Integrative and Segregative Institutions: a dichotomy for understanding institutions of sustainability

Konrad Hagedorn

Humboldt University Berlin
Department of Agricultural Economics and Social Sciences
Division of Resource Economics
Philippstr. 13, 10099 Berlin, Germany

Phone: + 49-30-2093 6305, Fax: +49-30-2093 6497
E-mail: k.hagedorn@agrar.hu-berlin.de
www.agrar.hu-berlin.de/wisola/fg/ress/

1 Introduction

Economic and technological development has been associated with numerous disturbances of ecological systems and serious degradation of natural resource stocks. This impact requires an increase of the capacity of societies to regularise human behaviour in a way that at least limits such adverse or even sometimes catastrophic effects. This is the reason why achieving sustainability has become an issue of institutional change and institutional innovation. At the same time, there is increasing evidence that this processes will lead to a higher degree of institutional diversity (Ostrom, 2005) and to more complex governance structures (McGinnis, 2002), because interactions between ecological and social systems are complicated and to are large extent unknown. In line with these insights, there is a growing awareness of the analytical limits of concepts which frame problems of coordination within a "market or state" dichotomy (Ostrom 1990). As a response to this problem, a framework for the analysis of “Institutions of Sustainability” (IoS) that has been applied in several studies (Hagedorn et al., 2002). The application has raised new questions as regards the particular features of institutions supportive to sustainable development. “What is special about those institutions which bring about sustainability?” Is there a special class of institutions predominantly relevant for solving sustainability problems?

In theories of institutions, many categories and definitions 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 conceptions of the institutional world and different preferences regarding the suitability of terms. Most institutional scientists distinguish in some way between institutions as rules and governance structures as the organisational solutions for making rules effective (e.g. Ostrom 1990, North 1990, Bromley 1989). In contrast, others seem to prefer the notion 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 the formal ones. In his “four levels of social analysis” he attributes informal institutions to the level of “embeddedness” in social traditions and norms.

Homann goes beyond the notion of institutions as single rules and at the same time explains its difference to norms: “Institutions are distinguished from norms by the fact that norms determine single actions, while institutions are understood as being systems of norms or rules which give order to whole complexes of actions and interactions in a way that stabilises expectations. This implies that single norms may change without the institution it belongs to, for example a market, also having to change. In this sense institutions are a meta-arrangement to norms” Homann (1999: 52f.; translation from German by the author). Institu-

tions consist of abstract rules and not of individuals which are members of groups or communities. A family can mean both a group and an institution, but in the latter case the perspective is different. This also applies to organisations like parties, bureaucracies and firms which are formed by positions and have the role of collective actors in societies. “Institutions seem to be closer to what the sociological systems theory conceives of social functions systems for which typically the economy, the legal system, science and politics are mentioned as examples (Luhmann, 1984; 1997). However, appearances are deceiving. These subsystems of society are indicated by its functions and by codes, programmes and eventually media. In contrast, institutions like private property and the family go across the borders of these systems and are determined from a different perspective” (Homann, 1999: 52; translation from German by the author). He also disagrees to defining institutions by their purpose or function but prefers to understand an institution only as a being a “set of rules”.

Furthermore, distinguishing between formal and informal rules is certainly very popular, but it is often not clear how to draw a line between them. Are formal institutions those which are somewhere written, or should we prefer a 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)? The objective to create an operational framework that enables a systematic and detailed analysis of institutions is best served by differentiations of rules according to levels of decision making and social interaction, as suggested and applied by Ostrom (1998). She distinguishes between meta-constitutional, constitutional, collective choice and operational rules. In this paper, I will follow notion that institutions, organization or governance structures should be seen as coherent elements. Rather than isolating them from each other I will treat them as elements embedded in, and representing, the system of rules and coordination in societies which affect different levels of decision making. This is a very similar understanding of institutions as the one suggested by Kiser and Ostrom (2000).

The background of this paper resides in the search for a concept appropriate for the analysis of institutions that promote sustainability - Institutions of Sustainability (IoS). This framework assumes that which institutions, in particular property rights in nature attributes, and governance structures to put these sets of rules into practice emerge, this depends on the properties of transactions related to natural systems and the characteristics of actors involved in such transactions (see Hagedorn et al., 2002). By adding a new dichotomy we expect to develop a potential to distinguish those institutions which bring about sustainability from others. This is the dichotomy of Integrative and Segregative Institutions (ISI). In particular, it may be of interest for economists who are used to arrange their guiding concepts in dichotomies that define alternative options of social organisation. In the past, “the market and the state” has been used as such a dichotomy.

The Institutions of Sustainability Framework (IoS) together with the new dichotomy of Integrative and Segregative Institutions (ISI) build on the widely agreed convention that institutions are sets of 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, the institutions 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 legitimate scope of action (room of manoeuvre). Institutions are more than rules of the game providing constraints. They are also enablement to do “what the individual cannot do alone” (Schmid, 2004: 7).

In this paper, I will make an attempt to demonstrate the value of understanding complex “transaction-interdependence phenomena”. It will also be shown that a dichotomy change towards integrative and segregative institutions could stimulate institutional analysis that relates to ecological systems and natural resources. A main strategy will be to look at the integrative-segregative dichotomy from two perspectives which I call the physical and the social

view on transactions, and the costs and effects caused by them. Combining these two perspectives leads to a concept that allows for distinguishing sustainable and unsustainable states of institutional integration and segregation. Finally, a procedure for transforming the regulative idea "sustainability" into "meta-constitutional rules" is proposed.

This approach to institutions and governance structures is complementary to the analytical 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 also be enlightening to start with the problem of interdependence which actors try to solve, that is ordering the relationships which influence the conditions of transactions they want to improve. Starting from this point, we first have to look at the properties and implications of physical transactions, in particular as regards the social interdependence and the conflicts between actors, and then draw conclusion regarding the emergence or design of adequate sets of rules. As the concept of interdependence is considered a part of the transaction-interdependence phenomenon, the influence of actors and their forms of interaction - as well as actors constellations and orientations - on the choice of rules is by no means neglected. "Properties of transactions" and "characteristics of actors" are jointly influencing the process of how institutions arise and change.

2 Towards an Understanding of Integrative and Segregative Institutions

Usually economists and political scientists prefer simple and clear-cut definitions. However, doing justice to complex realities sometimes requires a more diverse picture. This applies to the question what integrative and segregative institutions are best thought of. For clarifying this question, we will stepwise discuss various properties of a phenomenon which we will call the *"transaction-interdependence phenomenon*". Transactions of goods caused by decisions made by those actors often not only have an impact on these actors but also affect other actors in a positive or negative way who were not involved in that decision. This creates interdependence between these actors and may provoke either conflict that requires solutions or synergies enabling mutual benefits from cooperation. These relationships, which are outlined in Figure 1, will be explained in more detail in the following sections. For the moment, it may be sufficient to note that we look at the transaction-interdependence phenomenon from two different angles: first from the (physical) transaction of a good or resource and secondly from the (social) interdependence between actors or organisations.

As sustainability is closely related to the physical world[1], institutional choice in this area particularly depends on the physical nature of transactions. Therefore, a framework for the analysis of institutional change which focuses on sets of rules and governance structures that are supposed to foster sustainability must emphasise the physical properties of transactions. Accordingly, we start with the physical perspective on transactions which differs from other institutional concepts in political science where the primary focus is on the characteristics of actors and their relations (see, e.g., actors-centred institutionalism; Scharpf, 1997).

