

PROBLEMS OF POLYCENTRIC GOVERNANCE IN THE GROWING EU

Integrative and Segregative Institutions

by

Konrad Hagedorn

Humboldt University Berlin
Chair of Resource Economics
Luisenstrasse 56
10099 Berlin
Germany

Phone: + 49-30-2093 6305

Fax: +49-30-2093 6497

E-mail: k.hagedorn@agrار.hu-berlin.de

www.agrar.hu-berlin.de/wisola/fg/ress/

(First Draft, please do not quote!)

© 2005 Konrad Hagedorn

Paper presented at the TransCoop Workshop on
"Problems of Polycentric Governance in the Growing EU"
Berlin, June 16-17, 2005

Preliminary Remark

This is the first draft of an introductory paper to this topic. It still has to be completed and corrected. For this reason, criticism and recommendations are very welcome; additional ideas and contributions may help to improve the quality of the paper. It represents the start of a research process on integrative and segregative institutions. Therefore, comments on the framework and the methodology of this research process are also very welcome.

1 Introduction

In the theory of institutions, many categories and differentiations regarding institutions and governance structures have been created. What classes and types of institutions are used in the various institutional approaches, often depends on the discipline of social sciences they originate from and the authors who have different notions of the institutional world and different preferences regarding the suitability of terms. Most institutional scientists distinguish between institutions as rules and governance structures as the organisational solutions for making rules effective (e.g. Ostrom, North, Bromley). In contrast, others maintain that the term institutions covers both rules and organisations. For example, Williamson (2000) has introduced the terms “institutional environment” and “institutional arrangements”, the latter being more or less identical with “governance structures” and the first covering a subset of rules, that includes only the formal ones. In his “four levels of social analysis” he attributes “informal institutions” to the level of “embeddedness” in social traditions and norms.

Furthermore, distinguishing between formal and informal rules is certainly very popular, but it is often not clear how to draw the borderline between them. Are formal institutions those which are somewhere written, or should be prefer more thoughtful definition that calls formal institutions those which are explicit in the perception of the actors following these rules, and those which are implicit, informal rules (see, Theory of Conventions; e.g., Morand and Barzmann, 2004). Very plausible are differentiations of rules according to logical levels, for example, metaconstitutional, constitutional, collective choice and operational rules (Ostrom, 1998; Kiser and Ostrom, 2000). Property rights theory has its own categories of rules governing the cost and benefit streams resulting from the availability and the use of physical objects. In this theory, the differentiation between regimes like categories private property, state property, common property and open access is well-known. However, as property rights represent very complicated bundles of entitlements and duties which can be designed in a very heterogeneous way, other types of property rights may be found.

In addition, most institutional scientists agree that “shared mental models” or “common believe systems” represent the basis of institutions because they are internalised by the people (North, 1990; Mantzavinos, North and Shariq, 2003); thus, institutional change requires learning processes. Psychologists would use the term cognitive schemata that are

socially expected, and perhaps this would be a more adequate notion to explain internalised “interpretation systems” (Hagedorn, 1996). For the definition of governance structures we also find well established categories, for example distinguishing between markets, hierarchies and hybrid governance structures (Williamson, 2000), where cooperation also somewhere finds its place. However, the literature in political science shows that governance structures can be much more complex (McGinnis, 2002; Hooghe and Marks, 2003). The concepts of polycentricity and multifunctionality contribute to understanding this complexity (Mc Ginnis, 2000; Hagedorn, 2004).

In this paper, a new classification of institutions (and governance structures) will be introduced which seems to be of major importance for the way how social scientists – and in particular economists – could find a better way to understand complex institutions and organise enlightening institutional analysis. This is the Concept of Integrative and Segregative Institutions (ISI). This dichotomy not only provides a new terminology, it may also an innovative model of thought that improves our understanding of the role institutions play, particularly their role in safeguarding and maintaining sustainability. The ISI concept may even be as relevant as the most important one which is the differentiation between institutions as rules and organisation by governance structures. In particular, it may be useful for economists who are used to arrange their guiding concepts in dichotomies that define options and alternatives of social organisation. In the past, such a dichotomy was “the market and the state” and this still dominates the reasoning in economic studies. As analytical capacity of this traditional dichotomy measured against present requirements of institutional analysis is insufficient, the author of this paper suggests to replace it by “integrative and segregative institutions”¹.

This paper is organised as follows: First the basic ideas of the concept of integrative and segregative institutions (ISI) will be outlined (Section 2). Then we will argue that the market and state dichotomy represents an inadequate concept and terminology for analysing institutions of sustainability (IoS) (Section 3). This requires a paradigm shift towards integrative and segregative institutions which is necessary if we take sustainability seriously (Section 4). Section 5 shows the close relationship between the ISI and IoS concepts and how both integrated into an analytical framework. Finally, some examples illustrating the relevance of the integrative-segregative perspective on institutions and governance structures (Section 6): family farms in structural change, multifunctionality and institutional jointness, and coexistence of GMO farming and conventional or organic agriculture under the German law on genetic engineering.

¹ Some authors use the terms integrating institutions for specific purposes for example for integrating environmental policies into the policy making of the EU and its member states (Morand and Barzmann, 2004) or for the analysis of corruption (Tonoyan, 2003). In this paper, “integrative and segregative institutions” are considered as a more general concept for institutional analysis.

2 Basic Ideas and an Outline of the Concept of Integrative and Segregative Institutions

The ISI concepts builds on the widely agreed convention that institutions are rules of interactions between individuals and groups and also between more aggregate actors such as nations and societies. They shape the relationships between people and, provided that we “got the institutions right” , they are embedding actors in such relationships to others that enable a sustainable development. To be effective, they must be associated with adequate governance structures and be able to adjust to constantly changing technological and social conditions. The established constraints restrict the behaviour of individuals vis-a-vis other individuals, but also provide them with opportunities in social action by defining their scope of action (room of manoeuvre).

2.1 Beneficial and Adverse Effects of Transactions

Transactions represent the economic side (often being related to physical and ecological objects) of the interactions regularised by institutions, particularly in those cases where interactions refer to scarce goods and services. These transactions may be simple, for example, if only one physical entity that is homogenous and visible, has clear boundaries and is not connected with any non-intended effects and implications is concerned (like selling bricks). But transactions may also be complex, for example, non-visible, without clear boundaries, showing physical heterogeneity, consisting of many sub-units and dimensions, involving numerous actors, causing diverse and often hidden side effects and causing even impacts over a long time that may be even affect future generations (for properties of transactions see also Section 3.2). As transparency of such transactions would require much knowledge and information, they are usually connected with insecurity and risks for the actors involved.

Many transactions which must be regularised by rules and governance structures have become very complex, for example, if they are related to eco-systems. In such cases, the following two questions are relevant:

- (1) What kind of impact of his or her activities is an actor expected to take into account? This refers to both beneficial and adverse effects: Which process yielding beneficial effects is he permitted to initiate and to appropriate the positive results, and which adverse effects is he allowed to cause and to leave the negative outcomes to others? As there is no full information and complete transparency on many effects which will materialise in the processes of a transaction, for example during the production and provision of a collective good, it is important at which stage of the process entitlements to beneficial effects or liability for adverse effects becomes effective (see also Section 4.1 and 6.3). In particular, when innovations which are associated with a high degree of insecurity are implemented, this issue is relevant.

(2) What institutions (and governance structures) are able to select and attribute the adverse and beneficial effects mentioned above to those eligible or responsible in a precise and reliable way? Not only single rules, but arrangements of different rules and combinations of different types of governance may be necessary for this purpose. At this point, the concept of polycentricity becomes relevant.

2.2 An Operational Definition of Integrative and Segregative Institutions

From these general notions we can now derive an operational definition of integrative and segregative institutions. It seems plausible that this definition has to be derived from the impacts these institutions produce for the actors involved (see Table 1):

Table 1: Behavioural Consequences of Integrative and Segregative Institutions

	Integrative institutions	Segregative institutions
Beneficial effects	Appropriate all benefits	Forego some benefits
Adverse effects	Accept complete responsibility	Shift some responsibility to others

(A) Integrative institutions allow actors, who make decisions on transactions, not only to profit from beneficial effects, but thus also hold them responsible for adverse effects. Decision makers enjoy most of the benefits and bear most of the costs of their own decisions.

(B) Segregative institutions force actors who make decisions on transactions to refrain from receiving some beneficial effects, but also allow them to shift some of the burdens resulting from adverse effects to other actors. To a certain extent, decision makers forego benefits and avoid costs although they have caused them, and actors who have not participated in decision making will have costs and enjoy benefits.

In other words, integrative and segregative institutions establish different incentive structures which, over time, lead to different actors orientations. Integrative institutions require learning processes on how to organise "the whole", while segregative institutions induce learning processes including only a part of the bundle of effects of the transactions concerned. The same applies to the perceptions and motivations actors develop.

Since institutions are supposed to reduce complexity in social interaction, they are always somehow integrative and segregative at the same time. On the one hand, they are integrating the interests of those who want to be protected against adverse effects into the decision making of other actors by exposing these to corresponding constraints. On the other hand, they secure a reasonable room of manoeuvre for a decision maker, even if this may require that not all adverse effects are kept away from other actors. Accordingly, we could also speak of institutions which are more/less integrated and institutions which are more/less

segregative in nature. Strictly speaking, a frame of reference is necessary for making precise statements on which institutions should be called integrative and which segregative. The “Sustainable Area of Social Relationships” which will be defined in Section 4 could serve this purpose.

