

# 11. Nature conservation in agricultural areas: contracts between government and farmers

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## *Abstract*

The interest in the rural areas in the Netherlands shifted away from creating an optimal environment for agricultural production to a policy where nature and landscape preservation also play an important role. The contribution of this paper will be the discussion of the existing nature conservation contracts in agriculture from a transaction cost point of view.

In a real economy, a loose mix of systems is used to co-ordinate and manage various kinds of activities. The kind of co-ordination that is most effective depends on the nature of the case. In New Institutional Economics, as elsewhere in mainstream economics, the preferences of agents are taken as given. But now, in addition to agents adjusting their behaviour to prices (as in neo-classical theory), they also do so in relation to the overall 'incentive structure' of society, which consists of formal and informal rules.

This paper focuses on governance structures in which farmers are involved. Most of the structures concerning nature conservation are hybrid forms. In these hybrid forms there is a role for both price as well as hierarchical adaptations. Partly due to asset specificity classical contracts are often not possible, although some contract types contain classical elements. Important aspects are time specificity and site specificity.

## **11.1 Introduction**

In the past, nature conservation and landscape preservation in agricultural areas depended largely on farmers; there was almost no interference of the government or private organisations. In the last two decades, this changed rapidly in the Netherlands. The public interest in the rural areas shifted away from creating an optimal environment for agricultural production to a policy where nature and landscape preservation also played an important role. Landscapes provide not only resources for human consumption and recreation but also important habitats for wild animals and plants.

The primary target of nature management is the preservation of biological diversity. But, biological diversity is difficult, perhaps even impossible to quantify. Yet, one can make judgements about the likely potential of certain areas to have greater or lesser biodiversity than others (Van Kooten and Bulte, 1998:257). Policies could be addressed globally, to areas with a great deal of biodiversity (e.g. tropical forests), or one could develop policies that aim to preserve representative ecosystems in each country or locality. Preserving representative ecosystems in each political jurisdiction often results in inefficient allocation of global resources (Van Kooten and Bulte, 1998:257). Our starting point in this paper will be the current ecological situation in the Netherlands and we will

look for the organisation of nature production <sup>1</sup>. We are especially interested in the co-ordination mechanisms and contracts, used in the Netherlands, to produce nature.

After the introduction we will analyse in section 11.2 co-ordination mechanisms, both price and non-price mechanisms. The difference between market and non-market co-ordination failures plays a central role in the discussion of these mechanisms. Contracts and the contracting process are an important strand of modern institutional economics. In section 11.3 we will pay attention to contracts from a New Institutional Economics point of view. In section 11.4 and 11.5 we will apply the theory to existing contracts for nature production in the Netherlands. Section 11.6 contains a summary and conclusions.

## **11.2 Co-ordination; prices versus non-price co-ordination**

The standard microeconomic theory focuses on the market as the mechanism to co-ordinate economic transactions. In the extreme case there are no firms or organisations apart from the market system itself. Individuals exercise foresight and choose between alternatives. The system assumes that everyone knows what the prices are and when goods can be bought and sold. The theory assumes further that the allocation of resources is dependent directly on the price system. Coase (1937:90) argues that an economist thinks of the economic system as being co-ordinated by the price mechanism. The economic system 'works by itself'.

We can identify a market equilibrium as an outcome of a market economy in which each agent in the economy (i.e. each consumer and firm) is doing as well as he can given the actions of the other agents. The first welfare theorem provides a set of conditions under which we can be assured that the market economy will achieve a Pareto optimal result. An economic outcome is Pareto optimal if it is impossible to make individuals better off without making any other individual worse off. The second theorem states that under the same set of assumptions, the first welfare theorem plus convexity conditions, all Pareto optimal outcomes can in principle be implemented through the market mechanism. That is, a public authority who wishes to implement a particular Pareto optimal outcome may always do so by appropriately redistributing wealth and 'letting the market work' (c.f. Mas-Colell et al., 1995:307-308). If the competitive equilibrium of the neo-classical model actually did provide a good and complete description of how markets work, there would be no need for other economic organisations aiming at improving economic efficiency, although political organisation might still exist in order to bring more equity into the system.

The price system achieves efficient allocation of resources without requiring communication among individual decision-makers of anything more than the summary information about the economy embodied in the prices. Furthermore the price system does not require any individual to do other things than what he or she deems to be in his or her own best interest (c.f. Milgrom and Roberts, 1992:89). Any inefficiency that arises in a market economy, and hence any role for Pareto-improving market intervention, must be traceable to a violation of some of the assumptions of the welfare theorems. In that case the

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<sup>1</sup> Throughout the text we use 'nature production' as a synonym for preserving the quality of the soil, water and air, and wildlife and landscape.

market equilibria fail to be Pareto optimal and we have the case of market failures. The price mechanism that neo-classical economist expect to overcome these problems may be ineffective. Instead of speaking of market failures we could also speak of co-ordination problems. But also planning (in firms, organisations or countries) obviously serves a co-ordinating purpose, performing functions that could be co-ordinated instead through the pricing mechanism (Medema, 1996:572).

