The architecture and transformation of governance systems: Power, knowledge, and conflict

Tom R. Burns[a,*] and Christian Stöhr[b]
[a]*Department of Sociology, Uppsala University, Uppsala, Sweden*
[b]*Department of Applied IT, Chalmers University of Technology, Gothenburg, Sweden*

Abstract. This article aims at contributing to governance conceptualization and its application to case study analyses. Two of the challenges which the theoretical and empirical work in the present article address concern a specification of universal dimensions of governance systems and an identification of selected mechanisms of governance formation and transformation – specifying a few *key drivers* that explain how governance systems are established, maintained or changed through power, knowledge, and contestation/conflict processes. These tools are applied to empirical cases of governance structures as well as cases of governance transformation.

Keywords: Governance, governance architecture, transformation of governance systems, power, knowledge, conflict

Tom R. Burns (Professor Emeritus at Uppsala University, Sweden; Visiting Scholar, Woods Institute for the Environment, Stanford University) has published more than 15 books and 150 articles in the areas of governance and politics, environment and technology, administration and policymaking. He has also published extensively on social theory and methodology, with a focus on the new institutional theory, a sociological game theory, theories of socio-cultural evolution and social systems. He has been Jean Monnet Visiting Professor at the European University, Florence (2002), Fellow at the Swedish Collegium for Advanced Study (SCAS) (1992, 1998), Visiting Professor in Lisbon, Lund (Sweden), Ås (Norway), Stanford, Stockholm, Wissenschaftszentrum Berlin, among other parts of the world. Recent works include The Meta-power Paradigm: Structuring Social Systems, Institutional Powers, and Global Contexts (2011) (with Peter Hall) and Public Policy Paaradigms: The Theory and Practice of Paradigm Shifts in the EU (2009) (with Marcus Carson and Dolores Gomez Calvo).

Christian Stohr is Ph.D. candidate at the Department of Applied IT of Chalmers University in Gothenburg, Sweden and holds a M.A. in Sociology. His research interests include the conceptualization and practice of environmental governance systems, particularly the role of science and technology and stakeholder participation. His recent research also includes the governance of information technology.

*Corresponding author: Tom R. Burns, Sociologiska institutionen, Box 624, 75126 Uppsala, Sweden. Tel.: +0046(0)708247050; E-mail: tomburns@stanford.edu.

1. Governance

Governance refers to a complex of public and/or private coordinating, steering and regulatory processes established and conducted for social (or collective) purposes where powers are distributed among multiple agents, according to formal and informal rules.[1]

---

[1] The concept of governance [13, 18, 20, 21, 26–28, 32, 33, 35, 37, 50 among others] was articulated in the 1980s necessitated by

Governance systems are developed and applied to a vast array of objects in modern society, for purposes of shaping, governing, and regulating such objects. The range of "objects" varies from natural, technical, and biomedical (genetic structures, biotechnologies, body parts, life and death) to organizational and cultural (including gender relations, scientific knowledge, abstract human constructions such as money, credit, and debt, and sacred objects (buildings, areas, animals), among others.

Governance systems are the basis on which to make as well as reform, interpret, implement, and enforce complexes of rules and policies with respect to domains of policy and regulation in social life. The agents – both directing governance systems as well as subject to them – may be diverse: "political actors" (parties, states, international government organs), economic interests (private companies, business alliances and associations), non-profit organizations, NGOs, groups and associations of scientists and other experts, local communities, networks, or any social entity that conducts activities of deciding, governing, coordinating, regulating, allocating resources, etc.

Given the contrasting objects of regulation systems (and the diversity of human behavior and the material and socio-cultural contexts related to the objects of governance), it is not surprising that *governance arrangements exhibit great variability, in particular in their specific relation(s) to the objects of regulation.*[2]

---

the emergence of entirely complex hybrid forms of coordination and regulation in contemporary society. Public-private boundaries had become blurred, where business interests as well as NGOs increasingly became intimately involved with government (and in some cases more important than government agents), and where in a related development much power and sovereignty had been shifting upwards to supra-national bodies, downwards to regional and local levels and outwards to multiple agents in civil society. Diverse stakeholders, "organizational citizens" and the new politics of "organic democracy" are part and parcel of a major transformation of contemporary governance arrangements and, more generally, "democratic politics". The conceptual development of governance ideas was then motivated by the realization that state and state-centric international regimes are not the only or the most important forms of rule- and policy-making, implementation, and regulation in a number of areas. Business interests and NGOs as well as other non-business associations and communities have come to play key roles in shaping and influencing the design and establishment of governance mechanisms.

[2] Governance design and functioning take into account or reflect characteristics of the governance objects and their environmental context. Thus, a governance institution combines ("composes" if you will) social structural "facts" with material "facts" (human biology, environment, time and space, "natural" conditions) – with their different types of causality and "logics". This is apparent in the case of socio-technical systems; for example, in the case of a hydro-power

In governance processes, operations are carried out not only on the objects to be regulated but also on the actors in the governance structure who are to perform the functions of governing, regulating, and developing. Regulation typically extends also to those who receive or use the objects (e.g., goods and services) of governance systems.

2. Governance architecture and the comparative analysis of governance systems

2.1. The architecture of governance systems

Governance systems – and their policy goals and tools – are institutional and cultural arrangements characterized by universal dimensions of governance systems (see Table 1) [14]:[3]

(1) Their social organizational features: Particular classes of designated agents, their roles and relations of power/authority, and procedures for making collective decisions.

(2) Their normative-cognitive features: The definition of relevant or appropriate "problems" or "issues", the goals or priorities relating to the problems and to favourable states of the world, conceptualization or models of sources of the problems, the causal linkages, and strategies and methods to solve problems or deal with issues.

The paradigms define, frame problems or problem situations, the "objects" that are to be shaped, produced, governed, or transformed. The distinctions between the two basic building blocks of governance systems – the social organizational configuration and the cognitive-normative configuration – are not just analytical ones. The important point to note regarding the different

---

system, diverse but more or less integrated governance arrangements deal with water reservoirs and flows, land, people, electricity production and distribution – the different governance sub-systems have varying social organization, expertise, and problem-solving models.

[3] Institutional approaches to theorizing and empirical research have contributed, in general, to increasing interdisciplinarity in the social sciences. Among the major contributions here are the works of March and Olsen [31], North [36], Ostrom [37, 38], Powell and DiMaggio [41], and Scott [44]. Among the new institutional approaches, some emphasize theorizing about systems of rules [10, 14, 16, 40]. The institutional approach stresses the structural contexts which shape agents social relations and interdependencies as well as their situational action opportunities and constraints, their knowledge and models of reality, their values and interests, and modes of judgment (some might say their "particular rationalities".)

Table 1

Elements comprising the architecture of a governance paradigm

Feature of the governance paradigm	Explanation
Social organizational configuration	
Authority and responsibility	Actors with formal or informal responsibility for addressing and/or resolving key issues and problems
Expertise and knowledge requirements	Actors that are legitimate knowledge sources and producers to explain sources and solutions of any particular issue
Other affected actors, stakeholders	Actors that are not directly part of the governance regime itself but are affected by it and/or try to influence it
Procedures for (legitimate) decision making	Designation of persons with authority to make decisions or define who and how actors should be involved in a collective decision making process Also includes deliberating, resolving or settling conflicts, and deciding the nature of the problem and the right strategy and solution
Cognitive-normative configuration	
Problem or issue	Framing and characterization of the key issues that the governance system is supposed to regulate
Goals and priorities	Definition of legitimate values and appropriate goals which are expected to be applied in the policymaking and governing processes
Conceptualization/model of the situation or issues	The applied model(s) of the social arrangements, the natural or technological system and the interaction between them (which may or may not be correct)
Solutions	Specification of form and range of acceptable methods to achieve the goals including the appropriate, available institutional practices, technologies and strategies

categories is that they exert different kinds of influence. Organization exerts a direct pressure influencing and regulating overt behavior, while the influence that stems from the cognitive-normative configuration is conceptual and normative. In an instance where a policy paradigm is highly institutionalized, the two would be expected to mirror one another to a very large extent.[4] In instances where the level of institutionalization is much lower, such as in periods of transition or confrontation over paradigmatic elements, one would expect the configurations to be objects of struggle, and reconstructed over time and space.

---

[4] For the application of the framework to describe the architecture of specific governance systems, one would typically represent the institutionalized view of the most powerful agent (e.g., the EU in the cases in this article). However, in governance systems with major cleavages or a low level of nstitutionalization, conceptions of an appropriate or correct cognitive-normative and social organizational framework might vary significantly among different agents or groups of agents. One of the applications of our theory entails comparing the different conceptions of an appropriate governance paradigm among actors in order to identify and explicate sources of conflict that might lead to dysfunctioning, negotiations, and ultimately transformations of the governance system [12, 14].

2.2. Comparative analysis of governance cases

Below we briefly present for purposes of illustration three EU governance areas:[5]

2.2.1. Baltic sea fisheries [12]

Fisheries in the Baltic Sea with its 8 bordering EU member states[6] is regulated through the EU's Common Fisheries Policy (CFP). The CFP was established in 1983 with the goals of achieving both a "thriving and sustainable European fishing industry". These objectives are the two basic conflictive rationales represented through the two most important stakeholder groups at the grass-roots level – the fishing industry and Environmental Non-Government Organizations (ENGOs). The fishing industry (e.g., fishers, ship owners, processing industry) is trying to realize economic gains from fishing. ENGOs promote nature conservation and obtain their influence mainly through private campaigns to

---

[5] The establishment of these systems are instances of the exercise of meta- or structural power in agent-driven innovation and transformation of governance [14].

[6] Germany, Sweden, Finland, Denmark, Poland, Estonia, Latvia and Lithuania, added by the non-EU Russia.

mobilize public opinion, consumer behavior, and even electoral results. The power, scope and size of both the fishing industry and ENGOs vary among the different countries.

