

Birner, Regina

Institute of Rural Development
University of Goettingen
Waldweg 26
D-37073 Goettingen
Germany
Fax: 0049-551-393076
e-mail: rbirner@gwdg.de

The Political Economy of Change in Property Regimes - A Case Study from Sri Lanka -

Stream: Theory - Agriculture
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1 Introduction

It has been a major thrust of the literature on common property to challenge HARDIN'S alleged "tragedy of the commons" (1968) and to modify the policy recommendations derived from it, which focused on privatisation or state intervention. The ongoing research has shown that common property regimes are often superior to private property, both in terms of efficiency, equity and sustainability.¹ Such type of research typically led to normative policy recommendations in the sense that the state should restore and protect common property institutions. However, the positive analysis of the political process involved in the change of property regimes has, so far, received less attention in theoretical and empirical literature on common property institutions. This type of research, however, would be necessary to find out if and how the normative policy recommendations concerning the change of property regimes can actually be implemented.

Against this background, the present paper deals with the positive analysis of the political process involved in the change of property regimes. The paper suggests a theoretical framework which draws on concepts of the New Institutional Economics (NIE) and on collective action theory. The proposed framework is illustrated by an empirical case study on the change of property regimes in the Hambantota District of Sri Lanka. The paper is organised as follows: Section 2 introduces the empirical case study material. In Section 3, four steps of analysing the political process of change in property regimes are suggested and illustrated by the empirical case study. Conclusions are drawn in Section 4.

2 Case Study: Change of Property Regimes in the Dry Zone of Sri Lanka

The empirical material presented in this paper deals with a "classical case" of conflict over property rights in land: the conflict between pastoral livestock keepers and crop farmers in a situation of increasing population density. The case study investigates a manifestation of this conflict in the semi-arid zone of Sri Lanka. It is based on empirical data from a research project conducted in the Hambantota District of Sri Lanka between January 1994 and August 1995 (BIRNER, 1996). The present paper deals only with the so-called "Dry Zone" section of the district which covers 70 % of its land area and receives between 700 and 1,000 mm of

¹ See e.g., OSTROM (1990) and BROMLEY (1992).

rainfall. In this section of the district, 207 households in 8 selected villages were interviewed. Interviews were also conducted with representatives of the local farmers' and livestock keepers' organisations, with administrative officers, local politicians and representatives of NGOs and development projects. During the research period, three elections took place which allowed to observe the election campaigns at the local level. A comparative survey in other districts of the Dry Zone of Sri Lanka showed that with regard to land use and property rights the situation there was similar to that observed in the research region. Information on the process of change after 1995 was obtained during a visit to the research region in 1998.

The prevailing land use system in Sri Lanka's Dry Zone is characterised by the co-existence of three land use systems which differ considerably in their intensity:

- (1) **Intensive irrigated paddy cultivation**, mostly within irrigation and settlement projects managed by state authorities. The households in such projects, which derive their main income from paddy cultivation, are hereafter referred to as paddy farmers.
- (2) **Slash and burn agriculture** on non-irrigated land resources, which is referred to as *chena* cultivation in Sri Lanka. The majority of the households in the research region depends on this type of land use for their subsistence. These households are in the following referred to as *chena* farmers.
- (3) **Cultivation of vegetables and fruits** in the plots adjoining to the houses which are referred to as home gardens. This type of cultivation is practised to a small extent both by paddy and *chena* farmers.
- (4) **Keeping of large cattle and buffalo herds** in an extensive, pastoral system. This type of livestock keeping is concentrated in the hands of comparatively few influential families which typically have other income sources, as well. A special Sinhalese term, *gambarayas*, is used to address these families. For convenience, this group will in the following be referred to as "livestock keepers."²

These diverse types of land use are governed by different formal and informal property systems. Paddy lands and home gardens are held as formal private property. Due to the utilisation of common irrigation facilities, paddy cultivation involves a dimension of common resource management, which in irrigation projects is governed by far-reaching legal regulations (especially the Agrarian Services Act). The land resources used for *chena* cultivation and livestock farming are formally state property. Different user groups hold overlapping informal property rights in these land resources. *Chena* farming families hold individual, inheritable rights to use certain plots during the cultivation period. Such rights in a particular plot of *chena* land are guaranteed by the village community on the grounds that the respective family has first cultivated this plot. Formally, *chena* farmers would need a cultivation permit from the district administration. Due to environmental concerns, such permits are hardly issued any more. Nevertheless, the authorities usually tolerate *chena* farming without permit, because the *chena* farmers lack alternative income sources. Livestock keepers have traditionally used the paddy lands after harvesting and the fallow lands as well as land resources not used for crop cultivation as common grazing grounds. During the cropping season, the herds are shifted to more remote areas where the incidence of crop cultivation is lower. The livestock keepers claim that they have traditional (informal) rights to use these land resources. As a comparatively small, homogeneous and wealthy group, the livestock keepers