Where price, information and mobility characteristics of perfect markets depart significantly from those prevailing in actual markets, the outcome will not be efficient. Nonmarket failures concern the failures of governance structures other than markets. Both market failure and nonmarket failure can be viewed as resulting from the particular transaction cost characteristics and burdens associated with markets and organisations (which include governments) as alternative governance structures for organising economic activities (Wolf, 1993:7). In comparison to the study of market failure, the study of hierarchical failure is seriously underdeveloped (Williamson, 1996:17). Non-market failures include government failures as subject of the public choice theory (see for government failures: Slangen, 1996:181). The government is one of the non-market organisations, others are firms, universities, foundations, etcetera, with non-market failures. The behaviour and deficiencies of those organisations should be included in a comprehensive theory of non-market failure that can highlight similarities and differences among them, as well as permit suitable comparisons to be made between the non-market sector and the market sector (Wolf, 1993:6). The opposite extreme of the market mechanism would be a situation where the price system is eliminated by a system of explicit central planning (organisation). Economic organisations are created entities within and through which people interact to reach individual and collective economic goals.

The economic system consists of a network of people and organisations, with lower-level organisations linked together through higher level organisations. The highest-level organisation is the economy as a whole (Milgrom and Roberts, 1992:19). Private parties as well as governments can make arrangements to replace the simple price system when they are not satisfied with the results of this system. Formal organisations make at most limited use of prices to co-ordinate their activities (Milgrom and Roberts, 1992:89). Even in the existing market systems, there is extensive use of means of co-ordination besides prices. Governments, in particular, favour direct orders that specify particular actions to be taken. An example is the Dutch regulation concerning the emission of ammonia for pig sheds, which can be seen as a direct order. These direct orders specify the actions that farmers are obliged to take, in order to prevent the ammonia emission from their pig sheds.

Resource allocation is a problem of allocating a fixed set of resources among various possible uses. The term resource can be interpreted broadly enough to denote virtually every kind of important economic or business decision as a resource allocation problem (Milgrom and Roberts, 1992:92). Alternative mechanisms of co-ordination entail different levels and patterns of cost and therefore the allocation of resources is impacted. In addition to the planners' time and equipment, planning demands time from production people who must fill out forms, complete reports, and answer the planners' queries. At the end of the planning process, errors inevitably still occur, both because the prices or plans are based partly on guesses and partly on erroneous, incomplete or misleading information and because miscalculations and mistakes occur (see Milgrom and Roberts, 1992:90).

Understanding the importance of these costs of planning is thus central to understanding how and why co-ordination matters (c.f. Medema, 1996:573).

### **11.3 Co-ordination from a New Institutional Economics point of view**

According to Williamson (1998:24) New Institutional Economics (NIE) comes in two parts. Part one deals with the institutional environment - the rules of the game - and part two deals with the institutions of governance - the play of the game. One of the salient differences between the institutional environment and the institutions of governance are that the former mainly defines the environment of the latter (Williamson, 1996:5). According to Ménard (1995:175) a governance structure is a way to implement and operationalize the 'rules of the game' as they are defined by the institutional environment. Several studies have shown that the institutional environment matters for the making of contractual arrangements (e.g. the regime of property rights); for the implementation of contracts (e.g. the role of the judiciary); and rewarding or penalising of partners (e.g., the political feasibility of these arrangements) (c.f. Ménard, 1997:2).

A difference between the environment and the institutions of governance is that the level of analysis is very different. The institutions of governance operate at the level of individual transactions whereas the institutional environment is more concerned with composed levels of activity. Another difference is that the two operate differently with respect to intentionality. Spontaneous governance can be addressed as the 'invisible hand' introduced by Adam Smith according to which each businessman 'by pursuing his own interest ... frequently promotes that of society more than when he really intends to promote it' (Smith, 1992:423, cited in Williamson, 1996:145). Markets can be seen as spontaneous mechanisms, whereas organisational mechanisms are often intentional. Generally, the study of governance is concerned with the identification, explication and mitigation of all forms of contractual hazards (Williamson, 1996:5). Among the hazards with which transaction cost economics is concerned and hazards of bilateral dependency; hazards that accrue to weak property rights; measurement hazards (especially in conjunction with multiple tasks) and/or oversearching; intertemporal hazards; and hazards that accrue to weaknesses in the institutional environment (cf. Williamson, 1996:14). Governance is the means by which order is accomplished in a relation in which a potential conflict threatens to undo or upset opportunities to realise mutual gains (Williamson, 1996:12; Williamson, 1998:37).