The CFP as one of the most comprehensive fisheries agreements worldwide follows a hierarchical governance paradigm. The EU Council of Ministers as the highest decision maker determines broad policy measures that are to be implemented by the member-state Fishing Ministries. The most important determination is the annual Total Allowable Catches (TACs), which are distributed among the member states according to the principle of permanent share for each member state involved based on historical catch level (the "principle of relative stability").[7] The European Commission (more precisely, DG Maritime Affairs and Fisheries, DG MARE) prepares and proposes the regulations for the Council (the Council together with the EU Parliament are the main co-deciders of legislation and policy [14].[8]

Although the regulatory power is concentrated at the EU level, the decisions are informed by several knowledge sources. Scientific expertise is provided by the International Council for the Exploration of the Sea (ICES), an umbrella organization for the marine research institutes of member states, as well as the Scientific, Technical and Economic Committee for Fisheries (STECF). Especially in the recent years stakeholders have also gained greater opportunities to provide advice to the European Commission. This takes place, on the one hand, through the Advisory Committee on Fisheries and Aquaculture (ACFA) that consists of members of the fishing industry and since 2000 also of scientists and NGOs. Within the scope of the last CFP reform in 2002, the Council also decided to set up Regional Advisory Councils (RACs)[9] that consist of representatives of the fishing sector and so called "other interest" groups (e.g., ENGOs). Both the Advisory Committee (ACFA) and the RACs provide – preferably consensus based – advice to the Commission, but do not have any formal regulatory power. The

Commission typically asks the Committee for advice concerning certain issues related to the CFP, but both can also issue its own opinions.

2.2.2. EU chemical governance [14]

This governance systems entails a radical regime of regulation passed in 2006: Registration, evaluation, authorization, and restriction of chemicals (REACH). It has been designed to cover a major part of all chemicals (substances of either high concern or manufactured or imported over 1000 tonnes). The law replaced about 40 legislative instruments in force at the time. The European Chemical Agency (ECHA) was established in 2007. Thousands of substances (approximately 30,000 expected) already on the market are being assessed and will be subject to authorization. The burden of proof of chemical safety lies now with the producers, not with consumers or with the regulator. Chemicals can be banned – or if their value to society is judged to be very high they can be allowed but under very tight controls. REACH – in effect since June, 2007 – was one of the most radical and contentious policy initiatives of the EU, involving almost 10 years of debate, mobilization, struggle, and negotiations between the Commission, the Council of the European Union, the Parliament, and industry, labor unions, environmental, consumer and animal rights NGOs, among others. In addition, there were substantial cleavages and struggles within EU institutions: in Parliament (between, for instance, the Committee on Environment and Committees on Industry and Legal Affairs); in the Commission (between DG Environment and DG Enterprise), and in the Council itself between the countries (in particular Germany, France, UK) fighting to defend the old paradigm of a privileged position and limited regulation for the chemical industry and those states pushing for a new, much tougher regime of chemical regulation (for instance, Sweden, Austria, Finland, and Denmark). The US Government and US companies were key players in these struggles. Arguably, never has a public policy process in the EU involved so many players with such intensity over such a long period of time.

2.2.3. EU gender governance [14]

The aim of this governance system was to eliminate inequalities and to promote equality between men and women – and to do this in *all* EU policy sectors, a policy principle referred to as "mainstreaming" (established in 2000). The scope of the development is suggested by such sectors as "women in science," "their role in

---

[7] Relative stability is the permanent share for each member states, usually defined through historic catch records.

[8] Thus far the European Parliament is only consulted but does not have any regulative power in the matter of fisheries. However, this is going to change to the co-decision modality engaging the Council and the Parliament after the next reform of the CFP 2012.

[9] This decision can be seen as a result of the continuous pressure from the fishing industry and the general shift of the EU governance paradigm towards greater inclusiveness with increased stakeholder involvement. The Baltic Sea RAC was established in 2006 [12].

structural funds," "EU development aid, reconciliation between work and private life," "women in societal decision-making," "domestic violence," etc.

The EU came to make gender equality a core public policy goal during the 1990s. The EU approach evolved over three decades from, on the one hand, its previous approach that limited the issue to only the labour market to, on the other hand, an extensive approach that considers gender relations in a much broader public perspective [22]. The multiple "parallel tracks" concept in the evolution of EU gender equality policy has been driven from "below" and "above". National and international women activists and organizations have nudged EU policy along through periods of relative inactivity or painfully slow progress punctuated by occasional surges forward – a process of fits and starts that resembles the evolution of the EU itself. At the same time, it has been facilitated by contemporaneous developments within individual member states and at the international level – driven in large part by women's activism.

These developments were nurtured and driven forward by an array of local, national, and EU-level actors: women's organizations and other sympathetic NGOs, officials within the European Commission, members of the European Parliament, and civil servants and officials within several Member States. Moreover, international organizations such as the United Nations (UN), the International Labor Organization (ILO) and the World Health Organization (WHO) have been important sources of influence.

Table 2 applies key dimensions specified in section 2.1 to all three cases. This approach enables comparisons of the social organization of governance, the particular agents having responsibility and exercising authority, the expert groups and networks serving the governance system, the problem or issue motivating regulation, the key goals of the system and the models and methods used in monitoring and regulating.

Several immediate observations may be made based on Table 2:

(1) Contradictory goals characterize fisheries and chemicals: there is to be control over fishing and chemicals, respectively, but also these very industries are to be maintained and developed as economically valuable. On the other hand, there are no conflicting goals concerning gender equality at the policy level; however, on a practical level, that is the level of implementation, there are of course other goals such as avoiding disruption of established practices that

play a role and compete for priority with gender equality.

(2) Fisheries and Chemicals are governed through specialized Commission directorates within the established EU institutional arrangements. Gender policy is not associated with a new and separate agency. However, special gender equality units and programs were set up in DG Research, DG Development, DG Europe AID, DG for Justice, Freedom and Security;[10] and an established unit DG Employment, Social Affairs and Equal Opportunities (DG-ESAEO) has been expanded for the purpose of coordination in the gender equality area.

(3) A new special EU agency of expertise has been created for chemicals, ECHA, respectively. A partial "Europenization" of expertise can also be seen in the case of the Baltic fisheries governance with its strong reliance on the ICES. On the other hand, no specialized unit of expertise was established for gender.[11]

As might be expected in these EU cases, the types of expertise and knowledge requirements vary considerably. However, all have substantial involvement of scientists, but natural scientists predominate in chemicals, and to a great extent fisheries, while social scientists including criminologists are engaged in the gender area. At the same time, non-expert types of knowledge brokers have become predominant in these EU governance settings. In fisheries governance, there have been conflicts, and the integration of the different knowledge agents has not been accomplished thus far. Fisheries governance is also weakest in terms of multi-stakeholder participation in deliberations and policymaking (although such participation is an established normative idea in the EU); nonetheless, there are currently initiatives to correct this.

---

[10] The DG for Justice, Freedom, and Security has been divided into two DGs in 2010: the DG for Home Affairs and the DG for Justice (the latter consisting of three directorates: Civil Justice, Criminal Justice, and Fundamental Rights and Citizenship).

[11] There is, of course, a unit in DG ESAEO and gender coordinators in the different DGs (most DGs do not have gender units but officers that act as gender coordinators). Some of these bodies are the Advisory Committee on equal opportunities for women and men (created in 1981), the Commission Inter-Service Group on Gender Mainstreaming (created in 1996), and the European Institute for Gender Equality (established in 2007). We are grateful to Dolores Gomez Calvo for these details [see also 14].

Table 2

Selected EU governance systems in a comparative framework

	Fisheries governance	Chemicals governance	Gender governance
Social organizational configuration			
Authority and responsibility	Authority in the council of Ministers on the basis of proposals from EU Commission's DG Maritime Affairs and Fisheries which monitors and regulates member-state governments compliance with policies	Authority for implementing law and policy located in the EU Commission's DG Environment which sees that member states enforce EU chemicals legislation such as REACH	Dispersed Authority located in a multi-sectorial policy model. Expanded Commission role, and the EP and the Council to be involved in gender issues
Expertise and knowledge requirements	ICES (umbrella group for the national fisheries research institutes): Status and prognosis about the fish stocks STECF: Socio-economic experts: Impact assessments (of e.g., new regulations) Fishers: Fishing data, regional particularities	Single Autonomous Agency, ECHA, for protection of human health and the environment in the chemicals domain. Collects data on the safety and socio-economic aspects of the use of chemicals. Recommends chemicals to be subject to obligatory authorization (also possibly banned)	Wide Spectrum of EU, national, and NGOs with sector specific expertise. Social scientists including criminologists.
Other affected actors, Stakeholders	Fishers, fishing industry National and local governments	Consumers, chemical industry, health care, environmental interests	Women, gender relations, society
Procedures for (legitimate) decision making	Council of Ministers, European Commission, National governments engaged. Pressures for Multi-stakeholder participation: Fishing industry & NGOs	Multi-stakeholder Participation: multiple EU & national as well as NGOs organizations	Multi-stakeholder participation, typically specialized in multiple sectors
	Fisheries governance	Chemicals governance	Gender governance
Cognitive-normative configuration			
Problem or issue	Declining fish stocks in the Baltic, some at risk of collapsing	Chemical threats to human health and environment	Gender gaps and normative issues of equality ignored or neglected nationally and at EU level
Goals and priorities	Substantial reduction of fishing effort Keep fishing pressures on Baltic Sea fish stocks within sustainable limits Keeping a healthy fishing industry	Effective control of chemicals identifying unknown or unacknowledged hazards, banning or limiting most high risk chemicals. Also maintenance of a healthy chemical industry. Hence, precautionary as well as innovation principles apply	Gender equality as core EU value to be accomplished in all policy areas

(*continued next page*)

Table 2

(*continued*)

	Fisheries governance	Chemicals governance	Gender governance
Conceptualization/Model of the situation or issues	High fishing pressure is the main cause for declining fish stocks Anthropogenic A case of "the Tragedy of the Commons" [19]	Many chemicals are risky for humans, other species, and the environment and must be regulated by EU public policy. This is in the part the result of a long history of introducing chemicals into society without much attention to or control of side-effects and hazards to human health and environment	Gender inequality & discrimination found in all sectors of society. Structural and hidden sources of inequality need to be identified and analyzed. Different models in different sectors
Solutions	Catch quotas (TACs) based on Precautionary Principle, Technical Measures Monitoring (catches, boat positions, etc.) Diverse solutions on national and local level	Control of chemicals from manufacturers, importers, and down-stream users, including powers to ban chemicals or to limit their applicability	EU policy intervention necessary in all areas of public policy

(4) The models of the problems and their mechanisms (or causes) differ accordingly. Baltic fishing is a classic commons problem (a potential "tragedy of the commons" [19]). Chemicals had come to be identified as major problems as the result of a long history of introducing thousands of chemicals into society without adequate testing or knowledge about the human and environmental health risks. Gender inequality and discrimination – in the context of expanding democratic norms and practices – called for new actions and policy responses. There were major differences among member-states in addressing gender issues, but some issues such as violence against women were shown through European research to be largely neglected everywhere. This and other policy considerations – in the context of feminist research and rhetoric about systematic structural discrimination in all societies – set the stage for the EU "mainstreaming initiative" [14].

