

# **Survival in the past - survival in the future? Past and present challenges of community-based management of alpine pastures in the canton Graubünden, Switzerland**

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## **ABSTRACT**

Community-based and common property institutions are able to sustainably use common pool resources. In Switzerland, this insight goes back to the research of Robert Netting (1981), who described the historical development of the common property resource (CPR) institutions in Törbel and their sustainable adaptation to ecological and social conditions. The case study of the mountain village Sumvitg in the canton Graubünden presented in this paper illustrates another case of sustainable CPR regime that managed to adapt to various disturbances over time.

## **INTRODUCTION**

Community-based and common pool resource (CPR) institutions are able to sustainably use common pool resources. In Switzerland, this insight goes back to the research of Robert Netting (1981), who described the historical development of the CPR institutions in Törbel and their sustainable adaptation to ecological and social conditions. Since then, studies about CPR institutions in Swiss alpine communities have been increasingly focused on transition processes identifying persistent, decaying and abandoned common property structures but without providing a history focused in depth case study (Kissling-Näf et al. 2002, Stevenson 1991, Thomi et al. 2008) or only focusing on history without relating to common property research (Condrau 1958, Mathieu 1992, Weiss 1942). Looking at the international commons literature, de Moor (2009) equally observes that historical processes in the development of common property institutions and their adaptive responses to change have so far been neglected. This fact stays in contrast to the few authors, which have pointed out that historical processes are important in explaining institutional change, collective action to deal with changing conditions and the present state of common property arrangements and resources (Agrawal 2003, p. 244; Haller ed. 2010, York and Schoon 2011, p. 390). The social-ecological system framework developed by Ostrom and scholars (Ostrom 2009) has integrated a historical component, namely the history of use (U3), however, without expressing its importance.

The objective of this article is to show the relevance of historical processes in explaining institutional change. Based on anthropological research, a CPR institution to manage common pastures in Sumvitg, a mountain village in the canton Graubünden of Switzerland, is presented, which succeeded in upholding its common property management system over a long period of time. Following the written regulations since 1800 it becomes clear that the farmers and users of the CPR were willing and able to adjust their management to social, economic, legal, and political changes in order to maintain the primary function of the alpine pastures, also called “alps”: to enable the farmers to enlarge their fodder base provided by the privately owned or rented meadows in the valley by the collectively used summer pastures on the alps. The persistence of the CPR system over centuries suggests that the CPR institution is robust, in the sense that it has proved institutional flexibility, to be able to cope with internal and external disturbances while maintaining its performance (see Fleischmann et al. 2010, p. 10). In the case study the farmers of the commune were able to establish institutional arrangements that limit access and protect the alpine summer pastures from overuse. However new challenges arose from structural change and the functional shift from a common property

good providing economical services towards a public good providing cultural and ecosystem services.

The main research questions to address the dynamic of the CPR institution under study, its production and reproduction over time are the following:

How did the institutional arrangements to manage common pastures in Sumvitg change over time? What factors played a role in those changes? What are future challenges perceived by the farmers regarding the survival of the CPR institution?

### *Setting of the case study and methodology*

The case study site was purposely selected: the agricultural department and the agricultural training and advisory centre of the canton Graubünden helped to select a commune with a positive institutional development. The commune Sumvitg is located in the south-eastern part of Switzerland, in the valley of the Vorderrhein that belongs to the Surselva region encompassing the valley of the Vorderrhein and all its side valleys, from the source near the Oberalppass down to Reichenau. Sumvitg comprises four villages, so called fractions: Rabius, Surrein, Cumpadials and Sumvitg itself. Sumvitg is located at around 1000 m.a.s.l. 49% of the total territory of 10'258 ha are pastures and alps. The summer pastures reach from 1600 m.a.s.l. up to 2400 m.a.s.l.

The data on which this article is based are derived from a triangulation of methods: In order to observe behaviour and to get to know the local context in which collective decision-making takes place, participant-observation was carried out during the alp season 2010. Half of the alp season (1.5 month) I worked on the summer dairy farm Alp Naustgel of Sumvitg. In the following winter 2010/2011 ten out of twelve farmers of the alp association of Alp Naustgel as well as the local authorities of the two communes (president, head of the agricultural office) and of the alp associations (board members, alp masters) were interviewed. During the summer 2011 the objective was to observe the activities on the private lands in the valley in order to get a more systemic picture of the agricultural cycle and the interrelation between valley and alp activities. I spent one to two days with four farmers participating in harvesting activities at the valley as well as at the Maiensäss level. In the winter month of 2011/2012 I carried out interviews on local oral history with the oldest and former farmers of the village (N=5). Regarding the analysis of the data, the participant observation resulted in research diaries and the interviews were recorded and transcribed. Both data sources were then qualitatively analyzed according to the research questions. A core of this paper is the analysis of the written regulations from 1805, 1890, 1940, 1985 and 2000. They were analyzed according to the 8 design principles (DPs) of Elinor Ostrom (1992) and put in context by adding secondary literature on the historical transformations of that time. Relevant statistical data from the Swiss Federal Office are added in order to illustrate change also in numbers.

### *Theoretical Framework*

Regarding the theoretical approach, I follow Acheson's (2011, p. 333) perception that anthropology should focus again on "new institutionalism", on the generation of rules, social change, and social evolution. The new institutionalist approach is particularly useful for analyzing the historical evolution of institutional change, as "it enables us to explain why common property systems worked so well in the past but are now giving way to alternatives" (Ensminger 1992, p. 126). Ensminger's model of institutional change (Ensminger 1992) is used in the analysis of the case study presented in this article to illustrate the development of the CPR institution and its adjustment processes necessary at different points of time to react to endogenous and exogenous disturbances and to maintain a sustainable resource management system (see Figure 1). Already in earlier publications (Haller 2010b, Haller and

Merten 2010, Landolt 2010), researchers have tested the utility of Jean Ensminger's framework as a theoretical instrument to examine institutional change in the management of common pool resources in African contexts. Ensminger's model proved to be a useful instrument in explaining why institutions erode and common pool resources are overharvested or badly maintained. Her model of institutional change considers the interaction between external (economic, demographic, social-political and technological) and internal factors (ideology, bargaining power, organization and institution) and their impacts on distributional effects as well as the social, political and economic behaviour of the individuals (Ensminger 1992, Haller and Merten 2008, Haller 2010a). It provides a suitable basis to discuss under what conditions collective action takes place, particularly because she introduces the notion of bargaining power and ideology, the latter considered as a source of legitimacy for actors in social interaction changing institutional design. Ensminger emphasizes that political, ecological, demographic, technological, and social changes affect the value of a resource and of one resource compared to another, named as changes in relative prices. Changes in relative prices shift economic incentives which can induce institutional change. The direction of change is not prescribed but negotiated and depends on the bargaining power of actors and the ideologies used to legitimize the institutional design highlighting the central aspect of power relations and the influence of internal variables on institutional outcomes.