3 The Market and State Dichotomy as an Inadequate Concept and Terminology for Institutions of Sustainability Analysis

In traditional economics we are also used to a dichotomy that sounds similar to the ISI concept but is less universal and appropriate for present problems, because it does not refer to a result-oriented definition of classes of institutions (as the segregative-integrative dimension does because it is derived from the effects of regularising) but to two selected and concrete types of governance: the market and the state. This is the first reason why the concept is not neutral but biased. The second reason for this is that this concept usually implies a hierarchy: The market as a superior institution is expected to organise all transactions, and only if it “fails”, the state as an inferior institution is supposed to play a role.

3.1 Market Failure

This leads us to a few very important terms used in economics: “market failure” and “externalities”. The term “market failure” is used to suggest that, in principle, the “market” should be able to cope with all tasks of coordination. However, this view is prone to failure from the beginning. How could we expect that only one institution (and type of governance) could be able to arrange all interactions and transactions properly, if we take into account the complexity of social relations, modern technologies and economic transactions? Nevertheless, the mode of operation and the institutional capacity of markets are measured against the fictitious ideal of a co-ordination mechanism which is able to work perfectly and can be used without any costs. Such an institution, provided that it could actually exist in the real world, would be able to co-ordinate all processes of re-allocation associated with structural change of agriculture without any transaction costs. However, the diagnosis of failure or insufficiencies of markets and competition actually serves as a basis for legitimising political therapies, in the most extreme case for justifying a constitutional exemptions. De facto a choice between alternative institutions takes place, which could only be substantiated by really comparing these alternatives as regards their typical transaction costs and transaction benefits that are related to their integrative capacities as shown in Figure 1.

Obviously, the view that markets are alleged to be prone to failure is implicitly based on a comparison with a perfect mode of operation of these institutions which hardly occur in reality. Furthermore, it is implicitly assumed that they can actually be replaced by never failing political processes and instruments. However, this notion of politics based on pure

instrumental rationality has convincingly been criticised by public choice theorists who have stated that this would imply a "benevolent dictator". As a consequence, proponents of that view soon discover "policy failure", what is more or less predetermined by the logic of the concept. The discovery of policy failure has obviously motivated many liberal economists to resort to the healing powers of the market again. The unrealistic notions of the co-ordination capacity of these two institutions obvious lead to an oscillation between extremes and reasoning in extremes, instead of starting with a realistic institutional analysis that recognises the diversity of institutions and governance structures and not only argues in terms of "Market and State".

As Eickhof (1984: 4ff.; 1986a: 468ff.; 1986b: 124ff.) has pointed out, the term "market failure" has insufficiently been defined, and its economic meaning is not clearly understood. Accordingly, economists often talk about market failure although the market in a realistic view is working properly. This is due to the fact that an idealised mode of operation is taken as a frame of reference, and this implies that the actual performance of markets *must* more or less differ from this idealised norm. Such a comparison, which Demsetz (1969: 1) has termed the Nirvana Approach, in fact focuses on the difference between reality and a blissful final state, but doesn't say anything about reality and what can be achieved under realistic premises (Eickhof 1986a: 468f.). Although such a concept only enables unacceptable comparisons between notional ideal types and concrete real types of institutions, they are frequently used to justify exemptions from the constitutional rules of competition, which automatically leads to government regulation. Where the "invisible hand of competition" is said not to be effective due to alleged insufficiencies, it must be replaced by the "visible hand of government" (Eickhof 1983: 2; 1985: 64).

For these reasons, an adequate definition of market failure can only be based on really achievable and empirically observable modes of operation of markets and competition. This criticism also maintained by Eickhof (1986a: 469; 1986b: 126) leads to two important conclusions:

As long as the diagnosis of market and competition failures is based on a frame of reference that pretends these institutions could function perfectly and co-ordinate all economic transactions, we must inevitably arrive at an ubiquity of market failure. This is a cognitive barrier to a reliable assessment of the coordination capacity of markets as compared to other governance structures.

The notion that the market, in case it fails, should (and can) be replaced by only one alternative, the state, neglects the fact that the organisation of modern societies has become much more complex and heterogeneous. In other words, it is a cognitive barrier to recognising and searching for diverse institutions and governance structures that would be better adjusted to the plurality of transaction and interaction, and to finding necessary polycentric structures and relationships.

3.2 Externalities and Public Goods

The way the term “externality” or “externalities” is used in economics is closely related to the notion of “market failure” outlined above. In fact, the question arises as to “external to what” the phenomena called externalities are thought to be (see Bromley). That there are effects that are actually external in the market cannot be perceived of as a surprise, provided that we do not assume that this type of governance structure should be able to solve all sorts of coordination tasks. If they are assumed to be external to all existing institutions they can no longer be interpreted as “market” externalities. In this case, institutional economists usually use the term “open access”. Usually, discourses on “externalities” also reveal that most people share the expectation that they “should” be “internalised”. Strictly speaking, shared expectations of this sort already represent rules, at least informal ones, although these rules may still lack sufficient formalisation and implementation.

The market and the state dichotomy has also shaped our perception of what private and public goods are. In fact, there is no real definition of public goods in economics, but only one of non-private goods. More precisely, we do not define private or public goods, but market and non-market goods (the latter traditionally being assumed to be managed by the state). In other words, the traditional definition is shaped by the dominance of one institution and governance structure in our conceptual reasoning: those forming the market.

Strictly speaking, the properties of goods which are used to distinguish between so-called private and non-private goods actually refer to the feasibility and circumstances related to the transaction of the good. Which problems and particular requirements arise during the process of transferring the good from the domain of one actor into the domain of the other? (In the case of immobile goods like land not the good itself but the actors have to move!). Of course, for these features of transactions the properties of the good itself and of surrounding goods and physical matter are also relevant. Whole physical structures and ecological systems and their dynamics and transformations are involved. Thus, transactions may have many physical properties (including ecological ones) that are relevant for the choice of rules and organisational tools which are adequate for governing them in a satisfactory way.

Having said this, it is surprising that only two properties of transactions (or goods) are mentioned in traditional economics for the distinction between private and public goods (i.e. non-private goods): excludability and rivalry (or depletable). However, this can be explained by the fact that these attributes have been identified against the background of one type of institutions and governance structures dominating economic thought. The scientific terms describing the relevant features of transactions are also not restricted to the characteristics of a good or transaction; they also include a judgement on whether or not the transaction can be effectively subjected to a certain rule and governance structure. In other words, excludability and rivalry define main prerequisites for an institutional fit to markets. Extending this way of reasoning to other governance structures is equally important. For example,

includability clearly is a precondition for cooperation: a farmer living too far away from a producer group cannot be integrated into the latter. Similarly, transactions which are supposed to be regularised by a bureaucracy should have the property of “controllability” or “suitability for command and control“. In addition, many other features of transactions being relevant for the workability of corresponding rules and organisational solutions exist, for example some goods are not subtractable but grow when they are used like biodiversity.

Besides the attributes of transactions emphasised by Williamson (2000) (uncertainty, frequency and factor specificity), which are taken from the domain of private goods, other features exist and can be frequently be observed in the area of public goods: separability and jointness, e.g. multifunctionality, complexity, difficulties to standardise, stochastic character, etc. As a consequence, the question arises whether institutional economics has made enough effort to identify the heterogeneity of transactions in the real world. This could contribute to an understanding of how diverse integrative and segregative institutions must be (and in fact are) if they are expected to be able to govern transactions efficiently. Discovery and description of properties of transactions and exploring what they mean for suitable institutions and governance structures is a relevant area of future applied research.

This approach to institutions is complementary to the procedure suggested by Ostrom (2005: 25) which starts with “understanding the working rules”, then discusses “where they come from” and finally “rule following or conforming actions” of people. It may enlightening to our to start with the problem actors try to solve, that is ordering the relationships which influence the conditions of transactions they want to economise. Starting from this point, we first have to look at the properties and implications of transactions and draw conclusion regarding the impact on the emergence or design of adequate rules. This does not mean, however, to neglect the influence of actors and their forms of interaction - as well as actors constellations and orientations - on the choice of rules. “Properties of transactions” and “characteristics of actors” are both determining the process of how institutions arise, and they should not be considered as isolated variables but show manifold interrelations (Hagedorn et al., 2002).

4 Integrative and Segregative Institutions as a Necessary Paradigm Shift if Sustainability is Taken Seriously

At first glance, everybody might agree that institutions should be more integrative in nature if they are supposed to be in line with the principle of sustainability. Inappropriate agricultural practices that do not integrate concerns for nature conservation may endanger the resilience of eco-systems. Excessive energy consumption is detrimental to the stability of the global climate, because it does not internalise the greenhouse effects. Profit-oriented tourism may destroy rural cultures if it does not take into account its impact on rural society. Many examples of this sort which call for integrative institutions could be collected. Daly's (1990)

plea for recognising the complementary of man-made and natural capital is nothing else than a recommendation of an integrative strategy.

4.1 Balancing and Sequencing the Impact of Integrative and Segregative Institutions

However, an analytical framework focussing on integrative and segregative institutions must be able to produce a more balanced assessment. It can easily be understood, that a too high demand for integration may cause considerable disadvantages. For example, an entrepreneur who wants to apply a new technology faces the problem that it is more or less unknown, how serious and costly the side effects of this new technology will be, and to whom these side effects will accrue. If society holds him responsible for all possible side effects, he will hesitate to make use of the innovation because his liability could ruin his firm in the future. If many or all entrepreneurs respond in this way, neither they themselves nor society and politicians will learn fast enough about the real progress and dangers associated with a new technology. Simultaneously, society will forego potential gains in welfare from the innovation process. Obviously, it can be reasonable, to allow for some segregation in order to maintain dynamic sufficiency regarding economic and social processes.