(5) The "solutions" in the difference governance areas vary greatly. In some areas, "strong sanctions" are almost absent (or they are easily circumvented or subverted) as in the case of fisheries. In the area of chemicals, strong sanctions have been established: Heavy fines can be imposed, products can even be banned from EU markets. In the gender area, contrary to some prognoses about a "toothless policy", the EU found it had considerable leverage in areas such as science funding (DG Research) and structural funds (DG Regional Policy), where it became very unlikely for projects to obtain EU funding without demonstration of gender equalization among applicants. Even in the area of violence against women and children, the EU has supported widespread monitoring and financing of national efforts, which had a significant impact on public awareness and national and international policy during the course of the 1990s and 2000s.

To sum up: a full-fledged institutional approach can deal with all levels of governance, including dealing with multi-level and complex governance systems. The process of conducting case studies on multiple levels and organizing the data according to the governance framework presented enables the empirical materials to be used in a systematic comparative manner. The methodology also facilitates theoretical development essential to cumulative science and to strengthening the interdisciplinarity of the institutional approach.

3. Governance paradigm shifts and transformations: Meta-power and social structuring[12]

In spite of a great deal of excellent research on governance, there remain gaps and challenges. One of these shortcomings, which our theoretical and empirical research tries to address, concerns a specification of several key mechanisms of governance formation and change. The work also identifies a few *key drivers explaining how governance systems are established, maintained or changed through power, knowledge, and contestation/conflict processes.*

3.1. Key factors in the transformation of governance systems

Governance systems are a type of social system. Social systems are characterized by institutional arrangements, organized forms of power, diverse knowledges and conflict/struggle within and over the systems [5, 8]. Power, knowledge, and conflict are three key dimensions with which to explain a significant part of the functioning and transformation of governance systems. Briefly:

3.1.1. Power[13]

Power and control are central to governance systems – both in their functioning but also in establishing or changing them. In their functioning, relations of authority and responsibility have been singled out in our characterization of the architecture of governance systems. In general, the power arrangements of governance systems may vary greatly: there are hierarchical forms including bureaucratic and patron-client types of hierarchy), horizontal (for instance, negotiating orders run by a committee, board, or a network), "markets-like," "democratic-like decision-making," and a great variety of hybrids. McGinnis [34, p. 6] also stresses that, in general, governance need not be conceptualized as authoritative agents having "power over" subjects or citizens, but can entail various forms of agents jointly exercising "power with others" in joint efforts to solve common problems or realize shared goals. Power may be backed by substantial economic or political resources, but increasingly there are various forms of "soft powers".[14] The role of power in the functioning, stabilization, and change of governance systems is illustrated in the cases discussed later.

3.1.2. Knowledges (also, paradigm as an organized knowledge factor)

Governance systems typically entail knowledge acquisition and production processes evolving in concrete, practical ways, particularly those dealing with objects or phenomena about which specialized (scientific and other) knowledge is believed to be essential to regulatory effectiveness.

Because most governance arrangements consist of multiple regulatory mechanisms, diverse bodies of knowledge are required (for example, drawing on different scientific disciplines plus diverse stakeholders with their local or tacit knowledge).[15] Together these increase the likelihood of effective policymaking and regulation. One of the aims of many governance arrangements is through the design of organizational forms and procedures to enable the systematic application of relevant knowledges to governance problems, for instance, local practical knowledge, scientific knowledge, knowledge of law (and, thus, sustainable in any challenge "according to the law") etc. Indeed, one of the challenges in contemporary governance design

---

[12] There is a meta-politics to establishing and changing governance structures (see later; also, [33]).

[13] Power in social life is typically characterized by complexes of potential causal factors, mechanisms which entail "control", "influence", power over, power to, etc with respect to states of the world, agents, activities, developments [11]. The bases of power are diverse: ownership rights, government authority, contractual relationships, powerful laws with sanctioning capacity, norms, knowledge based and expert power, power based on position in communities and informal important networks, etc. Power systems are based on causal factors or complexes, which can be "owned" and manipulated in relation to social action and interactions and their outcomes. Some rules, for instance relating to ownership or positional authority, give to particular social agents control ("control rights") over resources and agents, which are a major basis of social influence or power. For a discussion of the relationship between rule systems and social causality, see [16, also 10].

[14] Research has identified a variety of mechanisms of "soft means" to advance social policy in the EU [7, 14, 45]. The methods put a stress on framing of issues (e.g., defining a policy issue as "European"), "European" data collection and distribution, standardization of measurements and classification, monitoring of opinion and behavior, opinion formation (consciousness raising), mutual learning processes, the diffusion of "best practices", collecting and sharing standardized and comparable data among member states, making international comparisons and applying peer pressures (including "benchmarking") to align policy among others.

[15] Raw data and different types of information become relevant and useful when organized in knowledge systems. In other words, information requires framing and organization into meaningful knowledge frameworks if it is to be useful in policy processes and regulation (or in action more generally).

is to effectivize legitimate procedures incorporating the increasing diversity of expertise as well as an increasing engagement of a variety of "relevant or appropriate stakeholders". The results are highly complex governance arrangements, as illustrated in the Baltic fisheries case presented earlier.

3.1.3. Contestation/conflict

Governance systems typically entail multiple forms of power and regulatory processes, multiple agents (including different stakeholders), diverse forms of knowledge and interests among those involved and affected by such systems. This provides a context for contradiction and conflict. Since agents involved in government systems typically have differing roles as well as knowledge and interest bases and even varying conceptualizations of governance aims and arrangements, struggles take place about the proper architecture, functioning, and reform of governance. Those directly involved as well as those affected in one way or another are likely to be concerned about issues such as what are defined as problems, goals, preferred governance forms and procedures (public, private, hybrid, etc.), procedures for deciding what are "problems" or "solutions", or what are strategies and methods to use in finding solutions. One of the challenges of modern governance systems is to coordinate and integrate the different regulatory mechanisms, diverse agents, and their differing material and ideal interest as well as variation in their governance conceptions.

3.2. Mechanisms of governance formation and reformation

Of particular interest in our research are shifts from one regime to another, for instance from state or public governance of goods to private (e.g., privatization of electricity or gas in the EU), or from a loosely regulated market regime (such as food in the EU) to a tightly regulated markets treated as a "commons" (for example, the security and public health aspects of food in the EU).

There are several major processes whereby a governance regime may be formed or reformed [9, 14]. Key factors concern not only power (and agents exercising power) and their values and interests but also the development of a paradigm concerning the design and functioning of a particular governance system. The paradigm entails a type of "knowledge," although the knowledges need not be necessarily correct or contribute to effective performance of the governance system. Stinchcombe [46] stresses the structural factors

(including the power positions of actors in social structures) which enable them to initiate developments of new organizational arrangements *within* existing social structures.

Conditions of power, knowledge (paradigms), and conflict are distinguished below in a consideration of the transition/transformation of governance systems.

3.2.1. Dominant power (autocracy) and a shift in the agent's cognitive-normative framework[16]

A hegemonic agent (or alliance) adopts or develops (as a result of a learning or persuasive process) a new governance paradigm, using its power to establish and maintain it. This may operate locally, regionally, or globally. For example, the USA at Bretton Woods after World War II is a global example. Paradigm(s) of modernization has been introduced and imposed (usually in a highly selectively manner) in a number of instances – a recurrent pattern of social transformation since the Industrial Revolution: Among others, the Meiji revolution in Japan (1868), Haile Selassie's transformation of Ethiopia (1930–1974), Pahlavis Shahs (1925–1979) restructuring of Iran, and Gorbachev's initiatives launching glasnost (opening) and perestroika (restructuring) [9]. Such transformations characterized by the re-orientation of an established ruling elite entail then processes of learning, conversion, and entrepreneurship. Under the direction of the elite adhering to a new paradigm, a new institutional order is launched and unfolds. The major structural feature of such transformations is the more or less intact domination by a ruling elite, at least initially (unintended developments take place, including erosion of elite power as an unintended consequence of their innovations).

The agent in a position of substantial if not monopoly power is able to initiate a new paradigm in order to deal with policy failures, problem-situations, anomalies, or threats to regime power. Similar studies have been carried out in the private sector, as discussed below, for instance in the case of BP when the CEO became convinced (through an external environmental NGO) of the feasibility and effectiveness of an internal GHG emissions trading system and introduced it and saw to its implementation.

---

[16] The domination may be based on administrative power, wealth, charismatic authority, coercion, etc. Of course, the resources and control activities differ significantly with the different modalities of power. Their limitations and vulnerabilities to erosion or collapse differ as well [11].