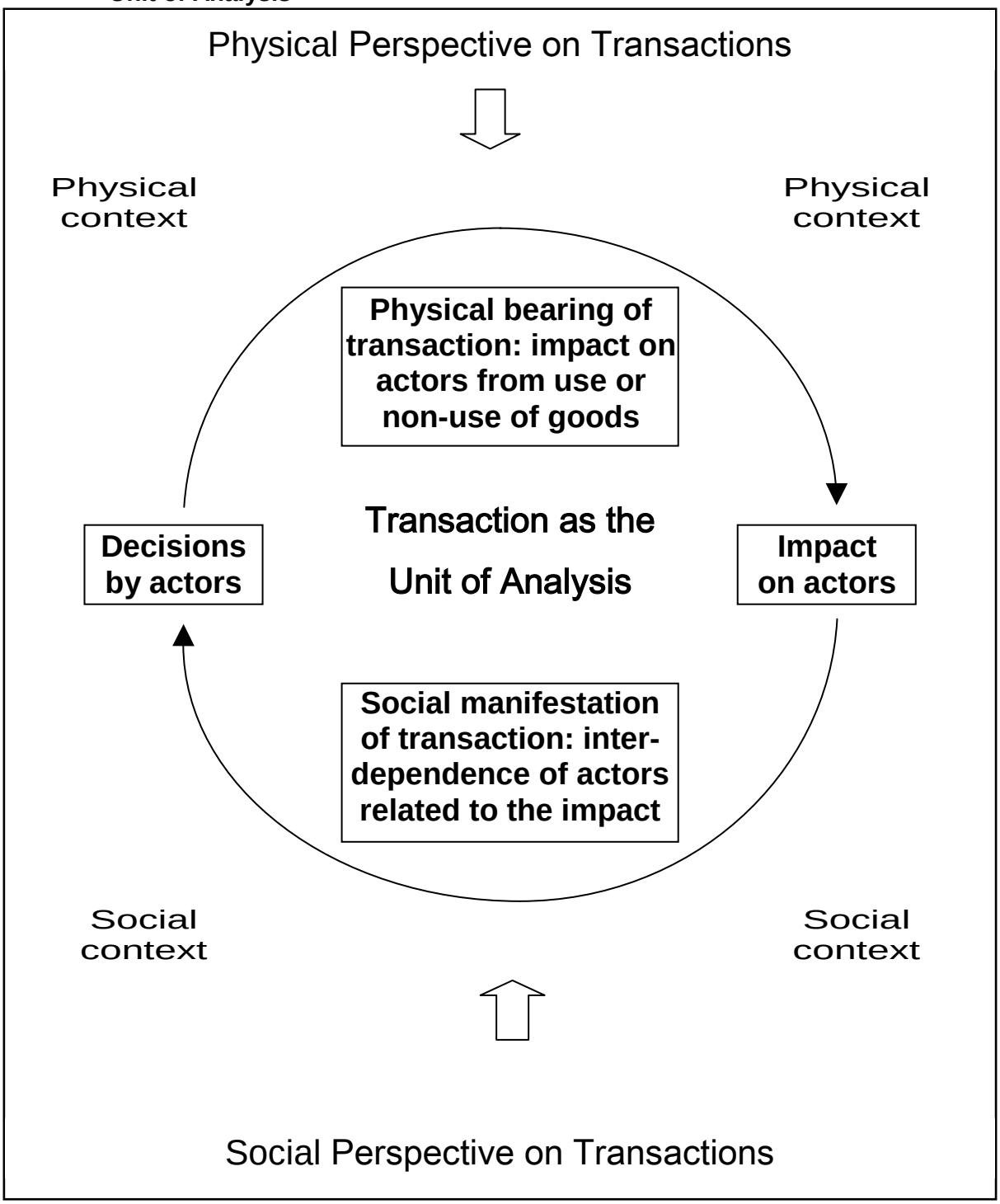
However, when developing a framework for analysing, or even designing, institutions of sustainability, we are not equally interested in all kinds of physical transactions, but particularly in those which are related to natural resources and ecological systems. This also distinguishes the Institutions of Sustainability Framework (IoS) suggested by Hagedorn et al. (2002) from conventional transaction cost economics (Williamson, 2000). The latter has been developed against the background of transferring "commodities" - goods mostly produced by means of engineered processes within designed systems set up by humans. The IoS Framework focuses on "non-commodities"[2]; that means resources, goods and services which

[1] Sustainability is not a concept which merely relates to issues arising from the use of natural resources and ecological systems. Just for the purpose of this paper I will only refer to this area of application where sustainability plays a prominent role. For a overview of this issue area see Perman et al. (1997)

[2] The distinction between "commodities" and "non-commodities" has emerged from the discussions on multifunctionality of agriculture. See, for details, Durand and van Huylenbroeck (2004)

are received (at least partly) through processes of self-organisation in ecosystems not completely engineered by humans, but often influenced or even disturbed by them.

Figure 1: The Physical and the Social Perspective on the Transaction as the Basic Unit of Analysis



If we accept that analysis of institutional change not always must pay equal attention to both the properties of transactions and the characteristics of actors, we may consider concentrating on either one of these aspects:

1. For emphasising the relevance of transaction properties for institutional change, characteristics of actors could be subjected to the ceteris paribus condition. In this case, the diversity of actors would be blinded out, assuming that only “standard actors” are involved.

2. For emphasising the influence of actor characteristics on institutional change, properties of transaction could be subjected to the ceteris paribus condition. In this case, the diversity of actors would be neglected, assuming that only "standard transactions" take place.

Although we tend to prefer the first view in this paper, we resist the temptation of actually setting the characteristics of actors ceteris paribus. This is because the causal connection between transactions and institutions cannot be understood without including actors and their interaction. Transactions cause conflicts or cooperation and thus affect social relationships, and institutions emerge non-intentionally or by intentional design as a response to such conflicts or opportunities of cooperation[3]. The definition of integrative and segregative institutions elaborated in the following section will try to do justice to this Janus-faced nature of the reasons why institutions arise, exist and change.

3 Integrative and Segregative Institutions from a Physical Perspective on Transactions

We start by defining the terms "integrative" and "segregative" by how the consequences of decisions on transactions made by an actor are dealt with under an existing set of rules. These rules can be (more or less) integrative or segregative. Therefore, the anticipated consequences will either be integrated in or segregated from the decision maker's area of accountability.

3.1 Consequences and Heterogeneity of Transactions

The consequences of a decision consist of three elements:

1. The *effects of transactions* which may be adverse or beneficial and can cause conflicts among the people affected. For example, high nitrate levels in water caused by reinforced nitrogen leaching due to inadequate application of fertilizer or manure can cause methemoglobinemia or blue baby syndrome.[4] This will provoke severe conflict, for example between the parents of the sick babies and polluting farmers.
2. The *process of transaction* itself which requires transaction cost and therefore raises the question as to who is obliged to bear them. For example, nitrogen leaching as an unintended side effect (nevertheless to be expected) of crop growing certainly goes without special transaction costs, but monitoring and restricting this "adverse external effect" is causing considerable cost of information, measurement, monitoring and coordination.
3. The *interdependence of actors* caused by transactions. Transaction costs reflect the resources used to govern this interdependence. For example, in the case of nitrogen leaching the transaction costs occur in different policy areas such as water policy where maximum thresholds for nitrogen in drinking water are defined and agri-environmental policies dealing with constraints on cultivation practices, liability and enforcement mechanisms.

For assessing the impacts of institutions which could be appropriate to regularise this type of interdependence we will, at least implicitly, refer to two normative principles; for the moment, we will only mention one of them: "Those who have caused costs should also bear these costs, and benefits should accrue to those actors who have produced them". Later we

[3] The link between transactions in a physical sense and the interdependence of actors associated with them will be further discussed in Section 4.1.

[4] Nitrate (NO_3) is an integral part of the nitrogen cycle in the natural environment. Improper application of fertilizers and manure can reinforce nitrogen leaching into groundwater and thus lead to high nitrate levels in drinking water that can cause an illness called methemoglobinemia. Pregnant women, adults with reduced stomach acidity, and people deficient in the enzyme that transforms methemoglobin back to normal hemoglobin are susceptible to nitrite-induced methemoglobinemia, and particularly babies. Therefore methemoglobinemia is also known as the blue baby syndrome found especially in infants under six months. The most obvious symptom of methemoglobinemia is a bluish color of the skin, particularly around the eyes and mouth. Severe methemoglobinemia can result in brain damage and death.

will introduce the second one and show that only obeying the first one may be misleading and a more thoughtful interpretation of the norms is required.

One more aspect is crucial for understanding the research problem this paper addresses: Processes and effects of transactions are different, and thus the interdependence between actors they cause and the task to regularize them by institutions also differ. If all physical transactions were simple as regards both the process and effects of transactions, the concept of segregative and integrative institutions would be without meaning. Only if the processes of transaction are of some complexity and not easy to comprehend, and the effects of transactions are rather numerous and diverse and affect many and heterogeneous actors, the question arises to what extent the produced costs and nuisances, or benefits and amenities, should exclusively be left with those who decided for the transaction or may be reloca

ted to others, and to whom precisely, and why and how this should be done. In other words, only in such cases the question of how much integration or segregation should be achieved by means of setting and implementing rules becomes relevant.

The example of nitrogen fertilising introduced above represents such a complex transaction with a variety of both desired and problematic effects and a complicated action situation. Applying high amounts of nitrogen or manure in crop growing certainly increases yields and may under certain conditions also improve soil fertility. However, these beneficial effects are usually accompanied by numerous adverse effects that also affect others than farmers. It can not only cause the blue baby syndrome via water pollution, but may also contribute to the emission of a greenhouse gas (N_2O), indirectly reduce biodiversity and result in too high nitrogen content in food like vegetables or lettuce; and all these effects imply difficult and even unknown bio-chemical and geo-physical transformations. Selling bricks may serve as a contrasting example where both the transaction process and the structure of effects are rather simple and the question of integration and segregation does not arise.

3.2 Processes and Effects of Transaction

Transactions refer to physical objects (for example natural or and ecological entities) and thus represent the physical dimension of the interactions between actors regularized by institutions[5]. Three main phenomena seem to be relevant:

1. *The properties of the good or the resource being transferred and of its physical context:* These are not important per se but only when it comes to a transaction of a unit of the good or resource. For example, the toxic influence of nitrate in groundwater on babies only exists if somebody causes to much nitrogen leaching, for example by excessive fertilisation with nitrogen. Or physical open access to common grassland only leads to degradation when pastoralists actually use and overuse this land. It is important to note that transactions are usually not only influenced by the particular good or resource in question, but also by other goods, resources and physical circumstances. For example, nitrogen leaching depends much on the soil quality and geological conditions. Whether overgrazing becomes a problem differs between years because of weather differences.
2. *The process of transaction by which the good or resource is transferred:* In New Institutional Economics, a transaction is defined by means of a technically separable interface where one stage of activity terminates in a system of production and provision and another one begins. A transaction 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

[5] It is important to note that the conception of a transaction prevailing in New Institutional Economics, which emphasises transference over a technically separable interface, may be biased because it focuses on physical movements. Transactions can also (or should even primarily) be defined by emphasising the social dimension instead of the physical dimension (without neglecting the physical one). From this point of view, a transaction is a change in social relationships that may or may not result in a movement of physical objects. It is the change in individual rights and mutual obligations which constitutes a transaction in this perspective (see, Schmid, 2004: 69ff.).

also be complex (like nitrogen application), 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. As making such transactions transparent and monitoring them would require much knowledge and information, they are usually connected with insecurity and risks for the actors involved. This knowledge problem seems to be more crucial for ecological systems than for production systems. Systems of production are "engineered" systems that are modularibly comprehensible, and only decomposable systems can be simple. Transactions related to natural systems are complex, often not standardized, even unknown. Transaction impacts may go unseen with hidden causalities. As transaction costs can be high under such conditions, the question as to who should be accountable for these costs becomes a particularly relevant economic question here. Providing set of rules on this very issue is the *first task of integrative and segregative institutions* as shown in Table 1. Integrative institutions consist of rules which hold decision makers liable for the transaction costs they cause, they have the duty to internalise them and no right to externalise them. Segregative institutions soften this restriction maybe to different degrees and relief decision makers from transaction costs and burden others with them[6].