As already mentioned in Section 2.1, it is not negligible at what phase in processes of decision making on activities of planning, production, marketing, provision, etc. integrative and segregative institutions become effective. In the centrally planned economies of the former socialist countries, for example, rules for income distribution and social security were integrated “too early” in the economic process, i.e. already in the production and provision activities. Due to the resulting distortion of economic incentives, losses of efficiency were caused. In social market economies, rules for the same purpose are more segregated from the domain of production and provision, and its burdens become effective after income has been generated. This example shows the importance of not only balancing but also sequencing the impact of integrating and segregating in a reasonable way.

To put it another way, both integrative and segregative institutions usually cause both private costs for the decision makers and social costs. These costs are, of course, not equal in all cases, but depend on the properties of the particular transactions and the characteristics of the actors involved, as explained in Section 3 (see also Hagedorn et al., 2002). Accordingly, the costs of integration are a function of the various properties of the transactions and characteristics of the actors:

$$(1) CI = f (PT_i, CA_j)$$

Similarly, the costs of segregation depend on these factors:

$$(2) CS = f (PT_i, CA_j)$$

We will call the sum of costs of integration and costs of segregation the “costs of embedding” of actors in social relationships:

$$(3) CE = CI + CS$$

CI = Cost of integration

CS = Cost of segregation

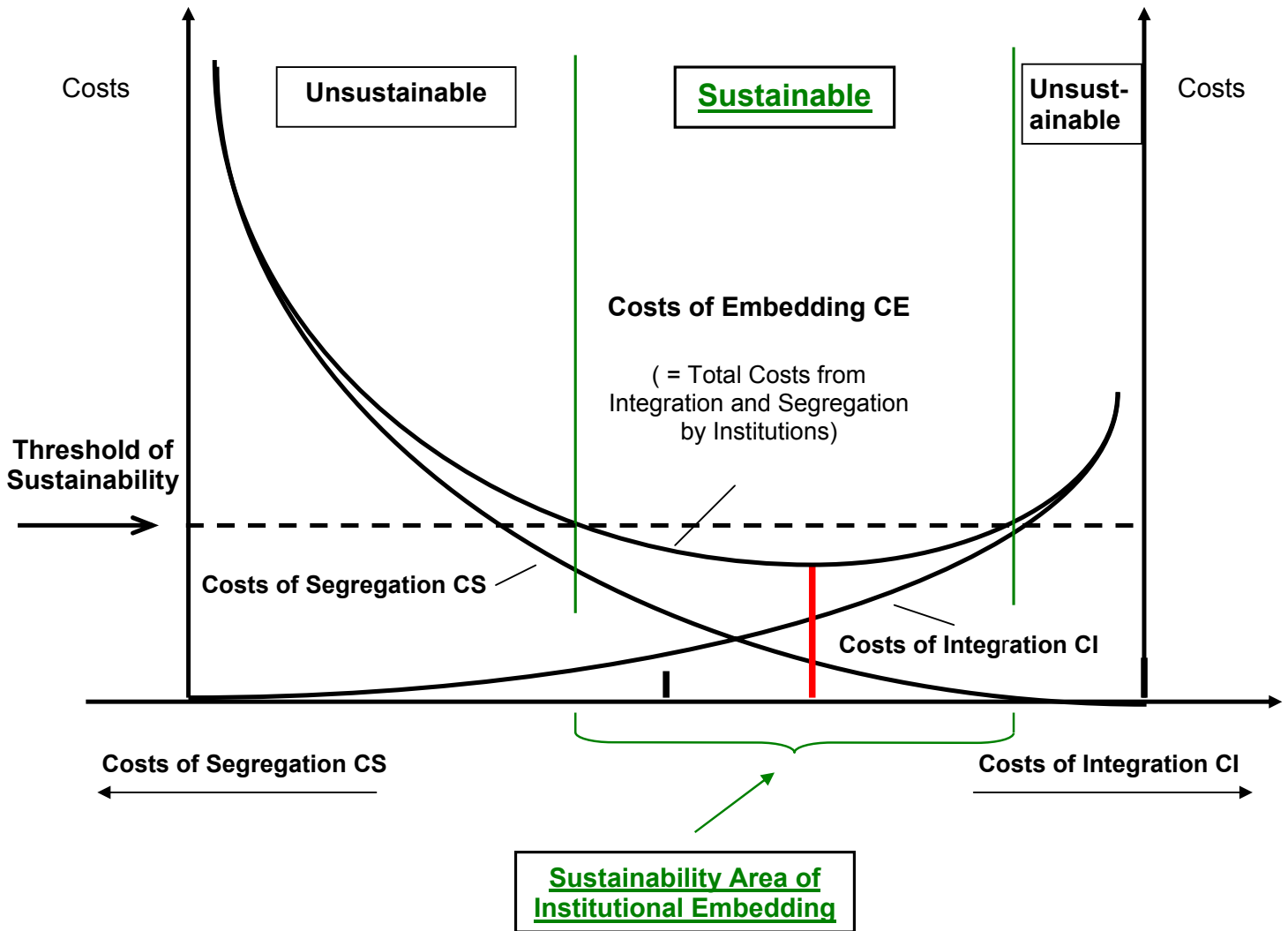
PT = Properties ($i = 1-n$) of the Transaction(s)

CA = Characteristic ($j = 1-m$) of the Actor(s)

It should be noted at this point that both integration and segregation are associated with benefits and not only with costs. Thus, the degree of integration and segregation also affects the benefits which accrue to the actors as has been pointed out in Section 3. Integration causes direct costs, for example when roundtables are organised to solve conflicts between nature conservation and agriculture or for discussing agri-environmental programmes to be adjusted to the local specificities of the ecosystem and farm structures. Equally, cost of segregation can be direct costs, for example if politicians have to produce plausible justifications for laws allowing excessive energy consumption associated with high greenhouse gas emissions. At the same time, rules and governance structures that limit integration or segregation make actors forego benefits from more integration. These potential benefits have to be taken into account as opportunity costs. Benefits from integration which cannot be collected due to (segregative) institutional constraints are opportunity costs of segregation, and vice versa.

If we now start from the principle, that rules have to be agreed upon by the individuals participating in decision making, we also have to assume, that those individuals want to avoid both the cost caused to them by integrative institutions and those resulting from segregative institutions. As shown in Figure 1, the costs of integrative institutions will increase, if more effects are integrated in the decision making of the actor concerned. Similarly, the cost of segregative institutions will be the higher, the more effects are segregated from the decision maker. Figure 1 also shows that the total cost including both components tend to increase, if the integrative and segregative aspects of institutions are in an imbalanced state. As the decision, to what extent rules and governance structures should either expose an actor to, or isolate him from, the effects of transactions he or others have caused, represents a basic contribution to the construction of social relations, we call these costs the “costs of embedding in social relationships”.

Figure 1: Embedding Actors in Integrative and Segregative Social Relationships



Institutional settings in which these cost of embedding in social relationships are too high will not be sustainable. If there is a lack of integration (too much segregation), the social and ecological systems will suffer from excessive burdens resulting from non-integrated adverse effects and will lose their stability or even their capacity of resilience. If the existing rules and governance structures demand a too high degree of integration (lack of segregation), society and economy will lose its dynamic potential and will be unable to achieve the technological and social adjustments necessary to avoid frictions and crises. This may not only result in a decline of economic welfare but also lead to a loss of stability and coherence in society and could finally negatively affect the process of civilisation. Similar consequences may if the sequencing issue already pointed out above is not efficiently solved.

Of course, it has to be found out what “too high costs of embedding actually means. This is matter of empirical research and social discourse in which politicians, scientists, journalists, writers, administrators, NGOs and other public actors may play a stimulating role. This may lead to a better understanding of the threshold of costs of embedding beyond which sustainability becomes unlikely (see Figure 1). The “Sustainability Area of Institutional Embedding” derived from that can be considered as a frame of reference for determining when institutions can be called integrative, and when segregative.

4.2 Plurality and Diversity of Families of Transactions and Families of Actors

Obviously, transactions between actors, due to the diverse and complex properties they have, require different kinds and combinations of institutions and governance structures. In this respect, some transactions may be more similar, others more different. From this point of view, it appears instrumental to look for families of transactions, or perhaps more precisely, families of properties of transactions, which fit to certain types of rules and organisation. Such families of transactions may differ with regard to the need of integrative or segregative institutions, i.e. may have different CI and CS curves in Figure 1. Equally, there certainly are different families of actors, or families of characteristics of actors. Also for this case, the integrative-segregative dimension may be reflected in different CI and CS curves. The CE curve depends on the resulting aggregated effects and may have different forms which can be interpreted in a way that resembles the interpretations used in the Economic Theory of Constitutions (see, for example, Kirsch, 1997):

(2) In those cases where the CE curve in Figure 1 has the form of a “U”, the integrative-segregative dimension may be relevant for the design of institutions and governance structures, because the actors are not indifferent as regards different degrees of integration and segregation.

(3) Whether or not the integrative-segregative dimension is actually relevant, depends on the sustainability threshold and on to what extent the “U”-shaped CE curve is located above or below it, the latter section representing the Sustainability Area of Institutional Embedding.

(4) The more the actors consider the cost of segregation CS important, the more the “U”, the Sustainability Area of Institutional Embedding and the minimum of the costs of embedding M are located at the left side of Figure 1. Actors want to be well protected against the effects of a high degree of segregation and accept relatively high levels of integration.

(5) The more the actors consider the cost of integration important, the more the “U”, the Sustainability Area of Institutional Embedding, and the minimum of the costs of embedding M are located at the right side of Figure 1. Actors want to be well protected against the effects of a high level of integration and accept relatively high degrees of segregation.