² Due to cultural constraints imposed by the Buddhist religion, other types of livestock such as pigs, poultry and goats have, so far, played a limited role in the research region.

were successful in excluding newcomers and outsiders from using these land resources for livestock rearing, but they have not developed specific regulations to limit the herd sizes.³

The major motive force of change in the region is the increasing population density which almost doubled from 106 to 204 persons per square km between 1971 and 1994.⁴ Reduction of fallow periods and overstocking has led to increasing soil degradation.⁵ Technical solutions to this problem can be seen in the expansion of the irrigated area and in the shift from *chena* cultivation to more sustainable permanent cultivation systems. Even on non-irrigated land resources, the agro-ecological conditions in the research area allow to establish contour bounds planted with legumes. Likewise, perennials such as woodapple can be integrated with the traditional annual crops cultivated on *chena* fields. Several development projects (e.g., the Norwegian funded Hambantota Rural Development Project) and NGOs (e.g., the internationally recognised NGO *Sarvodaya*) have attempted to introduce such land use systems. Even though the projects and NGOs recorded considerable interest on part of the *chena* farmers to switch to such land use practices, the problem of crop damages by the free grazing cattle and buffalo herds proved to be a major barrier to the adoption of such more sustainable land use practices. The danger of crop damages is especially an obstacle to the establishment of perennial crops. Under the prevailing price relations, fencing is not an economic solution.⁶ Crop damages by free grazing cattle and buffalo are also a problem which threaten the viability of the more recently established irrigation projects.⁷ As the interviews revealed, the livestock farmers feel that their informal property rights in the respective land resources are violated both by the expansion of the area under irrigation and by the switch to the permanent utilisation of the land which earlier served as grazing land when they were under fallow. Therefore, the livestock farmers are not prepared to take actions to reduce crop damages caused by their herds. Most of them do not herd their animals throughout the day, neither do they usually paddock the animals at night.

In view of this problem, the adoption of more efficient land use systems in response to the increasing population density requires a change in the system of property rights which has so far governed the use of the land resources in the Dry Zone. With regard to the study of communal resource management, two questions arise:

- (1) Which institutions can be developed in order to avoid overgrazing on the land which are used as common-pool resource by the livestock farmers?
- (2) Which institutions can be developed in order to avoid crop damages by grazing livestock in order to make the adoption of more sustainable permanent crop farming systems possible?

For reasons of scope, this paper deals only with the second question. It is worth noting that the problem underlying this question is rather universal in certain phases of agricultural development, especially in areas which are ecologically suitable for both crop and livestock farming. The problem typically arises, when land resources used for pastoral livestock keeping

³ The field observations revealed that a system of “might makes right” governed the number of animals kept by the individual livestock owners. This may be due to the fact the competition among the livestock keepers for grazing resources emerged rather recently (see BIRNER, 1996).

⁴ Calculated according to information from the Statistical Branch of the District Secretariat, Hambantota, 1994.

⁵ This problem is a common phenomenon in the Dry Zone of Sri Lanka. WICKREMASINGHE (1987) even records desertification.

⁶ Traditional fencing material such as thorny shrubs have become increasingly scarce. The *chena* farmers use to watch their fields day and night during the entire cultivation period of three to four months, even though this is considered as a heavy burden.

⁷ The impact evaluation study the Kirindi Oya Settlement and Irrigation project, the largest recent irrigation project in the area, stated that “the conflict between cattle owners and paddy farmers has become one of the major problems of the project, threatening its sustainability.” (IIMI, 1995, Vol. II: 54).

become scarce due to population pressure. Two historical examples may illustrate this point: As HOFFMANN (1975) points out, the problem to prevent livestock from causing damages to crops was one of the reasons for the emergence of the common field system which dominated land use in Northern Europe during the medieval and early modern periods. HOFFMANN (1975: 59) held that the institutional solution of the common field system which entailed the communal management of both pasture and arable land was economically superior to the available technical solutions such as fencing of either crops or livestock. In the 19th century, the problem of crop damages by grazing livestock represented an obstacle to the expansion of crop farming in several states of the USA. It led to the “closing of the open range,” i.e. the adoption of legal regulations which removed the obligation of the crop farmers to fence their land in order to be entitled to claim compensation for crop damages from livestock farmers. KING (1982) and KANTOR (1991, 1994) show that the “fence question” was an important political issue at that time. As the next section will show, this is also the case in the research region.

