour are means of increasing the strength of the co-operation norm in the village, which is modelled as increasing the share of norm believers, who induce co-operation by imposing social disapproval on defectors. In this manner, good leaders increase the probability of reaching a co-operative outcome. This section analyses how different leaders have affected the outcome of the forest project in the different villages.

The village is the basic power structure and decision-making arrangement in rural Malawi. The village leader (VL) uses councillors, normally relatives and acquaintances, as advisors, and calls for public meetings when there are issues relevant for the whole village. More important issues will first be brought to the group village leader (GVL), who might convey cases further to the TA (traditional authority). Information moves both ways through this chain; people – VL – GVL – TA. Village decisions are taken at public meetings, either at village or group village level. The leader introduces the issue, it is discussed publicly and a decision is made by consensus. This traditional democratic process is an effective way of avoiding conflicts and power struggles in the communities (Kayambazinthu, 2000).

Traditional leaders in Africa have lost authority due to political and economical change the last decades. Western educational influence has supported ideas about equal treatment and equal access to power among all individuals and led new generations to question traditional power forms. The same development is evident in Malawi, by several sources blamed upon "the democracy". Democratic election processes on state level have introduced the idea of a priori equality, and it results in new ways of looking at the traditional authority system also at village level. Erosion of traditional power is often considered an important factor behind unsuccessful management of common pool resources at village level, due to the organisational hole it creates (Baland and Platteau, 1999).

"There were a lot of natural resources in the mountain during Kamuzu (former president Banda) period…, but after the coming of democracy people have changed their good behaviour of not cutting trees carelessly. … Many trees have been cut down in the name of democracy and freedom. When I asked them why they were cutting trees like that, they

always said it was their freedom. So I had nothing to say because we village leaders are not even respected. People stopped obeying what we were telling them." (Leader, village 3)

Authority of the village leaders differs between the research villages, as to respect and legitimacy obtained from the villagers. Highly respected leaders have a greater ability to persuade people to follow rules, not necessarily by imposing hard punishments, but due to their reputation as trustworthy individuals. When leaders are considered as well behaved and working for the best of the whole community, not pursuing individual interests, people are more willingly led by them. They follow the leader's order, because they trust her decisions to be right and good. This is what I consider as believing in the norm of co-operation in collective action problems, which means obeying leader's orders and imposing some kind of social sanctions on the ones who do not. People are not found to believe in a co-operation norm when their leaders behave badly and act mostly for their own personal benefit. These leaders are not respected, their orders are not considered to benefit others than themselves, and hence people do not take their orders. If nobody believes in the norm, there are also no sanctions imposed on the norm breakers, and no further incentives to follow it. As the power of traditional authorities in Malawi is eroding, the consequence seems to be that traditional leaders have to earn their respect through good behaviour, to a greater extent than previously.

"The trees were planted and they grew but the problem is that the group village leader 2 is selling them secretly. As a result people are also cutting them down at night. Nobody can stop them cutting the trees down. The VLs are the ones who are supposed to take action but they are too weak. People do not seem to take them seriously. I wish they were like a certain group village leader on the other side of the district. After a hill in the area was afforested he told his people that who ever will be found cutting trees the only remedy is expulsion from the area. Up to now the trees are intact. But this is because he is feared and respected by his people." (Man, Village 3; MLTSC research project field notes[11])

[11] Malawian Land Tenure and Social Capital Research Project collected qualitative data from villages around the country, included village 3 analysed in this thesis. The data is collected by Malawian research assistants who speak the local language.

4.2.1 Group village leaders

Group A and group B have very different leaders. Group village leader of group A (GVL A) is said to have the hardest leader style in the area. People are scared of her, simply due to the way she acts:

"GVL A is very strong. She's hard if people don't work. It is not that she punishes them, I never heard of that, it is the way she speaks to people. They are scared of her. For example, look at the forest in the mountainside, people in group A are too scared to cut the trees down, while at the other side the forest is gone." (Man, group A)

Though feared, this leader is also highly respected. Almost daily, villagers from all eight villages under her group come to her courtyard to ask advice or for a court sentence in conflicts. For such court cases both parts in the conflict has to pay a considerable amount of money[12]. I take the fact that so many still come to the group leader with conflicting issues as a sign of their faith in her judgements. Their faith in her behaviour is what I believe have convinced them to believe in the co-operation norm.

Whereas GVL A is highly respected, and hence gets a lot done in her villages, the leader of group B (GVL B) seem to have a lower position. She is said to be much weaker and not able to control her people. Her limited role in solving village conflicts might be a sign of less control over village life. During my seven weeks stay in the villages, GVL B was only once called to solve a conflict. This dispute was however too difficult for her to settle on her own, so she sent the case further to the TA. My impression is that this lack of cases brought to her is a sign of little faith in her abilities to settle disputes fairly, which, in addition to little respect in other regards, have contributed to a low share of norm believers, at least in her own village, V2, but probably also in the whole of group B.

"GVL B is always in conflict with her people and that is why you don't see any development like in Village I.… She has also been trying to grab land from her people. With that do you think people will love her? We are just watching her". (Old woman, V2)

[12] Each part in the conflict must pay 200 K (US$1,4) to get the conflict judged. Traditionally, the premium was one chicken from each part, but this have lately turned out to be too expensive for the villagers.

As this old woman in V2 hints, GVL B is short of land. She has many daughters, who all have been allocated land from her, due to matrilineal custom. None of them, however, have enough land, and several of them rent land, something it seems like a chief's family is not supposed to do[13] (MLTSC research project field notes). Just the fact that the village leader, who is supposed to control all village customary land (on powers delegated from the TA), is lacking land, can have contributed to eroding her authority in the village. The power of a leader is originally based on controlling land[14]. A chief without land might hence loose her legitimacy as chief, also because little land makes her poor. A man in village 2 to some extent confirms this hypothesis:

"GVL A is much more powerful and respected than GVL B. In Village 1, the response is rapid and positive, but in Village 2, people just sit down. If there is a dispute, everyone will follow what is said in group A but not in group B. GVL B is even renting land herself. This gives her an even weaker position." (Man, V2; MLTSC research project field notes)

The difference in authority between the two leaders came clear when attending public meetings in the two groups. GVL A behaves like a boss. She takes seating on a chair in the high end of the meeting, while people are sitting on the ground in front of her. People discuss one at a time. The leader contributes with facts and explanations, and otherwise listens to people's arguments. In the end, she is the one who concludes the discussion with a final decision, based on the arguments she finds appropriate. Under similar meetings in group B, GVL B is seated on the ground among her people and discusses the issues in the same manner as everybody else. People do not seem to listen more to their leader than to anybody else, and arguments are often interrupted. Coming to the decision making, decisions seem to be made in consensus to a greater extent in group B than in group A. GVL

[13] Traditionally, renting land has been unheard of in Malawi, because land has been abundant. Lately, rules concerning this and other land issues are changing, due to increased pressure on land and modernisation efforts. Rules of today, according to the TA of the area, state that it is allowed to rent out land, but for a period of maximum 2 years to the same person.

[14] Chieftaincies initially emerged when a clan came to settle down in an unpopulated area and hence claimed rights to this land. Newcomers would later have to get permission from these first people to settle on their land. In this way the village developed. The first settlers hold rights to the chieftaincy, which is inherited within their clan. Although leaders today do not have any land to allocate to newcomers, the role of leaders is still closely related to the control of land.