Ensminger's model not only satisfies the objective to add a historical perspective to the common property analysis but also meets concerns pointed out by various common property researchers such as the combination and interdependency of factors (Poteete 2010, p. 244), the linkage of broader contextual variables with micro contextual variables (Ostrom 2010, p. 25), power-relations (Agrawal 2003, p. 258; Nightingale 2011), social aspects (Ostrom and Ahn 2003, Cox et al. 2010, Ostrom 2010), and ideology (Haller 2010a).

## RESULTS

### *The pastoralist cycle*

It is inevitable to shortly describe the transhumant cycle of the farmers and the different common pastures in use to provide the context for the further sections. All animals were stall-fed during winter time. In spring time the so called communal grazing (*Gemeinatzung*) started the grazing season for the small livestock. During the communal grazing in April all private land becomes open access to all small livestock in the commune. In May and June the pastures below the alpine zone are used for grazing. As part of the decentralized system, most farmers own a *Maiensäss* on higher levels of the valley (stables located between around 1200 to 1700 m.a.s.l). Adjacent to the private *Maiensäss* are the common *Maiensäss* pastures. They are owned by the commune and mostly used by the *Maiensäss* owner most close to them. From mid June on the animals move to the alpine pastures. Towards the end of September, the cattle move to the *Maiensäss* level for grazing before the communal grazing starts again beginning of October. The communal grazing in fall equally opens all private pastures but this time to all animals of the commune including cattle. After the communal grazing the animals again are stall-fed until spring.

This is just a general description of the transhumant cycle. Other authors (among many: Netting 1981, Stevenson 1991) have described it in detail. Also, it has altered over time particularly because communal grazing got restricted more and more and finally was abolished what made it possible to graze on the private land during spring and fall.

The systemic interrelation between the different levels of pastures and transformations in the CPR management are reflected in the regulations established by the communes. The commune of Sumvitg is a particular case as it revised its regulation by a commission of

farmers and officials every ten year since 1805. For the purpose of analyzing institutional development the regulations of 1805, 1890, 1940, 1985 and 2000 have been structured according to Elinor Ostroms 8 DPs (1990, 2010). What all regulations presented below have in common is a high number of rules determining when, where, how long and with what kind of animals grazing is allowed during each period of the transhumant cycle. From those rules only the most relevant are listed in the tables.

### *Before the creation of the Federal State 1848*

The alps were given to the settlers, called neighbors, of Sumvitg by the monastery of Disentis as hereditary fief (*bäuerliches Erblehen*) in the 15<sup>th</sup> century. In Sumvitg the fief was bound to residency preventing that user rights would become a private right that could be rented out or sold to outsiders (Condrau 1958, p. 18, 24).

The first written regulations still available today regarding the use of the common pool resources are the “Pugns da Roda” from 1805. *Pugns* stands for the rules and the *roda* for the usufruct of the common pool resources during a ten year period.

**Table 1: Regulation of the commune Sumvitg 1805-1814**

Pugns da Roda 1805-1814	
1A. User boundaries	<ul style="list-style-type: none"> <li>Each head of a household and citizens has lot rights. The lot carries the right to use the common pastures and to choose an alp. If the choices of the farmers lead to overstocking, the lots are drawn in order to distribute the animals equally among all alps.</li> </ul>
1B. Resource boundaries	<ul style="list-style-type: none"> <li>The limits of all common grazing grounds are clarified in detail.</li> </ul>
2A. Appropriation and provision rules are congruent with local conditions	<ul style="list-style-type: none"> <li>Animals must be wintered in the commune with own fodder, and may not be bought or rented from outside the commune for summering.</li> <li>The farmers have to accomplish one day of communal work on each common pasture used. The alp associations one more for infrastructure maintenance.</li> <li>Households without cattle may summer proportionally more small livestock than households with one cow. They may also rent a cow during summer.</li> <li>Communal grazing in spring (small livestock only) and fall (also cattle).</li> </ul>
2B. Appropriation and Provision: costs and benefits are proportional	<ul style="list-style-type: none"> <li>It is forbidden to let early calving cows go dry on the alps on purpose, except for one cull cow per household. Alp associations decide upon how much to pay for cows with low milk yields (below 0.5 litres).</li> <li>For animals summered on foreign alps, the farmers share the costs as if the animals would have summered on the alps of the commune.</li> <li>Every citizen is allowed to keep two bulls and one cow or vice versa on the home pastures but only out of necessity and not out of convenience.</li> <li>From the 20<sup>th</sup> of May the Maiensäss owners are not allowed to use the home pastures anymore.</li> </ul>
3. Collective-choice agreements	<ul style="list-style-type: none"> <li>All major decisions regarding common pastures are taken by the majority of the community assembly.</li> <li>Every household head is obliged to participate at the community assembly in order to decide upon economic issues of the commune.</li> </ul>
4. Monitoring users and resources	<ul style="list-style-type: none"> <li>The reeves of the alps have to inform the commune about absentees from the communal work and are rewarded with 0.72 CHF per case. The alp masters are in charge of monitoring the communal work on the cow alps.</li> <li>The reeves of the dry cattle alp have to visit the alp in fall in order to estimate the amount of fodder left and to decide when to move to lower pastures.</li> </ul>
5. Graduated sanctions	<ul style="list-style-type: none"> <li>Every duty is related to fines proportionate to the severance of the abuse or damage done and is much higher for authorities (alp masters, reeves) than for the farmers (fines between 0.60 CHF to 1.80 CHF).</li> </ul>
6. Conflict resolution mechanisms	<ul style="list-style-type: none"> <li>Victims or accused may address the community council to call for justice.</li> </ul>

The regulation reflects the high autonomy of the neighborhoods (today’s communes) over their internal affairs. The village assembly emerged as the central organ to manage the

common pool resources, regulated the agricultural cycle, changed and produced rules, and elected both a council to oversee village affairs and employees such as reeves (*Vögte*) and alp masters (*Alpvogt/Alpmeister*) to carry out common tasks (Head 1995, p.19, 93).