3.2.1.1. Example 1: Public authority: Establishing healthy food governance in the EU (healthy food as a public good) [14]. Prioritizing public health and consumer protection over market principles illustrates nicely one major paradigm shift in governance in the case of the EU response to a food crisis. Numerous "risks" and "technical" problems emerged during the deregulation associated with the establishment of the EU "internal market" in food and agricultural products. These necessitated the development of a number of new regulations at the European level – ironically, under the pressures arising from the performances of the "free market" paradigm that calls for the removal of regulatory obstacles to trade. However, the new regulations remained ineffective and significant food-related crises developed – the best known among these being the "mad cow disease" or BSE. As a result, the European Commission itself adopted a new paradigm – new by virtue of a reordering of guiding principles and the establishment of a new EU regulatory agency for food. It placed public health and consumer protection *above* free market deregulatory principles. The new priorities/values have been steadily institutionalized in the subsequent regulatory mechanisms with regard to food. The best example is the Commission's response to discovery of dioxin contamination of Belgian poultry, followed by an immediate ban on Belgium poultry exports. This reaction contrasted with the early treatment of the BSE case in which the Commission sided initially with the British government and allowed the free EU market to continue operating. The new governance arrangement has been institutionalized: the Commission has been re-organized; primary responsibility/authority for dealing with food policy was moved from the directorates dealing with agriculture and markets to a new directorate, Health and Consumer Protection. The European Food Authority was established, representing a further institutional expression of the new governance paradigm and its principles and values. Food policy in Europe is no longer seen only/primarily as a commodity or market issue.[17]

---

[17] Unfortunately, there is not the space here to consider the power dynamics of the most radical paradigm shift in EU governance, namely the comprehensive regulation (with powers of banning) of chemicals: REACH entailed a reversal of many previous assumptions regarding product safety, burden of proof (producers, not customers or government agencies), and the treatment of risks. A new governance structure was established (see earlier), and thousands of products already on the market had to be assessed since there was insufficient publicly available data to properly determine their safety.

3.2.1.2. Example 2: Public-private governance formation. A public-private initiative is reported by Ostrom [39, p. 15184–15185], drawing on the work of Acheson [1] and others, concerning Maine lobster fishers. The latter experimented with and evolved a diversity of governance rules and norms after the crash of lobster stock in coastal waters during the 1920s and 1930. Given established, multi-generation community and fisher networks which provided a basis for stabling governance structures defining and regulating allowable catches and thus enabling the revival and effective reproduction of lobster stocks. But "community integration" was necessary but not sufficient for effective governance. The lobster fishers had substantial knowledge about the lobster resource system and its vulnerabilities and reproductive patterns. Some of this knowledge could be translated into harvesting rules and norms that contributed to the eventual recuperation of the stock. Without this knowledge, the initiative would surely have failed. Ostrom [39, p. 15184–15185] also points out the importance of the state government in the formation of the effective governance system, legislating laws which were supported, monitored, and enforced by the fishers themselves. (For instance, much earlier, the state of Maine had made it illegal to harvest egg-bearing female lobsters in the 1870s, but the law failed to gain compliance until the fishers organized themselves in the new governance arrangement). Also, important for the eventual effectiveness of governance were the particular characteristics and behavioral patterns of the lobsters (facilitating the regulative regime – and a contrast to the problems of regulative regimes in the Baltic [12].

Private governance initiatives

There have also been a number of outstanding global "private governance" initiatives.

3.2.1.3. Example 3: Private initiative for GHG emissions control. A major private driver, British Petroleum (BP), established in 1998 an emissions trading pilot scheme for a limited number of its business units (eventually 150 were involved) with an ambition to cut its emissions by 10% by 2010 from their level in 1990 (a goal comparable in magnitude to salient Kyoto targets) [14, 51, 30, p. 13]. This initiative was partly the result of the US pressure group Environmental Defense Fund (EDF), the most active supporter for many years of emissions trading on the environmental side in the USA [51, p. 9]. EDF viewed emissions trading as a way

to end the polarity between business and environmental groups over the climate change issue. EDF forged a partnership with BP which in 1997, under its new chief executive John Browne, broke ranks with the other major oil companies, announcing that it accepted that global warming was a major threat and that action was needed. EDF's President, Fred Krupp, 'lobbied John Browne to adopt a cap and trade system,' which it did [30, p. 13, 47, p. 2102]. Again, this is a case of the top leader in a hierarchical system (BP) using his or her power to establish an innovative governance paradigm.

In sum, the dominant agent in a social system is able to initiate a new governance paradigm in order to deal with policy failures, opportunities for gain, problem-situations, or threats to regime power.

3.2.2. *Power shifts*

A shift in power takes place, and a new group or leadership assumes power guided by a different governance paradigm than the previous regime. The shift of power may occur through a democratic process (e.g., elections or a decision of a parliamentary body), a negotiation between elites, coup d'état or revolution.

The pattern in a transformation with elite replacement is typically one of more or less open struggle for, and ultimately a shift in, domination relationships. A group, organization, or movement with a new paradigm of social order takes political power. These shifts may take place through the replacement of elites with relatively few persons or groups involved; or they may take place with great popular participation, as in popular revolutions. Both of these forms of transformation are discussed below.[18]

Transformative coup d'état [9, 7]

Through military action, a group of military or military allies takes state power, in large part without mass mobilization or movement. For example, communist regimes were introduced into Eastern European countries with the backing of the Red Army at the end of World War II. There are many other examples of such forms of transformation: Ataturk in Turkey (1922), Peron in Argentina (1944), Nassar in Egypt (1952), the disillusioned officers who in April, 1974, ended the

Portuguese dictatorship and its colonial wars and set in motion the dissolution of the empire and the democratization of Portugal. Here we will briefly illustrate this genre of major transformative process with the military takeover of Turkey by Ataturk.

3.2.2.1. Example 1: Ataturk and the transformation of Turkey. Kemal Ataturk (1881–1938), a modernizing army officer in Turkey, used military force to abolish the Sultanate of Turkey in 1922 and to establish a new political order, the Turkish Republic. He ran for election and was elected president by unanimous parliaments in 1923 (and again in 1927, 1931, and 1935). He launched a systematic program of Westernization and institutional restructuring. Among other things, he separated Islam from the state, abolished religious orders, and forbade polygamy and the wearing of the traditional fez; women were given suffrage and emancipated legally; and civil marriage was made compulsory. At the same time he eliminated or suppressed all religious opposition to his reforms. New industries were launched, with the state playing a key role. School systems were established, government was reformed, and the legal structure was transformed with the adoption of the Swiss civil code, the Italian criminal code, and the German code of commercial law. The Latin alphabet was substituted for the Arabic script, and all Turkish citizens under 40 years of age were required to attend schools to learn it. The transformations were not only political and economic but religious and social. Until recently, Turkey could be characterized as being a highly secularized society, to a large extent Western oriented, in large part as a result of Ataturk's radical initiatives. But there emerged counter-forces, which until relatively recently were supposed (for example, through a series of military coup d'etait) when democratically elected Islamic politicians (with considerable support from the EU and the USA) have been able to exercise meta-power (as well as more routine state powers) and accomplish considerable restructuring of Turkish society, including changes in constitutional rules and other formal principles.

Popular revolutions [9]

The major revolutions of the 20th century (but also the English (1648), American (1783), and French Revolutions (1789)) engaged large masses of people acting within revolutionary movements. The most dramatic cases involved peasant and worker revolts led by organized groups or parties (for instance, the Russian and

---

[18] While the examples presented here are focused on political and societal transformations, one observes in private business, that corporations may be taken over by new owner interests (private or public) with an entirely new paradigm for conducting business and developing the enterprise, such as in the pursuit of globalization.

Chinese revolutions) and urban revolutions such as the Iranian Islamic revolution (see below).[19]

Two factors characterize these revolutions: (1) power transformations where struggles over power and the shifts of power result in new agents coming to power, and in the abdication or defeat of those representing or identified with the old order; (2) the mobilization and participation of large numbers of highly motivated people struggling for new arrangements (for example, urban masses, workers, peasants); (3) vision(s) or pre-paradigm ideas relating, for instance, to equality, democracy, new relations of production. In mass revolutions, the struggles may or may not be highly violent [9]. Agency is not manifested simply in the acts of particular agents but in the interaction processes themselves, the struggles, the formation and dissolution of coalitions, and the taking and consolidation of power.

Analysis of such revolutions must examine the ways in which particular agents, initially outsiders or challengers, have come to a new conception or model of society, in part through the learning and diffusion processes referred to earlier. Through facing new types of problems, or through a conversion process, they arrive at a new orientation and model of society different from the perspective of the established elites.

Of course, the process of learning does not end with seizure of power. The agents of change may intend to make relatively modest alterations, but the process of mobilization, struggle, and taking power radicalizes their conceptions. They often have to form alliances in their struggles and this may compel them to alter their programs and discourses, and pursue a more radical path, or under other conditions, to pursue more moderate scenarios.[20]

What ultimately results, whether radicalization or moderation, will depend on the alliance formation processes and the dynamics of the struggle. There are emergent selection processes, typically different from those operating initially. This is not only because

new institutional arrangements are established, but also because alliances and networks are altered in the revolutionary and post-revolutionary processes. Several of the characteristic features of mass revolutions are illustrated by the Iranian revolution.

3.2.2.2. Example 2: The Iranian revolution [2, 3, 25]. The Pahlavis Shahs (1925–1979) played a major role in modernizing and transforming Iran. However, they never enjoyed total control over developments, in spite of massive use of police methods. The policies and programs they instituted working in parallel with other developments, had many unintended consequences, as is typical of political rulers, especially autocratic ones. Modernization threatened key groups, such as the clergy (*ulama*) and the traditional business class (*bazaris*) in the old social order, which were critical of many of the modernization developments. At the same time, socio-economic, administrative, and professional modernization led to the emergence of new social groups (in particular, the middle and working classes as well as urban marginal groups, the "dispossessed"), that not only were critical but had visions of another modernization, one which would take their concerns and interests into account. In the context of the autocratic regime, which excluded traditional as well as new groups from government influence, opposition to the Shah grew and spread and over time became a common cause across otherwise disparate groups. Traditional groups such as the clergy and the bazaris had a legitimacy and a capacity to resist (in part, based on the relative autonomy of civil society [25]). At the same time, the Shah – resisting democratization and reform of the political order – alienated the new middle classes which had been created in large part by the Shah's modernization program and who expected civic rights and modes of political voice and influence that their counterparts in many comparable societies enjoyed. *In a word, their conception of modern society did not correspond closely to that of the Shah.*

This set the stage for a coalition of key groups in the old order as well as the middle classes in the new, and the urban "dispossessed" who partook of both worlds, to mobilize and successfully oppose the regime and led to a major political and social transformation [2, 3, 25]. A key rallying point was the concept of removing the Shah and replacing the Monarchy with a type of Islamic government, later specified as an "Islamic Republic". The latter paradigm was an innovation on Khomeini's part (since no such concept is found in the Koran or in

---

[19] Major power shifts may be violent as well as broad in scope, as was the case of many of the communist "revolutions", commencing with the Bolshevik Revolution. In all of the major communist revolutions (Russia, China, Vietnam), the transformation entailed the introduction of the one party state and total domination of government ("dictatorship of the proletariat"), nationalization of most means of production, establishment of a command economy in which the party plans and controls the production and distribution of goods and services, regulates the movements of people and resources, provides universal education, health care, day care, and rapidly deploys women in the labor force, etc.