3 A Polit-Economic Framework for Analysing Change in Property Regimes

The change of property regimes can be considered as a type of institutional change. In the NIE literature, one can distinguish two basically different ways of approaching the analysis of institutional change: an “efficiency approach” and an “interest-group approach.”⁸ While the efficiency-approach implies that institutional change leads quasi “automatically” to more efficient institutions, the interest-group approach can be characterised by the following statement:

“Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interests of those with the bargaining power to devise new rules.” (NORTH, 1990: 16).

The analytical framework proposed here applies the interest group approach to study the change of property regimes and suggests the following four analytical steps:

- (1) Analysis of the motive forces which lead to the formation of interest groups,
- (2) analysis of the potential interest groups and their organisational capacity,
- (3) analysis of the relative power of the interest groups within the political and administrative system, and
- (4) analysis of the interaction of the interest groups and the political and administrative decision-makers.

3.1 Analysing the Motive Forces of Change

The motive forces of institutional change discussed in the NIE literature can be classified into four categories:⁹

- 1) long-run changes in relative prices of factors or products,
- 2) new technological opportunities,
- 3) opportunities of rent seeking, and
- 4) changes in collective attitudes (ideology).

In the perspective of the interest-group approach, these motive forces can be interpreted as incentives for people to organise themselves as interest groups in order to bring about an institutional change which increases their utility. While the first three categories of motive

⁸ This classification follows EGGERTSSON (1990: 249) who refers to the efficiency-approach as “naive theory of property rights.”

⁹ See DAVIS/NORTH (1971) and BROMLEY (1989).

forces can be analysed with established concepts of economic theory, this is not the case for the fourth category. As preferences are assumed to be stable in standard neo-classical theory, a change in the preferences of groups of individuals is difficult to explain from an economic perspective. The NIE have yet not overcome this deficit either. Collective preferences or attitudes may be subsumed under the concept of “ideology.” In his review of NIE, EGGERTSSON (1991: 73 ff.) notes that the lack a theory of ideology is an important obstacle to a better understanding of institutional change. This deficit is especially relevant for analysing environmental issues, because - without a theory of ideology - it remains difficult to explain under which conditions preferences for environmental protection will emerge.

In the case study presented here, increasing population density can be considered as a major motive force of institutional change, because it increases the value of the production factor land relatively to that of the production factor labour (category 1) and induces a shift to more intensive land use systems. Especially the system of extensive livestock keeping which emerged in a situation of low population density came under pressure due to this change in factor price relations. New technical opportunities which enable a shift to more sustainable permanent land use systems (category 2) also play a role. As will be explained below more in detail, rent-seeking (category 3) is of relevance, too, in the case considered here. The emergence of NGOs which pursue, among other things, the goal of resource protection, can be subsumed under category 4. In the research region, ecologically sustainable resource use was also one of the goals of the foreign funded development projects. This reflects the influence of collective attitudes (category 4) which have emerged in the donor countries.

3.2 Analysing the Interest Groups Involved

It is suggested here to consider as a “potential interest group” all persons (or households, etc.) who are in a similar way (positively or negatively) affected by a proposed change in the property regime. The word “potential” indicates that they have not yet organised themselves in order to articulate their interests collectively. With regard to resource use, one can distinguish two types of (potential) interest groups:

- Groups which actually use a particular resource system and which, therefore, have a *direct interest* in the property system governing it, and
- groups which are indirectly interested in the way in which a resource system is governed and used, because they pursue goals of overriding interest such as poverty alleviation or ecological sustainability.

In the case considered here, the paddy farmers, the *chena* farmers and the livestock keepers correspond to the first type of interest groups, while the development projects and NGOs belong to the second type.

Table 1 indicates to which extent the interests of the different (potential) interest groups are congruent, neutral or conflicting. The changes of land use which are discussed in the research region are indicated in the columns 1 to 4 of Table 1. All these changes of land use imply a change in the prevailing system of property rights. The changes listed in columns 1 to 3 imply that crop farmers are formally granted private property rights to land resources which were heretofore formal state property. This change necessarily affects the traditional rights of the livestock farmers concerning these land resources. As a means of compensation, the livestock farmers demand the declaration of “reserved pasture land.” This option implies the transfer of formal state property into the formal common property of the livestock farmers. In this case, the traditional rights of the *chena* farmers (who have been cultivating land within the proposed pasture land) are affected.

The groups with direct and indirect interests in the change of land use are listed in the rows of Table 1. “+” indicates a positive interest of the group in the respective change, “0” means

indifference and “-” marks opposition. *Chena* farmers, for instance, are interested in the expansion of paddy cultivation, because this increases their chances to become owners of paddy land. Livestock keepers have an interest to prevent the expansion of paddy cultivation as this measure affects their traditional grazing rights, etc. Table 1 shows that with regard to all changes indicated in columns 1 to 4, conflicting interests arise only with respect to the livestock keepers. As already mentioned, a particular interest in resource protection on non-irrigated land resources (column 2a) is especially prominent among NGOs and development projects. The *chena* farmers are primarily interested in stabilising or increasing their income by adopting permanent land use systems.