Table 1: Impact of Integrative and Segregative Institutions on Transaction Costs

Physical view on transactions	Integrative institutions	Segregative institutions
Internalising transaction costs	Duty to internalise	Incomplete duty to internalise
Externalising transaction costs	No right to externalise	Some rights to externalise

3. *The effects of the transactions on actors and their relationships:* Similar to the process of transaction, also the effects of transactions can be very different. These effects can be beneficial and adverse as seen from the point of view of the actors concerned. As engineered processes of production are often based on systems of decomposable transactions, the latter may often have only a small number of and rather effects which are clear and simple to conceive of. The effects of transactions that relate to natural resources and therefore often represents interventions in and disturbances of ecological systems are often numerous and complex. They often include side effects which may be welcome or undesired, foreseen or unexpected. For such transactions the question who is allowed to profit from for the effects or who has to accept liability for them is much more relevant. Here we see a *second role of integrative and segregative institutions* which is similar to that in Table 1. They provide sets of rules on the distribution of the positive and negative effects of a transaction to the decision makers and those who did not make the decision but are concerned, as shown in Table 2. Integrative institutions are rules which make the decision makers eligible to the beneficial effects they cause and hold them liable for the adverse effects. Segregative institutions allow to deviate from this principle so that the decision makers may forego some benefits which then accrue to others, but their liability for some adverse effects may also be reduced and others have to accept nuisances[7].

[6] For simplicity, the properties of integrative and segregative institutions are always described in a polarizing way in Table 1 and also in Table 2-5. It might be more adequate to think of this relationship in terms of a continuum because institution can be more or less integrative and segregative, respectively.

[7] We will come back to this issue which has always been considered a central question in Institutional Economics and discuss it in more detail in Section 5.1.

Table 2: Impact of Integrative and Segregative Institutions on Effects of Transactions

Physical view on transactions	Integrative institutions	Segregative institutions
Beneficial effects	Appropriate all benefits and leave no gains to others	Forego some benefits and leave gains to others
Adverse effects	Accept all liability and shift no nuisance to others	Deny complete liability and shift nuisances to others

3.3 Definitions of Integrative and Segregative Institutions Derived from a Physical Perspective on Transactions

These brief illustrations show that the model of thought that distinguishes these two particular classes of institutions - integrative and segregative institutions - , can be considered as a response to the observation that many transactions induced by humans have become very complex, in particular, if they are not related to engineered production and distribution systems but to self-organising eco-systems. It is the increasing occurrence of such cases, which makes the following two questions relevant:

(1) What kind of effects of his activities an actor is expected to be accountable for? This refers to both *transaction costs coming up in the process of transaction* and *final beneficial and adverse effects of such processes*: To what extent is internalisation of transaction cost compulsory and how much externalisation of transaction cost is tolerated? Which process yielding beneficial effects is an actor permitted to initiate and to appropriate the positive results, and which adverse effects is an actor allowed to cause and to leave the negative outcomes to others? As there is no full information and incomplete transparency on many effects which will materialise in the process 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 5.1). This issue is in particular relevant, when innovations associated with a high degree of insecurity are implemented.

(2) How and to what extent should institutions (and governance structures) be integrative or segregative in attributing or not attributing *transaction costs*, *adverse and beneficial effects* to specific actors involved or affected? In addition such institutions (and governance structures) should have the capacity to identify those eligible or liable and to select and delineate the effects 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. Individuals may like to exploit benefits, avoid cost, and to reduce complexity. But the social choice situation is different and implies balancing cost and benefits for society and distributing them in a way that stimulates fruitful dynamic changes for example by processes of learning and innovation. This is what a proper composition of integrative and segregative institutions (and governance structures) is expected to achieve, and we will come back to this expectation in Section 5.4.

From these general notions we can now extract operational definitions of integrative and segregative institutions. It seems plausible that these definitions have to be derived from the impacts produced by transactions which these institutions attribute to the actors involved.

(A) *Integrative institutions* allow actors, who make decisions on transactions, not only to profit from beneficial effects, but they also hold them fully liable for adverse effects. Similarly, they not only force them to internalise the transaction costs they cause, but also protect them against transaction cost resulting from the activities of other agents. Decision makers enjoy all benefits and bear all costs of their own decisions, and other actors can be rather sure that decisions made by others will cause them no gains or nuisances.

(B) *Segregative institutions* force actors who make decisions on transactions to refrain from receiving all gains from beneficial effects, but also allow them to shift some of the nuisances resulting from adverse effects to other actors. They may externalise transaction costs within limits, but can also not avoid bearing transaction cost caused by decisions made by others. 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 actor orientations and economic behaviour. 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 transaction costs and effects of the transactions concerned. The same applies to the perceptions and motivations actors develop. In other words, integrative institutions co-ordinate decision making by means of a "system approach" to learning and knowledge dissemination. Segregative institutions coordinate decision making by means of a "part-of-the-system approach" to learning and knowledge dissemination. This has consequences for the speed of change and the ways in which the benefits from changes can be appropriated by actors and groups.

4 Integrative and Segregative Institutions from the Social Perspective on Transactions

However, integrative or segregative institutions do not internalise or externalise transaction costs and effects of transactions directly. They do so by creating or demanding, or not creating or demanding, the willingness and capacity of actors to do so. The segregating or integrating order established the institutions enable them to solve or at least reduce the conflicts caused by the transactions. This aspect has not been discussed in the preceding sessions because we have restricted the discussion to the physical view on transactions for defining integrative and segregative institutions. We now change our perspective and look at the social dimension of transactions, which refers to actors and their interdependence, to learn what this may contribute to our understanding integrative and segregative institutions.

4.1 Transactions and Interdependence

Any concept of transaction must sooner or later take into account transaction costs. Transaction costs, for example costs of information or negotiation, clearly result from intended, ongoing or past transactions which have affected different actors. In other words, transactions cause or reveal interdependence between actors. “Interdependence occurs when a choice of one agent influences that one of another …. Interdependent agents cannot simultaneously realise their incompatible interests in scarce environmental resources and their conflicts must be resolved by defining (or redefining) initial endowments” (Paavola and Adger, 2005: 355). Strictly speaking, transaction costs do not exclusively result from the physical procedure of transferring a unit of a good, service or resource from one point to another, but in particular from how the actors involved prepare for or respond to this physical change which may have caused a conflict for example by incompatible use of natural resources between them. Accordingly, transaction costs could also be called “interdependence costs”. Obviously, we deal with a phenomenon in which the physical and the social dimensions are closely intertwined. “Interdependence has two distinct sources: the attributes of the resource and the attributes of the user” (Paavola and Adger, 2005: 356).

Can actors find institutions and governance structures which help them to solve these conflicts (or use the opportunities for cooperation) brought about by their interdependence which, again, may have become relevant as a consequence of the effects of physical transactions as pointed out in the previous sections? Should institutions form their relationships in a more integrative or more segregative manner to arrive at this objective? These questions lead us to an actors-oriented concept of the integrative-segregative dichotomy.

4.2 Different Understandings of Integrative and Segregative Institutions

The term integrative institutions and the integrative-segregative dichotomy have been used in different areas of literature. Some of them are outlined in the following paragraphs:

(1) The term "integrating institutions" - without reference to an opposite notion of institutions - is occasionally used in the literature on the integration process of the European Union (see, for example, Jupille, Caporaso and Checkel, 2003a,b; for integration processes in the EU see also Kreppel and Tsebelis, 1999). Some authors use the terms integrating institutions for very specific aspects of EU, for example for integrating environmental policies into the policy making of the EU and its member states, or with reference to the Lisboa Process (Morand and Barzmann, 2004). This reflects a rather a specific use of the term not aiming at theoretical generalisation.

(2) Kenneth Boulding has distinguished three main forces which play a dominant role in the organisation of social relationships: "exchange", the "threat system (fear)" and the "integrated system (love)" (Boulding, 1970: 34ff.; 1973: 1-13 and 103-122). "The integrative system ... involves such things as status, identity, love, hate, benevolence, malevolence, legitimacy – the whole raft of social institutions which define roles in such a way that you do things because of what you are and because of what I am, that is, because of some kind of status or respect" (Boulding, 1970: 44). However, Boulding does not apply any institutional analysis to these systems but describes the values they implicitly establish. "Economics clearly occupies the middle one of these three. It edges over towards the integrative system insofar as it has some jurisdiction over the study of the system of one-way transfers of exchangeables, which I have called the "grants economy," for the grant … is a rough measure of an integrative relationship. On the other side, economics edges towards an area between the threat system and the exchange system which might be described as the study of strategy or bargaining" (Boulding, 1969: 3).