A has a more authoritarian leader style than GVL B, which seems to be respected in group A because her decisions are considered fair and efficient.

4.2.2 Village leaders

The group village leaders discussed above also function as village leaders in their own village. A village leader, also referred to as chief, has the daily contact with his[15] villagers, as he lives in the village among them (in nearly all cases). He is the one they bring their problems and conflicts to and he is the one who knows and sees what is going on in village daily life. The village leader is thus very important in terms of making people contribute to village development.

VL1

VL1 and VL2 are already discussed, as they are the same as VL1 = GVL A and VL2 = GVL B. VL1 is respected to a larger extent than the other leaders in the analysed villages. She seems to have contributed to the high share of norm believers by taking control and working devotedly for village development. My respondents were all over satisfied with the job she does as village leader. My impression is that she distributes goods[16] relatively fairly among villagers.

VL2

VL2 seem to obtain less respect and obedience from her villagers, partly due to her liberal leader style. However, her personal behaviour also seems to have contributed to her weak position in V2, as she is reputed to distribute large parts of outside help within her own family. An example of this self-pursuing behaviour is a case in which Oxfam[17] gave 15

[15] This gender form is used for simplicity. Both men and women are village leaders in this area.

[16] Development organisations and governmental offices once in a while, especially during times of hunger, distribute help in forms of food, clothes or equipment to rural villages. The help is normally given to the village leader, who is supposed to distribute according to the donor's intensions. However, leaders often take large parts for themselves and their close friends and relatives, but this behaviour of course differs among leaders. Such distributions seem to cause many conflicts in the villages.

[17] Oxfam, an international confederation of 13 development organisations, is the only NGO currently working at community level in Chiradzulu district. They mostly support local CBOs with training in skills, management and organisational work, but also distributes material help among poor villagers once in a while.

goats to be distributed as a gift to the poorest households in the village. The VL listed the 15 "poorest" villages to receive a goat each, a list which suspiciously included all ten households in her own close family, from a village of 69 households. It is my impression that these households are at the same wealth level as most others in the village, hence that the VL to some degree favours her own family. This is probably a general pattern in all villages, but seems to occur to a greater extent, or at least be less accepted among villagers, in V2 than in V1 and V5.

VL3

Village 3 is lead by an old man who is drunk most days and puts little effort into village life and development. Much work is in practice delegated to others, but the VL is the one representing the village at group meetings and the one who distributes goods and is consulted for the most serious issues. He does not control his people to any considerable extent, but does not seem to be very interested in doing so either.

VL4

Village 4 has some aspects different from the other villages. The people have a bad reputation in neighbouring villages for being thieves, bad-behaved, dangerous and not listening to their leaders. According to my observations, at least the latter is likely to be relevant. Compared to V1 and V5, few villagers in V4 seem to make an effort to follow their leader's orders. Overall, my impression is that the leader is not as respected as the leaders in V1 and V5, due to the way she acts and the way her villagers behave towards her. The leader, an old woman, also without land, behaves disrespectfully, according to this village woman:

"... she (the VL) is a problem sometimes. She shouts at us when she speaks, "don't let your goats go there and there", and so forth. She gives orders like she has great powers, only because she is VL. It doesn't bother me much, I just don't take into account whatever she is saying." (Woman, V4)

According to my observations in V4, many villagers do not obey their leader's orders, and, more importantly, this non co-operative behaviour seems to be accepted by other villages. This implies that the social norm of co-operation in village project is not as generally shared as it is in village 1.

VL5

The leader of village 5 was also in weak powers at the time of the forest project, according to local sources. However, his power changed around 2004/2005 due to new government policies. At this time, the government decided to subsidize poor farmers with fertilizer, as a step towards increasing agricultural production and making subsistence farmers self-supplied with food. Each household was supposed to obtain one coupon which could be used to buy subsidised fertilizer. These coupons became extremely important for the population, which mainly consists of pure subsistence farmers, who never could have afforded fertilizer without the subsidy coupons. Village leaders were given the task of distributing the coupons. This new system increased the chiefs' power in V5. Suddenly, it was beneficial to be on good terms with the chief and people started coming when he called in for public meetings and contributing to public works when he ordered it. People now got incentives to co-operate in village projects. The external positive shift in leader's power brought a new equilibrium in people's behaviour and a new co-operational atmosphere, which developed into a norm of co-operation in V5. However, the new co-operation norm came too late to benefit the forest project. The trees planted in the forest project were cut down relatively immediately after planting and people never stopped cultivation, as the norm had not yet developed. Other villages were also given this new system of fertilizer subsidy coupons; did it increase the powers of the chiefs in other villages than V5? Probably yes, but of the villages I visited, it was only in village 5 I found such a considerable change in leader powers and this was the explanation I got.

VL9

Village 9 also has a special history of leadership. The village is divided in two when it comes to support of the current chief. One generation ago, the leadership belonged to another clan. As the old chief died and her clan was in a weak position, a man from another clan managed to take over the chief position, with great protests from the original clan. This conflict of the leadership has left the village split. Half of the population does not support the leader and don't contribute to public works nor obey his orders. They claim that he distributes outside help only to members of his own clan. This leader thus seems to have little ability to convince his villagers to co-operate in collective action problems.

Leaders' authority in the villages seems to have affected the forest outcome through their ability to convince people to co-operate, and hence creating a norm of co-operation. A high

share of norm believers in V1 increased net utility of co-operation, through fear of social disapproval and by increasing expectations about co-operative behaviour from others. In V1, everybody was aware of the reputation cost of defecting, and thus people expected few others to defect. The mere expectations about high co-operation have probably increased farmers' evaluation of the project and hence induced co-operation. All other analysed villages initially had less respected leaders, who did not manage to convince their villagers about general co-operation, and thus expectations about co-operational behaviour in the forest project were also lower. It should be emphasized that the causality between leader behaviour and share of norm believers in a village is unknown and probably goes both ways. Improper leader behaviour might result in few norm believers, but an initial low share of norm believers also lowers leader's motivation for village development and hence might as well contribute to illegitimate leader behaviour.

4.3 Project design

Institutional design and how decisions are made can overcome barriers to collective action in forest management (Varughese and Ostrom, 2001). Different management schemes were imposed in the analysed villages and have affected net utility of co-operation for the individual mountainside farmer, especially through formal punishment. In addition, efficiency and distribution of benefits from the forest, and the implementation process, affected the general legitimacy of the forest project, which again affected expectations about others' behaviour.

4.3.1 Forest committees

The first public meeting concerning the forest project in 2000 elected three supervising committees. One was the leading umbrella committee for the two other sub committees. There was one sub committee for group A and B, including V1, V2, V3, V4 and V5, and one subcommittee for group C, including V6, V7, V8 and V9. These committees were supposed to manage the forest project and be responsible for the outcome, in co-operation with village leaders.

Each of the tree committees consisted of ten members. Several village leaders were among these. At the election meeting, people present from each village chose their own representatives for the committees. However, not all villages were represented, while other villages had several representatives. In the subcommittee for group A and B, most members came from villages under group A. V2, V3, V4 and V5 were not represented at all. This is probably due to their low attendance at the election meeting, indicating low initial enthusiasm for the project.