Table 1: Conflicting Interests Concerning Change in Resource Use in Hambantota District

<i>Column</i>	<i>1</i>	<i>2</i>	<i>2a</i>	<i>3</i>	<i>4</i>
	expansion of irrigated paddy land	permanent use of non-irrigated land resources	option 2 including resource protection measures	reduction of the herd sizes for reduction of crop damages	declaration of reserved pasture land
<i>Chena</i> farmers	+	+	0	+	-
paddy farmers	0	0	0	+	0
livestock keepers	-	-	0	-	+
development projects	0	+	+	+	0
NGOs	0	+	+	+	0

Source: own survey, 1994/95

The analysis of the interest groups involved has to include an assessment of their organisational capacity. While the NGOs and development projects are, by definition, already organised, the organisational capacity of the other potential interest groups is characterised by the classical problem of collective action described by OLSON (1965). In an NIE perspective, the concept of transaction costs can be applied in order to analyse the organisational capacity of the respective interest groups. The transaction costs influence what DAVIS/NORTH (1971: 56) call the “perception and organisation lag” - the time that is required to perceive the potential profits from a new institutional arrangement and organise an interest group. Drawing on the argumentation of DAVIS/NORTH (1971: 57-58), one can assume that the lag will be the shorter

- the smaller is the number and the greater is the socio-cultural homogeneity of persons who compose the relevant interest group,
- the larger are the expected net benefits, the closer (in point of time) are these benefits and the greater is the degree of certainty with which the expected costs and benefits are known,
- the lower is the risk aversion and the time depreciation of the potential members,
- the longer is the menu of known institutional alternatives to the present situation,
- the greater is the possibility to redirect an already existing organisation, and
- the better is the access of the potential members to the communication and transportation infra-structure.

In the research region, the livestock keepers have organised themselves during the 1980s in three formally registered organisations which are united in one umbrella organisation. According to the factors listed above, the organisational capacity of the livestock farmers can be explained by the fact that they represent a comparatively small and socially homogenous

group of comparatively wealthy people with easy access to means of transport and communication. The paddy farmers are formally organised in Farmers' Associations for the purpose of irrigation management. By contrast to the case of the livestock farmers, the organisation of the paddy farmers is strongly supported by state authorities (especially the Agrarian Services Department and the management of irrigation projects). The *chena* farmers in the research region were hardly organised at all in order to pursue their common interests. With respect to the factors listed above, this can be attributed to their relatively large number, their socio-cultural heterogeneity (different caste affiliations, etc.) and their comparatively low income, which implies a high time depreciation and risk aversion. Lacking access to the transport and communication infra-structure also reduces the organisational capacity of the *chena* farmers.

3.3 Analysing the Relative Power of the Interest-Groups within the Political-Administrative System

The political power of the respective interest groups crucially depends on the prevailing political and administrative system. The formal models of the New Political Economy (NPE) typically assume the system of a plural democracy,¹⁰ which limits the applicability of these models to developing countries. In comparative politics, different sets of variables have been suggested to characterise political systems,¹¹ including

- 1) the degree of democratisation,
- 2) the degree of decentralisation and
- 3) the relative autonomy of the state from interest groups (strong *versus* weak state).

The first variable indicates to which extent the central hypothesis of NPE is applicable that politicians act as to maximise votes. Moreover, the degree of democratisation is typically related to the opportunities of potential interest groups to organise themselves freely and to articulate their interests openly. The second variable indicates to which extent political decisions can be made on the local and regional level. This variable has received increasing attention in the context of the debate on devolution. The third variable refers to the ability of a state to pursue certain goals against the influence of particular interest groups. LEFTWICH (1995) has argued that successful "developmental states" are typically relatively autonomous with regard to the influence of interest groups. In LEFTWICH'S model of the developmental state, the civil society is the "weak and subordinated" (LEFTWICH, 1995: 405). The question arises to which extent LEFTWICH'S model can be maintained, if one takes into consideration the goal of sustainable development which also includes ecological and social goals. Experience shows that the recognition of environmental protection goals in the political decision-making process typically requires powerful environmental action groups which are part of the civil society.