(6) The steeper the slopes of the CI and CS curves are, and the higher the resulting CE curve in Figure 1, the more costly is it to solve the problem of embedding actors adequately in social relationships by choosing the right institutions and governance structures. In such cases it will demand considerable efforts to convince people that this is an important task and that it will be rewarding to devote some of their resources to institution building².

(7) The more narrow and skewed the CE curve in Figure 1 is, the more concerned the actors involved will be by the issue of finding effective and efficient rules and organisational solutions for sustainability. They consider this an urgent problem because the Sustainability Area of Institutional Embedding where the costs of embedding are low and do not exceed the Sustainability Threshold is rather small. The more the institutions and governance structures that emerge unintentionally or have been intentionally designed fail to hit this small corridor, the higher will be the cost of embedding which the actors have to cope with. In contrast, if the CE curve is flat, actors are more or less indifferent as regards this question.

5 The Relationship between the ISI and IoS Concept

We have already pointed out in Section 4.1 that the integrative-segregative dimension of institutions is of mayor importance for the social organisation of sustainability which requires, in our terminology, "Institutions of Sustainability" (IoS) (Hagedorn et al., 2002). The question arises as to how the logical link between ISI and IoS can be conceived of and how this connection can be consistently integrated into an analytical framework. For this purpose, the following steps seem appropriate.

5.1 Linking the Integrative-Segregative Dimension and Institutional Change and Design

We first have to identify those properties of transactions for which the integrative-segregative dimension is relevant. As it would often be too costly to establish rules and governance structures especially adjusted to single transactions, families of similar (and possibly coherent) transactions should be arranged, which match with corresponding types of rules and organisation (as already mentioned in Section 4.2). As the same is true regarding the characteristics of actors, the question of course arises whether analogously designed families of actors would match with the designed families of transaction. Although it is neither feasible nor reasonable to separate actors and the transactions they undertake, they may belong to families which are not congruent in terms of their institutional fit. If both sorts of families do not show the same institutional fit, they would - in an isolated view – call for different institutions and governance structures. As a consequence, incompatibilities may have to be overcome by adequate compromises and combinations of - possibly complemen-

² The high input in terms of time and discussion required when establishing institutions by participatory processes may be a good example for action situations of this sort.

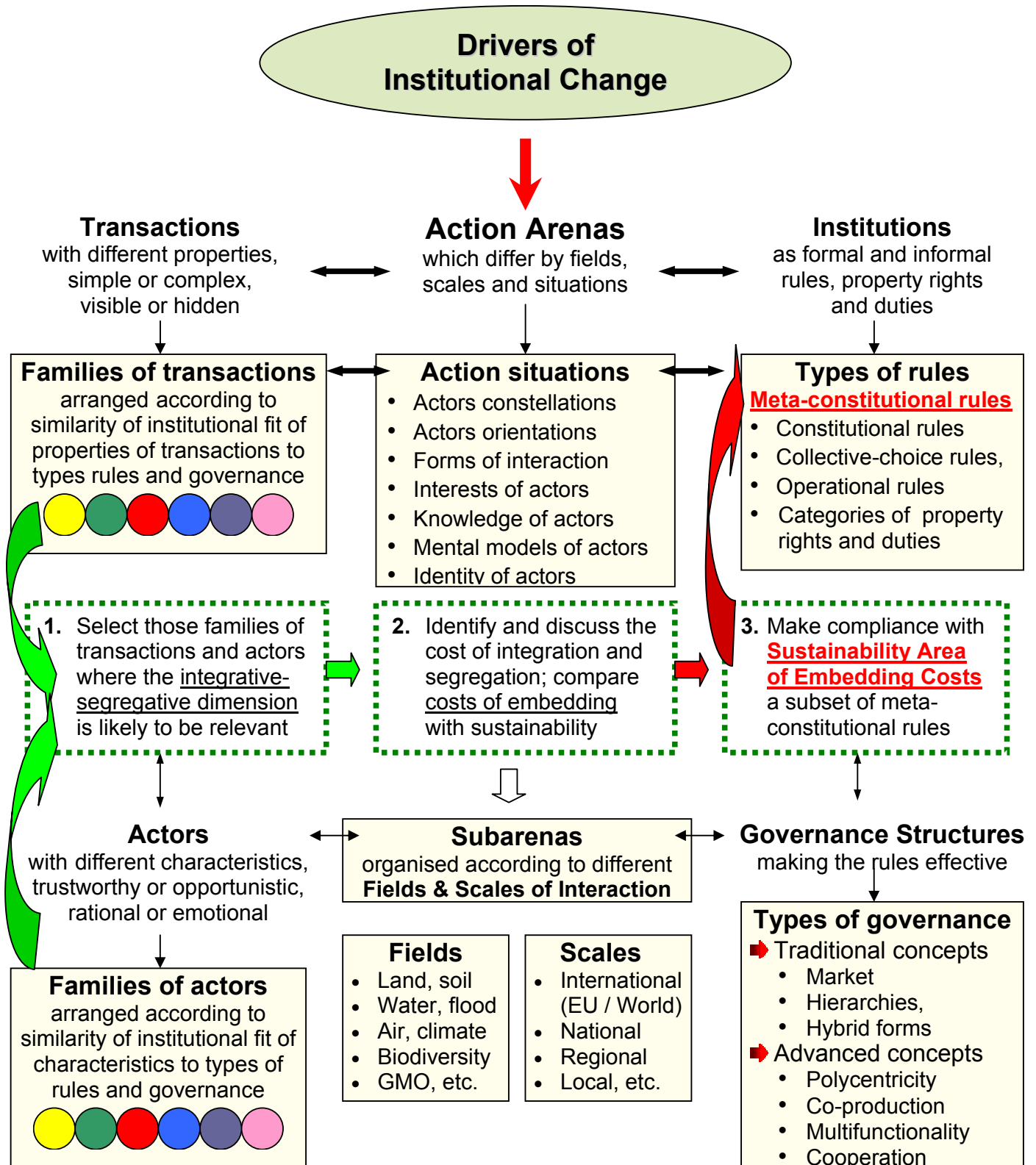
tary – types and elements of institutions and governance structures, and of course also by inventing new solutions. This calls for polycentricity and multifunctionality and represents a logical consequence of the concept of integrative and segregative institutions. For the moment, however, we may be allowed to neglect these rather complicated extension and to proceed to the next step.

Provided that sufficient information about the various bundles of beneficial and adverse effects of the transactions could be obtained, we may be able to identify costs of integration CI and costs of segregation CS as pointed out in Figure 1. As this would deliver information on the total costs of embedding CE, discourses and conclusions regarding the Sustainability Area of Institutional Embedding would be facilitated. Based on the interpretations in Section 4.2 of how the relevance of the integrative-segregative dimension for different families of transactions and different families of actors could be related to the curves reflecting the costs of integration CI and costs of segregation CS and also the total costs of embedding CE, the process of institutional choice could be organised as follows.

1. Select those families of transactions and families of actors where the integrative-segregative dimension is likely to be relevant (see Section 4.2).
2. Identify and discuss the cost of integration CI and the cost of segregation CS and compare the costs of embedding CE with the Sustainability Threshold (see Figure 1).
3. Make compliance with the Sustainability Area of Embedding Costs (delineated in Figure 1) a subset of the meta-constitutional rules to be followed when designing lower-level rules and governance structures.

This procedure which is pointed out here (in a rather simplified way) is outlined in Figure 2. It shows the (further elaborated) IOS Framework which is compatible with the IAD Framework and emphasises some additional aspects such as (a) the importance of properties of transactions, (b) the necessity of forming families of transaction and families of actors and (c) the need for a class of meta-constitutional rules for “Sustainability” which (d) result from a process of transforming the insights gained through the ISI concept into a basis for analysis and discourse which can make that regulative idea applicable. This raises the question what is meant by this process of making a regulative idea a part of the real world.

Figure 2: Analytical Framework for Institutions of Sustainability - IoS



5.2 Sustainability as a Regulative Idea Transformed into a Meta-constitutional Rule

Sustainability is often understood as a policy prescription according to a two stage logic: First, normative premises, that means political objectives, have to be clarified in order to obtain criteria for the design of political programmes: “Die Zweistufigkeit der gesamten Konzeption dient letztlich dazu, vorab eine normativ – und meist extern – begründete Vorgabe zu gewinnen, die eine plausible Handhabe bildet, die individuellen Interessen im Implementierungsprozess zu domestizieren und zu unterdrücken. Diese Strategie scheitert jedoch nicht an der Realität, sondern auch theoretisch, und zwar letztlich an der – unzulässigen – Übertragung des individuellen Handlungsmodells mit vorgegebenen Normen und gegebenen Bedingungen auf Problemstrukturen, in denen Normen und entsprechende Handlungsbedingungen erst noch gesucht und etabliert werden müssen, also auf gesellschaftliche Entwicklungsprozesse“ (Homann, 1996: 37). Homann also maintains that there ever will be a satisfactory definition of sustainability. Already searching for such a definition would be wrong. A reasonable understanding of sustainability can only be achieved after a long process of searching, learning, and gaining experience, and even then we would never definitely know what sustainability is. He recommends to conceive of sustainability as a “regulative Idee bzw. als Heuristik” (Homann, 1996: 37) that induces and guides a change in institutions. In this way, the normative content of that regulative idea is, by solving concrete problems, transformed into incentive structures which provoke modified, i.e. sustainability-oriented behaviour.