The committee members were paid the first months of the project, when nursery beds and plantings were made. The payment stopped when government withdrew from the project and it was left in the hands of the communities alone. Many members stopped working at that time, in March 2001. However, all members left were still active in the forest management work the first three years. They had regular meetings, guarded the forest and made decision about forest rules and policies for harvesting of timber. The sub committee for group C still works for this purpose. They have the highest authority over the forest in group C and decide whether people should be given permissions to cut trees or not. They co-operate well with the village leaders, and this gives the committees legitimacy for their activities. The subcommittee for group A and B has a more difficult time co-operating with the chiefs, especially GVL A. She was not satisfied with the work of the committee and therefore took the full management role herself. She sacked the committee, leaving them with no power over the forest in group A. The committee leader has complained this degradation of power to the TA, but has not come any further with his claims by now. Since most of the original members in this committee came from group A, they have resigned from the work, and the committee is not active anymore. Hence, neither group A nor group B have any managing committee, and the full responsibility is left with the group and village leaders.

Comparing with the faithful work of the sub committee of group C, it would have been favourable if groups A and B had assigned the power between leaders and committees. In lack of a working committee, all responsibility is left on the shoulders of the leaders. As is the case in group B, the leaders are not strong enough to manage the forest successfully. A supervising committee, consisting of members representing all villagers, could have had a better chance of inducing co-operative norms in the villages and leading the forest project towards the better outcome.

4.3.2 Project implementation

The local communities were not given a choice of whether to receive the forest project or not, the implementation was considered a government order. VL1 seems to be the only leader surrounding the mountain who welcomed the forest project and devoted efforts to its success already from the start phase. The other leaders were probably aware that the project would induce conflicts with the mountainside farmers, which they would have problems handling. As VL1 was more concerned about the forest project, she seems to have made larger efforts informing her villagers about the beneficial effects of trees and persuading them to co-operate. Still, most mountainside farmers, and also some in village 1, claim they never heard about the project before workers came to their gardens to plant the seedlings. There was an information meeting concerning the project in advance, but it seems that few people attended this meeting. Thus, the information they got was probably not more than that the government wanted to plant trees and that they had to stop cultivating.

"We were not told of the project in advance. We heard that there was a meeting somewhere far away, not in the village, but our VL did not inform us about this meeting. He never called for a meeting, if he had then all the problems would have been avoided, people would have obeyed. We only heard the rumour that trees were to be planted in the mountain, and that those who continued to cultivate would be taken to the police." (Man, V9)

According to my respondents, nobody knew in advance how the user rights to the timber were going to be distributed. Rules for use of the future timber were decided upon in March, shortly after plantings. The same rules held for the whole mountain. The mature trees were to be used only for development work in the village or for house building for the poor. These rules were spread to people at public meetings at group level, but again not all people attend such meetings. Village 4 and 5 are especially badly represented at public meetings in group B. This may be due to dislike of their group leader, but may also be due to the longer distance they have to walk to reach the meeting ground. Present or not, rumours spread easily in these villages, hence most people should have obtained the information after a while. However, proper information about the future benefits of forest, how it would prevent erosion and how timber was going to be distributed, would have increased the legitimacy of the forest project and thus increased incentives for co-operation.

4.3.3 Control and expected penalty

Expected punishment imposed on defecting mountainside farmers is a considerable variable in their decision of whether to co-operate or not. The harder the penalties and the more probable their occurrence, the more costly it will be to defect. How did expected punishment influence the choice of mountainside farmers in the research villages? They all got some of the same message regarding punishment of defectors; those who continued to cultivate their plots or uprooted trees in the mountainside would be taken to the police. Threats of punishments are often stated from VLs when they need to induce people to follow orders. Such threats usually refer to not being listed for fertilizer distribution or other community benefits. Police custody is quite a fearful threat in this context.[18] In the case of the forest, that threat was put forward by the MoP, Mbewe, who put more weight behind the threat as he was a government representative. His random visits to the forest scared many from damaging the trees as long as he was in parliament.

The responsibility of guarding the forest and punishing defectors was held by VLs in co-operation with the committees. The question is, however, if people really expected forest managers to be hard enough to implements these heavy threats in the end. In V3, V4, V5, V6, V7 and V9, people sabotaged the forest project by uprooting trees, pouring salt over the seedlings or set the mountainside ablaze to prevent trees from growing. Only in V9, two of these defectors were actually sent to the police. The two men were said to be the forefront saboteurs in their village, encouraging others to do the same. Due to lack of evidence, the two men got away with two days in police custody and were then discharged by a local court. However, the incidence put an abrupt stop to the defecting in V9.

Rumours of police custody did not seem to scare defectors on the other side of the mountain. In villages 3, 4 and 5, cutting of trees continued. It was most extreme in village 5, where nobody ever stopped to cultivate and the forest was continuously kept down. In V2, V3 and V4, the trees grew to some extent and most people stopped cultivating, until MoP Mbewe withdrew from politics in 2004, taking with him the threat of government sanctions and

[18] Governmental punishments have a fearful reputation in Malawi, due to the hard treatments during Banda's dictatorship (1963-1994). Although Banda was removed in 1994 and democracy since then has softened up old systems, government officials and policy still has a job to do to ascertain Malawians that their government is acting for the best of the people. Police custody was therefore seen as a very scary punishment.

starting a new era of forest cutting at the mountain. GVL B did try to convince people in her group of not cutting trees, but she was not obeyed. She was only able to control a small forested area close to her own home in V2, guarded by her own presence. She hired guards to patrol the whole forest in group B, but as people knew who they were and when they were guarding, they kept illegal cutting activities to times without guarding. When asked, my informants claim that they do not know who has been damaging the trees. It might be garden holders who want to go back to cultivate or it might be regular tree thieves. Nobody has been punished for still cultivating in the mountainside, because there is no evidence that they are the ones who have damaged the trees. They say that others have destroyed the trees on their plot, and that they returned to cultivate only because there were no trees left. This is however unlikely. A thief stealing trees for its timber value would first of all not cut the tree until it was to some extent mature and secondly he would cut the tree, leaving a stem. Blue gum trees are fast growing and resistant species, and will grow up again after being cut in this way. If you want to prevent the tree from ever coming up again you have to destroy the root. This was done by pouring salt over the roots, setting the mountainside ablaze or up-rooting the seedlings one by one. It is unlikely that these damaging activities have been done by people wanting timber. It must be done by garden holders themselves, or alternatively by people wanting to help them.

However, garden holders were not punished when trees were destroyed in their own garden, due to lack of evidence. My interpretation of this low ability to punish defectors is that it pictures the low authority of group B leaders among their people. This being said, many trees were also cut by the stem, which did not kill them, but prevented them from taking much nutrition from the cultivated crops as they were still small. When the trees then matured and occupied precious soil nutrition, they were again cut by the stem. This practice is still done by some of the mountainside farmers who have densely spread trees left in their gardens. By trimming the trees in this manner, it is possible to harvest nearly as much as if the trees were not there. However, the trees then do not fulfil the main purpose of preventing erosion. Nor do they provide as much timber as they optimally could, because they are cut too early, only a few months old. As these trees are cut by the stem, it is possible that it sometimes is done by people stealing firewood, and not necessarily the mountainside farmers themselves. However, according to the small size of these trees, it is likely that the holders of the gardens are responsible for most cases of damaged trees themselves. Yet, mountainside farmers did not seem to risk much by this behaviour. The few who were

punished for destroying trees in group B were caught in the very act or for possession of blue gum trees in their homes. The penalty was a fine of 200 MKW, a considerably smaller penalty than that in village 9, where two of the defectors got police custody and trial in court.