In the case under consideration, the political and administrative system can be characterised as follows: Unlike the majority of developing countries, Sri Lanka managed to retain a comparatively stable democratic system since her independence in spite of the ethnic conflict. The political system has allowed to change the party or coalition in power by democratic elections, as it last happened in 1994, when a left-wing coalition called People's Alliance (PA) replaced the conservative-liberal United National Front (UNP) which had been in power since 1977. Since the introduction of a Provincial Council system in 1988, which was part of a devolution package designed to solve the ethnic conflict,¹² political representation in Sri Lanka

¹⁰ See KIRSCH (1993:312).

¹¹ See DOGAN/PELASSY(1990) for a review.

¹² The advantages of decentralising political and administrative power have been discussed in Sri Lanka since independence and even before (see WARNAPALA, 1997: 17). However, only the influence of the Indian

involves three levels: the parliament on the national level, the directly elected provincial councils at the regional level and the *Pradeshia Sabhas* at the local level. The members of parliament and the members of the provincial councils are elected according to a proportional system of representation and a preferential system of voting. The number of parliamentary and provincial council members per district depends not only on population, but also on area, which strengthens the political weight of rural areas. On a district basis, the voter has the right to mark a vote for a party and to mark up to three preferences to candidates of her or his choice. This election system creates a particularly strong incentive for the individual candidates to care for the interests of the voters in their district, because candidates have not only to compete with the candidates of the other parties, but also with those of their own party. As the different candidates typically concentrate on certain divisions within their district, the direct relations between voters and candidates tend to be rather strong. Such a system of representation creates a high degree of politicisation of the rural population. This was most apparent in the course of the election campaigns which took place during the research period. Even in rather remote villages several political meetings per week took place. The system also creates incentives for wide-spread clientelism. In exchange for political support, candidates promise direct benefits to their supporters which range from the issue of paddy land in new settlement projects to support for finding employment in the private sector. As a consequence, the Sri Lanka's state cannot be considered as "strong." By contrast, political scientists typically characterise Sri Lanka as a weak state in which patronage, clientelism and populist policies prevail (DUNHAM/KELEGAMA, 1997, MOORE, 1997).

The system of political representation described above also creates a strong incentive for politicians to induce the local administration to implement development programs and policies beneficial to their voters. The electoral districts are coterminous with the administrative districts and their administrative resources which facilitates the co-operation of politicians at all levels with the local administration. Additional attempts to strengthen the liaison between the political leadership and the bureaucracy at the local level have already been made prior to the introduction of the Provincial Council System. In the early 1970s, "District Political Authorities" were created in order to accelerate the process of development at the district level. This system also introduced elements of popular participation in local planning, project formulation and implementation and it emphasised the need to undertake development in consultation with grass-root level organisations (WARNAPALA, 1997: 20). Under the present system, the District Development Committees which are chaired by elected politicians continue to pursue these goals.

Against the background of this political and administrative system, the political power of the interest groups can be characterised as follows: As the *chena* farmers represent the largest number of voters, their interests have to be addressed by politicians, if they want to win elections or stay in power. The fact that the *chena* farmers are not organised certainly limits their ability to articulate their interests. Nevertheless, the political system described above which implies a close direct relation between the voters and the political candidates leaves room for the expression of interests even for groups which are not formally organised. This is especially the case during election campaigns. The *chena* farmers were indeed able to bring the problem of crop damages to the notion of the politicians and the local bureaucracy. As the interviews showed, both the politicians and the local administration consider the problem of crop damages as a serious obstacle to the agricultural development in the region.

government which negotiated the Indo-Lanka Accord of 1987 (in an attempt to settle the ethnic conflict) created enough political pressure to eventually implement the devolution of power.

The political power of the livestock farmers rests mainly on their ability to organise themselves effectively and act as a political pressure group. Since their number is comparatively small, their political influence cannot be based on votes they represent. However, due to their high degree of organisation, they are well prepared for lobbying activities and their representatives are able to communicate directly with political and administrative decision-makers. Moreover, due their comparatively wealthy status, the livestock keepers are able to support the election campaigns of political candidates. Due to these factors, the politicians have an incentive to find solutions which take into account the interests of the livestock farmers.

The paddy farmers represent more votes than the livestock farmers and, as described above, they are well organised, too. However, as only the paddy farmers in the new irrigation and settlement projects are severely affected by livestock-related crop damages, this issue is not very prominent in the lobbying activities of the paddy farmers' organisations. Other aspects of paddy cultivation, especially the distribution of irrigation water and the farm gate price of paddy appear to be of greater relevance for the paddy farmers as an interest group.

The local administration generally shows more sympathy for the crop farmers' interests than for the livestock farmers' interests. Most of the local representatives of the line departments, especially of the Departments of Agriculture, Agrarian Services, Irrigation and Forestry, consider the large free grazing herds of cattle and buffalo as an obstacle to achieving their respective goals, i.e. increased crop production and the protection of the irrigation facilities and of the forest resources from damages by free grazing livestock. Representatives of the general administration at the municipal, divisional and district level, too, perceive the crop damages by livestock as an obstacle to their development activities.