A problem is that not everybody addresses the same meaning to the concepts of the governance structures markets and organisations. Ménard (1995:168) states that it is paradoxical how variously and vaguely defined the concept of market is. It has long been approximated as the abstract space of exchange in which frequent intercourse among buyers and sellers determines prices. Differently, Jevons identified markets as extensive 'business relations', which generate a 'community of knowledge', namely the ratio of exchange. The predominant view of this shared knowledge is that it is produced by the invisible hand (Smith, 1776). This representation means that the price mechanism is the market, i.e. the fundamental and exclusive 'institutional arrangement' for co-ordinating economic activities (Ménard (1995:169).

The term organisation is often used as identical to that of the firm. But some authors emphasise the structural similarities with other forms, such as non-profit businesses and public agencies, and therefore they expect the theory to be valid for all of these forms as it is assumed to be in the tradition of the Organisation Theory. On the other hand, it is worthwhile to note, as often happens with new ideas, there is also a great deal of conceptual confusing about the concept of organisation (Ménard, 1995:162). In this section we will use the terminology of Williamson: he uses hierarchy in stead of organisation.

The two pure governance structures we distinguish are markets and hierarchies. A major contribution of the recent literature on transactions is the demonstration of the fundamental importance of 'hybrid forms' between the two polar cases of markets and hierarchies. Hybrid forms are characterised by specific combinations of market incentives and modalities of co-ordination involving some forms of hierarchical relationship (Ménard, 1995:175). Including the hybrid forms there are three main governance structures (equivalent to institutional arrangements): markets, hybrids, and hierarchies. Table 11.1 gives an overview of distinguishing attributes of markets, hybrids, and hierarchical governance structures.

Table 11.1 Distinguishing attributes of markets, hybrids and hierarchical governance structures a)

	Governance structure		
	Market	Hybrid	Hierarchy
Instruments:			
Incentive intensity	++	+	0
Administrative controls	0	+	++
Performance attributes:			
Adaptation, autonomy	++	+	0
Adaptation, co-operation	0	+	++
Contract law	++	+	0

a) ++ = strong; + = semi-strong; 0 weak.

Source: Williamson (1996:105).

As can be seen in table 11.1, incentive intensity (= prices) plays an important role within markets whereas they are of no importance for hierarchies, whereas administrative controls play an important role in hierarchies. The hybrid form is located between the other two governance structures. Contract law is important for markets because this type of governance assumes that law can solve most of the conflicts. The choice of adaptation mode depends on (c.f. Ménard, 1996:160):

- Whether there is bilateral dependency between the contracting partners or not;
- Whether distribution between the partners of gains of trade is well determined or not.

When significant disturbances of the environment and bilateral dependency develop, transactions cost economics predicts that delays in responding will decrease the efficiency

of the price system. Further, there is an increased possibility that opportunistic behaviour of the contracting parties will considerably reduce the efficiency of the price mechanism. Compared to market relationships, hybrid forms represent a shift towards co-operation and administrative controls in order to adjust more rapidly and in a more co-ordinated way to these disturbances (c.f. Ménard, 1996:159). But this shift also weakens the monetary incentives that are the strength of the market, without providing the incentives of hierarchical structures (e.g. promotions or extended powers of decision). Because of the limited role of the price mechanism and of the uncertainties surrounding the appropriation of rent, information disclosure will be essential to the existence and stability of hybrid forms (Ménard, 1996:159).

A fundamental explanation of the existence of hybrid forms is that they enhance the capacity of firms to deal with disturbances that spot-markets could not easily meet, or could meet only at prohibitive costs, while maintaining the incentives that pure integration lacks (Ménard, 1996:161). Within a firm there are adaptations to prices and adaptations to take place because of a hierarchical relationship (see table 11.1). According to Williamson (c.f. 1996:101-105), the central problem of economic organisation is adaptation to changing circumstances. He distinguishes two types of adaptations: (1) adaptations where prices serve as sufficient information and (2) adaptations through co-ordination within internal organisations. Changes in the demand or supply of a commodity are reflected in price change, in response to which participants are able to take the right action. Williamson (1996:102) refers adaptations of this kind as A-adaptations, where A denotes autonomy (see table 11.1). This is the neo-classical deal in which consumers and producers respond independently to parametric price changes so as to maximise their utility and profits respectively.