*After the creation of the Federal State 1848*

The federal state *Freistaat Gemeiner III Buende*, that later developed into the canton Graubünden, became a canton of the Helvetic Republic in 1803. At the beginning of the 19<sup>th</sup> century the cantonal government assigned more and more social and political responsibilities to the neighborhoods enlarging their competencies but also their dependency on the federal state. Due to the increasing services the neighborhoods had to provide, their expenditures rose. The CPRs (alps, forests, pastures) were the only sources of income and had to cover also non CPR related expenditures. Financial hardship drove the neighborhoods to allow citizenship for money, to sell alps and forests, and to increase taxes. To secure the availability of CPRs a federal law was introduced in 1848 prohibiting the use of communal and cooperative goods for private purposes (Liver 1968, p.207). The protection of the CPRs also included the forest, which became increasingly protected by federal and cantonal law from the 1840ies on (Zimmermann 2004, p.39).

With the constitution of 1854 the *Freistaat Gemeiner III Buende* became the canton Graubünden of today. Three years before, in 1851, the federal state was restructured into cantons, circles, districts and communes (former neighborhoods). The *Gerichtsgemeinden* fell apart and the neighborhoods took over the local self-government. A cantonal law that directly influenced the local CPR management was the law on settlement (*Niederlassungsgesetz*) released in 1874 guaranteeing residents access rights to CPRs for taxes (Durgiai 1943, p.85; Strüby 1919, p.59).

When it became clear that the industrialization of the 19<sup>th</sup> century opened the market for cheap agrarian imports and that the local production could not compete, a federal law to support the agricultural sector (*Gesetz über die Förderung der Landwirtschaft*) was released in 1893. Regarding alpine farming it subsidized soil amelioration and the construction of alp infrastructure (Werthemann 1973, p.137). However, those first efforts to develop and modernize alpine farming had little impact. A modern cantonal law on alpine farming, as introduced in many other Swiss cantons, was not known in Graubünden. An attempt was made to release a cantonal law on alpine farming in 1880, but it was opposed by the people (Steinhauser 1993, p.47).

**Table 2: Regulation of the commune Sumvitg 1890-1899**

Pugns da Roda 1890-1899	
1A. User boundaries	<ul style="list-style-type: none"> <li>• Same lottery system as 1805 but now also residents have lot rights but have to pay 1/3 more taxes than citizens.</li> </ul>
1B. Resource boundaries	<ul style="list-style-type: none"> <li>• The limits of all common grazing grounds are clarified.</li> </ul>
2A. Appropriation and provision rules are congruent with local conditions	<ul style="list-style-type: none"> <li>• In spring and fall the goats may graze freely.</li> <li>• The alp associations are obliged to clear 12m<sup>2</sup> of pasture from shrub and stones per cow. The farmers have to accomplish one day of communal work on each common pasture used.</li> <li>• Every owner of a Maiensäss is allowed to use the adjacent common Maiensäss pastures with animals wintered in the commune, except sheep, horses, and goats only in the designated areas allowed by the forestry office. Animals not wintered in the commune may use those pastures only by paying additional taxes. The Maiensäss holder is not allowed to take animals from other farmers, except animals from farmers without a Maiensäss.</li> <li>• Every rights holder is allowed to keep at most 2 cows on the home pastures in summer.</li> <li>• Only animals wintered in the commune are allowed to use the home pastures and they have to be supervised by the herder.</li> </ul>

2B. Appropriation and Provision: costs and benefits are proportional	<ul style="list-style-type: none"> <li>• Communal grazing in spring (small livestock only) and fall (also cattle).</li> <li>• In spring and fall the Maiensäss owners are not allowed to use the home pastures.</li> <li>• Taxes are introduced according to the quality of pastures and kind of animal (0.20 CHF to 1.50 CHF per head). No tax for communal grazing.</li> </ul>
3. Collective-choice agreements	<ul style="list-style-type: none"> <li>• All important decisions are taken by the majority of the community assembly</li> </ul>
4. Monitoring users and resources	<ul style="list-style-type: none"> <li>• The fractions, i.e. their elected reeves, have to monitor the communal work on the home pastures, the alp masters on the alps and the commune council on the Maiensäss pastures.</li> </ul>
5. Graduated sanctions	<ul style="list-style-type: none"> <li>• Sanctions for illegal behaviour are determined in proportion to the damage done (fines from 1.50 CHF to 2 CHF).</li> </ul>
6. Conflict resolution mechanisms	<ul style="list-style-type: none"> <li>• The commune council is in charge of the jurisdiction regarding the use of the alps and pastures, as long as public matters are concerned. Complaints and claims can be handed in to the commune council twice a year.</li> </ul>

After the creation of the Swiss Federal State, the communal regulation not only contains articles about the management of the CPRs but also about its embeddedness in the cantonal structures. The first article notes that Sumvitg is part of the canton and that the canton may release laws affecting the commune but that the commune remains independent in economic affairs. Also the competencies of the newly created offices such as the commune council (*Gemeinderat*), and the school council (*Schulrat*) as well as the poverty relief commission (*Armenkommission*) are introduced.