"… they (people of villages 4, 5 and 6) uprooted the trees in order to continue cultivating up mountain. Though it was stated by the village leaders that people who had gardens in the area planted with trees should stop cultivating, it did not work. Besides uprooting the trees, people have kept setting the mountain ablaze, damaging the trees in the process. But, people of villages 1, 8 and 9, which have thick forest today, obeyed their leaders. In short, leaders of those villages are more powerful as compared to the other villages." (Woman, V6)

As the forest matured and got valuable for its timber in V1 and V9, another issue came into place; to protect the trees from firewood thieves. Trees are stolen every month, which is a current problem for the forested villages. They say the thieves come at night, and that they come from all around the area, not necessarily the same village. However, it seems unlikely that someone can fell a tree with axe and carry it down without anybody hearing it. It probably means that people don't report such incidents to their leaders. A story from V9 illustrates how this can happen. As I was finishing up an interview with an old woman living high up in the mountainside near the forest, we saw some children carrying small trees and branches for firewood down from the forest. When I asked, the woman replied that it was not allowed and that they would be fined if the chief got to know about it*: "It doesn't happen often in this village, because people are afraid. Others might report to the chief when they see something like that. I will not report such things myself. It isn't good to report on each other."* This woman lives in a village in which half of the population do not support the current VL as the legitimate chief and hence it is likely that more people are prone to think like her when it comes to reporting on others behaviour. The hard sanctions imposed at the project start by the committee and the general conflict level in the village has probably contributed to this unwilling behaviour from possible reporters. People feel closer to their fellow villagers than their leader, and hence they do not report on each other. This probably holds at least for the people belonging to the group not supporting the chief, but might be different for the supportive half. Nevertheless, stealing trees is a

dangerous business in this village with general low trust levels. After all, it seems to be done quite often. Thieves are caught once in a while, last time a few months before my fieldwork, when a group of people were fined 500 MKW each. They were taken by the forest committee, which got a tip from other villagers that these people had cut trees in the forest. The committee found blue gum trees (the main tree specie growing in the forest, but which can also be bought at the market) at their compounds, which was considered as evidence for theft.

Theft of trees does not seem to happen as often in V1, as people are scared of VL1 who also lives close to the forest. However, thieves have occasionally been caught in these villages too, and are then charged approximately the market value of the tree stolen, around 250-500 MKW. The penalties are low compared to national forest laws[19], because few people in the villages are able to pay any more.

How did expected penalties affect the forest outcome? The arrest of the two men in V9 proved that the committee was able and willing to enforce its threats on defectors. It stated an example towards the rest of the mountainside farmers, who were scared off from resisting orders any more. This early display of power from the committee was a major contribution to the fact that the forest still exists in V9 today. The committee is still active and has the main responsibility for guarding against and punishing tree-thieves. Hence, their first heavy sanctioning still stands as an example of what could happen to people cutting trees and hence protects the forest from further damages. In the other villages, nobody took this role of enforcing harsh punishments, and defecting was never as risky.

4.3.4 Who benefits from the timber?

V1

Village 1 is the village which has fulfilled the harvesting intentions from the project at most. All villagers from group A (from all eight villages) can ask GVL A for permission to cut some trees if they need poles for building a house. She gives permission to everybody, no matter how poor or rich, but only for a limited amount of trees, normally two or three. The

[19] Punishment for cutting trees illegally in forests managed by national governments is either 5 years in prison or a fine of 15.000 MKW.

support is enough to build a small house. The only use which will be considered is poles for house building, as this is only occasionally needed. Firewood, on the other hand, is needed in every household every day. If this demand would be met from the forest supply, the forest would soon be depleted again. The only exceptions are a very few cases of village development projects, in which trees have been given for use of firewood.

V9

In village 9, the system is a little bit different. Villagers must ask the forest committee for permission to cut trees if they need. The committee has by now not given such permissions, because they do not think the forest is mature enough. They need to set up a policy for tree harvesting, which they have not yet decided on. Some villagers have asked for trees, but have not been given. Hence, the mountainside farmers, who were already ill-mooded regarding the forest and loss of user rights to their land, feel sure that they will never see anything to the timber values.

V2

One major reason of GVL B's low ability to prevent tree-cutting is the rumour that she is logging trees illegally herself. Hence, her legitimacy when trying to convince people to take care of the forest is limited. Many of my respondents complain about her behaviour, like this guy:

"Whenever people go there (to ask for trees) she is always refusing them. But when people go with a little something she tells them to go and cut down the trees at night. I think we should just be going there to cut at night without first going to her. She thinks it is her forest. Her daughters and granddaughters go there and cut trees anytime for any use. People have been seeing them." (Guy, V2)

A man in another village belonging to group B complains about the same thing:

"There is some kind of biasness regarding the trees towards the clan of GVL B. Some people can go and get 2-3 trees for free, but I would have to pay. It is not necessarily the needy people who get trees. The trees are supposed to be for the community, but the GVL is selling the trees like her own business." (Man, group B)

I could also observe this process. GVL B's household used poles taken from the mountain forest for firewood most days. In such a small and open village, where people live everywhere, nobody can steal trees regularly without everybody else getting to know about it. Hence, her behaviour probably affects the behaviour of all people under her group, not only in her own village. People are not likely to listen to their chief as long as she does not follow the rules herself. This behaviour leads to acceptance for not obeying her orders. She has however been able to keep a few trees in her own village, probably because she lives very close to the forest and is able to catch thieves herself. In the other villages of group B, the mountainside is all bare.

The question is not only how timber was distributed in the end, but more which expectations mountainside farmers had about it in advance. According to their previous experiences, they might have had a clue about the general distribution of benefits in the village, and thus have some expectations of this also regarding the forest project. When they expect that the benefits will be captured by the village elite or stolen by thieves, leaving them as suckers in the game, their willingness to co-operate decreases because of two things: First, their utility of a forested mountainside is lower and hence their direct incentives for contributing and inducing others to contribute, weakens. Secondly, general respect for the leader and belief in the norm of co-operation decreases.

4.4 Social capital

I have argued that VL1 is more powerful than the other village leaders, meaning that people obey her orders to a larger extent, which I have taken as a sign of a stronger co-operation norm. The existence of a co-operation norm is not necessarily only due to personality treats of the leader or the design of institutional change. Such a norm might have developed independently of these two variables, rather from exogenous properties of people in the group. According to my respondents on the south side of the mountain, it is the people in the northern villages themselves who are the problem, not their leaders:

"The people of V3, V4, V5 and V6 are very troublesome. If you are chief there, you fear your own people. Especially in V4 they have a bad behaviour. They are very dangerous, have no respect and do whatever they want. Their leaders fail to handle them in fear of getting

beaten up. The VL wants to control the trees, but people don't listen to her." (Forest committee headman, group A)

In this chapter I argue that there is less social capital in group B and V9 than in group A, and that the low levels of social capital is partly explaining the low share of norm believers in the former villages. Durlauf and Fafchamps (2004) defines social capital by three main principles: "(1) social capital generates positive externalities for members of a group; (2) these externalities are achieved through shared trust, norms and values and their consequent effects on expectations and behaviour; (3) shared trust, norms and values arise from informal forms of organisations based on social networks and associations". Estimating social capital is not an easy task, due to the elusiveness of the concept. I take each community as an analysing unit, focusing on the ways in which community members interact and collaborate on issues of shared concern, an approach recommended by Dudwick et al (2004).