Some disturbances, however, require co-ordinated responses, let the individual parts operate at cross-purpose or otherwise sub-optimize. Failures of co-ordination may arise because autonomous parties read and react to signals differently, even though their purpose is to achieve a timely and compatible combined response. Williamson (1996:103) refers adaptations of co-ordination as C-adaptations, where C denotes co-operation (see table 11.1). Bilateral dependency introduces an opportunity to realise gains through hierarchy. As compared with the market, the use of a formal organisation to orchestrate co-ordinated adaptation to unanticipated disturbances enjoys adaptive advantages as the condition of bilateral dependency progressively builds up. But these adaptation gains come at a cost (Williamson, 1996:103).

In summary, in an economy a mix of systems is used to co-ordinate and manage various kinds of activities. The kind of co-ordination that is most effective depends on the nature of the case. In the approach of the New Institutional Economics, as elsewhere in mainstream economics, the preferences of agents are taken as given, exogenous, or performed. But now, in addition to agents adjusting their behaviour to prices, as in neo-classical theory, they also do so in relation to the overall 'incentive structure' of society. In other words, legal norms, along with other formal and informal rules, impose constraints to which individual agents respond in a rational, calculative manner (c.f. Deakin and Michie, 1997:14). Formal rules are an important part of the institutional framework but only a part. To work effectively they must be complemented by informal constraints (conventions, norms of behaviour) that supplement them and reduce enforcement costs (North, 1993:20).

## 11.4 Contract theory

Contracts and contracting processes play central roles in modern institutional economics. The different approaches to contractual arrangements can be structured along two broad trends. One, which is predominant in recent literature, emphasises the formal analysis of contracts, looking for conditions that would determine an optimal contract, i.e., a contract that is self-enforcing (c.f. Ménard, 1997:1). Agency theory belongs to this branch of research. In the standard principal/agent model the parties negotiate only once and on a once-and-for-all basis (Furbotn and Richter, 1991:18). The other approach points out the incompleteness of most contractual arrangements: the implementation of contracts and their enforcement necessitate filling in the blanks of the contract and imposing constraints on partners involved (c.f. Ménard, 1997:1). In this paper we will focus on the second approach and we will apply this approach to the analysis of nature conservation contracts in section 5.

Our main focus will be transaction cost economics within the contract theory. Transaction cost analysis entails an examination of the cost of planning, adopting, and monitoring task-completion under alternative governance structures (Williamson, 1996:58). Transaction cost economics within contract theory emphasises two important behavioural assumptions: (1) opportunistic behaviour of the agents (self interest seeking with guile), particularly when there is only a small number of possible partners; and (2) their limited rationality, which is of major importance when significant uncertainty prevails (Ménard, 1997:3). In general all hazards can be attributed to these twin behavioural assumptions (cf. Williamson, 1996:12).

Table 11.2 Classification of contracts a)

	Role of prices as mean of adjustment	Degree of Asset specificity	Complexity of safeguards clauses
Classical contracts	++	0	0
Neo-classical contracts	+	+	+
Relational contracts	0	++	++

a) ++ = strong; + = semi-strong; 0 = weak.  
Source: based on Ménard (1997:4).

There is almost an infinite variation among clauses of contracts. At the same time, there seem to be some basic patterns that structures the variety of clauses, e.g. the very limited number of incentive devices (Ménard, 1997:2). In this section we will discuss the basic types of incomplete contracts. There is still no accepted definite and stable classification for contract types. Williamson (1998:41) draws his treatment of contracts on work of Macneil (1974, 1978) and we will follow this approach. We will start with characterising contracts by three variables: prices, asset specificity, and safeguards clauses. Table 11.2 gives an overview of the classification of contracts based on these variables.

A classical contract would be characteristic for market relationships. In these contracts, formal clauses specify most characteristics at stake, with the identity of the parties to the contract to be irrelevant and the transactions highly monetized (Ménard, 1996:157). The short term orientation makes it appropriate to regard the contract as fully expressing all the future rights and obligations of the parties while the absence or relation specific investments means that opportunism can be effectively countered by the threat of exit from the relationship or by resort courts. Law courts adjudicate in the event of a disagreement (litigation) (Lyons and Mehta, 1997:49). The courts, because of low likelihood of repeat trading, do not involve the loss of significant future goodwill (c.f. Deakin and Michie, 1997:11). Commitment plays no role in classical contracts. Classical contracts are less useful for long term contracting because not all-future contingencies can be specified in the contract.

A neo-classical contract is typically a long run arrangement in order to develop a continuing relationship. Normally the contract specifies a fixed duration or task to be completed (Lyons and Mehta, 1997:49). The identity of the parties does matter in this relationship, since bilateral dependency in non-trivial, while adaptation mechanisms must be elastic enough to enable parties to adjust to moderately consequential disturbances. A neo-classical contract defines adaptation mechanisms to improve, relative to pure market relationships, the capacity to adjust to unanticipated disturbances (Ménard, 1996:157-158). The parties accept at the outset of the agreement that the contract is incomplete, in the sense of being unable to specify their rights and obligations in all future states of the world. The parties attempt to use their agreement to plan for future contingencies by using mechanisms of 'trilateral governance', including hardship and arbitration clauses (c.f. Deakin and Michie, 1997:12). The written documentation provides the status quo point from which to renegotiate.