[20] In the Iranian Revolution, the "dispossessed" in alliance with the radical clergy radicalized the revolution (see below) (Kamali, 1998).

Khomeini's earlier writings).[21] The idea of an Islamic Republic made it possible for Khomeini and the radical clergy to establish a coalition with the new educated middle classes interested in instituting a Republican form of government.

Once the army became neutral, the fate of the Shah was sealed in the face of widespread opposition and revolt. The transition to the new regime did not involve high levels of violence, at least initially. The major differences between the radical clergy and the middle classes, left as well as right oriented, became apparent only after the collapse of the old regime. The neutrality of the armed forces left the middle classes disarmed (there had been close links to the military earlier). The radical clergy led the "dispossessed", the urban marginals, who were armed and became their armed forces. The future role of liberals (and leftists as well) was sealed. This development, among other things, represented another episode in the interplay between modernity and traditionalism. The dialectic continues today – now within Iran's Islamic order – providing a more or less common normative frame and discourse field. This contrasts with the situation during the Shah's period when there was a great divide and the lack of a common frame of reference and common discourses (a situation found today in politically turbulent Turkey, Egypt, Tunisia, Morocco, and Algeria, among others).

3.2.2.3. Example 3. "Velvet Revolutions" in several former communist countries. In the social revolutions that took place in Eastern Europe in 1989–1990, opposition movement(s) came to power and replaced to a greater or lesser extent a planned economy and a monopolistic political structure with market and liberal political institutions [43]. In a word, societal paradigms were shifted. Politically, new, emerging groups coalitions were established in these by and large "peaceful" revolutions in, for example, Poland or Hungary, in 1989. The establishment of the new paradigms involved negotiated settlements and eventually elections. The transitions brought victory to groups advancing liberal market and political paradigms, which led unequivocally to a new societal order.

Thus, the transformations entailed not only political (and power) shifts but changes in concepts, models and discourses. Such cognitive-normative changes *typically accompany institutional reform and transformation.*

---

[21] The innovation is particularly radical in light of the fact that in Shii Islamic beliefs, the clergy have no place in political leadership and the exercise of government power.

For example, there were transformations of several key paradigmatic components: (1) There was a shift in value expressions and in the definition of the major problems facing the economy and society as a whole. Stress was placed on such values as "liberating production" and "increasing productivity and wealth" rather than on "state ownership of the means of production," "planned economy," "equality of distribution" or "rational central control." "Opposition to Socialism" and "bourgeois economic behavior," ceased to be seen as threats to a well-functioning economy and society; "state ownership", "state controls", and "monopoly powers" – characteristic of a command economy and the one party state – replaced them as threats. (2) The appropriate solutions for the economy were market reforms in terms of "free enterprise," "privatization," "private initiative," "entrepreneurship," "positive investment conditions." Solutions for the polity were expressed in terms of "democratization" and "political pluralism" in the form of independent, multiple parties and competitive politics. The role of the state should then become more regulatory rather than controlling in detail. In the case of the economy, for instance – rather than the party-state deciding the quantities and distribution of goods and services as well as prices and wages – independent, decentralized enterprises were to assume responsibility and authority to make plans and to determine quantities and qualities of goods and services as well as prices. Thus, solutions to economic problems were not to be expected solely or largely from the state, but from enterprises and market mechanisms. State organized "solutions" would then concern only a few, select areas such as monetary policy, competition policy, research, and development policy. The policy measures to be taken were to operate rather indirectly (for instance, monetary policy) rather than directly and in detail (price and wage controls, national production plans, or detailed regulation of imports and exports). (3) Expertise would not be embodied in the political leadership or the "vanguard party" which was assumed to have a monopoly of "historical truth" but in specialized professional experts such as economists, lawyers, and business leaders – among whom knowledge is dispersed.

Electoral and formal democratic processes

A revolutionary group or party may come to power through electoral means, as Hitler did in 1933, by leading the largest party in the German Reichstag. Once legally in power, he and his supporters were systematic and ruthless in exploiting legal and semi-legal possi-

bilities to transform the more or less democratic state into a totalitarian state, for instance by using the "state of exception" (Ausnahmezustand) in Article 48 of the Weimar Constitution after the Reichstag fire), a clause which basically provided them with meta-powers without normal constitutional or parliamentary constraints. Ataturk (as well as Juan Peron in Argentina and many others), in addition to their military actions, utilized electoral processes to establish and legitimize their regime initiatives to establish new institutions and to transform others. Many more or less peaceful transformations been initiated through democratic transfer of state power: Roosevelt in the USA (1932), the Swedish social democrats (1932), the Norwegian labor party (1929), among others, all introducing new regulatory paradigms and bringing about significant social, economic, and political transformation.

In sum, a power shift brings to a position of meta-power or structural power an agent or a coalition with a new or alternative paradigm (possibly exogenous actors are involved or an alliance of some insiders and outsiders), and it uses its newly gained power to bring about a substantial shift in governance paradigms, resulting in restructuring and transforming the social order. Its struggle for power may be based on political, economic, religious or cultural considerations.

3.2.3. A new governance order is established through multi-agent negotiation

(possibly with mediation or some arbitration in relation to conflicting parties). The negotiation may be a rather simple bilateral negotiation, or it may be a complex negotiation process. Coleman [15, also see 14] and others have demonstrated that, for instance, corporatist governance arrangements lend themselves to the cumulative, negotiated, problem-solving trajectory in bringing about policy paradigm changes, for instance in Canadian agricultural policy and programs. Norwegian and Swedish economic and labor-market policies and programs set up through neo-corporatist tri-partite bargaining (business, labor, and government) functioned in similar ways, capable of establishing new regimes (reforms) but ones which were characterized by multilateral negotiation and compromise.

Coleman [15, p. 298] contrast governance shifts based on negotiation with shifts based on power replacement: "Following Risse-Kappen and Scharpf, we demonstrated that corporatist policy networks lend themselves to the cumulative, negotiated, problem-solving trajectory to paradigm change whereas state-directed or pressure group pluralist networks

are more likely to be associated with crisis-driven changes..."

3.2.3.1. Example 1: EU Establishes a Common Fisheries Policy [12][22].

The EU countries agreed in 1983, after many years of negotiation in the 1970s,[23] on the Common Fisheries Policy (CFP) (building on an earlier 1970 agreement). The 1983 CFP emerged as one of the most comprehensive fisheries governance agreements world-wide, regulating all aspects of fishing, among other things, setting catch quotas of each type of fish for what each member states is allowed to catch. The CFP transferred substantial policymaking power from the member-state level to the EU level (The EU Council of Ministers), and member states have only limited leeway for national regulations, for example with regard to coastal and inland fisheries. However, regulatory enforcement is the responsibility of member states, at the same time that there is a community level inspection service to ensure that member states enforce the rules within their own country. Enforcement involves managing quotas and implementing technical measures to preserve fish stocks. Inspectors may check fishing gear and inspect the register of fish caught. The type of fish caught is checked and compared to quotas of total permitted catch for a given vessel. Checks may be made in port or at sea, and using aerial photography. Nevertheless, non-compliance has remained a significant problem and stocks continue to decline. Fishers say the CFP threatens their livelihoods, although some scientific research shows that the fishing stocks were in decline long before the policy was established. The governance system is in a state of crisis, assessments of the system have been conducted in the past few years and it is expected to be restructured by 2013 [12].

---

[22] There are numerous examples of national governments in Europe and elsewhere establishing governance frameworks and policies to deal with commons issues, especially since the 1970s [52], for instance Nordic, Dutch, and French policy initiatives dealing with air pollution, waste disposal, and water purity. Similarly, countries like Austria, Australia, France, and the Netherlands introduced eco-labelling in the early 1990s, and later this practice diffused and was adopted by a number of national and multi-national agents (see below on the organic or polyarchy mechanism of paradigm shift with diffusion and mimetic function.). These initiatives were partly a result of learning processes and shift in elite perspectives, and partly a result of power shifts bringing into positions of influence agents with a new eco-governance paradigm.

[23] But already in 1957 in article 38 (the Common Agricultural Policy (CAP)) of the Treaty of Rome which created the European Community (EU), stated, among other things that there should be a common fisheries policy.

3.2.3.2. Example 2: Kyoto multi-agent negotiation [14]. At the Kyoto meeting (COP-3), December 11, 1997, more than 150 nations of the world adopted the Protocol (the USA as one of the signatories never ratified it). This extraordinary agreement committed industrialized nations to make legally binding reductions in emissions of six greenhouse gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarobons (PFCs) and sulfur hexafluoride (SF6). The reductions required varied from country to country, but would cut emissions an average of about 5 percent below 1990s levels by the period 2008–2012. The Kyoto Protocol, in spite of all of its limitations, was a major accomplishment of humankind. The establishment of the UN bodies IFCCC and the IPCC – and the meetings and preparations leading up to Kyoto – were predicated on the notion that the atmosphere is a commons, and human societies had to reduce their pollution of that commons and its likely impact on climate conditions. The Protocol was achieved through the preparations of thousands of scientists and drawn out international negotiations. Eventually, levels of reduction of GHGs (greenhouse gases) were agreed to for developed countries. This opened the way for the establishment of other governance systems such as the EU's Emission Trading System (ETS). However, a number of issues were not agreed to, in spite of the many days and weeks of negotiations, prior to and after Kyoto, for instance, concerning the issue of the responsibilities and commitments of developing countries, including relatively wealthy ones such as China and Brazil. Negotiations continue to this day even after the failure in Copenhagen 2009 to reach, for instance, legally binding commitments for reducing CO_2 emissions.