(3) Talcott Parsons (1937; 1951; 1967), in his functional theory of social action, distinguishes four main institutional functions in a society: pattern maintenance, which refers to social structures, goal-attainment by solving the problem of economic allocation, adaptation as a consequence of plurality of objectives, and integration. Solving the functional problem of integration requires mutual adjustment of segmented units or subsystems as regards their contributions to the effective functioning of the system as a whole. Particularly complex societies, the system of legal norms together with the legal system represent the main integrative mechanism. The predominant role of the system is seen in the allocation of rights and obligations. This integrative function of social systems is considered to be crucial for maintaining collectivity in society[8].

(4) In the literature on democratic regulation of ethnic conflicts, the dichotomy of integrative and consociational institutions plays a role. Lijphart's (1977) consociational model and Horowitz's (1985) integrative model have stimulated both empirical and theoretical debate in this research area. Although both approaches follow the objective to achieve a lasting settlement by means of inclusive rule, they differ in strategy. In Lijphart's model, the new political structure is based on the recognition of ethnic groups. In order to overcome ethnic conflicts the ethnic elites should cooperate in institutions that explicitly take into account the different ethnic groups and establish rules of governance which are based on their cooperation. In contrast, the political structure suggested by Horowitz bridges the ethnic divisions. He

[8] Seibel (1972: 18) similarly emphasises the integrative role of deviating behaviour. "In highly differentiated societies, usually special institutions, for example, the bureaucratic administration of a centralized political organization, keep society integrated. In undifferentiated societies without such unifunctional institutions, some of the more basic multifunctional social processes have to fulfil that function. Such a basic process is social deviance that is not just an outburst of antisocial tendencies but serves an integrative function in itself and/or in conjunction with subsequent sanctioning processes. Simple societies cannot afford the luxury of wasting the integrative potential of social deviance, whereas highly differentiated societies can, and do". Tonoyan (2003) uses the term "integrating institutions" in an analysis of corruption.

criticises the missing incentives for cooperative behaviour of the elites in the above model and aims at providing these by an electoral system in which a candidate of an ethnic group must attract votes from another ethnic group for being elected. Caspersen (2004: 571) has applied these models to postwar Bosnia[9].

(5) Integrative institutions are contrasted with aggregative institutions by March and Olsen (1989: Ch. 7). This notion of integrative institutions is "rooted in a republican or communal understanding of the world, emphasizing the need for bonds between the members of the institution to secure supra-individual goals of survival, and the obligation for the participants to actively reinforce those bonds by participation in political life. So, a departure is taken from the collective, and individual action is judged on the basis of its contribution to the common good. In return, minorities have guarantees against systematic defeat by a majority. Politics in such a setting deals to a large extent with establishing and confirming the purposes of the collectivity and maintaining the support of members by securing their trust in the common good. … Since the overarching issue is persistence of the community, participation in political life is linked to continuing membership of a deliberating community and participants are expected to raise voice on issues beyond their personal material interests" (Bogason, 2003: 5; 2004). "Integrative institutions achieve consensus and legitimacy by deliberation and rational debate. The role of public actors within them is to serve as trustees of the public good, articulating collective aspirations and shaping others' preferences to create new shared understandings of the common interest" (Skogstad, 2003). Aggregate institutions originate from the "enlightenment revolutions of the late 18th century in the USA and France which inspired most Western democracies as they unfolded during the 19th and 20th centuries, building up contractual relations between political actors. The aggregate perspective commences with the individual, giving him … certain rights that protect him from undue interventions from the state, but at the same time those rights make it possible for him to have a say in how the state rules the society. Participation in public affairs is mainly linked to material interests …; political parties and interest organizations function as watch dogs for such interests, relieving the individual from the arduous task of continuously pursuing political goals. The political leadership is seen as an intermediary between competing material interests, always bound to decide along the lines supported by a majority among politically active actors. Institutions and procedures are organized so that they guide actors to perform according to their preferences, under the assumption that any action is countered by action by other actors, thus creating continuous processes of weighing and counter-weighing interests. Participation in political life therefore is partial, and linked to an active, and mostly personal, material interest in the allocation of goods and values; when the issue has been settled, one withdraws from the scene - but one is ready whenever new initiatives are felt to be necessary" (Bogason, 2003: 5; 2004). "In aggregative institutions…political processes are characterized by strategic, self-interested behaviour. Policy outcomes reflect the results of coalition-building and bargaining. Here, public actors act as brokers, mediating and forging compromises among potential supporters in an effort to arrive at Pareto-optimal outcomes" (Skogstad, 2003). Integrative institutions reflect "a logic of unity", aggregative institutions follow "a logic of exchange" (March and Olsen, 1989: 126).

4.3 Definitions of Integrative and Segregative Institutions Derived from a Social Perspective on Transactions

The notions of integrative and segregative institutions outlined above are certainly different, but they help us to develop an understanding of this dichotomy based on a social perspective on transactions. Particularly the last concept of integrative and aggregative institutions illustrates relevant differences between these two types of institutions. These are characterised in Table 3. The criteria listed in the right column show that the terms aggregative and segregative which we use describe the same situations although they approach these from in a

[9] The role of integrative institutions is also analysed in other publications on ethnic conflict and multiculturalism, for example in a cross-country study by Premdas (1997).

slightly different way. If citizens are *aggregated* into clusters by procedures like majority voting, bargaining, coalition building, rent seeking or log-rolling, these procedures produce a *segregation* of society into groups of people who, for example, could influence decisions and others who couldn't, and groups who profit from transactions and others who suffer from the nuisances caused by them.

Table 3: Integrative and Segregative Institutions

	Integrative Institutions	Segregative Institutions
The people	A group	Cluster of individuals
Will of the people	Deliberated	Bargained
Base of order	Reason	Exchange
Leadership	Trusteeship	Brokerage
Change	Adaptation	Instantaneous
Majority rule	Curbed by norms	Dominant
Policy outcome	Shared purpose and trust	Allocation of resources
Loyalty of agents	Professional integrity	Incentive compatibility

Source: Bogason (2003: 6); based on March and Olsen (1989, 118-119).

Not surprisingly, there seems to be a congruency between the two views of integrative and segregative institutions derived from the physical and the social view on transactions: The more necessary and/or difficult the task of integration is, which institutions face at the physical level of transactions (processes with complex and non-decomposable transactions and numerous and divers effects of the processes of transaction), the more integrative institutions must be at the social level of transactions. The more segregation is sufficient and/or integration is easy at the physical level of transactions (processes with simple and decomposable transactions and only a few and similar effects of the processes of transaction), the more segregative institutions may be at the social level of transactions. However, the congruency is perhaps not completely symmetric. Institutions which are integrative at the social level will perhaps not always be associated with institutions working integrative at the physical level (and vice versa). For example, a community which is rich in trust, knowledge and communication may arrive at the conclusion that accepting some nuisances caused by their entrepreneurs is in the interest of the community as a whole, because this helps the entrepreneurs to be innovative and remain competitive and secures employment opportunities. Thus, we should rather conclude that it needs more empirical exploration to acquire more knowledge about the relationship between the two levels of integrative and segregative institutions.

In Section 3.2, we asked the question what integrative and segregative institutions from a physical perspective on transactions are expected to effectuate as regards internalisation and externalisation of transaction costs, and also liability for adverse effects or entitlements to beneficial effects (see Table 1 and 2). Now we ask the same question for integrative and segregative institutions defined from a social perspective on transactions. As shown in Table 4 and 5, we assume different properties of the processes of transactions and of the resulting effects. As already explained in Section 3.2, the physical properties of transactions processes and the resulting effects of transactions may differ considerably. Accordingly, the kind of interdependence between actors caused by them may be very different, too. Transactions that are simple, engineered and decomposable can usually be more easily coordinated, require knowledge that is already available and cause less severe disagreement among actors. Transactions related to natural systems are often complex and coherent or interdependent and less transparent and sometimes even incalculable for the actors involved, so that there is more scope for conflicts and opportunism and considerable knowledge generation and

communication required. The same may apply if we compare transactions producing only a few and similar effects and those which have numerous and divers effects. These characteristics are crucial for the choice between institutional segregation and institutional integration at the social level (see Table 4 and 5).

Table 4: Integrative and Segregative Institutions and Different Transaction Processes

Social view on transactions	Integrative institutions	Segregative institutions
Simple, engineered and decomposable transactions	Not necessary	Sufficient
Complex, nature-related and coherent transactions	Required	Inappropriate

Table 5: Integrative and Segregative Institutions and Different Effects of Transactions

Social view on transactions	Integrative institutions	Segregative institutions
Only a few and similar effects	Not necessary	Sufficient
Numerous and divers effects	Required	Inappropriate

Having now defined what we understand as being integrative and segregative institutions, it is important to note that we restrict our definitions to what integrative and segregative institutions are expected to achieve. In other words, our first objective is to clarify the desired functions of the institutions. We do not explore in this paper what concrete design of institutions may be able to perform in the respective ways and how such institutions can be designed. Of course, this is a relevant question which has to be tackled.

We have not clarified the question up to now whether the integration or segregation always happens directly *by the institutions or rather by governance structures* which make institutions effective. Is the integrative or segregative capacity contained in the institutions or in the governance structures? The same set of rules can often be put into practice by several types or combinations of governance structures which may differ with regard to their integrative or segregative impact on those decisions they are expected to govern. For example, the market position of farmers can be protected by antitrust laws (a set of formal rules) but also by a system of cooperatives (a governance structure).. In the latter case, property rights on the farmers' assets remain rather segregative (e.g., private property rights in land), but a collective form of organisation integrates a beneficial effect of farmers' market transactions into their own domain – countervailing market power against companies which might dominate the agricultural trade otherwise. However, one could argue that establishing this governance structure may leave those property rights untouched but requires a new set of rules that enable cooperation. Thus, we can suppose that integration and segregation can be achieved with different kinds of rules and at different levels of rule making, which in turn can be linked to different and even combined governance structures to become effective. In this paper, we will not explore this question in more detail although this would certainly be relevant for actually applying the concept of integrative and segregative institutions to concrete issues.