4.4.1 Inter village co-operation

Formal co-operation between inhabitants of different villages nearly did not exist some years ago, until a CBO (community based organisation)[20] was established in group A by local volunteers around year 2002. This initiative is a sign of relatively high co-operative abilities in group A already then, which was around the same time as the start of the forest project. In 2005, Oxfam[21] became an umbrella organisation which supported CBOs with financial and advisory help and convinced the group A CBO to include group B and 3 in their organisation. The merged CBO, in co-operation with Oxfam, has since then coordinated development projects across village borders, in which villagers must co-operate and work together. This has given villagers positive experiences of co-operation between them and increased the willingness of co-operation also in other regards. The co-operation norm is thus strengthened on a general level compared to the forest project start in 2001.

[20] Community based organisations are funded and managed locally, aiming at local management of local problems. CBOs were initially established in order to handle the HIV/AIDS epidemic and started locally managed care of sick and orphans. Today they work as umbrella organisations for community development committees, working with youth and women empowerment, health and care, agricultural productivity and educational training.

"After the CBO and different projects that work across village borders, it is more co-operation between the villages. People from different villages work together in the same projects and increased their understanding of each other." (CBO-director)

Such projects includes the building of bridges and schools in the communities, and establishing village development committees, which work with orphans, aids, care for sick and elders, youth training, agricultural advising or other development works across villages. Even if such projects increase understanding between villages, co-operation abilities are still very limited between villages in group B. The most recent CBO project serves as an example. The CBO wanted to build nursery schools for children under school age, especially orphans, to give the youngest children some educational activities and care at daytime. Oxfam offered financial support and the CBO decided that three and three villages were to share one school. The location of the schools turned out to a main conflict in group B.

"People are different in the different villages. People of V4 only think of themselves, they are individualists. They are thieves and have a bad behaviour. A reason for placing the nursery school in V4 was to give them a chance, try to change their behaviour by giving them this responsibility." (CBO director of the area)

This plan did not go well with V3, however:

"People in V4 like to fight, so we cannot send our children to school there." (VL3)

Long distance and little general contact between villages made trust difficult and co-operation hard. Few villagers were willing to work with erecting the school building and the teachers soon quit the voluntary work. At the time of fieldwork, none of the schools were running. Low trust between villages and low willingness to work without payment seem to be main reasons for failure of the nursery school project in group B. On the other hand, the three nursery schools in group A are working very well, although builders and teachers are equally unpaid. I see this as an example that villages in group A co-operate better and trust each other more across village boundaries than group B villages do. Abilities to co-operate

[21] Oxfam, an international confederation of 13 development organisations, is the only NGO currently working at community level in Chiradzulu district. They support local CBOs with training in skills, management and organisational work.

between villages are also most probably related to ability of co-operation within villages, therefore the example also indicates higher levels of trust and a stronger norm of co-operation in V1 than in group B villages.

Especially V4 has a bad reputation among neighbouring villages. My respondent in other villages considered most inhabitants of V4 as thieves, because they behave differently and possess a lot of valuable good, which people from other villages claim they must have been stealing in town. They, however, say that they earn their money by doing legal businesses in town. I did indeed observe a quite different behaviour in V4; we, as foreigners, were not greeted as kindly as in other villages, women played money games publicly ("a sin" other places) and people tended to interrupt us and each other during interviews. Whether they are thieves or not doesn't actually make a difference, as long as they have a different behaviour and obviously are not trusted among other villages. Low trust between villages might indicate a general low trust level also within the village, and hence have affected the forest outcome by inducing expectations about a low share of co-operators within the village. But low trust in neighbouring villages might also have affected the forest outcome directly, as the share of co-operators in one village in some senses also affects the utility of the forest project in the neighbouring village. Forest in the mountainside of one village would prevent soil erosion in the valley, also in the area of the neighbouring village. If one believes that the neighbouring village consists of defectors, who will not contribute to prevent soil erosion and afterwards might even steel trees from other village when they mature, it increases ones perceived risk of ending up as a sucker, and decreases incentives for co-operation.

4.4.2 Village level co-operation

I focus on two indicators of co-operation in the villages, which reflects the share of norm believers; membership of village development committees and contributions to public works. The new system of village development through CBO and Oxfam's strategy of building civic capacity in the communities has resulted in a whole lot of different committees which are supposed to work for village development. V3, for example, have seven such committees; orphan committee, home based care committee, youth club, aids committee, health committee, development committee and human rights committee. In addition they have members in the CBO committee at group level. All villages have a similar amount of such committees, with only slightly different names, and it does not seem

to be any considerable differences between villages in the number of such committees or the work they get done. Every committee consists of ten or twelve members, who contribute more or less to the committee work. As far as I could observe, the productivity of these committees is quite low, as a VL confirms:

"It is a problem with these committees; people don't like working for free. It was better before, then people volunteered for the committees and the people who joined were interested in doing the job. Now people are mostly just pointed out to join the committees, even if they don't want. Almost everybody in the village is member of some committee! When people are not willing to join the committee, they don't care and won't do the job at the end of the day. You know, most people join committees because they think they will be sent to seminars, where they will get some money. But when they experience that there are no seminars, they have other things to do, and quit working in the committee." (Leader, one of the villages in group B not bordering on the mountain)

The second indicator of village norm believers is contribution to public works in the village. In V2, V3, V4 and V9, few contribute to public works when the leaders order it, and those who do are mainly relatives of the leader. Non-relatives of the VL claim that they won't contribute to public works because they do not receive outside help when such are distributed. Relatives of the leader and the village elite often capture such benefits. In all but one of the villages I visited, people were complaining about an elite capture of fertilizer subsidies. (The one exception was V5, where the fair distribution of fertilizer subsidies seem to have given the chief new power and respect, as discussed in chapter 4.2) The share of left-out people was especially high in V2, V3 and V9, where they also consisted of people who were obviously "poor enough" to qualify for a subsidy coupon. In these villages, it was quite certain that mostly relatives and acquaintances of the leaders benefited. The VLs, on the other hand, claim that they do not give certain villagers fertilizer coupons or other kinds of help, because these people do not contribute to public works when they are asked. So, who started? What came first; the corrupt leader or the non-co-operating villagers? For this purpose I only state that there are often groupings within the villages, determined by relatives and close friends of the VL, the village elite, in one camp and non-relatives in the other. Members of the village elite both do the job and take the benefits. The difference to V1 was that everybody contributed to public works, no matter if they got such subsidies or not. It did not seem to be such groupings within villagers in V1. Some complained about an

unfair distribution, but it did not hinder them to do public works with the rest of the village. Hence, V1 has a higher share of norm believers than the other villages. The villagers have experienced several successful community projects, in which nearly all inhabitants contributed. They all know that the share of norm believers is high in their village and thus they expect everybody to co-operate also in future projects. The risk of ending up as a sucker is low. The inhabitants of V1 seem to value the benefits they receive from being a community and the benefits the community development work brings to each and everyone. A woman who gave up her mountainside land for the forest project, in spite of severe poverty and land dependency, confirms this community spirit. She had cleared the garden only two years before it was taken from her, which meant a lot of hard work wasted. Yet, when asked about how she greeted the forest project, she emphasized its benefits to the community:

"Because I had only been cultivating it (the garden in the mountainside) for such a short period of time, it didn't hurt me too much that I had to give up the plot. The trees are benefiting the community, so it is mostly a good thing." (Woman, V1)

When people in a similar poor situation in other villages were asked the same question, emphasize was always put on how dependent they were on the land and how unfair it was to take it away from them. The fact that she thinks about the benefit of the community is quite uncommon in my view, and represents a strong norm of co-operation in V1.