3.2.3.3. Example 3:. In the late 1990s, the WWF developed its "Strategic Action on Palm Oil and Soy" because the expanded production of these two crops appeared responsible for the rapid conversion of the world's major virgin tropical rain forests and dry savannah forests ('cerrado') [35]. For the WWF, there were connections between everyday consumer products (such as margarine and fats, found in thousands of products) and the destruction of the rainforest through the expansion of palm oil plantations. In 2002, the WWF mobilized industry actors (palm oil processing and trade companies, financial players, NGOs, and retailers and food manufacturers, among them Unilever, Body Shop, major plantation owners) to negotiate the formation of the Roundtable on Sustainable Palm Oil (RSPO), after two years of discussion, investigations,

and negotiations. RSPO was formally established it in 2004 as a non-profit Swiss association. A system of certifying "sustainable palm oil" was agreed upon, to ensure that palm oil plantation expansion and production was not based on destruction of Malaysian or other rain forests. This purely private governance system – established in the face of solid evidence of a lack of reliable government policy – is still functioning but has its limitations as well as potentialities for further development [35]. We have conducted similar studies of private international governance being set up by Springer Publishers, Green Peace, Nordic Paper and Pulp producers to protect Russian forest exploitation (as well as the working conditions of Russian forest workers providing wood for Nordic paper and pulp production (and ultimately, European paper users such as Springer).[24]

3.2.4. Governance shift through diffusion and emulation ("Organic" transformation)

The first three types of transformation of governance paradigms are characterized typically by a few identifiable, more or less organized agents, whether with few or many participants, and substantial scope of power. The transformations, even if drawn out over considerable periods of time, have a decisive character. Through particular collective actions, a new order is "legislated" and constructed, given sufficient resources and a feasible design,

A contrasting modality is observable when a new type of governance system is established through processes of diffusion and emulation (mimetic function) under decentralized conditions in which a multiplicity of agents make autonomous, yet similar decisions to shift to the new paradigm. On an aggregate level, there is an emergent development – the process results in transformations of prevailing governance paradigms with different agents, goals, and methods.

Such organic types of transformation entail multiple differentiated actors initiating change locally, without obvious coordination or direction, although the actors are typically embedded in communicative and other types of networks.[25] The participating actors in the

---

[24] The Forest Stewardship Council (FSC) is one of the most recognized cases of private actors making and enforcing rules to protect forest commons.

[25] This type of shift can be an indirect result of adopting new technologies or technique, but also of the spread of new values and discourses. To take an example: "democracy" or "equality" as values have spilled over from the political arena into such institutions as the family, business enterprise and health care system and influence the governance structures in each of these areas. In the development of

purest case have no intention to bring about the global transformation that they produce. And the processes of transformation are diffused in time and space. It is difficult, if not impossible, to define a moment of change or transition. There are spatial and temporal continuities, but in a larger perspective, transformations are accomplished through the "spontaneous", uncoordinated actions of many social agents. Although revolution is not directed or determined at a global or macro-level, macro-institutional conditions and polices are likely to affect the course of the transformation, and may help provide a certain directedness for such "spontaneous" processes.[26]

3.2.4.1. Example 1: Early Industrial Revolution (toward the end of the eighteenth century). This entailed many small and medium initiatives in the emergence and transformation of technologies, institutional arrangements, social relations, and values such as those for organizing factories, socio-technical systems, built environments, and entire industries. Such transformations could occur without any single agent or group of agents planning or even negotiating the overall pattern (although later variants of industrialization (for instance, in the cases of Germany, Japan, and the Soviet Union) involved considerable top-down organizing).

Much of the early industrial revolution entailed multiple agents initiating and developing many innovations in technologies and socio-technical systems. However, the transformations encompassed not only major innovations in technologies and technical systems, e.g., the invention of the steam engine, the development of mining, textile manufacturing, metal tools, optics, advances in transport, among other developments, and, of course, the shift from human/animal power to water and to coal. Critical to all these engineering developments was the establishment of organizational and institutional means to govern and develop the varying possibilities: factory systems, methods to coordinate and control

larger numbers of workers, ownership arrangements, regulatory agencies, legal innovations, the ideas – and realizations of the ideas – of mechanization and of standardized mass production, new research and educational organizations. In other words, the revolution encompassed also to a high degree new governance arrangements combined with machines and machine processes to make use of, for example coal, iron ore, and cotton on a scale and with a rapidity never achieved (or imaginable) before. Thus, there were not just machines and material technologies but organizational, legal, conceptual and normative innovations. Almost all aspects of everyday life were affected, but without any direct or central coordination (later industrialization in Germany, Japan, the Soviet Union entailed more top-down development following a design).

Inventors, innovators, entrepreneurs, scientists and engineers, business leaders, and government officials took a multitude of initiatives not only to make money but to gain fame and respect, to experience the power of changing and developing themselves and the world around them, and to advance the national power of Great Britain. Tens of thousands were involved in these developments over the decades when industrialization took off. The revolutions in mining, manufacturing, transport, chemicals, and agriculture were followed by those in electricity, electronics, and communications.

The development of the industrial social order – with its technologies, experts, and governance and regulatory systems – spread from England to North America and the rest of Europe and to most corners of the globe.

3.2.4.2. Example 2: The Emerging Sustainability Revolution [6]. Today we are witnessing the initial stages of a new societal revolution comparable in scale and significance to the industrial revolution. Tens of millions of people are considering and adopting new conceptions, goals, techniques and technologies, and practices relating to a wide spectrum of sustainability dimensions. The ongoing development – a more or less gradual shift from the economistic, industrialization paradigm to one or more forms of a sustainability paradigm. The latter entails the establishment of new ways of thinking, acting, organizing, and regulating (in part, the establishment of a new cognitive-normative discursive context).[27] Sustainability ideas, norms, and

---

"democratic culture" and principles of equality, new norms spread and became established in many social domains, implying that individuals and groups have rights not only to express themselves on matters of immediate concern, but also to know about, engage in, and influence deliberations on matters that concern their life chances.

[26] The industrial and sustainability transformations discussed below entailed complexes of governance (as well as value, technological, and economic) transformations. Societal paradigm shifts take place in the formation of more or less shared cognitive-normative frameworks with new values, norms, new techniques and technologies, and new principles of social organization. The emerging paradigms need not be coherent or complete, usually they are not.

[27] Earlier, people thought of the quality or use-value of something they needed or wanted, and, of course, its price. Now, more and more people are thinking about the resources that are being exploited to produce it, e.g. in the case of meat production, the substantial need

values permeate an ever-increasing part of modern life and have a significant impact on everyday thinking and practices in substantial parts of the world. This is occurring not only in developed countries but also in developing ones such as China, India, and Brazil.

Following several early efforts in the 1970s (for instance, the Stockholm Conference on the Environment in 1972), one can trace a cascade of initiatives and accomplishments from the 1980s through the 1990s, which set the stage for major policy and institutional initiatives in the 2000s (for example, in EU directives such as the REACH initiative, the most radical regulatory measure ever passed to deal with chemicals) (see earlier; also, [14]).

Masses of "sustainability" designs, plans, and initiatives at different levels have been developed as people try to forge new local-, meso-, and macro-orders as occurred in the case of industrialization.[28] Another way of thinking about this transformation is that "green" world conceptions and developments are emerging – as industrial conceptions, practices, and ethos emerged in and through industrialization. In the "green revolution", one finds:

- The increasing stress on green values: that is, articulation and development of new values, norms, standards, in a word, the "green" normative perspective.
- Part of this is an ever-growing generalized judgment that "green" patterns of action and developments are "good." And patterns and developments which are "non-green" or "anti-green" (use of high gas consumption vehicles, overuse or wastage of water or other critical resources, etc.) are "bad".
- The growing role of "green thinking, conceptions, standards and practices" in many areas of social life; there are also increasing narratives about green ideas, values, standards, and innovations which circulate in wider and wider circles.

- The growing role of "green" entrepreneurs – for whatever reasons, they initiate projects – beliefs in a green future, profitability, pressures of competition, or combinations of such motivators.
- Green governance; new regulatory mechanisms: distinguishing "good" (green) versus "bad" (non-green) innovations and developments.
- Institutionalization of green standards and considerations in decision and policymaking settings in government agencies, corporations, and associations.
- New practices, for instance new accounting conceptions and standards such as "triple bottom line".
- Increasing stakeholder involvement in the corridors of economic and policymaking power (Friends of the Earth, Greenpeace, WWF).
- Green innovative technologies and technological developments; new designs and development of "green" (or "greener") systems.
- Greening of consumption.
- Massive experimentation (accompanied by failures, of course) with "green" initiatives. These concern not only businesses but NGOs, other private agents, government agencies, etc.
- New alertness and readiness to experiment or innovate with green ideas, designs, technologies and practices;

The emerging sustainability paradigm is being established through *a process of multiple initiatives facilitated by diffusion of values, ideas, and practices through associations, communities, business and political networks*. Not only values are shifting, and there is some reordering (still limited) of priorities, governance changes, technical and technological developments, and changes in many daily practices. The conditions of initiative and innovation encompass multiple agents who enjoy some power and means of structural control over their own situations and are able to make relatively autonomous independent decisions. This process results *on an aggregate level* in adaptations and shifts in the prevailing industrial paradigm. The latter and its massive institutional and cultural nexus is being challenged bit-by-bit by the sustainability paradigm.[29]

The transformation process is an organic one with many different agents at different levels driven by diverse motives and interests. Gradually, blueprints

---

for high inputs of water and land (for grazing or grain for feed); also significant in the assessment of the environmental imprint of meat production are the GHG emissions of the animals themselves. There are numerous other examples such as the depletion of wild fish or the overuse or misuse of water in water-scarce regions (e.g., California, China, Iberian peninsula, North Africa). People are starting to collectively frame in new and different ways their needs and desires and their sources of satisfaction.