3.4 Analysis of the Interaction of the Interest Groups and the Political and Administrative Decision-Makers

The last analytical step proposed here refers to the interaction between the different interest groups and the political and administrative decision-makers. The New Political Economy offers a wide variety of formal models which can be applied to analyse such processes. Using the case study material presented here, this section intends to show that before specifying a formal model, the representation of the interactions as a game in extensive form can yield useful insights into the political process of change in property regimes. To illustrate this point, the process which has been induced in 1995 by a session of the above mentioned District Development Committee is considered here. Before specifying this process, the status quo which had been established at that time is outlined.

The Status Quo

In 1995, the formal legal regulations which were prerequisite for the changes in land use listed in columns 1 to 3 of Table 1 had already established. This was probably due to the political support that the crop farmers could attract at a national level for the same reasons which have been described above for the case of the research region. Settlers in irrigation schemes are granted individual property rights in both paddy land and, for their home garden, in non-irrigated land. Only the right to transfer these land resources is restricted. *Chena* farmers which commit themselves to using a particular plot permanently in a sustainable way are entitled to receive long-term individual property rights, too. As in the case of irrigation and settlement projects, the farmers are not granted the right to transfer such land resources. The local administration controls whether the farmers indeed establish resource conservation measures such as the integration of perennials, if they have received formal property rights in former *chena* lands.

With regard to crop damages, formal legal regulations had been established, as well. According to the Agrarian Services Act of 1979, the livestock farmers have to pay compensation for the crop damages caused by their animals. The crop farmers are not requested to fence their land in order to be entitled to compensation. However, there are major obstacles to enforcing these regulations. The crop farmers have to catch the animals which cause the damages and they often face difficulties to do so. In the case that they manage to catch the animals while the owner of the animals is not willing to pay, the Agrarian Services officer is entitled to auction the animals and use the receipts for paying the compensation to the crop farmer. Acting in solidarity, the livestock keepers, however, refuse to buy animals at such auctions and they induce the livestock traders to act accordingly. Therefore, the legal provision of auctioning the animals which caused crop damages is not effective.

According to another legal regulation which concerns “stray animals,” the local administration is entitled to catch and detain all free grazing animals and to demand a fee from the owner, if he wants his animals back. This legislation is generally considered as a means of ending the problem of crop damages, if it is enforced. However, the local administration has so far been reluctant to enforce this legislation, because it would consume considerable administrative resources and provoke conflicts between administrative officers and livestock keepers.

Until the early 1990s, the strategy of the administration, especially of the Department of Animal Production and Health, was to convince the livestock farmers to reduce their herd sizes and switch to a more intensive system of livestock keeping. This was seen as a solution to the problem of crop damages which would not involve major conflicts with the livestock farmers. However, even though the Department offered extension services as well as subsidies for breeding animals, concentrates, etc., the livestock farmers did not show any interest to change their system of keeping cattle and buffalo. Development projects which engaged in this field made a similar experience. The reluctance of the livestock farmers to switch to a more labour- and capital-intensive system can easily be explained by the economics of the prevailing extensive system. Since the livestock farmers do not have to bear any opportunity costs of land, their system of keeping large herds of animals in a labour- and capital-extensive system is highly profitable. By contrast, more intensive systems of cattle and buffalo farming are in Sri Lanka generally discouraged by an unfavourable relation of the prices for milk and concentrates. Moreover, the crop damages caused by the prevailing extensive system of livestock rearing represent an external effect which cannot be internalised by the prevailing legal regulations due to the enforcement problems described above. In the 1990s, it became eventually obvious that the strategy of the Department of Animal Production and Health to change their system had failed. At the same time, the problem of crop damages further increased due to the increasing population density and the expansion of crop farming. The crop farmers continued to complain about this problem to the politicians and the administration.

Potential Strategic Interactions

In order to analyse potential interactions and strategies to solve the problem of crop damages, it is useful to consider these interactions as a game. This requires an abstraction from the particularities of the reality, but it reveals more clearly how potential actions are strategically interrelated. In the case under consideration, it is justified to consider for the purpose of analysis only the politicians (P) and the livestock farmers (L) as players. The politicians can induce a bargaining process with the livestock farmers and offer reserved pasture land in exchange for a commitment of the livestock farmers to prevent crop damages, e.g., by herding the animals throughout the day and paddocking them at night. As the livestock farmers are