#### *After the World Wars 1940-*

The mountain farmers depended on subsistence economy with very modest and archaic production means until the Second World War. With the federal law on the national food security in 1938 the production was increased. The technical revolution that followed brought a further increase in production and the mechanisation of working processes. On the other hand operating costs increased and it became necessary to enlarge the farm business and to increase benefits (Werthemann 1973, p.137). In the draft of the communal law of the canton Graubünden in 1945 regulations were made regarding property rights and the management of the CPRs. The law was rejected though by the communes as the people did not want the canton to interfere in those highly traditional affairs of the commune (Condrau 1958, p.69). In 1951 the first Law on Agriculture was decreed, propagating food security, a healthy peasant estate and a productive agricultural sector (Werthemann and Imboden 1982, p.65). Fixed prices and a purchase guarantee for agricultural products were offered. But producer prices stayed low compared to the overall price increase so that the farmers tried to compensate this development by intensification and rationalization of the production. Overproduction and the closing down of many small farms not being able to compete and finding better paid jobs mainly in the industry, construction, and tourist sector was a result (Werthemann 1973).

**Table 3: Regulation of the commune Sumvitg 1940-1949**

Pugns da Roda 1940-1949	
1A. User boundaries	<ul style="list-style-type: none"> <li>• Residents and citizens have the right to participate in the lottery of the alps. Residents pay 1/3 if not all CPRs of the commune are used.</li> </ul>
1B. Resource boundaries	<ul style="list-style-type: none"> <li>• The limits of all common grazing grounds are clarified.</li> </ul>
2A. Appropriation and provision rules are congruent with local conditions	<ul style="list-style-type: none"> <li>• In spring and fall the goats may graze freely. On the cow alps 1 goat per cow and one per farmers is allowed. Poor households may summer three goats.</li> <li>• The farmers have to accomplish half a day (4h) of communal work on each common pasture used. The farmers using the home pastures in summer are obliged to fertilize the pastures with one barrow of manure per cow and half of a barrow per calve.</li> <li>• Every owner of a Maiensäss is allowed to use the adjacent common Maiensäss pastures with animals wintered in the commune, except sheep. Goats have the right to graze exclusively from 15<sup>th</sup> of May on but only in the designated areas</li> </ul>

allowed by the forestry office. Animals not wintered in the commune may use those pastures only by paying additional taxes.

- Every rights holder is allowed to keep at most 2 cows, but only out of necessity and not for speculation or the industry to use the home pastures in summer.
  - If and to what extent rented cows are accepted is decided by the commune council. The cow alps may add dry cattle but have to impose equal taxes compared to the other dry cattle alps.
  - Communal grazing in spring (small livestock only) and fall (also cattle).
  - Each resident without a Maiensäss has the right to use the home pastures in May and June.
- 2B. Appropriation and Provision: costs and benefits are proportional
- Taxes on foreign fodder: Animals bought after April 1<sup>st</sup> pay 0.50 CHF to 2 CHF per head for using common pastures and alps. Goats bought for the purpose of trade pay additional taxes. Bought or rented animals pay 0.10 CHF/m<sup>3</sup> pasture.
  - Grass taxes per head: on the alps 0.20 CHF to 1.70 CHF (cows), on common pastures 0.70 CHF to 8 CHF, for communal grazing 0.80 CHF to 2 CHF.
  - Alp amelioration taxes: 1 CHF for cows and pigs and 0.50 CHF for dry cattle.
  - Monetary compensation for communal work: 0.20 CHF to 1.40 CHF depending on the kind of animal and 3CHF per household. Hourly wage: 0.40 CHF to 0.75 CHF. Providing a horse or harness: 0.80 CHF to 1.40 CHF.
  - Farmers who summer their animals on foreign alps pay 1/3 more when putting the animals on the home pastures in spring and fall or when participating at the common grazing.
  - It is not allowed to summer cows for speculation reasons.
3. Collective-choice agreements
- All important decisions are taken by the majority of the community assembly.
4. Monitoring users and resources
- Besides the alp master in charge of monitoring the operational tasks, an alp reeve is elected, in order to monitor the melioration works.
  - The reeves of the pastures monitor the communal work on the Maiensäss and the fractions on the home pastures.
5. Graduated sanctions
- Sanctions for violating the statutes or decisions made by the community assembly are monetary fines in proportion to the damage done (fines from 2 CHF to 5 CHF). In case of repeated violation double the fines are applied.
6. Conflict resolution mechanisms
- Complaints and claims can be handed in to the commune council two times a year.

The first article notes that the income of the commune is not only generated by the communal utilities but also through a direct tax, which amounts to 10 CHF per household.

### *State subsidies and agrarian policies 1980-*

The first cantonal law on the communes was released in 1974. It defines the competencies of the communes among those the management of the CPRs, highlights the obligation that common property may not be sold and that those assets have to serve public purposes, and provides the communes with the option to outsource the CPR management to public legal corporations.

Since 1980 alpine summer grazing is financially supported by the federal state. The protectionist approach did not last long mainly due to international pressure to abstain from price regulations. A fundamental agrarian reform took place in 1992. Direct payments became bound to ecological services, i.e. for maintaining cultural landscapes, while price guarantees were continuously reduced (BLW 2000).

**Table 4: Regulation of the commune Sumvitg 1985-1994**

Pugns da Roda 1985-1994	
1A. User boundaries	• Every farm owner has the right to participate in the lottery of the alps.
1B. Resource boundaries	• The limits of all common grazing grounds are clarified.
2A. Appropriation and provision rules are congruent	• The number and kind of animals are limited according to the common pastures. • During spring and fall goats may graze freely.