Relational contracts are characterised by the substitution of the legal system by a contract and its accompanying formal documents by informal agreements such as verbal promises, letters or intent, or gentleman's agreements (Lyons and Mehta, 1997:51). In relational contracting prices play a small role for adjustments, instead norms of behaviour, or shared codes of conduct, inform responses to new developments as they unfold. These norms or shared codes of conduct overrule written documents in settling outputs. The duration is normally indeterminate (c.f. Lyons and Mehta, 1997:49). In these contractual arrangements, adaptability to highly consequential disturbances is crucial, while highly specific assets create risks of opportunism that detailed safeguards are built in to reduce. Hierarchy is at the core of adaptability and operates through 'fiat', acting as 'its own court of ultimate appeal' (Ménard, 1996:157). The identities and personal attributes of parties are crucial within these types of contracts (c.f. Lyons and Mehta, 1997:49).

According to Ménard (1997:6), the diversity of institutional arrangements within the same sector and the same institutional environment is an important and intriguing issue. Although some contracts are more successful than others, there are also contracts, that almost equally important within the same sector. There are both differences and regularities among contracts besides the differences signalled above by distinguishing three basic forms of contracts. Differentiation among contracts involves three factors (c.f. Ménard, 1997:7):



- duration. The fundamental relationship is that the more specific the investments are the more continuity matters, and so the longer the duration of the contract;
- degree of completeness with regard to several specific variables, such as price qualities quantities, delays, and penalties. The degree of completeness tends to decrease when specificity of assets and uncertainty increase, the trade-off being between flexibility and security;
- enforcement procedures.

Besides the differences we can explore regularities between contracts. Regularities between contracts are (c.f. Ménard, 1997:7-8):

- there are only a few type of incentive mechanisms when it comes to fundamental design, although the actual provisions may vary largely from one contract to another (piece rate systems, hourly wages, share attributed to managers, return on assets paid to owners, and rent divided among legally independent partners to a joint project, are the basic schemes);
- adaptation mechanisms implemented by contracts are very limited in their variety (Market prices, forms of command, co-operation, and related enforcement procedures are the essential ones);
- the institutional embeddedness of contracts. Their desirability, their feasibility, and their credibility contribute largely to the efficiency or failures of contractual arrangements.

In table 11.2 we introduced several characteristics of different types of contracts. We will now elaborate on aspects of the asset specificity and safeguards. For the explanation we will follow the simple contractual schema from Williamson (1996:61-63). We use  $k$  as a measure for transaction specific assets and  $s$  as the magnitude of any safeguards. Assume that a good or service can be supplied by either of two alternative technologies. One is a general purpose technology ( $k = 0$ ) and the other a special purpose technology ( $k > 0$ ). The special purpose technology requires greater investment in transaction-specific durable assets and is more efficient for servicing steady state demands. A  $s = 0$  condition is one in which no safeguards are provided: a decision to provide safeguards is reflected by a  $s > 0$ . Safeguards can either take two forms (Williamson, 1997:38):

- Credible interfirm commitment. Craft added supports to the contract, whereby penalties to deter breach are introduced, added information disclosure is provided, and specialised dispute settlement machinery (e.g. arbitration) is devised.
- Taking transactions out of the market and organising contracts under unified ownership where hierarchy (to include fiat) is used to effect co-ordination.

Figure 11.1 facilitates the comparative institutional analysis by emphasising that the technology ( $k$ ), contractual governance ( $s$ ) and price ( $p$ ) are fully interactive and are determined simultaneously. Transactions located at node A do not need protective governance structures ('ideal' market contract). Transactions that involve transaction specific investments ( $k > 0$ ) are effectively engaged in bilateral trade. Transactions at node B are apt to be unstable contractually (contractual hazards). Such hazards will be recognised by farsighted players, who will price out the risk in the contract (Williamson,

1997:39). There could be a tendency to introduce safeguards or to use a general-purpose technology.

Figure 11.1 gives an overview of contracting outcomes dependent on the several options concerning contracting.

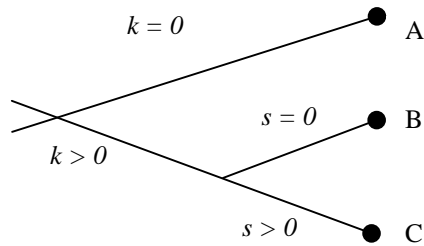


Figure 11.1 A simple contracting scheme  
Source: Williamson (1996:63).