What Homann calls a “regulative idea” clearly belongs to the “meta-constitutional rules” which represents an important element in the IAD Framework developed by Ostrom (2005). Such meta-constitutional rules influence the design or emergence of constitutional, collective choice and operational rules, and the corresponding governance structures closely interrelated with institutions. Such an impact of sustainability as a regulative idea, however, can hardly be expected as long as it stays an abstract term. To make it practical and applicable to concrete problems, we can make use of the notion explained above that sustainability can be interpreted as balancing and sequencing the integrative and segregative impacts of institutions and governance structures. By developing conceptions and knowledge about Sustainability Thresholds of embedding costs, members of society will be enabled to communicate about the Sustainability Area of Institutional Embedding hopefully supported by enlightening contributions from scientists. In this way, the regulative Idea “sustainability” may more and more become an applicable meta-constitutional rule.

At this point of our discussion we have constructed the main instruments to interweave the ISI and the IoS concept. As demonstrated in the left side of Figure 2, among those families having similar properties of transaction and characteristics of actors there are at least some for which the integrative-segregative dimension is relevant in terms of costs. This means that in case of an imbalanced impact of integrative and segregative institutions these “families”

may face problems of sustainability. This is reflected in those sections of the curve reflecting the costs of embedding CE in Figure 1 located above the Sustainability Threshold, for example beyond certain limits of stability or resilience. Accordingly, institutional change should be kept within the Sustainability Area of Institutional Embedding indicated in Figure 1. As show in the centre of Figure 2, this area can serve as operational tool for bridging the gap between the regulative idea “sustainability” and social reality by making it an applicable meta-constitutional rule. The left side of Figure 2 shows how this meta-constitutional rule can be put into practice, so that it can be followed when designing lower-levels rules and governance structures.

Finally the question arises, of what specific nature the influence of the regulative idea “sustainability” on rules and organisation will be. Although this question cannot be answered in detail, the following considerations seem plausible: In reality those problems for which the integrative-segregative dimension play a role, that means which may face non-sustainable developments, often refer to transactions which are very complex, extremely heterogeneous and difficult to standardise. The interactions related to these problems and transaction can often only be governed by institutions and governance structures which are similarly complicated, differentiated and adjusted to the specificity of the coordination tasks. This substantiates the hypothesis that at the level of rules institutional diversity and connectivity, and at the level of governance structures polycentricity and multifunctionality will play a predominant role for institutions of sustainability.

6 Some Examples Illustrating the Relevance of the Integrative-Segregative Perspective on Institutions and Governance Structures

6.1 Family Farms in Structural Change

Integrative institutional systems can, for example, differ from segregative institutional systems in two aspects: first, property rights (and duties) may be attributed to economic actors in a different way, and secondly, the specific governance structures for using these property rights and to fulfil duties may differ as well. This refers to bundling of property rights in the hands of one actor, or one group of actors (the farm family), and to joint governance of those production factors this group can dispose of (the family’s labour, land, capital and other assets). This can be illustrated by the following properties of the family farm system (see Hagedorn, 1996; 1997; 2003a,b):

- (a) The farm family usually possesses several own production factors at the same time, in particular labour, capital and land and not only one of these assets. In the most cases, they are jointly allocated together with some additional factors, provided by external actors.

- (b) The family members are not only owners of production factors, but also provide the management. In addition, a specific feature can be seen in the wide spectrum of management tasks covered. This results from the small size of farms that is due to the transaction costs structure of agricultural production, and differs from many non-agricultural firms where segregation and specialisation in the area of management can often be observed.
- (c) Engagement for the family, the household and for the profession are intertwined both in terms of time allocation and organisation of activities. This is reinforced by the fact that often several or all family members feel committed to the same profession and/or live at least in the same household, even if one or several of them have another part-time or full-time occupation.
- (d) Economic decisions for the private household and the agricultural firm are taken in close interdependence. This, for example, often applies to the question whether savings are to be spent for the purchase of durable consumer goods or for investments in the farm.
- (e) Production processes in the agricultural firm and others usually characterised as “household production” or “shadow economy” are less than in other areas of the society seen as separate spheres of economic activity with different priorities and unequal social legitimacy, but can be harmonised more easily and are regarded as equally justifiable. In addition, the families’ household economy provides the members of the family with the certain degree of social security.
- (f) Work time and free time are not subject to collectively agreed and formally fixed time schedules although there may be some intra-family agreements on time co-ordination. The resulting opportunities for flexible co-ordination of work time and free time may often be considered as an advantage, whereas the tendency to increase work time in order to compensate for income problems may be felt as a disadvantage.
- (g) The spatial proximity of farm buildings and living quarters usually existing in agriculture, together with the flexible shaping of work time just mentioned – encourages and facilitates mutual penetration of private and professional concerns. For this reason, for example, caring for old people and educating children can be more easily harmonised with the work on a family farm than with employment out of house. A clear indicator for this is that foundation of family starts much earlier in the agricultural population than in other groups (also due to the desire to have a farm successor as soon) and the relatively high number of children of farm couples (see, for details, Hagedorn, 1996; 1997; 2003a,b).

We will focus on one aspect which is the different impact of integrative and segregative institutions on transaction costs of decision making, which, as a further consequence, influences effectiveness or attenuation of property rights. Economic actors may be able to strengthen their own property rights and to weaken those of other actors, and opportunities

of this sort may be different between integrative and segregative institutions because they may affect benefits and costs of transactions in the following way:

(1) Decision makers may not be able to collect all components of benefit of his or her factor re-allocation activities completely, or this is only possible by incurring prohibitive costs.

(2) Decision makers may be successful to burden other actors with some cost components resulting from his or her factor re-allocation activities without incurring prohibitive costs.

These two phenomena are of major importance for the institutional performance of the family farm system: Farm families working in an integrative institutional system have to internalise a larger number of aspects and transactions – and accordingly also higher transaction costs – into their decision making processes, and are only able to externalise less of them, than economic actors working in segregative institutional systems.

6.1.2 Reasons for the Internalisation of Transaction Costs

Integrative institutions like the family farm lead to an “*institutional cumulation of transaction costs*” because the costs of factor mobility not only accrue to the individual members of the economic organisation “family farm” in a separated way, but are at the same time jointly and as a whole taken into account in the collective decisions of the farm family on factor re-allocation. In segregative systems such decisions are taken in a separated way, and are only based on a part of the total transaction costs. This cumulation of transaction costs does not mean that mobility costs are higher in absolute terms, and that this would be the reason for a delay in structural change. Instead, we assume that the costs of re-allocation for an aggregated factor unit consisting of labour, land, capital, management, etc. are equal. In spite of this, higher transaction costs would be attributed to each act of decision making by an integrative institution than by a segregative institution. This can be illustrated by the following examples:

(1) A farmer on a family farm will internalise more costs of factor mobility because he is taking the respective decisions in personal union as landowner, capital provider, employer and employee. The production factors corresponding with these functions are combined within a family farm in such a way that one factor can only be effectively used if the other factors also remain in the farm. If one factor is taken out of the production process, also the other factors can no longer be employed and may be subject to a costly process of transfer into other uses. If one factor is intended to be re-allocated, not only the costs of mobility of this factor, but also those of the other factors have to be taken into account. In more general terms: the costs of re-allocation originating from the different elements of the institutional system cumulate. For example, a farmer may consider it profitable to allocate his own labour outside agriculture, but this would cause him such high capital losses that it is rational for him to refrain from the re-allocation of his labour. In contrast, in segregative institutional systems

those costs of change accrue separately to different actors and have an isolated impact on mobility decisions. For this reason, in many branches outside agriculture such decisions on mobility are made faster than within family-based agriculture.

(2) A similar case in which costs of re-allocation are internalised by the institution “family farm” results from the fact that the farmer influences, by means of his decision for or against mobility, the utilisation of the production capacity, in particular of labour, of his collaborating family members. If he gives up the farm, his spouse, his farm successor and other collaborating family members have to look for another gainful employment, provided that they want to (or must) continue to contribute to the family income. The farmer feels the consequences of his mobility decision directly, because incomes changes in his own family, and his family members will also let him know whether they agree or disagree with his decision.³ Even if in segregative institutional systems a mobility decision would have similar impacts as regards transaction costs, such immediate tacitility would not exist because loss of employment would nearly always concern other persons and families.

(3) In principle, the same is true not only for the decision of a farmer to improve his income from his own labour force by leaving the agricultural sector. It also applies to the attempt to achieve a similar result by detaining new labourers from entering agriculture. This is customary in other branches of the economy where, for example, legal entrance qualifications regarding professional training or academic education exist or the number of persons admitted to work in the branch is limited directly in an administrative way. If a farmers’ union would demand similar regulations, this would be directed against the farm successors in agriculture and, accordingly, against the own daughters and sons of the farmers. At the same time, this would affect the freedom of the farm family to decide whether or not the farm is supposed to continue to exist or not.

(4) The integrative institutional system “family farm” leads to cumulating transaction costs in the case of mobility not only for the families of present farmers, but also for the families of the (potential) farm successors. There may be institutional reasons that motivate them to take over the farm from their parents. We can distinguish between management and ownership of a firm, and the institutional setting of a family farm unifies these two spheres. Furthermore, farms are mostly owned by the farmers themselves and the proportion of rented land is relatively low. As a consequence, the choice of farming as a profession is closely connected with the decision of the potential farm successor whether or not he wants to acquire considerable assets. In other words, he has to calculate the trade-off between the disparity in factor incomes, which he may anticipate for his future professional life as a farmer, and those positive property values which are connected with the take-over of the farm. Hence, the

³ At this point, it becomes evident why farm families show particular preference for combined incomes. This can be understood as an opportunity to avoid at least a part of the cumulating transaction costs.

institutional particularities of the family farm system may not only hampers structural change for the present, but also for the coming generation.