[28] Industrialization became a "development" concept which was more than a description. It became as well a metaphor of progress, advancement, and thus a normative idea.

[29] But the ongoing sustainability revolution is much more than a "Third Industrial Revolution" to which Jeremy Rifkin [42] refers in a book that has just appeared. But, significantly, Rifkin recognizes the organic processes at work.

will be developed specifying standardized designs and strategies. Industrialization was also characterized first by such a highly organic phase and then later a more blueprint-like modality: where Germany, Japan, the Soviet Union, and others adopted and imposed a design.

Social science research has identified some of the drivers and facilitators of the sustainability revolution: (1) normative pressures and resource and power mobilization everywhere; (2) open, new sectors are able to develop quickly on green dimensions by utilizing new ideas, models, methods, technologies and techniques where there is often less resistance from, or resilience of established arrangements; (3) some strategic sectors – such as energy and chemicals – are subject to particular attention and pressures to transform themselves, because in the case of energy some forms such as fossil fuels are becoming increasingly scarce and also because these fuels contribute significantly to pollution, GHGs, and climate change.

In the sustainability revolution we see hybrid cars, re-development of the electric car, solar energy innovations and other renewable energy developments, "smart switches," recycling systems, banning or tighter regulation of chemicals, increased controls of many pollutants, movements to protect forests and threatened species. These changes take place more in some parts of the world than others, but there is a powerful and sustained thrust, involving many thousands of initiatives and innovations. The emerging social trend is manifested in the plans and actions of thousands of international regimes, international bureaucracies, national agencies, local and transnational activist groups and expert networks. At the same time, "earth system governance" can be understood as a political project that engages more and more actors who seek to change the current architecture of institutions and networks at local-, meso-, and global-levels in order to advance the cause of sustainability.

The "green revolution" represents then multiple paradigm shifts, not only in production, technologies, consumption, and lifestyles, etc. but in governance and practical ethics and related normative developments. The new paradigm (or family of paradigms) is spreading readily – horizontally – new knowledge, values, and practices. "Green modernization" entails "green re-industrialization", "green capitalism", "green governance," "green thinking and lifestyles."

In sum, we are arguing that a "sustainability revolution" is already taking place on multiple levels: (1) a moral-cognitive level; (2) a level of action and the establishment of new practices on the part of individuals,

groups, and organizations; (3) an institutional level as "green" institutional arrangements and policies are promoted, often cautiously, but sometimes boldly – with varying degrees of success.

Several key factors explain why the sustainability revolution is likely to continue and even to accelerate:

- continuing environmental crises (that will not go away)
- continual outpouring of critical analyses and prognoses about the current failings and hazards
- normative ethos and collective pressures
- sustained creative challenge; the excitement of innovating, experiencing the new, its opportunities as well as exhilarating risks and uncertainties
- the paradigm shift itself entails new ways to frame, think, judge, and act that are challenges to be mastered and developed
- diffusion and imitation mechanisms through diverse social networks

While the sustainability revolution shares the organic character of the industrial revolution, the two differ significantly in a number of ways, as would be expected given their obviously very different historical, institutional, and cultural contexts as well as the difference in levels of scientific and technical knowledge.

- *Complexity*: sustainalization is taking place in a much more developed and complicated world in terms of institutions, cultures, and technologies including of course communications; for instance, the infrastructures of agriculture, manufacturing, government, science, education, etc. are very different.
- *The numbers and diversity of stakeholders and regulatory and governance systems* that must be taken into account is much greater (partly a result of democratization and partly learning to deal with modern complexity).
- Our modern world has *its established expectations about consumption levels, lifestyles and welfare* (this is also the case in developing countries).
- There are greater explicit concerns about *issues of general welfare, justice, human rights.*

In spite of the complexity and the many institutional and cultural as well as power constraints, sustainalization is likely to proceed much more rapidly than industrialization did – in large part because of modern science and technology and the availability of more rapid and widespread advanced communications (scientific and technical associations, the WWW, twitter,

facebook, blogs linking people concerned about environment and sustainability and facilitating the spread of sustainability thinking and increasing rates of innovation and application).[30]

While "sustainability" initiatives continue to grow and spread by the many thousands, the ongoing transformation will be no walkover. There is a formidable opposition (including deniers and opposers) among the powerful, for instance, many in the established industrial-commercial-banking complexes and their allies. The struggle will be long and difficult. But most of the established systems they represent will be replaced or radically reformed in the medium to long-run. Whether the sustainability revolution is fast enough or comprehensive enough to save the planet remains to be seen. History provides numerous examples of great societies that collapsed, visions that failed or were never realized.

4. Conclusions[31]

Power, knowledge, values, and struggle are key factors in governance transformations. The power of elites to mobilize resources, such as wealth, legislative authority, and various – positive and negative – sanctions, to affect governance arrangements, is of critical importance to their capacities as institutional innovators (and also deniers and resisters). But emerging movements may also manage to mobilize substantial power resources – normative and political power – with which to challenge status quo-defending established elites, and to force or negotiate change in governance sys-

tems. New kinds of knowledge, either adopted through learning by established powerful actors or brought in by new actors is essential in redefining existing conceptualizations and acceptable solutions. The conflicts between the establishment and challenging movements is also a major factor in institutional dynamics. This conflict is fueled by actors' material and ideal interests, as well as a stake in a particular paradigm which they associate with "right and proper" governance arrangements (for further consideration of different patterns of agent-driven institutional innovation, see [7, 9, 46]). Table 3 below outlines the power, knowledge and conflict conditions relating to the different mechanisms of governance transformation.

The work presented here article can be understood as a contribution to the new institutionalism, a major feature of contemporary interdisciplinarity among the social sciences (see footnote 3). As illustrated here, a full-fledged institutional approach can address all levels of governance, including dealing also with multi-level and complex governance systems.

Our efforts here have been limited to a few elaborations on the dimensions of power, knowledge, and conflict in governance systems. (1) The article considered not only powers *within* a governance system, for instance, the operative powers (and their limitations) *over* different agents and objects but also structural or meta-power to establish, maintain, or transform governance systems [11, 33]. (2) While factors of information and knowledge are important in any institutional analysis, particular emphasis was put in this paper on knowledges of different groups of actors, for instance those that constitute the hegemonic governance paradigm in the first place, professional groups of experts, and the knowledge and models of "users"

---

[30] Given the organic mechanisms of the sustainability revolution, policy should be oriented to collecting, consolidating and diffusing knowledge about new conceptions and designs, innovations, initiatives, and many of the successful developments worth pursuing. This concerns not only technical and natural science knowledge but the knowledge of the social sciences and humanities. Collaboration among these – and between them and policymakers and activists – also should be facilitated and developed.

[31] As indicated earlier, complexity of governance regimes arises because there are typically multiple regulatory processes, multiple agents, diverse forms of knowledge, and interests at stake. Effective governance requires substantial coordination and integration of these different components. Integrating actors with different types of knowledge – responsibilities, control tools and techniques into multi-faceted governance processes – is a challenge for governance design as well as operative management. At the same time, socially integrated components must be coordinated and integrated with, for instance, material-ecological mechanisms and regulation. In systems analysis [5], one distinguishes "social integration" from technical, "systemic integration". In brief, three major integrative accomplishments are required in modern governance systems:

(1) Technical-material integration ("systemic"); (2) Social integration; (3) The integration of technical-material processes with social processes. Although technical, or purely "systemic" problems of integration may be effectively managed, disruptive problems can arise from a failure at social integration, e.g., there is strong opposition or conflict among key agents and a lack of effective conflict resolution methods. In the Baltic fisheries case, there were knowledge conflicts between scientists and fishers, and between fishers and some ENGOs). There was also a failure to integrate scientific and fisher knowledge, although the integration of diverse pieces of evidence from different national research institutes was accomplished to a greater or lesser extent through the ICES. While organizing arrangements may improve communication and integration, they do not guarantee it. Much research from Science and Technology Studies (STS) [e.g., 17, 23, 24, 49] has exposed the conflicts and instabilities as multiple forms of knowledge are brought to bear in governance processes.

Table 3

Power, knowledge and conflict conditions in different mechanisms of governance transformation

	POWER CONDITIONS	KNOWLEDGE CONDITIONS	CONFLICT CONDITIONS
AUTOCRATIC	Dominant agent can decide and impose a governance paradigm	Knowledge shift if the dominant agent learns, or is converted to, a new paradigm	Latent conflict situation
SHIFT IN AUTOCRATIC POWER	A new agent comes to dominant power with a new governance paradigm	New knowledge and cognitive frames are brought in through the power shift	Conflict is manifested in the process entails struggle and results in the power shift
NEGOTIATED PROCESS	A group sharing power use their collective power to decide or determine a new paradigm	There is knowledge exchange, persuasion, and negotiation	Conflict is manifested in the processes of exchange, persuasion, and negotiation
ORGANIC (autonomous agents connected through networks)	Autonomous agents decide on their own, but through their networks influence one another	Knowledge diffuses through the network	Conflict is minimal unless there is competition between multiple paradigms

or subjects. (3) Given the multiple, diverse agents, with their differing perspectives and material and ideal interests with respect to governance, governance systems are typically characterized by internal and external contestation and conflict, which drive the exercise of power and, under some conditions, result in transformation of governance systems.