Transactions located at C incorporate safeguards ( $s > 0$ ) and thus protected against expropriation hazards (hybrid contract). Inasmuch as price and governance are linked, parties to a contract should not expect to have their cake (low price) and eat it too (no safeguard) (Williamson, 1996:63). Safeguards, under this conception of contract will progressively build up as asset specificity increases. In the limit, interfirm contracting will be supplanted by unified ownership (vertical integration) (Williamson, 1997:15). Williamson (1997:47) extends the contracting scheme by introducing hybrid forms, the firm, regulation and the public bureau. When safeguards are incorporated ( $s > 0$ ) there could be market safeguards which result in a hybrid form contract or administrative safeguards. The administrative safeguards could be private which results in a firm or public bureau. Finally, the administrative safeguards can result in regulation or a public bureau. Williamson (1997:46-47) sees the public bureau as the organisation form of the very last resort.

According to Ménard (1997:2) the enforcement procedures are the procedures necessary for most contracts to be implemented and/or adjusted. Ménard (1997:4) emphasises that, with the possible exception of 'classical contracts' which correspond to agreements that are essentially self-enforcing (e.g. spot markets) all these forms of contractual problems raise problems of enforcement, encapsulated in the 'safeguards' variable. We already paid attention to the existence of safeguards and the role of law in contracting. We also paid attention to different forms of safeguards: market/administrative; public/private and regulation/public bureau.

Table 11.3 Contracts, governance structures, and enforcement procedures a)

		Complete contract?	
		No	Yes
Complex Contract?	No	<i>Firms</i> Private ordering (I)	<i>Markets</i> Self enforcing (II)
	Yes	<i>Hybrid forms</i> Mix of private and public ordering (III)	<i>Agency</i> (IV)

a) Italics indicate the governance structure; underlined terms indicate the dominant type of enforcement procedures.

Source: Ménard (1997:24).

Table 11.3 gives an oversimplified, but synthetic view of interdependencies between the characteristics of contracts, the governance structure, and the mechanisms of enforcement that tend to prevail.

The diversity of contractual arrangements and its analysis suggests that contracts are more or less complete and more or less complex. Incompleteness results from bounded rationality. A bounded rational individual attempts to maximise but finds it costly to do so and, unable to anticipate all contingencies, and aware of this inability, provides ex ante for the (almost inevitable) time ex post when an unforeseen contingency will arise. Given this insight, the theory of incomplete contracts emerges as an inevitable development (Kreps, 1990:745). The incompleteness of contracts will increase with the specificity of assets involved, i.e. from markets to hybrid forms and to firms. There could be a reliance on incomplete contracts if economic agents were wholly trustworthy. But realistically, since there is, in Williamson's phrase, 'self-seeking with guile', and since it is normally very costly to distinguish opportunistic from non-opportunistic actors ex ante, comprehensive contracting breaks down (Furubotn and Richter, 1997:4). According Ménard (1997:13-14) complexity is likely to be its peak with governance structures of the hybrid form, with its combination of autonomy of rights and tight co-ordination of transaction.

Within firms (table 11.3:I) private ordering prevails (nonlegal sanctions), with very few interference's from the judiciary. On markets (table 11.3:II) contracts are largely self-enforcing, with the institutional environment interfering only in last resort, through credible arbitrators. Hybrid arrangements (table 11.3:III) are enforced through a complex set of rules, mixing private ordering, i.e., an authority acting as the government of interdependent firms, and public ordering, i.e., the legal rules and political arrangements regulating this class of governance structure (Ménard, 1997:25).

The fourth quadrant (table 11.3:IV) represents no specific governance structure. According Ménard (1997:25-26) this is typically the territory of Agency Theory, which considers all forms of contractual arrangements as a continuum, making governance structures irrelevant. Contracts tend to be complete, although they may have to be very complex. Agency theory is continuously looking for the optimal contract, in which built-in mechanisms would also be self-enforcing. According to that perspective, there is almost no room for enforcement procedure other than the built-in mechanisms (c.f. 1997:26).

## 11.5 Contract Theory: the case of nature conservation

In the previous section we paid attention to co-ordination and contracts from a theoretical point of view. In this section we discuss several types of governance structures used to co-ordinate nature production. As we have seen before most of the mechanisms are more or less vulnerable to co-ordination problems (market and non-market failures). In the ideal market no co-ordination problems will arise; everything is co-ordinated by the price mechanism. In this section we will explore co-ordination problems in nature conservation in the Netherlands. The contractual relationships are illustrated in figure 11.2. We are mainly interested in contractual relationships in which farmers participate: A<sub>4</sub>, A<sub>5</sub>, B<sub>1</sub>, B<sub>2</sub>, and C.