effectively organised, they can directly enter into a such a bargaining process. The *chena* farmers are not considered as players here, because - as they are not organised - they cannot participate in the bargaining process. However, their interests are indirectly considered in this game, because they are relevant for the decisions made by the politicians. The paddy farmers are not considered as players either, even though they are organised, because - as mentioned above - their organisations do not prioritise the crop-livestock issue. Nevertheless, their interests also influence the decisions of the politicians. NGOs and development projects are not considered as players, because they are - according to the observations in the research region - not politically active and, therefore, not able to mobilise votes. They can be assigned a role as facilitators or arbitrators. To keep the game tractable, the administration (A) is not considered as a player but as a factor which introduces uncertainty. The administration has the possibility to enforce the commitment of the livestock farmers to prevent crop damages by implementing the stray animals legislation mentioned above. It is assumed here that the probability (p_i) that the administration enforces this legislation increases, if the livestock farmers do not co-operate in finding a solution. The payoff of the politicians is assumed to depend on the following factors:

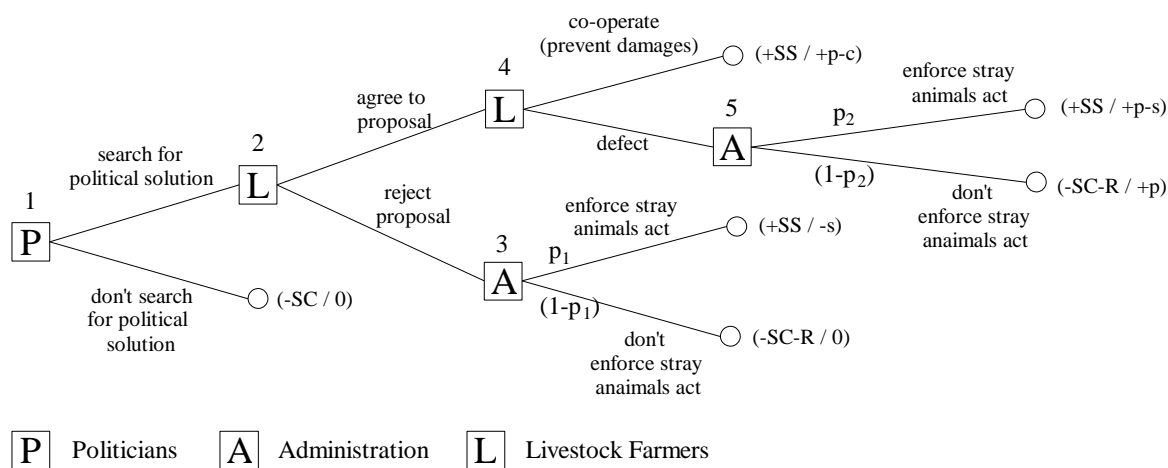
- SC: loss of political support on part of the *chena* and paddy farmers, if the problem of crop damages remains unsolved
- R: loss of reputation, if the politicians are not able to negotiate a solution with the livestock farmers
- + SS: gain of political support on part of the *chena* and paddy farmers, if the problem of crop damages is solved

The payoff of the livestock farmers is assumed to depend on the following variables:

- + p: advantage of receiving reserved pasture land
- c: costs involved in avoiding crop damages (reduction of herd sizes, continuous herding)
- s: costs which arise if the stray animals legislation is enacted ($s > c$)

In the following figure, the outcomes of each terminal node are given as (politicians' payoff / livestock farmers' payoff).

Figure 1: Strategic Interactions between Politicians and Livestock Farmers



Source: own representation

The politicians have to decide whether or not they start the process of bargaining for a solution (see node 1 in Figure 1.) If they do not start the bargaining process, they lose

political support on part of the crop farmers, because the problem of crop damages remains unchanged. Node 2 in Figure 1 represents the choice of the livestock farmers to accept a proposal of the politicians to receive a certain area exclusively as pasture land, if they commit themselves to prevent crop damages. As the land resources in the research area are limited and the interests of the crop farmers have to be taken into account, the politicians will not be able to offer an area which is large enough to maintain the entire number of animals presently kept by the livestock farmers. Therefore, even if reserved pasture land is available, the livestock farmers will still have to bear costs for preventing crop damages. This is an important aspect of the game, which reflects the real situation in the research region. The negotiation of a balanced solution is affected by the problem that the *chena* farmers cannot directly participate in the negotiation process.