4.4.3 Self-organised co-operation

Self-organised co-operation, not managed on village level by committees or VLs, are rare in these villages. Generally, people do not share food in hard times, because few have something extra to share. Some people have a few close friends or relatives who assist each other with small things during sickness or other emergencies, but many are left without anybody, as this old woman:

"Nobody in the village help me when I have problems with too little food, I cannot ask them. Last year one of my grandchildren got sick. I tried to approach many people in this village, but nobody helped. They have their own needs. I get no help

from my relatives, they are all drunkards. They have their own problems." (Old woman, V3)

People rarely lend each other money, because they know that there is little chance of getting it back. However, some women save with ROSCAs (Rotating savings and credit associations)[22], consisting of 6-15 women using their saved money for small-scale businesses on their own. Two of the ROSCAs we found had already closed down their activities, in one case because the participants were not able to pay their turns, in another case because someone suspected that others would not be able to pay at their next turn, hence they pulled out in advance.

I did not find any differences between villages in level of self-organised co-operation. The higher level of co-operation in V1 than in the other villages hence only refers to co-operation on village and group village level. It implies that people in V1 have positive previous experiences with village co-operation, but not necessarily with co-operation person-to-person. The forest project was a co-operation project on village level, as it included a high share of the village population, and hence it was probably experiences with village level co-operation that induced expectations about others' behaviour in the forest project. In V1, the high share of norm believers induced expectations about a high share of co-operators also in the forest project. In the other villages, a low share of norm believers induced the opposite expectations about others' behaviour.

4.4.4 Trust

Durlauf and Fafchamps (2004) identify trust as a necessary condition for collective action, in addition to good leadership. People are bound to trust the contributions of others if they are to contribute in collective action problems themselves. It does not seem to be differences in general trust levels between villages, which support the previously mentioned argument; the higher share of norm believers in V1 is not a result of a generally higher trust level between

[22] ROSCA is a group of individuals meeting regularly to save money together. Each time all members contribute the same amount, while only one of them receive the sum. The members rotate on being the receiver. ROSCA can be used to save money, in lack of a proper banking system, and works as investment credits for small-scale businesses.

individuals, but rather a result of more trust in people's contributions to village level projects.

Asking respondents directly about trust gave few valuable answers. It is a sensible issue, which demands a lot of trust also in the interviewer. However, respondents did often not seem to mean the same thing with trust as I do. Here is an example. I asked two brothers who they trusted in the area (they both spoke English, so this time I was able to communicate without my translator). They said they trusted everybody, even people from village 4, *"…although these people are all thieves"*. Later, they said that this kind of trust only meant that they talk with them when they meet occasionally. When I asked if they would be willing to let these people sell their food at the market for them and trust them to bring back the right amount, the answer was abrupt: *"No, no, then they would probably take the profits and tell me they only got to sell at the lowest price. That would be the same as leaving your house with the door open, and tell your neighbour to watch it. It would be like an invitation to rob you! I would never do that. We always lock the house with a key when we go away. The only one I would lend my business to is my brother."* For these guys, trust hence seems to be more like an expression of liking people personally and interacting nicely with them, more than expecting a non-selfish behaviour when not seen by others. Other experiences indicated the same. Many respondents seemed to take trust as a degree of liking and chatting with the person, but nothing more. I interpret this as a sign of low general trust among people. Higher trust levels between individuals in these villages might have increased people's expectations about co-operative behaviour of others in the forest project, which would have increased individual incentives for co-operation.

4.5 Co-operation norm

4.5.1 How leadership and trust shape the norm

Krishna (2001) emphasises that existing levels of social capital needs to be drawn upon by capable agency, for example leaders, in order to reach collective action. The analysed villages differ when it comes to contribution to public works. Respondents in village 1 claim that everybody else in the village contributes to public works, an indication of trust towards each other of co-operating. An important reason behind this trust is however the enforcement

of their village leader. People who do not show up to public works are always dragged in afterwards by the village leader and forced to do their parts of the work, or even more. In other villages, contributions to public works are less. Defectors are faced with threats of not receiving fertilizer coupons and other types of development help. How real this threat is depends on their relation with the chief.

"If one does not participate in such works (public works in the village) you become the enemy of the village leader and you are not involved in the list of those receiving handouts especially the coupons for subsidized fertilizer." (Woman, V2)

People are either well connected with the chief or not. If you for some kind of reason do not receive handouts from the chief, you don't face any extra sanctions if you skip contributing to public works, as this woman in V9 puts it:

"I have never moulded bricks for the nursery school. It is deliberately, I don't want to. I see no reason of contributing to these things when I never get listed for help that comes from outside." (Woman, V9)

Why does village 1 have higher co-operation levels than the other villages? Their strong leader plays an important role, as she is able to convince people that everybody else will contribute due to her authority. When people believe that everybody else will contribute, they are more willing to co-operate themselves. Is this really co-operation based on trust, when people are forced through the authority of the leader? It might be a different kind of trust, but the result is however the same. Nobody skips contributing to village projects in V1, because they trust that they will not end up as suckers. Everybody knows that everybody else generally co-operates in village projects, and this seem to have induced a high share of co-operators also in the forest project. This certainty of others' contribution is a mutual trust, although it is an enforced trust. Trust must develop from some kind of positive experiences, and whether these experiences are enforced from outside does not make a difference to the way they work. But notice that this trust only works on the specific issues on which it is enforced, which is contribution in common village projects. People only trust each other to co-operate in such specific projects, and it does not necessarily mean that they trust each other also in other regards.

Is it the intertwined variables of strong leadership and social capital (used as a more general term for trust and trustworthiness) which have induced the strong norm of co-operation in public projects in V1. A powerful leader has contributed to encourage existing levels of social capital by inducing co-operational experiences. From increased co-operational experiences, the norm of co-operation has strengthened, and stands on its own without threats of sanctions from the VL.