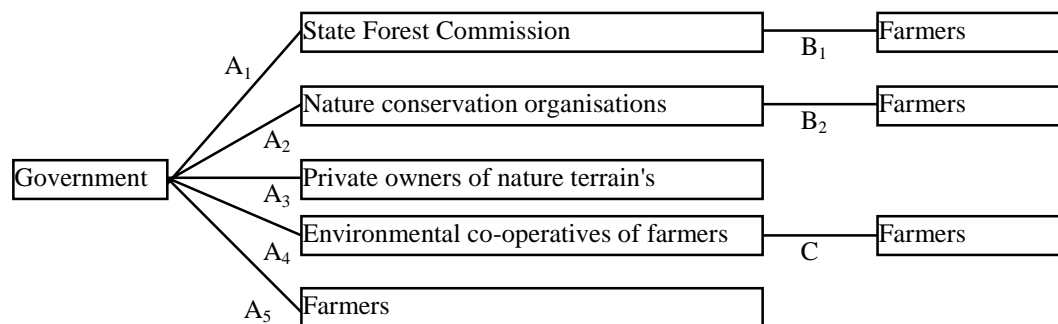


Figure 11.2 Relations in nature conservation in the Netherlands. The different arrows refer to sets of relations

At the moment (end 1998) we have in the Netherlands about 50 environmental co-operatives of farmers (more than 4,000 farmers and about 50,000 ha), which have an agreement with the government to achieve certain targets and agreements with individual farmers to carry out certain tasks (case A<sub>4</sub> and C). The type of contracts varies among and within the co-operatives. Contracts for grassland birds are quite common. Other possible contracts are for instance botanical grassland management (field margins) and small scale nature development. The environmental co-operatives often work together with volunteers for controlling the nature production. Controlling is labour intensive and presumes knowledge about the flora and fauna by both the farmer and the volunteer. At the moment we do not have much experience with agreements between environmental co-operatives of farmers and individual farmers due to the relatively short period that co-operatives exist. The contract would be a neo-classic type; the enforcement mechanism is a mix of private ordering and self-enforcing and the governance structure is hybrid. Arrow A<sub>5</sub> refers to the government who concludes different types of agreements with individual farmers. The most important types are:

- *Maintenance agreements*

Under maintenance agreements, farmers are obliged to maintain, in a specific way, one or more 'nature elements', such as hawthorn hedges, windbreaks or pollarded willows, pools, in exchange for compensation. An important incentive mechanism are the hourly wages.

- *Management agreements*

The most important characteristic of management agreements that farmers must eschew certain treatments, and hence land use is restricted. The totality of the management obligation to which the contractor binds himself and the compensation to which he is entitled are referred to as the management package. These management agreements are mostly passive in nature conservation; certain management activities are modified (e.g. mowing or livestock grazing are postponed), or scrapped (e.g. fertilising, scarifying). The compensation farmers receive is intended to compensate for the resulting production loss.

- *Agreements based on compensation for 'products delivered'*

The reward for 'nature production' depends on the results, i.e. on the 'products delivered': for example, a payment per clutch of eggs of certain rare meadow bird species, or a payment proportional to the number of rare plant species found in field. An important incentive mechanism is the 'piece rate system' and the enforcement procedure is mainly self-enforcing.

The governance structure of these agreements could be 'market' or 'hybrid'. Simple maintenance agreements or management agreements like the 'less favoured areas' agreement have the character of a classic contract. The degree of asset specificity is small, just like the complexity of the safeguards clauses. That is not the case with management agreements like 'grassland bird management'. The degree of asset specificity is much higher and the safeguards clauses are more complex. It is more a neo-classic contract. Agreements based on compensation for 'products delivered' are contracts which are largely self-enforcing. The role of prices is important. However the degree of asset specificity is high. The latter aspect makes it more a neo-classic than a classic contract. Generally spoken the governance structure of the agreements (a), (b) and (c) together is hybrid.

In the case of the contractual arrangements  $B_1$  and  $B_2$  farmers are often contracted to perform some tasks according to specified standards in a given time period, like mowing of grass at a given period at a rent, grazing of animals against at a rent. This type of contract has often the character of a classical contract. The duration could be short; the price as incentive is an important decision variable; the degree of asset specificity is limited just like the complexity of the safeguards clauses. In case of difference of opinion is private ordering (contract law) the enforcing mechanism. On the other hand we also see in actual practice long-term relationship based on trust. In that case we have more to do with relational contracting. But in case of difference of opinion the enforcing mechanism stays contract law.