4.4 The "Integrative-Segregative Dichotomy" and "Internal and External Effects"

"Integrative and segregative institutions" sounds similar to a concept economists are used to – "internal and external effects". However, it is important to be aware of the different mean-

ing. This is even more recommended as internal and external effects are often not properly understood. In particular, the following two definitions popular in applied ecom´nomics are not compatible with the view developed in this paper:

(a) *Comparing economic behaviour of private agents with a social optimum as a frame of reference:* Externalities occur when production or consumption decisions of one agent affect the utility of another agent in an unintended way, and when no compensation is made by the producer of the external effect to the affected party. If an adverse externality exists, private and social costs/benefits differ (put in reference to a textbook, perhaps Perman 1997). This definition is based on a welfare economics view which differs from our institutional perspective which looks at actors in action situations, simultaneously motivated and constrained by the physical and institutional world they live in. In the ISI concept, the terms "integrative" and "segregative" do not refer to the question whether or not elements of cost and benefits are made a part of an overall welfare optimisation.
(b) *Consequences of the limited coordination capacity of market mechanisms as a frame of reference:* Due to their physical properties, some (positive or negative) goods and services lack excludability and rivalry and cannot be traded on markets. In this sense, they are external to the governance structure "market", but not necessarily external to any governance structure such as cooperation or hierarchies (Bromley 1991). As institutional analysis would not give a priori methodological priority to markets over other types of governance, this view is hardly convincing. In the ISI concept. The terms "integrative" and "segregative" do not refer to the question whether or not goods or actors providing them can be included in or excluded from organisations like markets.

Strictly speaking, the latter equally applies to other types of governance such as bureaucracies and cooperatives. For example, neither does the term "integrative" refer to the includability of an individual into collective action organised by cooperative governance for the provision of a common good, service or resource, nor does the term "segregative" refer to the excludability of an individual from the use of a private good, service or resource under market governance. This does not mean that such processes cannot originate from the impact of integrative or segregative institutions. For example, if the effects of transactions are widespread they may affect many people, and this may imply that integrative institutions for covering most of these effects (e.g., spillovers) also must lead to the inclusion of many people. Nevertheless, the starting point is processes and effects of transactions.

An interpretation of "internalising and externalising effects" that is in principle compatible, but not identical, with the ISI concept can be found in property rights theory. However, here the question arises whether it really describes what the institutions we are talking about actually effectuate? "What converts a harmful or beneficial effect into an externality is that the cost of bringing the effect to bear on the decisions of one or more of the interacting persons is too high to make it worthwhile, and this is what the term shall mean here. 'Internalizing' such effects refers to a process, usually a change in property rights, that enables these effects to bear (in greater degree) on all interacting persons" (Demsetz, 1967: 347). In other words, internalisation is an act performed by the actors participating in the decisions. In contrast, what institutions like property rights actually do in this case is to include the effects in the decision making procedures of the actors by exposing them to corresponding incentive structures[10]. Such internalisation by may be achieved by both integrative or segregative institutions because both subject the actors to institutionalised incentive structures. In the terminology of property rights theory all transaction costs and effects of transactions that are exposed to either integrative or segregative institutions are called "internalised" and only those

[10] "A primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities. Every cost and benefit associated with social interdependencies is a potential externality. One condition is necessary to make costs and benefits externalities. The cost of a transaction in the rights between the parties (internalization) must exceed the gains from internalization. In general, transacting cost can be large relative to gains because of "natural" difficulties in trading or they can be large because of legal reasons" (Demsetz, 1967: 347).

remain “externalised” do so because the cost of setting up (integrative or segregative) institutions were considered higher than the benefits.

5 Merging the Physical and Social Views of Integrative and Segregative Institutions

At first glance, everybody may 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 complementarity of man-made and natural capital is nothing else than a recommendation of an integrative strategy.

5.1 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 consumers and other actors like politicians will learn fast enough about the real progress and dangers associated with new technologies. Simultaneously, all together will forego potential gains 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.

Obviously, we are arriving at the second principle already announced at the beginning of Section 2 as a part of our frame of reference. The first principle assumed that all Transaction costs and effects of transactions should be borne by those who caused them. What we found now is to a certain extent contradictory to this: there may be a value in admitting some deviation from this very formal prescription.

It is well-known in institutional economics that already Coase (1960) raised this point. He complained that economists usually expect that all nuisances resulting from production activities should be averted for example by government intervention. “While most economists seem to be under the misapprehension concerning the character of the situation with which they are dealing, it is also the case that the activities which they would like to be stopped or curtailed may be well socially justified. It is all a question of weighing up the gains that would accrue from eliminating these harmful effects against the gains that accrue from allowing them to continue” (Coase, 1960: 26).

However, this is not the starting point of the train of thought which leads Coase (1960) to this conclusion. Before arriving at that statement he points out in a *first step* why this decision-making problem cannot be avoided, that means why it is necessary to make basic and well substantiated decisions on actors’ rights to externalise and corresponding duties to internalise effects of transactions. He initially assumes that rearrangements of legal rights will be done through the market whenever this leads to an increase in the value of production. However, this implies that market transactions are costless. “Once the costs of carrying out market transactions are taken into account it is clear that such a rearrangement of rights will only be undertaken when the increase in the value of production consequent upon the rearrangement is greater than the costs which would be involved in bringing it about. When it is

less, the granting of an injunction (or the knowledge hat it would be granted) or the liability to pay damages may result in an activity being discontinued (or may prevent its being started) which would be undertaken if market transactions were costless. In these conditions the initial delimitation of rights does have an effect on the efficiency with which the economic system operates. One arrangement of rights may bring about a greater value of production than any other. But unless this is the arrangement of rights established by the legal system, the costs of reaching the same result by altering and combining rights through the market maybe so great that the optimal arrangements of rights, and the greater value of production it would bring, may never be achieved".

After this explanation why it is relevant for a society to arrange efficiently the rights to externalise and corresponding duties to internalise effects of transactions, he shows in a *second step* how such decisions should be made to serve the common interest. For this purpose, he explicitly refers to his empirical studies on the behaviour of courts. "The problem which we face in dealing with actions which have harmful effects is not simply one of restraining those responsible for them. What has to be decided is whether the gains from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the action which produces the harm. In a world where there are costs of rearranging the rights established by the legal system, the courts, in cases referring to nuisance, are, in effect, making a decision on the economic problem and determining how resources are to be employed" (Coase, 1960: 27).

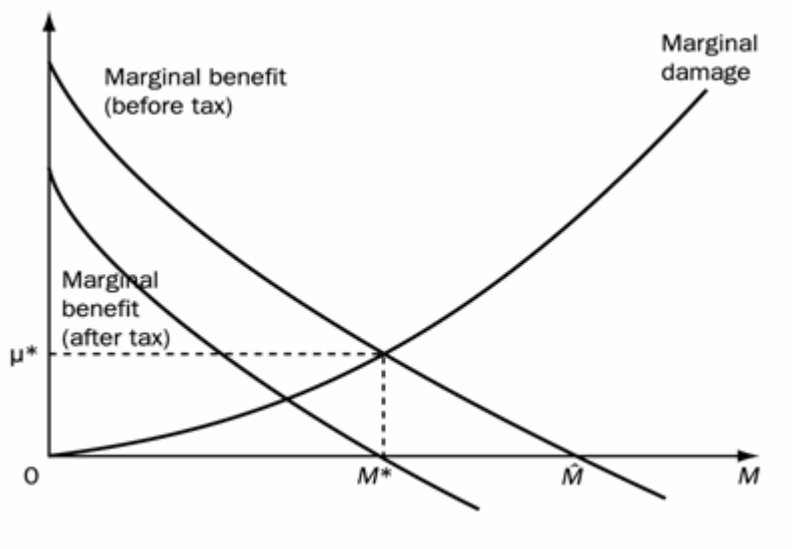
It is this premise which leads Coase (1960) to criticise the Pigouvian tradition. First, he argues that a liability rule which demands that an actor who has caused damage to another one must fully compensate him or her by paying the market value of the damage cannot be justified. The latter may, for example, save costs by giving up the production activity suffering from the nuisance. Secondly adjustments in factors allocation will take place which reduce the net losses. In other words, an opportunity cost approach that takes into account all (or at least the main relevant) changes in the economic system as a whole is required instead of only referring to the market value of damages. He responds in the following way to the "railway example" used by Pigou (1932: 129f.) and his conclusion that railway companies should be held liable for the damage done to surrounding fields and woods by sparks from railway engines: "How is that the Pigouvian analysis seems to give the wrong answer? The reason is that Pigou does not seem to have noticed that his analysis is dealing with an entirely different question. The analysis as such is correct. But it is quite illegitimate for Pigou to draw the particular conclusion he does. The question at issue is not whether it is desirable to run an additional train or a faster train or to install smoke-preventing devices; the question at issue is whether it is desirable to have a system in which the railway has to compensate those who suffer damage from the fires which it causes or one in which the railway does not have to compensate them. When an economist is comparing alternative social arrangements, the proper procedure is to compare the total social product yielded by these different arrangements" (Coase, 1960: 34).