If the livestock farmers do not agree to a proposal which is acceptable for the politicians and, by inference, for the crop farmers, there will be a chance p_1 (node 3) that the administration enforces the stray animals legislation. This would lead to a solution which is less favourable for the livestock farmers as any other outcome. If the livestock farmers accept a proposal which is acceptable for the politicians, they have to decide whether or not to fulfil their commitment to prevent crop damages (node 4) in exchange for the reserved pasture land. There is a chance of p_2 (node 5) that the administration enforces the stray animals legislation, if they defect. It is assumed that defection is an additional incentive for the administration to enforce the legislation ($p_2 > p_1$). In the case that the administration will not enforce the legislation, the livestock farmers have an incentive to free-ride and enjoy the advantage of the reserved pasture land without taking the still necessary measures to prevent crop damages. The strategies and potential equilibria of the game depend on the values assigned to the payoff parameters and on the probabilities p_1 and p_2 . As the next section will show, the actual process of change in the research region has not yet proceeded far enough to provide an empirical basis for the assignment of plausible values to the payoff parameters.

The actual process

As already mentioned above, the District Development Committee, which is chaired by a Member of Parliament (MP) decided in 1995 to attend to the problem. This can be interpreted as a decision on part of the politicians to search for solutions (decision node 1 in Figure 1). The District Development Committee organised a special meeting to which representatives of the livestock farmers' organisations, the paddy farmers' organisations, NGOs and development projects and the local administration were invited. The *chena* farmers did not participate, because they were not organised and, therefore, had no representatives who could claim to speak for this group. The meeting primarily served to articulate the interests of the invited groups. The interests of the *chena* farmers were expressed by the MP and by members of the administration. As the number of participants was too large to start immediately a negotiation process, a special committee was nominated. The committee is chaired by a Sri Lankan member of a foreign funded development project. In the following three years, the committee developed a solution for one Agrarian Services Division in the district which is particularly seriously affected by the problem of crop damages. The committee carried out an extensive survey and eventually proposed to declare an area as exclusive pasture land where the livestock farmers could keep their animals during the cropping season. The committee selected an area in which - according to the survey - the incidence of *chena* farming was the lowest. *Chena* farmers who cultivated plots within the proposed pasture land should according to the proposal be granted permits to cultivate *chena* in other areas. The property rights in the proposed pasture land (not included the right to sell the land) should be transferred to the livestock farmers, who were requested to form a registered company for this purpose. The

management of the pasture land should be entrusted to this company. Development projects were envisaged to play a facilitating role by offering support (extension, loans, etc.) for improving the pasture land and, thereby, increasing its carrying capacity. In return, the livestock keepers should commit themselves to avoid any crop damages, even though the proposed pasture land resources were not sufficient to maintain during the cropping season the entire number of animals presently kept by the livestock farmers.

The livestock farmers' organisation already agreed to this proposal in a special meeting (see decision node 2 in Figure 1). The local administration promised to enforce the stray animal legislation in the case that the livestock farmers failed to fulfil their commitment to prevent crop damages. At the time of writing this paper, the pasture land had not yet been formally transferred to the livestock farmers so that the outcome of the process is still open.

4 Conclusions

The application of the analytical framework to the case of Sri Lanka's Dry Zone shows that the type of political and administrative system warrants particular attention in the study of the change of property regimes. In the case considered here, the search for a political solution for the prevailing resource use problems of the region was enhanced by a decentralised democratic system and an election mode which creates strong direct relations between voters and politicians. The prevailing system of political representation also ensured that the interests of the poorer segments of the population (the *chena* farmers) were taken into account, even though they were not in a position to organise themselves as an interest group and engage in expensive lobbying activities. However, if the organisational capacity of this group can be strengthened, e.g., by social mobilising activities of NGOs, this group would be able to enter the bargaining process directly. This might facilitate the process of finding a solution which is considered to be fair by all the groups concerned.

The case study also showed that development projects and NGOs can play an important facilitating role, even if they are not involved as "players of the game." They can fulfil a crucial function as arbitrators, as it is shown by the case of the committee which developed the proposal for a solution. Moreover, by developing and promoting technical solutions which increase the productivity of non-irrigated crop land and of pasture land, they can help to reduce the competition for land between crop and livestock farmers. The case presented here also shows that development projects and NGOs can play a prominent role in promoting the goal of ecological sustainability by offering innovation packages which include resource protection components. Without the commitment of NGOs and development projects to ecological sustainability, this goal easily might have been lost in the political negotiation process about property rights in land.

The case presented here also shows that the local bureaucracy has a decisive function in enforcing the terms of a negotiated solution as long as self-enforcing mechanisms cannot be found. The devolution of power with the aim to strengthen the liaison between elected politicians and administrative officers, as intended in the institution of the District Development Committee, may increase the incentive of the local bureaucracy to fulfil this function.

Finally, the case study demonstrates the need to analyse the political process involved in the change of property regimes in a comparative perspective. The analysis of the experiences of diverse societies which act in different political and administrative systems will allow to better understand the conditions which promote efficiency, equity and ecological sustainability in the management of natural resources.

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