6.1.3 Opportunities for Externalising Transaction Costs

While the integrative institutional system provides incentives for internalising transaction costs associated with factor mobility, considerable opportunities for externalising such costs are typical for segregative institutional systems. This can be illustrated by comparing the labour market for employed workers with agricultural labour. Two basic differences in institutional performance play a major role:

- (a) Whereas farmers are interested in an adequate remuneration for their production factors in a holistic way, this interest is only partial in nature in the case of employers and employees in other areas of the economy. In the case of employees, for example, it mainly concentrates on the level of wages, the number of working hours and working conditions.
- (b) In the case of farmers operating a family farm decisions on the level of factor incomes are made by individual action, in other areas of the economy they are strongly influence by collective action. They are decided on in bargaining processes between labour unions and employer associations which are usually subject to strictly institutionalised rules.

At this point an important institutional deficit of the family farm system can be revealed: It does not offer any institutionalised solution to deal with the problems of a polypolistic supply of labour (and equally with the problems of polypolistic demand for labour). The price of labour (wages) do not change in a perceptible way if one farmer gives up his family farm, not withstanding the fact that he himself could not longer profit from this increase of income. Operators of family farms and their family members as owners of labour have no agent for collective action who offers the labour supply collectively and, in this way, tries to optimise prices and quantities (and other working conditions) for them by means of joint strategies. The same is true for farmers and their family members in their role as owners of job opportunities whose demand for (their own) labour is also not organised collectively. In contrast, in other areas of the economy large organisations developing collective strategies and playing complicated bargaining games have evolved, for example, labour unions, employers associations, and companies.⁴ Only an agent who is in charge of collective action can act as a supplier of a large quantity of labour effectively and is therefore able to defend lower thresholds of wages in a credible way. However, if agricultural production is predominantly organised by family farms, there is nobody at the level of factor allocation who takes collective decisions on the price of labour (and indirectly on the quantity of labour employed). Due to this lack of co-ordination, voice does not arise early enough and is not

⁴ Of course, this also applies to dependent agricultural employers and their employees, but does not include the family workers in agriculture to whom our analysis refers.

backed up by credible threats if factor incomes are decreasing relative to those in other branches. Another problem reinforces this inability for collective action: The farm families would have to direct this protest against themselves, because provision and utilisation of production factors are in the same hands. As a consequence of this “institutional failure” of a governance structure which could be called “too integrative”, preventive decisions in the process of structural change are made “too slowly”, limits to the decline of (relative) factor incomes are set “too late”.⁵

In particular, the following opportunities for externalising transaction costs in the process of structural change are not available to farmers subject to the integrative institution family farm:

(1) Burdens of adjustments are usually shifted to those whose interests could not be successfully enforced during wage negotiations. In wage negotiations, for example, workers may be able to get acceptance of high wage increases because their labour unions are able to communicate a credible threat to go on strike. As this will cause processes of factor re-allocation in the firms, employers have to accept corresponding transaction costs of change, due to their lack of negotiation power. In the opposite case, if the employers have turned out to be more powerful than the employees, such transaction costs of adjustment accrue to the workers.

(2) Externalisation of transaction costs of re-allocation may not only burden other groups, but also the members of one's own group. After having been successful in obtaining higher wages, workers possibly have to pay a price for that consisting of increased unemployment. Obviously, the interests of a majority in higher wages wins over the interest of a minority in more unemployment, at least to a certain degree, during the collective decision making process within the labour unions. This seems to be a result of the internal political economy of such organisations, as has been convincingly demonstrated by Berthold and K ulp (1986).

Comparable strategies to push through one's interest at the disadvantage of other economic actors, or even of “fringe groups”, are hardly operational in the family farm system, because the process of factor combination is subject to different rules. Just as an example for many other similar relationships between bundled property rights this can be illustrated by means of the relation between labour and capital: whereas outside agriculture property rights on labour and capital are put into practice *separately* by large groups of people (employers or employees), they are *jointly* used by *small* groups of people (families) in the family farm system. This leads to a *division* of interests in the first case and to a *collision* of interests in the second. Farm families are facing an *internal conflict of interest* which makes them consider the trade-offs between an alternative use of the labour and capital of the family, which both may be associated with various advantages and disadvantages. If labour intends to migrate to the non-agricultural sector, the losses of capital associated with giving up the

⁵ This also leads to the effect that there is less open unemployment but more hidden unemployment in agriculture than in other branches.

farm cannot be neglected. If capital is to be allocated elsewhere, the family has to take into account costs and risks caused by searching for non-agricultural occupation.

6.1.3 Consequences of the Differences in the Integrative-Segregative Dimension

In other words, if a branch of the economy experiences the necessity of structural adjustment, for example driven by deterioration of its price relations, adjustment behaviour will differ between integrative and segregative institutional systems. In the most non-agricultural areas of the economy, economic actors will continue in attempting to achieve parity of factor incomes by means of collective action, and in this way they will (probably non-intentionally) accelerate the adjustment process and externalise the resulting transaction costs at the disadvantage of some “fringe groups” (by elimination of firms, dismissals and increased unemployment). *Similar strategies of collective action of farmers operating a family farm will not emerge because of the internal conflicts of interests mentioned above. If those farmers would behave as organised workers do, they would harm themselves as entrepreneurs, and vice versa.* In areas with integrative institutions such as the family farm system it is not possible to organise decision making on factor remuneration and factor allocation in the same way as it has arisen under segregative institutions. As operators of family farms play the roles of employees and employers (and also other roles mentioned above) at the same time, this would require that collective action could be organised by a group against all members of the same group.

These differences lead to far-reaching consequences: Since different institutions for economic decision making have formed in family-based agriculture, different institutions for political decision making also had to evolve at the political level as well. For the reasons illustrated above, agriculture (at least as long as family farms are prevailing) cannot focus its collective strategies directly on the payment of labour, land or capital, but must restrict itself to individual and family decisions when issues of factor allocation and factor combination are at stake. Instead, collective action must be oriented towards variables and instruments which are more appropriate to the particularities of decision making in this group, for example, agricultural price support, guarantees quantitative quotas, direct payments, etc. *This type of collective action does not take place at the level where the remuneration of production factors is decided on, but is instead located at a higher level where prices for products and other components of incomes are negotiated. Negotiations on incomes between the owners of production factors are to a large extent replaced by collective bargaining between producers, consumers, tax payers, etc., or between those agents who represent the interests of these groups.*

6.2 Multifunctionality and Institutional Jointness

In European Common Agricultural Policy, the concept of multifunctionality (OECD, 2001) is interpreted as “jointness of production” of goods and services by agriculture.⁶ “Jointness” can be interpreted as existing within a production activity with a defined production function (e.g., cultivating wheat) or rather in an economic and social organisation organising a production programme defined by an institution (e.g., a family farm integrated in a network of environmental co-operatives and contracts). In addition, the main interest is devoted to the combination of commodities and non-commodities.

We use an extended concept of multifunctionality that includes different options of contributing to sustainability. Multifunctionality cannot be seen as an end in itself but has to serve more fundamental objectives. Thus, we conceive of multifunctionality as a tool for achieving increased sustainability. Having clarified this normative relationship, we can differentiate between the following perspectives on multifunctionality (see Hagedorn, 2003a,b; 2004). *Agriculture can be a producer of contributions to sustainability by multifunctionality in two ways:*

(1) By joint production of commodities and non-commodities within production activities. The rigidity of the production relationship between commodity and non-commodity outputs depends on various factors, for example, technology and intensity. Changes of multifunctionality may therefore result from corresponding changes in production functions, e.g., variations in agronomic methods. We call this “multifunctionality of a production activity” or “*technical jointness*”.

(2) By separate production in different activities, which are jointly institutionalised either within the farm firm, or even beyond the limits of individual farms, in individual and collective arrangements of farms and by rights and rules. In this case, changes in multifunctionality derive from changes of the institutional form of farming or institutional environments or arrangements related to farms, usually affecting the production programme as a whole, e.g., transformation of diversified family farms into specialised corporations. We call this “multifunctionality of a farming system” or “*institutional jointness*”.

Institutional jointness of commodities and non-commodities is based on integrative Institutions. They may replace technical jointness lost in processes of technological change.

7.2.1 Normative and Positive Understanding of Multifunctionality: Incompatibilities due to Technical Jointness with “Goods” and “Bads”

At the level of technical jointness, the internal consistency of the notion of joint production as an analytical concept for studying multifunctionality depends crucially on whether or not we

⁶ For a more detailed description and classification of the multiple goods and services provided by agriculture see Durand and Van Huylenbroeck (2003: 4, 8f., 10f.); see also Challen (2001).

focus on “jointness of *products*” or “jointness of *goods*”. This differentiation is closely related to the question whether we conceive of multifunctionality as an objective or as a characteristic of agricultural production. The first meaning dominates in the political debate, the latter is usually preferred by agricultural economists (Cahill, 2001; OECD, 1998; 2001). If we subscribe to the first view, which is a *normative* one, we only want to receive those outcomes of the physical process of production which society, or at least those who represent its preferences, desires, and these are usually only the “goods” and not the “bads”. In this case multifunctionality is a discriminating concept that does not allow for all joint products in a physical sense. It includes the positive externalities resulting from joint production in agriculture such as a beautiful landscape, but excludes negative externalities such as water pollution by nitrates. If we agree to the second view, which is a *positive* one, every outcome of the physical process of production is considered a subject of analysis, the goods *and* the bads, or the positive and the negative externalities.

In other words, it includes both, those cases in which effects of joint production are in accordance with the objectives of citizens and politicians, such as having a beautiful landscape as a by-product of agricultural production, and other cases where joint production has an impact that is in contradiction with the preferences of people and political actors like nitrate pollution of groundwater. In the latter case, fulfilling the normative demand for multifunctionality coming from the society would mean to abandon multifunctionality in its positive interpretation by dissolving the technical jointness of agricultural production and unwanted side-effects. Obviously, multifunctionality of agricultural production as it is understood in the political debate is clearly incompatible with the economists’ conception that multifunctionality is always equivalent to joint production in the sense of technical jointness. Multifunctionality as a social preference or political objective requires more technical jointness in the case of “goods” and less technical jointness in the case of “bads”.