- with local conditions
- The farmers have to accomplish half a day (3h) of communal work on the home pastures and during summer the users have to fertilize the pastures with one barrow of manure per cow and half of a barrow per calve. The alp associations as well as the dry cattle herders are obliged to spread the dung evenly on the alps.
  - In spring and fall the Maiensäss owners and tenants are not allowed to use the home pastures. Residents without a Maiensäss are allowed but pay a tax. The commune council may allow additional animals according to demand.
  - Every owner of a Maiensäss is allowed to use the adjacent common Maiensäss pastures with animals wintered in the commune, except sheep. Goats have the right to graze exclusively from 15<sup>th</sup> of May but only in the designated areas allowed by the forestry office. Animals not wintered in the commune may use those pastures only by paying additional taxes.
  - Every household is allowed to keep at most 2 cows (for more the fraction has to decide) on the home pastures in summer.
  - Communal grazing in spring (small livestock only) and fall (also cattle). Every land owner has the right to buy out some or all of his land from the communal grazing but has the duty to fence it. In order to graze with cattle in the spring time the farmers may fence an adequate part of their meadow.
- 2B. Appropriation and Provision: costs and benefits are proportional
- Residents and citizens pay the same taxes. Farmers summering dairy cows on foreign alps pay 150 CHF and half of the grazing taxes, for dry cattle 75 CHF and half of the grazing taxes. Citizens summering outside the commune but using the common pastures during spring and fall have to pay 1/3 more.
  - Amelioration taxes: 4 CHF per livestock unit.
  - Grass taxes per head: on the alps 2 CHF to 40 CHF (cows), on common pastures 1 CHF to 20 CHF, for communal grazing 0.50 CHF to 2 CHF.
  - Taxes on land to buy out: 0.05 CHF to 0.10 CHF per m<sup>2</sup>.
  - All important decisions are taken by the majority of the community assembly.
3. Collective-choice agreements
4. Monitoring users and resources
- A commission of farmers together with the head of the office of agriculture monitor the melioration work done.
  - The reeves of the pastures monitor the communal work on the Maiensäss and the fractions on the home pastures.
5. Graduated sanctions
- Sanctions for violating the statutes or decisions made by the community assembly are monetary fines in proportion to the damage caused. In case of repeated violation double the fines are applied (fines 10 CHF to 20 CHF). Exceptionally high fine (200 CHF) for violating the communal grazing regulations.
6. Conflict resolution mechanisms
- Complaints and claims may be addressed to the commune council.

Another change worth mentioning is the rule that alp masters may be elected for five year instead of every year and may be re-elected. According to the farmers the terms changed when they realized that it was more sustainable not to force people into the position but to allow motivated farmers to take over the responsibility for longer terms.

### *Structural adjustments and institutional innovation 2000-*

In 1999 the former direct payment system was revised and replaced by the ordinance on summer pasturing payments (*Sömmerungsbeitragsverordnung, SöbV*). The novelty of the SöbV was the concept of calculating the sustainable yield of summer pastures. The sustainable stocking (*Normalbesatz*) per alp was determined by the cantonal departments of agriculture according to the number of summered animals of the past years. The SöbV also includes sustainability criteria regarding the maintenance of the pastures: protection against scrub and weed, biodiversity enhancing fertilization, and the maintenance of alp buildings and infrastructure.

The SöbV had a direct impact on the development of the CPR institution in Sumvitg: Since 2000 the SöbV allowed paying the summering payments directly to corporations under public



law allowing them more autonomy in financial matters. Inspired by the new policy and aiming at operational independence in order to react more rapidly to change, particularly to the continuing trend to shift from dairy cows to suckler cows, the alp commission elaborated the idea to unify all alps under the roof of an alp corporation. The alp corporation, having the status of a public law institution, was able to lease the common pastures for a yearly rent.

**Table 5: New institutional setting 2000 (aggregated data from all relevant written regulations)**

Communal law, lease contract, and the statutes and regulations of the alp corporation 2000	
1A. User boundaries	<ul style="list-style-type: none"> <li>• Same lottery system, but now not only residents but also non-residents may become members of the corporation and hence use the CPRs.</li> </ul>
1B. Resource boundaries	<ul style="list-style-type: none"> <li>• The limits of all common grazing grounds are clarified and mapped.</li> </ul>
2A. Appropriation and provision rules are congruent with local conditions	<ul style="list-style-type: none"> <li>• Home pastures are reserved to the sheep and goats during fall and spring.</li> <li>• Home pastures used by cattle during summer have to fertilize the pastures according to the necessities of the fractions and regulations by the ordinance of summer payments.</li> <li>• Communal work: Every farmer has to do one hour of communal work per livestock unit on dry cow alps and Maiensäss pastures, on dairy cow alps 2 hours per cow. Additional or missing hours are compensated or have to be paid (28.- /h). Machine costs are adequately compensated.</li> <li>• Prohibition of communal grazing and grazing in the forest.</li> </ul>
2B. Appropriation and Provision: costs and benefits are proportional	<ul style="list-style-type: none"> <li>• Animals that are registered but not summered share the same costs as if they had summered the animals on the alp.</li> <li>• The corporation uses 10-15% of the state subsidies for the amelioration of the alps and pastures. The dairy cow alps manage their subsidies independently.</li> </ul>
3. Collective-choice agreements	<ul style="list-style-type: none"> <li>• Upon contract changes decides the community assembly (majority rule).</li> <li>• Operational decisions are taken by the assembly of the corporation and the assemblies of the alp associations (majority rule).</li> </ul>
4. Monitoring users and resources	<ul style="list-style-type: none"> <li>• The commune council is responsible for controlling the rules of the contract and visits the rented goods periodically together with representatives of the corporation.</li> <li>• The board of the corporation controls the alp masters and the compliance with the rules.</li> <li>• The alp master organizes and controls the communal work done on the alps.</li> </ul>
5. Graduated sanctions	<ul style="list-style-type: none"> <li>• The corporation is responsible for damage caused by neglecting these rules.</li> <li>• Neglect will be warned in written and the second time fines from 100 CHF to 500 CHF are applied.</li> </ul>
6. Conflict resolution mechanisms	<ul style="list-style-type: none"> <li>• Mediation of the board of the corporation together with the auditors.</li> <li>• Excluded or fined members may appeal to the commune council as last instance within 20 days.</li> </ul>
7. Minimal recognition of rights to organize	<ul style="list-style-type: none"> <li>• The commune refers to its right provided by cantonal law to outsource administrative tasks to public law bodies. It provides the farmers with the right to form a public law corporation.</li> </ul>
8. Nested enterprises	<ul style="list-style-type: none"> <li>• Obligation to comply with national, cantonal and communal law</li> <li>• The statutes of the corporation have to be approved by the commune council</li> </ul>

### *Statistics reflecting change*

The population has remained stable over a long period of time (Table 6). The higher population during and after the World Wars was due to the increasing industrialization of the region (for example the textile factory in the neighboring commune Trun), i.e. increased job opportunities. The peak in 1960 is related to the construction of a hydroelectric power station in the valley Valtenigia on the territory of Sumvitg that attracted even more people.