While shifts in governance paradigms may reflect performance failings, transformations also occur in the context of larger shifts in ideology and principles of governance, for instance, in the emergence of neo-liberalism ideology which promotes privatization and markets; historically, there have also been counter-trends stressing the transformation of "private properties" into collective ones and defining particular objects as "public goods".[32]

The process of conducting case studies on governance in diverse sectors and on multiple levels and assembling them, and using them as an empirical base for theoretical development is essential to cumulative science and to strengthening the inter-disciplinarity of an institutional approach. At the same time, this article has suggested that there is a need for the type of systematic comparative framework and analysis based on a few key dimensions (dimensions that nonetheless are highly contest sensitive) which has been presented and applied here [see 4, 14, 48]. The models of governance architecture and mechanisms of transformation facilitate the identification and analysis of similarities and differences among governance systems and promises to improve the accumulation of systematic knowledge about governance and its evolution.

Acknowledgments

---

[32] For instance, in the USA and in Europe including the Nordic countries, there have been "neo-liberal" initiatives and struggles to transform many public goods and common pool resources (CPRs) into private governance regimes (public services, utilities, buildings, infrastructure, etc.): in a word "privatization". Substantial collective assets were transformed into private assets (forms of "enclosures"). Similarly, there were struggles over cultural and scientific commons – attempts to turn cultural and scientific commons into private ownership regimes operating on markets as opposed to operating as commons or public domain regimes. In other periods, there has been an ideological climate favoring the development of public domains and commons of diverse sorts. That is, there were initiatives to transform "private properties" into collective forms. Sweden and a number of other countries, illustrate, for instance, successful attempts to define body parts of dead patients as CPR rather than "privately owned" either by the patient or by relatives (at the same time, there were counter-movements) [29]. Another very different development that took place in Sweden during the 1980s entailed the socialization of capital formation (1982–1991). A part of company profits were "socialized" under "Employee Funds" regimes (*Lönntagarefonder*)

in order to create an employee "capital fund" under the administration of labor unions – this was a very contentious issue in Sweden with drawn out struggles with many capitalists and managers literally demonstrating in the streets. Reversal of the regime came in 1991 when the Social Democrats lost power (see the discussion above about the role of power shifts in the transformation of governance paradigms). The employee funds which had become relatively sizeable were transformed by a Conservative Government in 1991-1992 into research funds – another kind of commons to the great benefit of research in Sweden (particularly environmental and technological development research). There is today a variety of "commons movements" very active and influential, part of a struggle over what kind of social order will prevail.

References

[1] J. Acheson, *Capturing the Commons*, University Press of New England, Lebanon NH, 2003.

[2] S. Arjomand, *The Turban for the Crown*, Oxford University Press, New York, 1988.

[3] S. Bakhash, *The Reign of the Ayatollahs*, Basic Books, New York, 1990.

[4] T. Baumgartner and T.R. Burns, *Transitions to Alternative Energy Systems: Entrepreneurs, Strategies and Social Change*, Westview Press, Boulder, 1984.

[5] T.R. Burns, System Theories, in: *The Blackwell Encyclopedia of Sociology*, Blackwell Publishing, Oxford, 2006.

[6] T.R. Burns, Sustainable Development: A Societal Paradigm Shift, An Emerging Revolution, prepared for *Sociopedia*, the online Encyclopedia of Sociology of the International Sociological Association, 2010.

[7] T.R. Burns and M. Carson, Actors, Paradigms, and Institutional Dynamics, in: R. Hollingsworth, K.H. Muller and E.J. Hollingsworth, eds., *Advancing Socio-Economics: An Institutionalist Perspective*, Rowman and Littlefield, Oxford, 2002.

[8] T.R. Burns and P. DeVille, Dynamic systems theory, in: C.D. Bryant and D.L. Peck, eds., *The Handbook of 21st Century Sociology*, Sage, Publications Thousand Oaks, California, 2006.

[9] T.R. Burns and T. Dietz, Revolution: An evolutionary perspective, *International Sociology* **16** (2001), 531–555.

[10] T.R. Burns and H. Flam, *The Shaping of Social Organization: Social Rule System Theory with Applications*, Sage Publications, London, 1987.

[11] T.R. Burns and P. Hall, *The Meta-Power Paradigm: Structuring Social Systems, Institutional Powers, and Global Contexts* Peter Lang, Frankfurt/Berlin/New York/Oxford, 2011.

[12] T.R. Burns and C. Stöhr, Power, knowledge, and conflict in the shaping of commons governance: The case of EU baltic Fisheries, *The International Journal of Commons* **5** (2011), 233–258.

[13] J.L. Campbell, J.R. Hollingsworth and L.N. Lindberg, eds., *Governance of the American Economy*, Cambridge University Press, Cambridge, 1991.

[14] M. Carson, T.R. Burns and D. Gomez Calvo, *Public Policy Paradigms: The Theory and Practice of Paradigm Shifts in the EU*, Peter Lang Publishers, Frankfurt/Berlin/New York, 2009.

[15] W.E. Coleman, From protected development to market liberalism: Paradigm change in agriculture, *Journal of European Public Policy* **5** (1998), 632–651.

[16] H. Flam and M. Carson, *Rule System Theory: Applications and Explorations*, Peter Lang, Berlin/New York, 2008.

[17] T.F. Gieryn, Boundary work and the demarcation of science from non- science: Strains and interests in professional ideologies of scientists, *American Sociological Review* **48** (1983), 781–795.

[18] P. Glasbergen, F. Biermann and A.P.J. Mol, eds., *Partnerships, Governance and Sustainable Development*, Edward Elgar, Cheltenham, 2007.

[19] G. Hardin, The tragedy of the commons, *Science* **162** (1968), 1243–1248.

[20] D. Held and M. Koenig-Archibugi, eds., *Global Governance and Public Accountability*, Blackwell, Oxford, 2005.

[21] P.Q. Hirst, *Associative Democracy: New Forms of Economic and Social Governance*, Polity, Cambridge, 1993.

[22] C. Hoskyns, ed., *Integrating Gender: Women, Law and Politics in the European Union*, Verson, London, 2000.

[23] S.S. Jasanoff, Contested boundaries in policy-relevant science, *Social Studies of Science* **17** (1987), 195–230.

[24] S.S. Jasanoff, *The Fifth Branch: Science Advisers as Policymakers*, Harvard University Press, Cambridge, MA, 1990.

[25] M. Kamali *The Modern Revolutions of Iran: Civil Society and State in the Modernization Process*, Ashgate, Aldershot, 1998.

[26] R.O. Keohane, *Power and Governance in a Partially Globalized World* Routledge, London, 2002.

[27] B. Kohler-Koch and R. Eising, *The Transformation of Governance in the European Union* Routledge, London, 1999.

[28] J. Kooiman, ed., *Modern Governance: New Government-Society Interactions*, Sage, London, 1993.

[29] N. Machado, *Using the Bodies of the Dead. Legal, Ethical and Organizational Dimensions of Organ Transplantation*, Ashgate Publishers, Aldershot, 1998.

[30] D. MacKenzie, The political economy of carbon trading, *London Review of Books* **29**, (2007).

[31] J.G. March and J.P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics*, Free Press, New York, 1989.

[32] G. Marks, F. Scharpf, P.C. Schmitter and W. Streeck eds., *Governance in the European Union*, Sage, London 1996.

[33] P. McGinty, T.R. Burns and P.M. Hall Meta-Power, in: G. Ritzer, ed., *Blackwell Encyclopedia of Sociology*, Blackwell, Oxford, 2009.

[34] M.D. McGinnis, *An Introduction to IAD and the Language of the Ostrom Workshop*, Indiana University, Bloomington, Indiana, http://php.indiana.edu/ mcginnis/iad_guide.pdf, 2010.

[35] J. Nikoloyuk, T.R. Burns and R. de Man, The promise and limitations of partnered governance: The case of sustainable palm oil, *Corporate Governance* **10** (2010), 59–72.

[36] D.C. North, *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge, 1990.

[37] E. Ostrom, *Governing the Commons*, Cambridge University Press, Cambridge, 1990.

[38] E. Ostrom, *Understanding institutional diversity* Princeton University Press, Woodstock, 2005.

[39] E. Ostrom, A diagnostic approach for going beyond panaceas, *Proceedings of the National Academy of Sciences* **104** (2007), 15181–15187.

[40] E. Ostrom, R. Gardner, and J. Walter, *Rules, Games, and Common-Pool Resources*, University of Michigan Press, Ann Arbor, 1994.

[41] W.W. Powell, and P.J. DiMaggio, *The New Institutionalism in Organizational Analysis*, University of Chicago Press, Chicago, 1991.

[42] J. Rifkin, *The Third Industrial Revolution: How Lateral Power is Transforming, Energy, the Economy, and the World*, Palgrave Macmillan, London, 2011.

[43] S. Saxonberg, *The Fall: A Comparative Study of the Collapse of Communism in Four Countries*, Gordon and Breach Publishers, Amsterdam, 2000.

[44] W.R. Scott, *Institutions and Organizations: Theory and Research*, Sage, Thousand Oaks, CA, 1995.

[45] L. Senden, Soft law, Self-Regulation and Co-Regulation in European law: Where do they meet? *Electronic Journal Of Comparative Law* **9.1** (2005), available at: http://www.ejcl.org/91/art91-3.html.

[46] Stinchombe, *Constructing Social Theories*, Harcourt, Brace & World, New York, 1968.

[47] D.G. Victor and J.C. House, BP's emissions trading system, *Energy Policy* **34** (2006), 2100–2112.

[48] J. Woodward and T.R. Ellig, Burns, *Municipal Entrepreneurship and Energy Policy: A Five Nation Study of Politics, Innovation, and Social Change*, Gordon and Breach, New York, 1994.

[49] Wynne, May the sheep safely graze? A reflexive view of the expert-lay knowledge divide, in: S. Lash, B. Szerszynski and B. Wynne, eds., *Risk, Environment & Modernity: Towards a New Ecology*, Sage, London, (1996), pp. 44–83.

[50] O. Young, ed., *Global Governance*, MIT press, Cambridge, 1997.

[51] P. Zapfel and M. Vainio, Pathways to European greenhouse gas emissions trading history, misconceptions, *FEEM Working Paper*, **85** (2002).

[52] A. Zito, A. Jordan and R. Wurzel, 'New' environmental policy instruments, patterns and pathways of change, *Environmental Politics* **12** (2003), 3–24.