In contrast, in the discourse on multifunctionality the term “production” is used in a more abstract way such as to “produce” a sound natural environment, soil, water and air quality, biotic and genetic diversity, a beautiful landscape, particular landscape functions, rural employment, rural viability, food security, protection of cultural heritage, etc. All these objectives certainly require numerous elements of joint production in agriculture *to be avoided* because they could be *detrimental* to the achievement of those goals. Does this go beyond the framework of multifunctionality? Clearly not, because in these cases we already have left the pure physical dimension of production processes and have arrived at more aggregate entities of allocation and at higher levels of coordination. “Production” has now become a synonym for coordination and organisation and includes what should be rather called provision. The question here is how various actors (farmers, politicians, bureaucrats, agricultural organisations, environmental NGOs or even the EU) can arrange relevant economic activities related to agriculture and rural areas in a way that make use of the multifunctional capacities of agriculture. In other words, we have left the domain of technical

jointness and are arguing at the level of institutional jointness. At this level, multifunctional agriculture can only be successfully contribute to sustainable development, if adequate rules and governance structures which comply with the Sustainability Area of Institutional Embedding discussed in Section 4.1 and 5.1 are established, and this requires a process of discourse, learning, consensus building and also accumulation of social capital.

7.2.2 Markets and Competition as Segregative Institutions Affecting the Jointness of Commodities and Non-commodities

The main motivation behind the search for such strategies arises from the observation that multifunctionality of agriculture has declined, because jointness of production of commodities and desirable non-commodities has weakened (of unwanted non-commodities increased) and, as a consequence, scarcity of the latter has grown. This raises the question, which basic (institutional) mechanisms are behind these changes.

What has been the main driving force behind the decrease in multifunctionality of agriculture to be observed during the process of “modernisation” of agriculture (and how is this related to the dichotomy of segregative and integrative institutions)? Or to put it another way: What has changed jointness of production of commodities and non-commodities? Admittedly, there may be many detailed and complex reasons behind this development, but in principle this seems to result from the dominance of segregative institutions like markets and competition, and their interplay with technological innovation. In order to explain this we have to start from the fact that “*ecosystems typically deliver multiple services jointly in non-separable bundles*.” This ‘jointness’ of the production output is a particularly salient feature of ecosystems” (Heal and Small, 2002: 1350, italics in original). Assuming that each of these outputs needs a part of the input, excluding those services which do not yield economic benefits because they are unpaid goods appears reasonable for economic actors. However, what can actually isolated from the production process depends on both technologies and institutions.

Markets and competition have been increasingly “successful” in separating those functions of the natural ecosystems and resource base which are suitable to produce commodities (that are profitable due to existing markets) from those function of the natural ecosystem and resource base which are, or are used for, non-commodities (being non-profitable due to lacking non-market institutions, or more precisely, Institutions of Sustainability). In other words, as markets and competition are only capable of attributing economic value to commodities, they failed in transacting information and remuneration regarding the value of non-commodities to agricultural producers. Due to this absence of an institutional incentive structure, focussing on non-commodities would have meant wasting input and effort.

Accordingly, exploring opportunities for further detachment of non-commodities from commodities is profitable for a farmer, but this is, of course, a question of agricultural

technologies. This corresponds with the observation “that the emergence of agriculture as a source of environmental quality problems is linked to forms of technical change that have attenuated the importance of stewardship incentives (see, for example, Strange, 1988). For example, the introduction of synthetic chemicals (fertilisers, pesticides) lowered the marginal value of the resource base of agriculture (soil fertility, natural populations of beneficials) and thus stewardship incentives. Strange (1988) and other have argued that, if the costs of environmental damage were fully internalised in farm decision making, smaller scale joint crop/livestock production would be more profitable than larger scale, specialised ‘industrial’ farming” (Lichtenberg, 2002: 1258f.).

Obviously, the segregative institutions markets and competition promoted a selection of those technological innovations which increase their institutional capacity to discriminate between the two categories of commodity. In other words, a special dynamic efficiency that affects multifunctionality by weakening jointness of production of commodities and non-commodities seems to be a characteristic of the institutionalised performance of markets and competition. This outcome raises the question how to arrive at integrative institutions (and governance structures) which in some sense work against, or at least mitigate or compensate for, the segregating impact of markets and competition. Answering this question will require considerable research in the coming decade.

7.3 Coexistence of GMO Farming and Conventional or Organic Agriculture

The European Union has introduced a directive which postulates implementation the principle of coexistence of genetically modified food and conventional or organic agriculture. In Germany, this directive has been transformed in binding liability rules that define “good agricultural practice” for those farms that introduce genetically modified plants. These rules are expected to make cultivation of GMOs possible, but also to internalise the adverse external effects associated with this kind of agriculture. In Germany, there is a broad discourse on the question in how far this concept of coexistence is technologically feasible (Soregaroli and Wessler, 2003). Genetically modified plants are becoming increasingly popular in EU agriculture. Recently a threshold value of 0.9 % has been established as a limit for the pollution seeds, fodder and fruit. If pollution exceed this threshold, this has to be declared. I view of this development, experts are convinced that a complete isolation between these two systems of production cannot be maintained in the long run (BMVEL, 2000). This would at least be associated with excessive costs and expensive re-arrangements in production structures and activities (Bock et al., 2000: IV). Even a threshold value of 0.1 % with a permitted pollution, for example for organic products, would not be feasible in the case of coexistence of the two production systems within a region.

7.3.1 The Emergence of GMO-free Zones

Unintended transfers of pollen from GMO plants to agricultural areas with conventional or organic cultivation can cause considerable economic losses which may even lead to the bankruptcy of the farms concerned. Products polluted by GMO can, for example, no longer be marketed under the label “ecologically produced” or may even be excluded from the food markets. As a response, farmers in some European countries have joined together and have declared their regions GMO-free zones. These movements are based on voluntary collective decisions and self-organised governance structures. Only in Germany more than 30 GMO-free regions exist which include more than 280.000 hectares of agricultural land (Federal Minister of the Environment Jürgen Trittin, quoted in Crollly 2004). Even in Poland one GMO-free region exists since September 2004 in the Wojewodschaft Pod Karpacie, and there are also numerous individual farms which have subscribed to binding obligations not to introduce GMO plants.

As there is a high proportion of organic farms in broad areas of Austria, here the introduction of GMO plants has caused a high pressure on these farms which see their possibilities to produce organic endangered by this new development. As a consequence, Austria farms belonged to the first who established GMO-free zones. In this context, it is particularly interesting that the federal lands Oberösterreich, Salzburg, Steiermark and Burgenland have tried to declare its complete agricultural area GMO-free zones based on decision of their Parliaments. I.e. that it would not have been forbidden by law to cultivate GMO plants in these federal lands. However, the European Commission has rejected this draft bill submitted by Austria. According to the EU directive 2001/18/EG, GMO-free zones are only permitted if they are based on voluntary agreements between the farmers involved.

The GMO-free zones which have been established or are presently in the process of being founded show considerable differences, for example as regards the number and the type of the participating farms, the size and the coherence of the region covered, the objectives of the actors associate with a GMO-free zone and the involvement of non-agricultural actors. The most important objectives are the reduction of the economic risks caused by GMO pollution, avoidance of additional costs produced by the coexistence of GMO cultivation and organic or conventional cultivation, prevention of potential conflicts between neighbouring farms, securing new markets for GMO-free products, maintenance of the trust of the consumers in regional products, and also ethical concerns related to genetic engineering. In addition, the GMO-free zones differ with regard to the process of self-organisation and the integration in project or network structures which already existed before. In many cases, organic farms took the initiative to form GMO-free zones, and also environmental associations supported this movement by providing regional structures. In other cases, the emergence of GMO-free zones resulted from public announcements by farmers unions or existing alliances against the use of GMO. The GMO-free zones have established an

information infrastructures and an umbrella organisation that provide administrative and coordinative services.

7.3.2 Do the German Rules for Implementing the Principle of Coexistence Result in too Integrative Institutions?

To date, only farms which want to protect themselves against the influence of pollen from GMO plants have formed GMO-free zones by means of cooperation. However, it doesn't seem unrealistic that in the future also farmers cultivating GMO plants will cooperate and form GMO zones in order to reduce costs and potential conflicts associated with the principle of coexistence. Both the activities of GMO-free farms and of GMO farms show that they want to avoid the high costs of coexistence and the risk of not being able to comply with this principle. In our terminology these are cost of embedding the actors in social relationships (see Figure 1 in Section 4.1); the principle of coexistence requires difficult innovations in regularising social relationships (including the economic ones).

German law on genetic engineering demands that cultivation of GMO plants must be officially approved in advance. The location of GMO field has to be registered in a land register system. This is because a neighbour of a farmer who cultivates GMO plants and is afraid to have disadvantages from that has the right to receive information on the precise plots under GMO cultivation. Special decrees define for each agricultural fruit specific rules of good agricultural practice for the treatment of GMO plants, which contains concrete prescriptions such as minimum distances, choice of varieties, establishment of barriers against flying pollen, etc. A farmer who wants to cultivate GMO has to announce this in advance and has to stick to a certain waiting period before he may start cultivation. During this period, other farmers have the right to express their concerns. GMO cultivation is subject to joint liability (or responsibility), this means that a farmer who cultivates GMO plants is in any case liable as a cause of GMO pollution even if he has taken all prescribed precautionary measures.