By preferring this interpretation of efficient economic behaviour Coase implicitly assumes the position that social responsibility is a norm which is superior to individual liability. "The belief that it is desirable that the business which causes harmful effects should be forced to compensate those who suffer damage (…) is undoubtedly the result of not comparing the social product obtainable with alternative social arrangements" (Coase, 1960: 40). In line with this argument, he shows in his smoke-pollution example that a pollution tax will not necessarily lead to an optimal solution. "An increase in the number of people living or of business operating in the vicinity of the smoke-emitting factory will increase the amount of harm produced by a given emission of smoke. The tax that would be imposed would therefore increase with an increase of the number of those in the vicinity. This will tend to lead to a decrease in the value of production of the factors employed by the factory, either because a reduction of production due to the tax will result in factors being used elsewhere in ways which are less valuable, or because factors will be diverted to produce means for reducing the amount of smoke emitted. But people deciding to establish themselves in the vicinity of the factory will not take into account this fall in the value of production which results from their presence. This failure

to take into account costs imposed on others is comparable to the action of a factory-owner in not taking into account the harm resulting from his emission of smoke. Without the tax, there may be too much smoke and too few people in the vicinity of the factory; but with the tax there may be too little smoke and too many people in the vicinity of the factory. There is no reason to suppose that one of these results is necessarily preferable" (Coase, 1960: 42).

Today there is no longer any serious disagreement about this meaning of social costs. Coase's interpretation serves as a basis for the understanding of the term "internalisation", for example as it is used in the concepts on pollution control policies. It can be found in text-books of environmental and resource economics where damage costs, when compared with abatement cost, are conceived of as opportunity costs and the value of damage is determined by its shadow price (Perman, Ma and McGilvray, 1997). Alternatively, benefits and cost of pollution are compared (see Figure 2). This is compatible with the following demand of Coase (1960: 44): "If factors of production are thought of as rights, it becomes easier to understand that the right to do something which has a harmful effect (such as the creation of smoke, noise, smells, etc.) ís also a factor of production".

Figure 2: The Economically Efficient Level of Pollution



Source: Perman, Roger, Yue Ma and James McGilvray: Natural Resource and Environmental Economics. London and New York: Longman, 1997.

In the following steps to be taken for completing our concepts of integrative and segregative institutions, we will build on Coase' theory and add additional elements of social costs.

1. As indicated by Coase, the issue of getting the actors' rights to externalise and duties to internalise effects of transactions right arises because transaction costs do exist. The concept of integrative and segregative institutions (in its social perspective on transactions) makes transaction costs related to institutions with different integrative and segregative capacity regarding the regularised behaviour of actors an explicit element of the comparison between different institutions and governance structures.
2. Coase has also shown that answering the question whether external effects of transactions should be avoided or compensated for should be based on an opportunity cost approach that takes adjustments in factor allocation into account. The concept of integrative and segregative institutions approaches the same question by considering two different but interrelated domains where transaction costs, opportunity cost, trade-offs and behavioural adjustments play a role – the physical and the social characteristics.

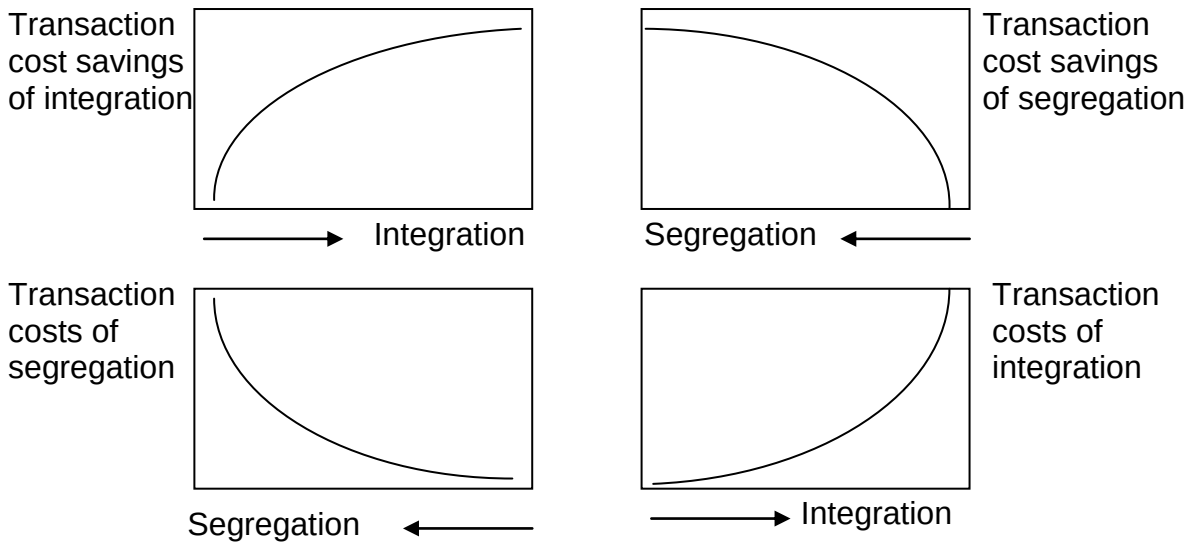
It is not negligible at what phase in processes of decision making on activities of planning, production, marketing, provision, etc. integrative and segregative institutions become effective. In the centrally planned economies of the former socialist countries, for example, rules for income distribution 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 integration and segregation.

5.2 Transaction Costs and Opportunity Costs of Integration or Segregation by Institutions

We will first discuss integrative and segregative institutions in the physical perspective on transactions (as developed in Section 3). Performance of both types of institution causes transaction costs and opportunity costs. Both integration and segregation is associated with these two categories of costs:

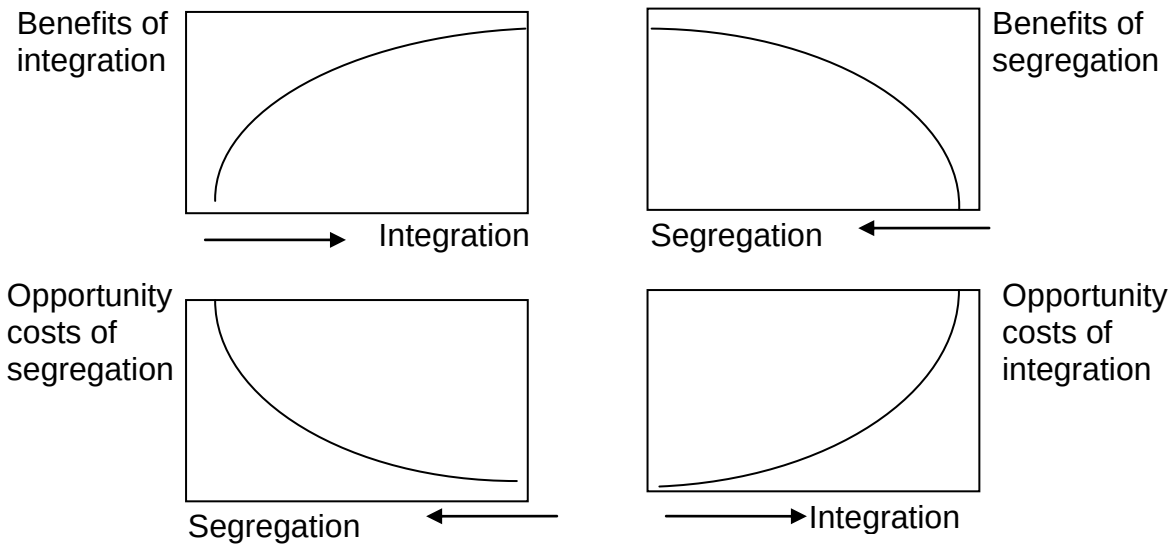
(1) *Transaction costs:* These are the costs of information, co-ordination, negotiation, etc. associated with the *processes* of transactions and the *interdependence* between actors provoked by the transactions. Both integrating and segregating the effects of a transaction causes transaction costs. Integration causes transaction 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. Transaction costs of integration will increase the more integration is demanded by the existing institutions what requires efforts for implementation (see Figure 3). Equally, transaction costs of segregation arise, for example when politicians have to produce plausible justifications for laws allowing excessive energy consumption associated with high greenhouse gas emissions. Transaction costs of segregation will increase the more segregation is admitted by the existing institutions because this burdens the agents with unresolved conflicts (see Figure 3). These costs are, of course, not equal in all cases, but depend on the properties of the transactions and the interdependence of actors involved, as explained in Section 3.2 (see also Hagedorn et al., 2002).

Figure 3: Transaction Costs of Integration and Segregation



(2) *Opportunity costs:* These are the benefits[11] of transactions from additional integration (and less segregation) forgone if the rules and governance structures are segregative (rather than integrative), and vice versa. As pointed out above, the degree of integration and segregation affects the benefits of transactions which accrue to the actors. 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 losses in allocative efficiency because incentive structures are distorted by incomplete liability. These benefits are opportunity costs of segregation. Benefits from segregation which do not materialise because of integrative institutional constraints represent losses in dynamic efficiency as complete liability may impede innovation and learning. These benefits are opportunity costs of integration. Opportunity costs of integration will increase, the more integration the existing institutions produce, and opportunity costs of segregation will also increase the more segregation the existing institutions allow for (see Figure 4).

Figure 4: Opportunity Costs of Integration and Segregation



Obviously, the transaction and opportunity costs curves are similar, i.e. both of them increase when the degree of integration or segregation grows. They can be easily aggregated.