The other example of high co-operative levels was found in V5. An outside positive shift in the power of the leader occurred when village leaders were given the task of distributing fertilizer coupons, which made his villagers more obedient towards him. They started co-operating on public village projects when the chief asked them. With such positive experiences of co-operation, they are in the process of building social capital. The new trust developed among villagers, however, is not fully established yet, but is probably in a constant move depending on their mutual behaviour. A man in this village answered this when he was asked whether he trusted the people in his village:

"I don't know how much to trust them. In a current project of building contour ridges, all people have until now worked together in building ridges for different gardens. We have built ridges in one garden at a time, and everybody has helped. We have not yet come to my gardens, that is why I can't yet say that I trust the others. If they all also help when they come to my garden, I will be able to say that I trust them very much." (Man, V5)

His trust is thus not yet fully established, it depends on the behaviour of the other villagers. He has probably not yet experienced enough projects with full co-operation to tell if they all will co-operate. But he himself has contributed up to now, and the same have all others. If they all continue to contribute when their own gardens are done, it will be taken as a sign of trustworthiness and they will earn trust for future use. This is an example of how social capital is built and how it is used in the villages. It shows how outside forces, here again increased power of the leader, can give a push to social capital, which gives positive externalities as to co-operation and trust among villagers. Village 5 is also an example of how outside organisations can help increase social capital in Malawian villages by introducing development projects which depend on co-operation by villagers. Several respondents in village 5 claimed that their village was picked out for development projects because of its high co-operative levels.

"People in V4, V6 and V7 don't listen to their chiefs. That is why you see that there are no development projects there, as it is here. For example the project of contour ridges couldn't have happened in those villages." (Woman, V5)

The project referred to by the respondent above, a project of building contour ridges in all gardens within the village, was introduced by an NGO coming from outside. They offered the necessary equipment and materials for building the ridges and taught villagers how to build such ridges. But the job had to be done by the villagers themselves. V5 got this one chance of developing their village, and they all knew that they would be unlikely to receive similar help again if the project failed. Incentives for co-operation were high. As it seems like the co-operation in the project is successful, this experience contribute to build social capital which will be useful in the future. Villagers will remember that everyone contributed the last time and expect a high share of co-operators also in the next collective action problem. Therefore, if a similar forest project would be introduced in V5 again, it is more likely that it would be successful. As co-operation becomes a habit, one can say that a norm of co-operation has been established.

4.5.2 What is the social disapproval?

The norm of co-operation stands stronger in V1 than in the others. For a social norm to be a factor in the decision making for the individual, it has to induce some kind of unpleasantness to norm breakers. How are norm breakers punished socially? When villagers were asked about whether defectors are punished socially in addition to penalties from the leaders, nobody admitted to impose any such social sanctions. However, when asked about which people they trust in the village, most state that they trust people according to their behaviour. There are always some people in each village who behave badly, and these people are not to be trusted. Bad behaviour refers to gossiping, talking badly about others, or being disrespectful towards leaders and others. The main social sanction on bad behaved people seem to be decreased trust from others, or loss of reputation.

According to how people define bad behaviour, mountainside farmers who were defecting while others were co-operating in the forest project, should be considered to be bad behaved by norm-believers. A woman from V1, who cultivated in the mountainside but stopped at

once the project was introduced, tells that someone else has now started cultivating in her old garden:

"The trees (in my old garden) have now been cut down, I don't know by whom, and now a woman from Village 1 is cultivating at that plot. People have different behaviour. I could not do anything about it, I had lost the rights to that plot after I stopped cultivating." (Old woman, V1)

This old woman says she does not react to the other woman who has started cultivating in her old mountainside garden, because the garden is not hers anymore. But, she states that the woman has a different behaviour than herself and others in the village, and hence marks a distance between them. This distance is what I refer to as the social disapproval. The cultivating woman probably feels this social distance. The two women might interact and talk normally when they meet, but they both know that the cultivating woman has left the other woman being a sucker in the collective action game.

4.6 Land dependence

4.6.1 Individual alternative land holdings

Land scarcity is the main reason behind deforestation of the research mountain and correspondingly also makes reforestation very difficult. Mountainside farmers with little alternative holdings of land should be more prone to defection to the forest project than others with additional large land areas in the valley. Is there a difference between villages when it comes to alternative land holdings for mountainside farmers? Not according to my interviews. All interviewed mountainside farmer[23] were asked about their land holdings, annual harvest, use of production inputs and general wealth. Nearly all of them were very dependent on their mountainside land, no matter which village they lived in. Alternative land holdings differed between farmers within each village, more than it differed between

[23] I interviewed 26 mountainside farmers from different villages, mostly from V1, V4, V5 and V9. The focus on these four villages was due to their distinct forest outcome in both ends of the scale, village 1 and 9 currently with thick forest and village 4 and 5 without trees.

villages. Respondents with very little land exist in all villages, no more in some than others. My impression is thus that alternative land holdings among mountainside farmers were equally distributed between villages. However, alternative land holdings differed among mountainside farmers within each village. A very few had enough alternative land, a few had almost no alternative opportunities, while most had a little alternative land. Thus, my impression is that the assumption made in the theoretical model in chapter 3.3.3 about a bell shaped distribution of land dependency among mountainside farmers within a village, seem to hold.

4.6.2 Wealth

The wealth variable needs to be discussed, as it might have significant influence on mountainside farmers' land dependency. General wealth of individual households differs within villages, and the distribution does also to some extent differ between villages. Richer households in this case are households who are able to have other sources of income in addition to farming. Overall, some households in V4 seem slightly richer than the general level in other villages. V4 has got more houses built with iron sheets and burnt bricks, which are good indications of wealth[24]. This impression is supported with my impression that more men within this village are formally employed and more of the women do private businesses in town. However, among the mountainside farmers interviewed, most were just as poor as people in other villages, thus they probably were just as dependent on the mountainside land as people in other villages. The other villages seem relatively similar when it comes to quality houses and general wealth. There are differences within the villages, but not any considerable differences between them. Hence, I have no indication that differences in wealth levels have directly affected the outcome of the forest project. However, one possible implication of the relative wealth in village 4 is that the villagers are less dependent on being on good terms with their village leader, because they do not depend on receiving fertilizer coupons and other benefits distributed by her. Hence, this might be one of the reasons for the

[24] Laying the roof of the house with iron sheets instead of thatched grass is expensive, but very valuable, as iron sheets works much better in holding rains out and does not need to be changed every year as grass do. Burnt bricks are as well costly, because the burning process demands a lot of expensive firewood. These two properties of a house are often referred to as wealth indicators in the villages. People seem very keen on getting a quality house, probably as it also works as a symbol of status. If they get in hold of more money, many state that the first thing they would do is to upgrade their main house.

low willingness to co-operate in this village. As their wealth derives from income earning activities which take time, they might just not have time to contribute to public works in the village. The wealthiest interviewed mountainside farmer in V4, a strong single mother who earns money on trading clothes in townships, is the same woman who stated that she does not listen to the chief (see quotation in chapter 4.2.2 under V4). She goes to town to do business nearly every day and do not contribute to public works. On the other hand, one of the poorer respondents claimed she obeys the chief and contributes to public works, but that many others in the village do not. My data is however not sufficiently large to claim that this relation between wealth and obedience is a pattern.