	1656	1850	1910	1930	1941	1960	1970	1990	2005	2010
Population	1300	1353	1205	1538	1725	2004	1555	1355	1383	1286

**Table 6: Population development Sumvitg (source: Maissen 1978, communal statistics)**

Since 1945 the salary of a cheese maker on the alp Naustgel has increased over ten times from 640 CHF to 7,000 CHF in 1975 and again doubled to 14,000 CHF in 2010 (data from accounting books 1975 and 2010). If we now compare the development of the milk and meat price the prices increased between the 1940ies and the 1970ies only by 2.5 times, from 1975 until 2010 only 1.5 times, and in the case of the milk price it even dropped by around twenty percent (Table 7).

	1938/49	1974/85	2010
2-3 year old cattle (CHF per 100 kg)	216.0	527.0	778.5
Consumer milk (Rp per liter)	30.0	79.4	58.2

Table 7: Producer prices milk and meat (source: Federal Statistical Office)

	1880	1916	1939	1955	1969	1975	1985	1990	2001	2003	2007	2011
Numbers of Farms	223	201	213	187	154	135	104	83	54	50	43	38

Table 8: Development number of farms in Sumvitg (source: Federal Statistical Office)

The decreasing number of farms (Table 8) and the decreasing number of animals (Figure 1) reflect the structural change in Sumvitg. Both aspects influence the management of the alps. In 1909 13 alps were used five of them dairy cow alps. In 1940 13 alps were used, but now four of them as dairy cow alps. In 1972 the alps were reduced to 10 (merging of alps because of less cattle, less goats and rationalization of the management) three of them dairy cow alps. In 2012 seven alps remain as the goat alp has been given up and the sheep alps have merged into one.

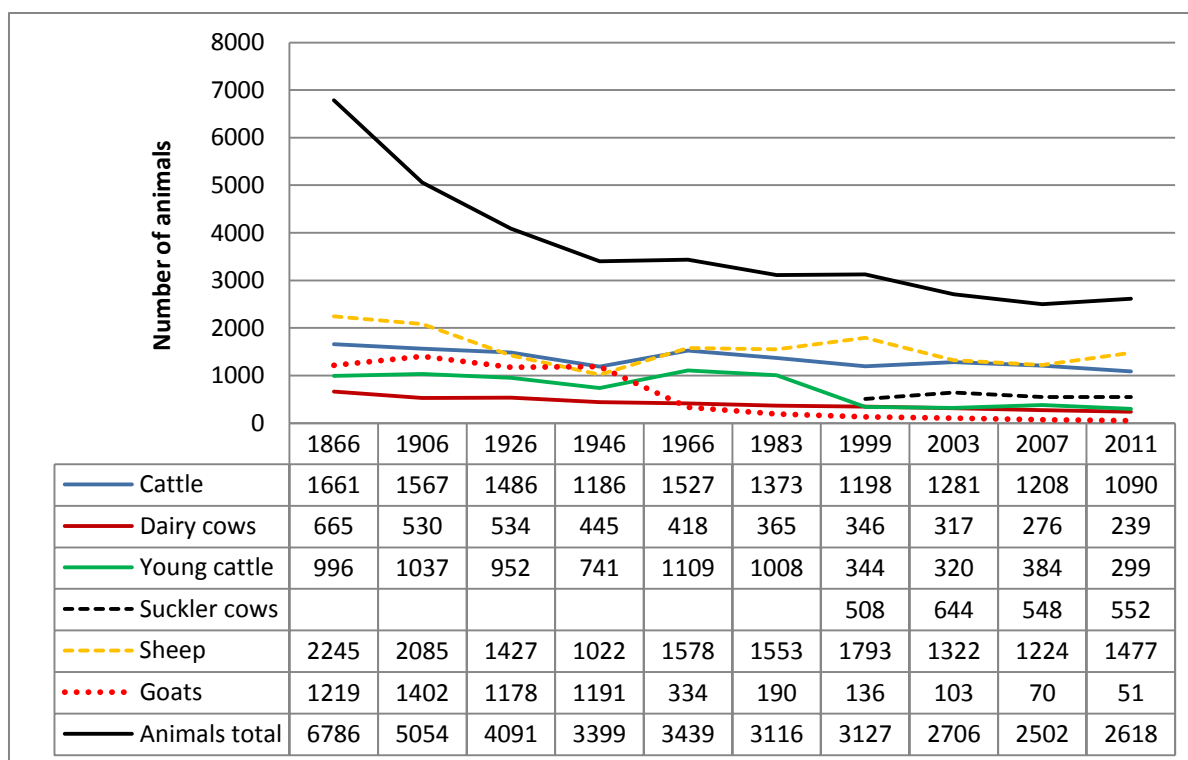


Figure 1: Development animal husbandry in Sumvitg (source: Federal Statistical Office)

### Oral history reflecting on change

Change was described in many ways and regarding a wide variety of aspects. Only the most relevant discourses may be stated here.

One of the big changes was the introduction of the suckler cow in the 1990ies and their increasing number since then (see also Figure 1).

Suckler cow farming became an option because we had no possibilities to increase production and because the milk price dropped. The suckler cows provided a way to stay farmer. The meat price was more stable and the extensive production allowed having a part-time job.

The suckler cows were and still are a big issue. New alps had to be found and the increasing number every year challenges the redistribution of the animals among the alps.