Up to now we have only discussed the "demand" for integration and segregation as a "need" that has to be fulfilled in order to arrive at a desired allocation of the impact of transactions among actors. This is what the institutions are expected to achieve. The question now is how the "supply" of this "service" will be organised. As we discussed in Section 4.3 and Table 3, the conflicts which arise from the interdependence between the actors affected by the impact of transactions can be regularised by institutions which, again, differ with regard to their integrative and segregative capacity, but now considered from the social perspective. The costs relevant for the choice of institutions being more or less integrative or segregative at this level are transaction costs which have already been pointed out in Figure 3 as cost influenced by the physical properties of transactions. At the same time they depend on the social organisation of transactions (i.e. dealing with the interdependence between actors provoked by the physical properties of transactions, and of course also influenced by the actors' characteristics) and consist to large extent of costs of conflict regulation and consen-

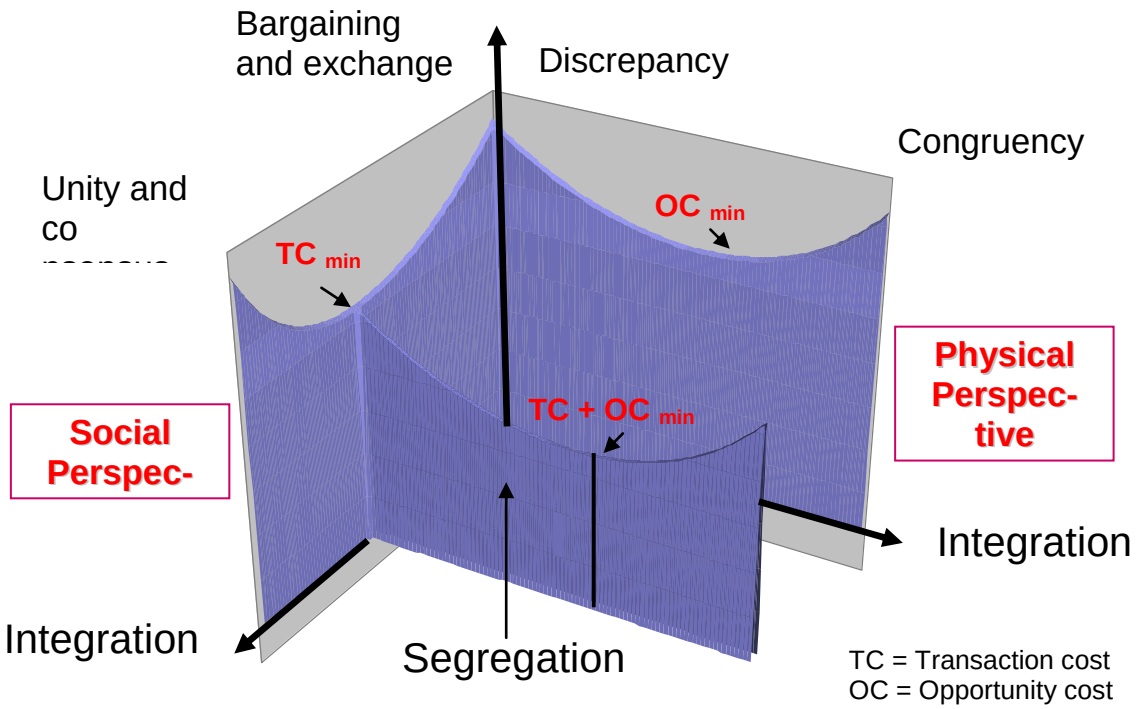
[11] Of course, both beneficial and costly effects should be taken into account, but for simplicity we only argue with benefits.

sus building. For reasons already mentioned in Section 4.3, it is an empirical question which needs further clarification by concrete studies whether or not the latter component of the transaction cost curves, for increasing or decreasing and integration respectively, is more or less congruent with the cost curves shown in Figure 3 regarding the physical level. As there are at least some plausible arguments for this, we continue on the basis of this an assumption being well aware that this may be different and more divers in reality. This simplifying assumption allows us to demonstrate more easily our line of arguments.

5.3 Integrative-Segregative Trade-offs at the Physical and Social Levels of Transactions

Figure 5 shows (based on Figure 3 and 4) how both the aggregated transaction costs and opportunity cost derived from the *physical perspective* and the *social perspective* on transactions relate to each other. Figure 5 also indicates how institutional choice can approach an point of low overall costs.

Figure 5: Transaction Costs Determined by the Choice of Integrative and Segregative Institutions at both the Physical and the Social Levels



- The right side of Figure 5 indicates how much integration or segregation of the effects of transactions is considered desirable from the *physical perspective* on transactions. This is indicated in terms of opportunity costs because the benefits forgone by increasing integration and decreasing segregation are opportunity cost of the opposite changes, and vice versa. Accordingly, we find different opportunity costs at each point of integration and segregation respectively.

- The left side of Figure 5 demonstrates from the *social perspective* on transactions to what extent integrative or segregative strategies can be applied when the actors decide on how the effects of transactions are to be allocated among them, and how this affects transaction costs. We follow the assumption made above that an increase in both integration and integration produces growing transaction costs. This results in a variation of the level of transaction costs at each point on the opportunity cost curve.

The minimum of transaction costs is indicated by TC_{min}, the minimum of opportunity costs by OC_{min}. The point where both categories of cost are minimised because integrative-segregative trade-offs have been optimised at both the physical and the social level of transactions is $TC+OC_{min}$. We will use these aggregated cost curve with this minimum for the following Figure 5. All costs components and also the aggregated costs represent both cost of integration and cost of segregation. We call the sum of costs of integration and costs of segregation the "costs of embedding" of actors in social relationships.

5.4 Finding the Sustainability Area of Institutional Embedding

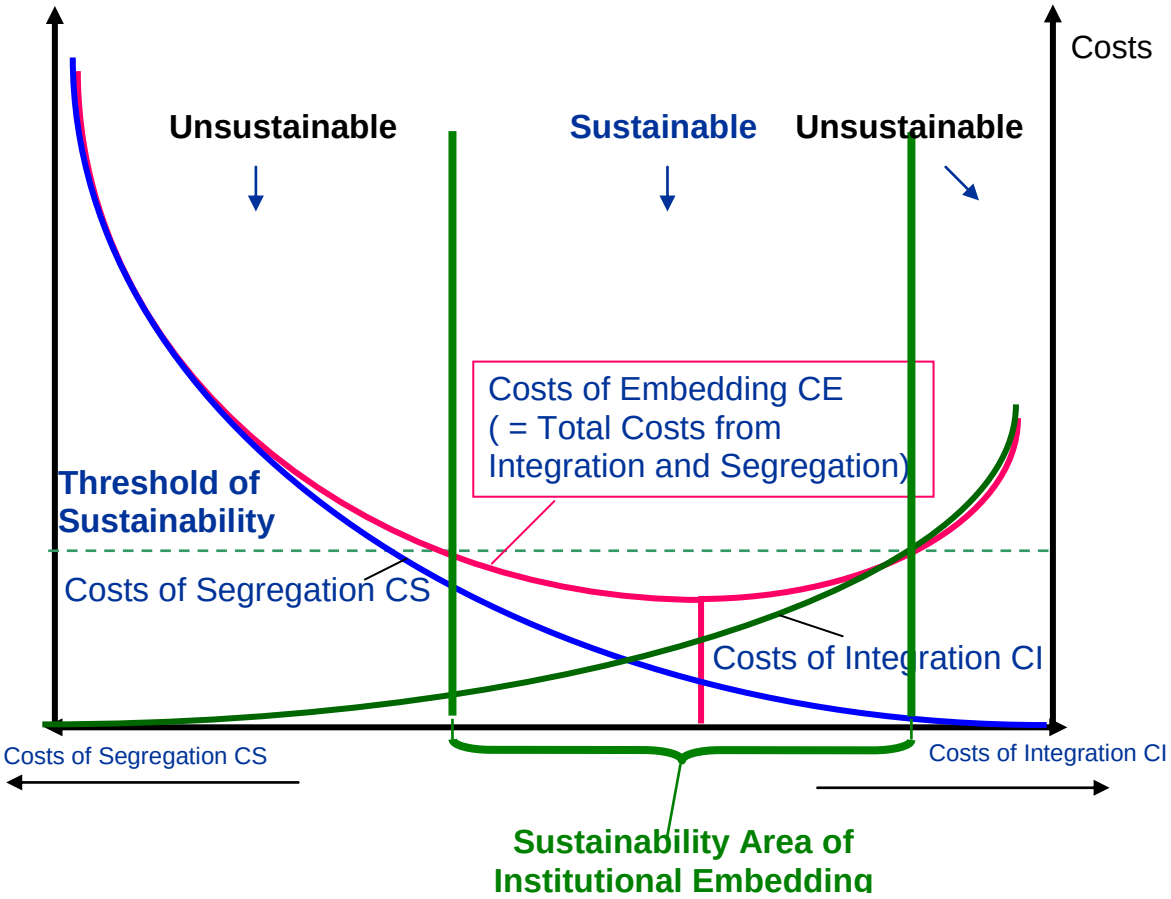
If we now start from the principle, that rules have to be agreed upon by the individuals participating in decision making, we also have to assume that those individuals want to avoid both the cost caused to them by integrative institutions and those resulting from segregative institutions.[12] As shown in Figure 6, the costs of integrative institutions will increase, if more and more divers effects of transactions are integrated in the decision making of the actor concerned, which at the same time causes increasing transaction costs for implementation of the rules. Similarly, the cost of segregative institutions will be the higher the more effects of transactions are segregated and thus separated from the decision maker, which at the same time causes increasing transaction costs for coping with unresolved conflicts.