In the case of  $B_1$  and  $B_2$  the farmers are not the owner of the land the parties agree on other contracts. The (nature) lease contracts are part of the Dutch Agricultural Holdings Act <sup>1</sup>. It is possible to lay down extra obligations to conserve nature in the lease contract when the land is part of certain reservation areas. Agricultural lease is a civil contract, but there is a large amount of public intervention in the contract. Land Chambers (entrusted with supervision of contracts of agricultural lease) and the agricultural chamber of the subdistrict courts (entrusted with jurisdiction in case of agricultural lease) play an

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<sup>1</sup> Article 70a. Agricultural Holdings Act.

important role (Hartkamp and Tillema, 1995:200). A part of the arable land owned (historically special) by this organisation are meant to be preserved as arable land (e.g. landscape characteristics and special species). Farmers (or private firms) are contracted to perform some tasks according to specified standards in a given time period.

The most important characteristics of the contracts between the parties presented in figure 11.2 are summarised in table 11.4. The relations between the different parties are given in the columns. The attributes give the distinguishing attributes of governance structures. This table is related to table 11.1.

Table 11.4 Classification of characteristics of relations a)

Governance structure attributes	A <sub>1</sub> hierarchy	A <sub>2</sub> hierarchy	A <sub>3</sub> hierarchy	A <sub>4</sub> hybrid	A <sub>5</sub> hybrid	B <sub>1</sub> hybrid	B <sub>2</sub> hybrid	C hybrid
Incentive intensity	0	0	0	+	+	+	+	++
Administrative controls	++	++	++	+	+	0	0	0
Adaptation: autonomy	0	0	0	0	++	++	++	++
Adaptation: co-operation	++	+	+	0	+	0	0	+
Contract law	0	0	0	0	0	0	0	+
Characteristic of contract	relational	relational	relational	neo-classic	neo-classic	neo-classic	neo-classic	neo-classic

a) ++ = strong; + = semi-strong; 0 weak.

In section 11.4 we discussed asset specificity as a variable to classify contracts; here we will explore the specificity of nature preservation contracts. Site specificity plays an important role for nature conservation. For instance, acquiring and managing protected areas as well as encouraging appropriate wider countryside measures (through agricultural incentive mechanisms) is important in order to maintain key concentrations of grassland birds. However, these measures alone will not be sufficient to conserve viable national and international populations throughout their ranges (c.f. Beintema et al., 1997:269). We can also argue that there is a form of time specificity: when an agreement is crafted the principal wants the farmer to continue for several years because the continuation of a conservation agreement is important. For instance, with continuity on 75% of the parcels in an area, a stable population of grassland birds can be achieved. When there is continuation on only 50% of the parcels (shifting after 7 years) the population will still decrease.

In normal conservation areas only one percent of the farmers yearly quit their conservation agreement (DLG, 1996:15). For a farmer continuation is important because he will be investing in nature conservation: he is making transaction specific investments. Human assets involved are also important because of the knowledge needed to carry out management agreements. For grassland birds this point is less important than for recognising species such as plants. Physical assets can also be quite important; for instance old grown hawthorn hedges cannot be replaced within week by hedges with the same characteristics. Dedicated equipment is less important. From the previous discussion we

can conclude that asset specificity can play an important role in the agreements concerning nature conservation.

From the existence of asset specificity in nature conservation contracting we can conclude that there is a degree of mutual dependency between the government and the farmer after the first time contracting. Depending on the degree of dependency the number of safeguards plays a more or less important role and 'ideal markets' are more or less useful. Contracts on these markets (classical contracts) are very specific, with prices as the variable of adjustment, and are easy to monitor; courts can implement them (Ménard, 1996:158).

## **11.6 Summary and conclusion**

In this paper we used the transaction cost approach for analysing nature conservation contracts. One of the key elements of the approach is the governance structure. The essence of Williamson's account of contractual governance is that particular mechanisms or structures will emerge as a response to characteristics of transactions, in terms of the degree of asset specificity (the extent of relation specific investments) and the frequency of contracting. The relevant criterion for comparing contract forms is to which extent an outcome, for which no superior alternative can be described and implemented with gains, is presumed to be efficient.

Within the same setting of nature conservation several governance structures exist. In this paper we focused on those relations in which farmers are involved. The asset specificity's results in a degree of mutual dependency, which has consequences for the appropriate governance structure. Hybrid and hierarchical forms are quite common in nature conservation. Most of the contracts are relational or neo-classical contracts, although some contain classical elements.

In practice it is difficult to come to a perfect and fully discriminating distinction between the several contract types in nature conservation. Many contracts have several aspects of different co-ordination mechanisms. This paper is a first step in a project concerning institutions and incentives to combine agriculture with the conservation of wildlife and landscape.

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