The time of mechanization, intensification and increasing the production of the farms has been stated by the farmers as having totally changed the way of farming and the whole socio-economic environment. While production is very positively perceived by the farmers, the structural consequences were looked at more critically:

Structural changes have only negative effects for the mountain region. Family run farms cannot survive anymore accelerating the out-migration of the young, and the decrease of farmers complicates the organization of the communal work (personal communication).

Ecological changes have been related mainly to the consequences of the structural changes (fewer farmers, less animals) but also to innovations such as the electric fence, or policies protecting the forest.

The Alp Gargialetsch and Alp Cugn are not grazed anymore due to the lack of small livestock and young cattle. Alp Valtenigia is only partially grazed by two year old cattle and sheep. Also Crap Ner is not grazed anymore and Glivers has merged into one alp. Those alps were full of animals. Also Naustgel loses pasture land, particularly the steeper parts, while the good pastures tend to be overused (personal communication).

The main reason for the forestation of the pastures was the introduction of the electric fence. The forest, i.e. the wood, was used for many purposes before: for fencing, making shingles for the huts and for collecting firewood. The importance of all those three functions of the forest has decreased but the electric fence had the biggest impact on the growth of the forest (personal communication).

Herding goats became more and more complicated when they were not allowed to graze freely in the forests anymore. We used to have 70 goats. They nicely ate off the shrub and the sprouts of the young trees helping to maintain the meadows. Today you have to cut them manually and because this affords a lot of time and effort the meadows are increasingly exposed to forest growth (personal communication).

An important factor to finally bring about change is good leadership, leaders that are able to act as mediators of change and conflicts.

And then there are a few clever young farmers, which are well educated and steer the boat. As long as the others join in, much can be achieved (personal communication).

Conflicts have always existed particularly regarding the pasture management and the alp staff. The alp masters were important to mitigate the conflicts and to maintain a good relationship with the alp staff (personal communication).

However, some changes introduced with the corporative system have also been criticized:

Before the alp corporation it was not allowed to graze on alps outside the commune. Well - you had the option to go but then you were obliged to pay the costs for the home alp too. This was an important rule, because otherwise some farmers would have taken advantage and had summered on a foreign cheaper alp. It would have been good to keep this rule, but well, the young do as they please. But to me it seems not right that one can escape the responsibilities and let the others pay for his action (personal communication).

For the future the farmers do not fear that their alp management system will break down as long as the summering of the animals is still lucrative what it still is thanks to the state subsidies. However, one of the biggest concern is the future direction of national policies:

There is a contradictory development: the alps shall be used more and more extensively but in the valley the farmers aim at increasing productivity. The cows which are serving the farmers purpose in the valley are not adapted to the extensive production on the alps (personal communication).

## DISCUSSION

A characteristic of the history of the CPR system in Sumvitg is the autonomy of the neighborhoods and later the communes in managing their internal affairs including the establishment of own rules and regulations regarding the CPRs. The two main principles characterizing all regulations until today are the principle of collective decision making by the majority and the principle of proportionality in the distribution of costs and benefits. However, there were some adaptations needed in order to maintain the system over time:

The regulations of 1805 had to deal with the scarcity of the financial, material and natural resources. The highest objective was to regulate access by restricted membership and the rule that animals have to be wintered in the commune in order to have grazing rights, to keep the costs low and to distribute the inevitable costs equally but socially fair (poverty relief rules). The only income resulting from the CPRs were the fines imposed.

The access to the CPRs has been opened to residents in 1890 probably as a reaction to the new cantonal law. The income through the CPRs has been increased by implementing grass taxes and taxes for residents in order to finance the newly created administrative offices.

The rules of 1940 reflect the necessity to increase the income of the commune in order to finance the expenditures for ameliorations: Increased taxes for the use of common pastures, introduction of taxes for the communal grazing, of taxes for not locally wintered animals, and of amelioration taxes.

In 1985 the most apparent change was the transformation of the communal grazing. As long as fencing was a time consuming activity involving the scarce resource of wood buying out land was not a real option. However with the introduction of the electric fence this became possible. In the light of increasing forest protection policies and the various authors dating the abolishment of the communal grazing to earlier times (Mathieu 1992, Weiss 1941, Zimmermann 2004) the survival of this institution in Sumvitg indicates the high autonomy of the commune and the resistance to change in this matter.

The new institutional structure in 2000 has resulted from the reduction of the farming population in Sumvitg, the increase of suckler cows and the reduction of animals. A more independent (because of the decreasing bargaining power within the commune), and a more flexible structure allowing the redistribution of animals every year, was needed.

Looking at the institutional development it seems that structural changes (less farmers, less animals) combined with changes in relative prices leading to high expenditures and a shift towards suckler cow husbandry have been the major challenges the CPR institution had to adapt to. The easement of the rules, which restrict the access and the animals allowed to graze on common pastures while the taxes have increased heavily support this assumption. The analysis of the rules by using Elinor Ostrom's 8 DPs indicates that the CPR institution maintained its robustness over time. Analyzing the results within Jean Ensmingers model of institutional change (Ensminger 1992) provides some ideas why the CPR management system has persisted (figure 1).

The farming population decreased but maintained the majority within the commune until the year 2000 when the new institutional structure was decided upon in the community assembly. The animals decreased what reduced the intensity of using the alp pastures and in a few cases even resulted in abandoning the alps (goat alp). However, the number of animals remained high enough not to depend on foreign animals. Regarding the influence of higher level governments, the laws to protect the CPRs from being sold have been important to prevent privatization. Since the 1990ies the subsidies by the federal state play a major role in sustaining the CPR system as they compensate the falling product prices and the increasing expenditures on the alps. How about internal factors helping to adapt to change? The ancient principles of collective decision making and fair distribution of cost have positively impacted the transformation processes and increased legitimacy of rules and elected authorities.