Figure 6 also shows that the total cost including both components tend to increase, if the integrative and segregative capacities of institutions are in an imbalanced state. Imagine that a new transaction is taking place, for example as a consequence of technological or biological innovation like cultivating GMOs. This causes a variety of beneficial and adverse effects, blessings and nuisances, agreement between some actors and disagreement between others. At the beginning, this is a strange matter to the social relationships, like an new substance entering an ecosystem. Then a process of mutual adjustment and rearrangements takes place, associated with a search for knowledge about the new phenomenon and for options how to respond to it. Sets of rules and means of organisation are adjusted or new ones are established to deal with "the new problem", for example liability rules and GMO-free zones. At the same time, the properties and processes associated with the good and its transaction may be changed what may include technologies for protect against the nuisances caused by the innovation.

Provided that this process is successful, the transaction will be implanted into the relationships between actors. This has to be considered an important achievement of social systems, because to what extent rules and governance structures either exposes an actor to or isolates him from the effects of transactions he or others have caused represents a basic element of the construction of social relations. Therefore, we call those costs the "costs of embedding in social relationships". The term embedding is used here in a somewhat different meaning as it is used in New Institutional Economics where it refers, at least in the concept of "four levels of social analysis" of Williamson (2000), to long-term norms and traditions. It also differs from the understanding of embeddedness in sociology as suggested by Granovetter (1985) who focuses on how actors are embedded in social relationships that form networks.

[12] This assumption is in line with the approach of methodological individualism.

Figure 6: Embedding Transactions 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. Similar consequences may arise if the sequencing of integrative and segregative institutions that determines when they actually become effective during processes of production and provision, income generation and redistribution is inadequate, as already pointed out above.

Of course, it has to be found out empirically what "too high costs of embedding" actually means. This is matter of knowledge generation, 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 6). 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[13].

[13] The solution derived in Figure 5 depends on the assumption that the curves CI, CS and CE are convex. If this assumption does not apply, the transaction in question may require extreme rules or even not be feasible.

6 Conclusion: A Regulative Idea for Crafting of Meta-constitutional Rules

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 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 complementary – types and elements of institutions and governance structures, and of course also by inventing new solutions.

Provided that sufficient information about the various bundles of beneficial and adverse effects of the transactions could be obtained, we might be able to identify costs of integration CI and costs of segregation CS as pointed out in Figure6. 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. If also families of transactions and families of actors with similar costs could be identified, the process of institutional choice could be arranged according to the following procedure:

1. Select those families of transactions and families of actors where the integrative-segregative dimension is likely to be relevant.
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.
3. Chose from existing or craft new rules that balance the cost and benefits of integration and segregation in a way so that total costs comply with the sustainability threshold.

This view of Institutions of Sustainability resembles of how Homann (1996: 37) explains sustainability being a regulative idea. 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” is similar to the “meta-constitutional rules” which represents basic elements 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.

References

Bogason Peter (2004): Democratic Governance: Allocative, Integrative, or Deliberative? In: Peter Bogason, Sandra Kensen and Hugh T. Miller (eds.): Tampering with Tradition: The Unrealized Authority of Democratic Agency. New Directions in Culture and Governance. Lanham, MD: Lexington Books.

Bogason, Peter (2004): Institutional Theory and Democracy. Working Paper 2004: 7. Centre for Democratic Network Governance, Roskilde University, December 2004.

Boulding, K. E. (1970). Beyond Economics. Essays on Society, Religion, and Ethics. Ann Arbor: The University of Michigan Press.

Boulding, K. E. (1973). The Economy of Love and Fear. A Preface to Grants Economics. Belmont: Wadsworth.

Boulding, Kenneth E. (1969): Economics as a Moral Science. American Economic Review 59, No. 1(March 1969): 1-12.

Bromley Daniel (1989): Economic Interests and Institutions: The Conceptual Foundations of Public Policy, Oxford: Blackwell.

Bromley, Daniel (1991): Environment and Economy: Property Rights and Public Policy, Oxford: Blackwell.

Caspersen, Nina (2004): Good Fences Make Good Neighbours? A Comparison of Conflict-Regulation Strategies in Postwar Bosnia. Journal of Peace Research 41, No. 5: 569-588.

Coase, R. H. (1974): The Lighthouse in Economics. Journal of Law and Economics 17(2): 357-76.

Coase, R.H. (1960): The Problem of Social Cost. The Journal of Law and Economics 3: 1-44.

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 I: 1-22.

Demsetz, Harold (1967): Towards a Theory of Property Rights. The American Economic Review 57(2): 347-359.

Granovetter, M. (1985): Economic Action and Social Structure: The Problem of Embeddedness. American Journal of Sociology 91 (3): 481-510.

Hagedorn, K. (1996): Das Institutionenproblem in der agrarökonomischen Politikforschung, Tübingen: J.C.B. Mohr (Paul Siebeck).

Hagedorn, K. (2005): Integrative and Segregative Institutions. Paper presented at the TransCoop Workshop on “Problems of Polycentric Governance in the Growing EU”, Berlin, June 16-17, 2005.

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.

Homann, K. (1996): Sustainability: Politikvorgabe oder regulative Idee?. In: Lüder Gerken (ed.): Ordnungspolitische Grundfragen einer Politik der Nachhaltigkeit. Baden-Baden: Nomos: 33-47.

Homann, K. (1999): Die Legitimation von Institutionen, in: Wilhelm Korff et al. (eds.): Handbuch der Wirtschaftsethik, 4 Volumes. Gütersloh 1999, Vol. 2: 50-95.

Horowitz, Donald (1985): Ethnic Groups in Conflict. Theories, Patterns, and Policies. Berkeley, CA: University of California Press.

Huylenbroeck, G. Van and G. Durand (eds): Multifunctional Agriculture: a New Paradigm for European Agriculture and Rural Development. Ashgate, Aldershot, 2004.

Jupille, J.J. Caporaso and J. Checkel (2003a), Integrating Institutions: Rationalism, Constructivism, and the Study of the European Union. Comparative Political Studies 36:1/2, 7-41.

Jupille, J., J. Caporaso and J. Checkel (2003b): Integrating Institutions: Theory, Method, and the Study of the European Union. ARENA Working Papers WP 02/27, Oslo.

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. Ann Arbor: University of Michigan Press: 56-88.

Kreppel, Amie and George Tsebelis (1999): Coalition Formation in the European Parliament. Comparative Political Studies 32, No. 8: 933-66.

Lijphart, Arend (1977): Democracy in Plural Societies: A Comparative Exploration. New Haven: Yale University Press.

Luhmann, Niklas (1984) Soziale Systeme. Grundriß einer allgemeinen Theorie. Frankfurt a.M.: Suhrkamp.

Luhmann, Niklas (1997): Die Gesellschaft der Gesellschaft. Frankfurt am Main: Suhrkamp.

March, J.G. and Olsen, J.P. (1989): Rediscovering Institutions: The Organizational Basis of Politics. New York: Free Press.

McGinnis, M. (2002): Polycentricity and the Core of Governance. Preliminary draft prepared for the discussion in Political Science Y673 seminar. March 20, 2002.

McGinnis, M. (ed.) (2000): Polycentric Games and Institutions. Readings from the Workshop in Political Theory and Policy Analysis. Ann Arbor: University of Michigan Press

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: Cambridge University Press

Ostrom, E. (1990) Governing the Commons. The Evolution of Institutions for Collective Action. New York: Cambridge University Press.

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 University Press.

Paavola, Juoni, and W. Neil Adger (2005): Institutional Ecological Economics. Ecological Economics 53: 353-368.

Parsons, Talcott (1937): The Structure of Social Action. New York

Parsons, Talcott (1951): The Social System. New York

Parsons, Talcott (1967): Sociological Theory and Modern Society. New York

Perman, Roger, Yue Ma and James McGilvray (1997): Natural Resource and Environmental Economics. London and New York: Longman.

Perman, Roger, Yue Ma, James McGilvray and Michael Common (2003): Natural Resource and Environmental Economics. Third Edition. Person Education Limited: Harow, Essex,.

Pigou, A.C. (1932). The Economics of Welfare (4th ed.). London: Macmillan.

Premdas, Ralph R. (1997): Public Policy and Ethnic Conflict. Management of Social Transformations – MOST. Discussion Paper Series - No. 12. UNESCO, Paris.

Scharpf, Fritz (1997): Games Real Actors Play. Actor-Centered Institutionalism in Policy Research. Boulder, Colorado/ Oxford: Westview Press.

Schmid, A. Allan (2004): Conflict and Cooperation. Institutional and Behavioural Economics. Oxford: Blackwell.

Seibel, H. Dieter (1972): Social Deviance in Comparative Perspective. In: R. A. Scott & Jack D. Douglas (eds.) (1972): Theoretical Perspectives on Deviance. New York & London: Basic Books: 251-281.

Skogstad, Grace (2003): Legitimacy and/or Policy Effectiveness?: Network governance and GMO regulation in the European Union. Journal of European Public Policy 10: 3 (June 2003): 321–338.

Tonoyan, Vartuhi (2003): Entrepreneurship and Corruption: Integrating Institutions, Rationality and Social Norms. Veröffentlichungen des Instituts für Mittelstandsforschung, Grüne Reihe 54. Universität Mannheim: ifm.

Williamson, O. (2000): The New Institutional Economics: Taking Stock, Looking Ahead. Journal of Economic Literature 38 (September): 595-613.