These conditions show, that the German law on genetic engineering actually tries to integrate as many potential adverse effects of GMO cultivation into the decision making of GMO farmers as possible. At the same time, the principle of coexistence require strict segregation between the two systems of agricultural production. As the feasibility of such forms of coexistence can be seriously questioned, also conventional and organic farms feel under pressure and respond with the foundation of GMO-free zones. A similar development is still to come in the case of GMO farms. It seems, that the high degree of integration of adverse effects mentioned above and segregation between farm types puts an extremely high burden on the agricultural decision makers which may motivate them to refuse undertaking any motivation of this sort. As a consequence, corresponding experiments, learning processes and development of technological solution and social concepts which

improve the possibilities of coexistence are unlikely to take place. This raises the question whether the costs of integration CI caused by the German law are too high and an increase in the cost of segregation CS may lead to lower cost of embedding CE. However, any conclusion whether or not the resulting institutional choice would be located within the Sustainability Area of Institutional Embedding (see Figure 1 in Section 4.1) would be highly speculative.

References

- Berthold, N. and Külp, B. (1986): Gewerkschaftsinterne Entscheidungsprozesse als Ursache inflexibler Löhne. *Jahrbuch für Neue Politische Ökonomie* 5: 174-190.
- BMVEL (2002): Diskurs Grüne Gentechnik. Ergebnisbericht: Durch den Lenkungsausschuss am 27. August 2002 verabschiedet. Berlin.
- Cahill, C. (2001): The Multifunctionality of Agriculture. What Does it Mean? *EuroChoices*, Premier Issue: 36-40.
- Challen, R. (2001): Non-Government Approaches to the Provision of Non-Commodity Agricultural Outputs: a Transaction-Cost Perspective. OECD-Workshop on Multifunctionality, Paris, July 2-3, 2001.
- CROLLY, H. (2004): Europaweit rufen Bauern gentechnikfreie Zonen aus. *Die Welt* vom 23.06.04 (Onlineausgabe).
- Daly, H. E. (1990): Towards some Operational Principles of Sustainable Development. *Ecological Economics*. Elsevier Science Publishers B.V.: Amsterdam: 97-102.
- Demsetz, H. (1969): Information and Efficiency. Another Viewpoint. *The Journal of Law and Economics* 12, No 1: 1-22.
- Durand, G. and Van Huylenbroeck, G. (2003): Multifunctionality and Rural Development: a General Framework. In G. Van Huylenbroeck and G. Durand (eds.): *Multifunctionality, a new Paradigm for European Agriculture and Rural Development?* Berlington, Singapore, Sydney: Ashgate: 1-16.
- Eickhof, N. (1983): Wettbewerbspolitische Ausnahmebereiche und staatliche Regulierung. *Volkswirtschaftliche Diskussionsbeiträge der Universität Bamberg* 24. Bamberg.
- Eickhof, N. (1984): Wettbewerbspolitische Ausnahmebereiche in der marktwirtschaftlichen Ordnung. Ansatzpunkte der normativen und positiven Theorie wettbewerbspolitischer Ausnahmebereiche. *Volkswirtschaftliche Diskussionsbeiträge der Universität Bamberg* 27. Bamberg.
- Eickhof, N. (1985): Wettbewerbspolitische Ausnahmebereiche und staatliche Regulierung. *Jahrbuch für Sozialwissenschaft* 36: 63- 79.
- Eickhof, N. (1986a): Staatliche Regulierung zwischen Marktversagen und Gruppeninteressen - Ein Beitrag zur Weiterentwicklung der Regulierungstheorie. *Jahrbuch für Neue Politische Ökonomie*. 5: 122-139.
- Eickhof, N. (1986b): Theorien des Markt- und Wettbewerbsversagens. *Wirtschaftsdienst*, 66, No. 9: 468-476.
- Eickhof, N. (1987): Strukturpolitik und Branchenkrisen. *WISU- Das Wirtschaftsstudium*, Bd. 16, No. 6: 324-329.
- Hagedorn, K. (1996): *Das Institutionenproblem in der agrarökonomischen Politikforschung*, Tübingen: J.C.B. Mohr (Paul Siebeck).
- Hagedorn, K. (1997): Regelungsdefizite der bäuerlichen Agrarverfassung in der Marktwirtschaft als Begründung für Agrarpolitik? Ein institutionenökonomischer Ansatz. In: S. Behrends: *Ordnungskonforme Wirtschaftspolitik in der Marktwirtschaft*. *Volkswirtschaftliche Schriften* (474). Berlin: Duncker und Humblot: 123-169.

- Hagedorn, K. (2003a): Rethinking the Theory of Agricultural Change in an Institution of Sustainability Perspective. In: G. Van Huylenbroeck, W. Verbeke, L. Lauwers, I. Vanslembrouck and M. D'Haese (eds.): Importance of Policies and Institutions for Agriculture, Liber Amicorum Prof. Dr. ir. Laurent Martens. Gent: Academia Press: 33-56.
- Hagedorn, K. (2003b): Integrating and Segregating Institutions. A Concept for Understanding Institutions of Sustainability. Paper presented at the Workshop in Political Theory and Policy Analysis. Indiana University, Bloomington.
- Hagedorn K. (2004): Multifunctional Agriculture: an Institutional Interpretation. Proceedings of the 90th Seminar of the European Association of Agricultural Economists (EAAE) on "Multifunctional Agriculture, Policies and Markets: Understanding the Critical Linkage", Rennes, France.
- Hagedorn, K., Arzt, K., and U. Peters (2002): Institutional Arrangements for Environmental Co-operatives: a Conceptual Framework. In: K. Hagedorn (ed.): Environmental Co-operation and Institutional Change: Theories and Policies for European Agriculture. New Horizons in Environmental Economics. Cheltenham, UK, and Northampton, MA, USA: Edward Elgar: 3-25.
- Heal, G. M. and Small, A. A. (2002): Agriculture and Equal System Services. In: B. Gardner and G. Rausser (eds.): Handbook of Agricultural Economics 2. Amsterdam: Elsevier: 1341-1369.
- Homann, K. (1996): Sustainability: Politikvorgabe oder regulative Idee? Sustainability: Politikvorgabe oder regulative Idee?. In: Lüder Gerken (ed.): Ordnungspolitische Grundfragen einer Politik der Nachhaltigkeit. Baden- Baden: Nomos: 33-47.
- Hooghe, L. and G. Marks (2003): Unravelling the Central State, but How? Types of Multi-level Governance. American Political Science Review 97(2): 233-243.
- Jaros, M. (2003): Argumente und Optionen für die Einrichtung von Gentechnikfreien Bewirtschaftungszonen im Bundesland Wien. Positionspapier der Wiener Umwelthanwaltschaft.
- Kirsch, G. (1997): Neue Politische Ökonomie. Düsseldorf: Werner.
- Kiser, L. L. and E. Ostrom (2000): The Three Worlds of Action: a Metatheoretical Synthesis of Institutional Approaches. In McGinnis, M. D. (ed.), Polycentric Games and Institutions. Readings from the Workshop in Political Theory and Policy Analysis. Ann Arbor: University of Michigan Press: 56-88.
- Lichtenberg, E. (2002): Agriculture and the Environment. In: B. Gardner and G. Rausser (eds.): Handbook of Agricultural Economics 2. Amsterdam: Elsevier: 1249-1313.
- Mantzavinos, C., D. C. North and S. Shariq (2003): Learning, Institutions, and Economic Performance. Perspectives on Politics (forthcoming).
- McGinnis, M. (ed.) (2000): Polycentric Games and Institutions. Readings from the Workshop in Political Theory and Policy Analysis. Ann Arbor: University of Michigan Press
- McGinnis, M. (2002): Polycentricity and the Core of Governance. Preliminary draft prepared for the discussion in Political Science Y673 seminar. March 20, 2002.
- Morand, F., and M. Barzmann (2005): Integrating Institutions for Sustainable Development: 'green speak' and beyond. IDARI Working Paper. Berlin: Humboldt University.
- North, D. C. (1990): Institutions, Institutional Change and Economic Performance. Cambridge.
- OECD (1998): Multifunctionality: A Framework for Policy Analysis. Paris: OECD.
- OECD (2001): Multifunctionality: Towards an Analytical Framework. Paris: OECD.
- Ostrom, E. (1998): The Institutional Analysis and Development Approach. In: E. Tusak-Loehman and D. M. Kilgour (eds.): Designing Institutions for Environmental and Resource Management. Cheltenham UK and Northampton ME, USA: Edward Elgar: 68-90.

- Ostrom, E. (2005): *Understanding Institutional Diversity*. Princeton: NJ: Princeton University Press (forthcoming).
- Soregaroli, C.; Wesseler, J. (2003): Minimum Distance Requirements and Liability: implications for co-existence. In: Wesseler, J. (ed.): *Proceedings of the Frontis workshop on Environmental Costs and Benefits of Transgenic Crops* Wageningen, The Netherlands 1-4 June 2003: 165-181.
- Strange, M. (1988): *Family Farming: A New Economic Vision*. Lincoln, NE: University of Nebraska Press.
- Tonoyan, Vartuhi (2003): *Entrepreneurship and Corruption: Integrating Institutions, Rationality and Social Norms*. Veröffentlichungen des Instituts für Mittelstandsforschung, Grüne Reihe 54. Universität Mannheim: ifm.
- Van Huylenbroeck, G. and G. Durand (eds.) (2003): *Multifunctionality: A new Paradigm for European Agriculture and Rural Development?* Aldershot, Burlington, Singapore, Sydney: Ashgate
- Williamson, O. (2000): The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature* 38 (September): 595-613.