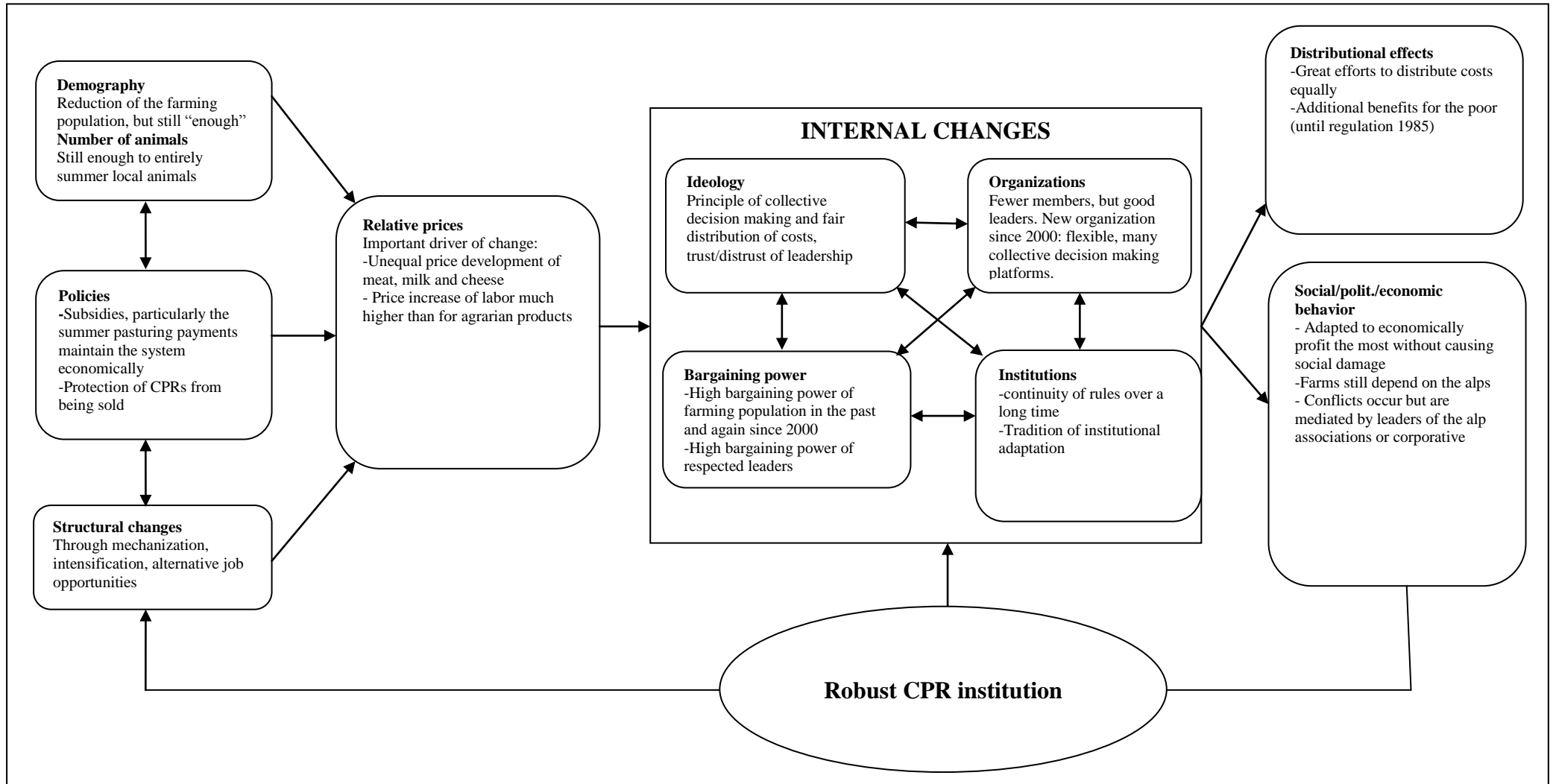
Leadership was limited and short term in the past highlighting the importance of the collectivity. Since 1985 the terms have been increasingly long appreciating motivated leaders taking over responsibilities. Both perception of leadership have facilitated institutional change. The little influence of external powers and good leadership (or the leadership of the collectivity) have apparently enabled different interest groups to achieve the most needed adaptations without disturbing the whole system. The organization as one community comprising all residents of the commune made sense in the past when Sumvitg still was a peasant village. The organization had to change in order to adapt to the increased disassociation between the farming and non-farming population and facilitate institutional adaptation in the future. As mentioned before, the respected leaders played a vital role in this transformation process. The institutional tradition of revising the rules every ten years created a culture of change. As the example of the abolishment of the communal grazing showed, changes still may take time, not occur at all (principles of collective decision and faire distribution) or may turn out negative in the future (freedom to summer on foreign alps). The equal distribution of benefits and costs is an important principle until today and the individuals still depend on the remaining CPRs. All those aspects seem to explain at least partially why the CPR institution in Sumvitg survived until today.

The institutional fundament to absorb disturbances also in the future has been laid. But the structural adjustment process will continue, and the gap between intensification of production in the valley and the extensive use of the alpine pastures to protect the cultural landscape will further increase. The reduction of animals has already reduced the number of alps and the costs to organize the communal work in order to maintain the pastures have increased (high price for labor, less farmers available for the work and more work to do due to the less intensive use of the pastures). The impact is yet hard to predict. Collective decision making guided by motivated, innovative leaders have proved to be important drivers of institutional adaptation in the past and will most likely be decisive for the future development of the CPR institution.

## **CONCLUSION**

Sumvitg looks back to a long tradition of revising regulations regarding the management of its CPRs. This culture of change has created a sustainable mix of persistence by conserving the fundamental principles, and change by adapting to the major demands at different points of time. To find reasons to explain the successful institutional change in Sumvitg has been very ambitious and to put it in one paper even more. More ethnographic data including detailed information about the CPR management system would have added validity to the study. However, the combination of analyzing the robustness of a CPR institution by applying Elinor Ostrom's 8 DPs (1990, 2010) at a certain point of time combined with the model of institutional change by Jean Ensminger (1992) has been useful to show that 1. various institutional equilibrium are possible at different points of time and 2. that the direction of institutional change is influenced by external factors but is determined in the end by internal decision making processes and the quality of leadership guiding negotiations.

Figure 2: Model of institutional change (Ensminger 1992), adapted by Gabriela Landolt



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