4.6.3 Share of mountainside farmers

The main difference between villages regarding land holdings is the relative share of land in the mountainside versus land in the valley. Briefly estimated, every second household in V4 and V5 have gardens in the mountainside. Finding mountainside farmers to interview in these villages was hence an easy task, in contrast to V1, V2 and V3, in which the shares of people previously holding gardens in the mountainside were much lower. Several sources have stated that V4, V5, V8 and V9 were more dependent on the mountainside land for cultivation than were the other villages, because the village area consists of more mountainside land relatively to valley land. Thus, the share of mountainside farmers in these villages is accordingly higher. The share of mountainside farmers in one village might have affected the forest outcome, through the legitimacy of the project. In a village in which 50 % of the population is negatively affected by the forest project, there are as many net losers as there are winners, hence the total efficiency of the project is less than in a village in which only 10 % is negatively affected. The villages with a higher total share of mountainside farmers also have relatively less land in the valley, which means that the prevention of soil erosion in the valley would not benefit inhabitants of the village to the same extent as in other villages. Lower total efficiency of the forest project in the villages with a higher share of mountainside farmers, might have decreased the legitimacy of the project and hence induced low expectations about initial co-operation.

4.7 Other possible factors

4.7.1 Group size and resource size

When the number of participants in collective action is large, the typical participant will know that his own contribution will probably not make much difference to the outcome and he will not bother to contribute (Olson, 1965). According to an enormous literature on the issue, smaller groups are hence more likely to engage in successful collective action on the commons, although the mechanisms are still under discussion (Agrawal, 2002).

Villages 1, 7, 8 and 9 are the largest villages in terms of inhabitants, while villages 4, 5 and 6 are the smallest. In this case it is the larger sized villages which have reached a successful outcome in collective action, hence the hypothesis above does not hold. This is because the villages with few inhabitants also have less land than the larger villages. Number of inhabitants is quite closely related to size of land area[25]. These smaller villages have a larger share of their total land in the mountainside, naturally because they have less valley land, which is to say that they have a higher share of mountainside farmers within each village. A higher share of mountainside farmers within the village seems to have had a negative effect on collective action in the forest project, as already discussed in chapter 4.6.3.

4.7.2 Infrastructure

The infrastructure on the south side of the mountain is considerably more developed than on the north side, which can be seen on the map in figure 4-1. This difference might have made it easier for agents outside the communities to control the project on the south side than on the north side. However, only two such agents are relevant; the MoP, Mbewe, who often visited a village in group A south of the mountain and whose visits thus had nothing to do with infrastructure, and the district forest minister, who visited the mountain only once and saw both sides, but did not enforce any reactions to the deforested villages on the north side. The only effect of this difference on the forest project outcome, which I can think of, is the

[25] This is logical, because of the way land initially has been allocated in these villages. Newcomers have been given the land they needed, as long as there was land left. Each household needs a similar area of land for cultivation, hence the population density should be similar in all villages.

negative effect of infrastructure on poverty, for example through employment possibilities. Wealth as an explanatory factor in the forest outcome is already discussed in chapter 4.6.2.

4.7.3 Relative prices

There is no considerable difference in relative prices of goods between the villages, as they to a large extent use the same markets and the prices are similar at these. This also holds for firewood and timber. All goods relevant to these villagers are cheaper in the countryside than in the city, hence location closer to the city does not make any difference in access to goods. As to the prices of land, it is not allowed to sell land and rental markets are also limited. However, land scarcity seems to be similarly problematic in the villages, in terms of land holdings per household.

4.7.4 Biological factors

Many respondents in village 4, and to some extent also in village 5, blamed biological factors for the lost forest on the north side of the mountain. They claimed that the soil on their side of the mountain was less fertile than on the south side, and hence the trees died. Others claimed that termites ate the trees in their gardens. I do not reckon these explanations as relevant, on the background of information obtained from other respondents. Blue gum trees are chosen for reforestation projects on mountains in the whole of Chiradzulu district, because of its properties as a fast growing and resistant specie, according to the District Forest Director. The forest committee headman claimed that blue gum trees can grow everywhere, if there is only a thin layer of soil. If the mountainside is fertile enough for foodcrops to grow, it is thus unlikely that blue gum trees cannot. In addition, the trees did mature to some extent before they disappeared, hence soil fertility in unlikely to be a main explanation for their disappearance. Then to the termites; the two sides of the mountain seems equal in terms of soil quality, hence I find it hard to believe that termites should have destroyed the trees only on the north side and not on the south side. However, the main reason why I do not believe biological factors can explain the different outcome, is that all respondents from neighbouring villages, and also some people from the northern villages, claim that it is the people on the north side themselves who have cut the trees in order to continue cultivation. My respondents from all neighbouring villages explain the different

outcome with the low co-operative and individualistic behaviour from people in the northern villages.

5. Conclusion

It is possible for rural communities to manage their common pool resources. In one village analysed in this paper, successful collective action was due to initial endowments of good leadership and social capital, which together induced a norm of co-operative behaviour on village level. When governments or NGOs want to introduce similar projects to rural communities, they might benefit from evaluating these variables in advance. The success of previous collective action projects indicates co-operative abilities and increased probability of success also in the future. At the same time, communities with low levels of co-operation can build such abilities through positive experiences. I therefore argue that there is a role for community based development, as a focus on local management and responsibility has the possibility for building social capital by introducing and supporting community co-operative projects.

Another of the analysed villages reached the same successful outcome in the forest project, mainly because a forest committee was able to enforce heavy penalties on non-co-operators. Given the leaders and the level of social capital in community, the presentation and implementation of such projects to the people who are directly affected by them, stand out as important. Correct information, a decision process including all the people affected and wide distribution of benefits increase the probability of a co-operative solution. Outside initiators are able to influence these factors, even if the project governance is left fully with the local community. In the forest project studied here, the governmental initiators did not intervene in any of management decisions regarding the project. Some suggestions and guidance on how to solve the conflicts could have been valuable. As MASAF contributed with the financing of the project, they could for example have suggested some sort of compensation for the mountainside farmers who lost their land. This might have brought a better outcome for all villages and decreased conflicts. Community based management can have good effects in terms of building social capital locally, but it might benefit from receiving some proper guidance from more experienced agents on project management.

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Appendix

List of respondents

(Approximated age in parenthesis)

Mountainside farmers

Village 1: Woman (30), woman (65), woman (30), woman (30), woman (20), man (50), woman (30). *Village 2:* Woman (30). *Village 3:* Man (40), Woman (50). *Village 4:* Woman (50), woman (50), woman (40), woman (60), man (30), woman (50), couple (50). *Village 5:* Woman (30), woman (30), woman (35), man (25), man (40). *Village 9:* Woman (35), woman (65), woman (60), woman (40). *Other villages:* Man (50), man (55).

Key informants

Group A: GVL A / VL1; CBO-director; Forest committee headman. *Group B:* GVL B / VL2; daughters of GVL B; VL, other village; VL3; two brothers, other village; woman V3 (30); man V3 (25); village chairman V3; VL5. *Group C:* VL9; village chairman V9; CBO-secretary V8. *Other key informants:* Former MoP Patrick Mbewe; Forest Director and Assistant Forest Director, Chiradzulu District; Oxfam representatives; priests and munks at the Catholic Mission.

Others

Group A: Man (20); VL (other village); VL (other village); VL (other village). *Group B:* Woman V2 (25); woman V2 (20); woman V2 (50); woman V2 (30); young girls V3; man V4 (35); man V4 (40); woman V4 (40); couple V4 (35); man V4 (30); woman V4 (20); woman V4 (30); man V4 (25); young guys V5; sister of VL5; girl V5 (15); woman V5 (25); guy V5 (20).