The sustainability of the agrifood system: determinants of the interaction between global and local agrifood governance

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The Sustainability of the Agrifood System: Determinants of the Interaction between Global and Local Agrifood Governance

Abstract

The sustainability of today's global agrifood system is shaped by a complex web of global and local forces. These forces include local values and practices, transnational corporations (TNCs), agricultural policies and politics of the EU as well as the activities of the United Nations Development Program, for instance. This paper aims to develop a framework for analyzing the interaction of various global and local forces in shaping the agrifood system and its sustainability characteristics. This framework allows the systematic and comprehensive identification of the relative impact of global versus local, material versus normative, and actor-specific versus structural forces. In a second step, the paper illustrates the framework's reach in an investigation of determinants of policies and practices regarding genetically modified organisms (GMOs) in India. GMO practices and policies represent a contested ground where local and "international" values and interests frequently clash. In consequence, the commercial introduction of GMOs in India presents an excellent case study for the interaction of forces in the agrifood system.

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Introduction[4]

The sustainability of today's global agrifood system is shaped by the interaction of global and local forces. These forces are of a material and ideational nature and result from agency by state and non-state actors as well as structural contexts. The resulting picture is a complex web of forces that makes it hard to grasp the interplay and conflicts of the involved powers. Which are the most powerful determinants of the sustainability characteristics of global agrifood production and consumption today?

One of the major problems in the global agrifood system is its lack of sustainability. Global food security and safety are still distant goals. In 2009, 1020 million people are suffering from hunger and 6 million people die from malnourishment according to FAO (FAO 2009). This is an increase of 97 million people from 2008 (ibid.). At the same time, even those who have enough to eat face health threats from unsafe food production methods, and today's agricultural practices are associated with biodiversity loss, greenhouse gas emissions, and soil erosion and degradation to name just a few. The sustainability of the global agrifood system, then, is too important an issue for the question of its determinants to be neglected simply because they are difficult to identify.

In consequence a comprehensive and systematic analytical framework is needed for investigating the interaction between the different global and local forces and their impact on the sustainability of today's global agrifood system. This paper aims to develop such a framework. It does so in three steps. The paper will first describe the complex interaction between different types of global and local forces in the global agrifood system and global agrifood governance. In a second step, the paper will develop a framework to analyze power relations, allowing a comprehensive and systematic assessment of these forces. Thirdly, the paper will illustrate the empirical applicability of the framework in an investigation of determinants of policies and practices regarding genetically modified organisms (GMOs) in India. The concluding section will sum up the argument and discuss implications for science and politics.

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Global and Local Forces in the Agrifood System

The current agrifood system represents an increasingly globalized system of commercial trade, which pools a multitude of participating forces. Liberalization and globalization of agriculture and food have had tremendous impact on the organizational structure of the system, actor constellations and interaction within. In today's global agrifood system, production, distribution and consumption of foods are managed in an opaque system based on "the logic of distancing" between production and consumption of foods. Globalization and liberalization have been associated both with capital concentration and with the industrializing of food production and processing. These developments have given rise to powerful agriculture and food corporations as well as new social movements focusing on the environmental and social characteristics of the current agrifood system. As a consequence, state as well as non-state actors play a pivotal role in governance of the global agrifood system, today, and influence its sustainability characteristics. Among the latter, food security and food safety reign prominent on the political agendas, each, in turn, requiring a range of sustainability issues to be addressed. Both between actors and norms, however, we can observe a contest between global and local forces in the global agrifood system.

The distancing between the production and consumption of food is one major development closely associated with organizational and structural shifts of the global food system (Kneen 1995; Friedmann 1992). Today, a large variety of actors pursue their interest in the agrifood system and its governance and their activities determine the opportunities and constraints for a sustainability transformation of the system. On the one side, market concentration in food production, processing, retailing as well as on the input side have fostered the rise of powerful agrifood corporations as well as the marginalization of small- and mid-size farming on the production side as well as small businesses on the retail side (Lang 2003). Agrifood corporations, today, exercise substantial power in the governance of the global agrifood system, influencing public regulation in their interest, but just as importantly creating, implementing and enforcing self-set rules and standards as well (Clapp and Fuchs 2009). Next to this rise of corporate actors in a globalized world, the traditional problem solving capacity of the state has rapidly decreased (Jessop 2008). Still, governments continue to play a pivotal role in global food governance due to their capacity to determine trade rules, agricultural subsidies or market access for GMOs and chemicals, for instance. Partly as a response to these developments, new social movements anxious about the environmental and social implications of the architecture of the current agrifood system try to

influence its governance (MacMillan 2005). Specifically, local communities continue to play an important role in shaping the sustainability of the agrifood system (Scott et al. 2009). The established rules and norms, thus, often compete with new ones over authoritative legacy, which even increases the complexity strengthens the opaqueness of the global agrifood system and its governance.

This opaqueness is further enhanced by the interaction between the various types of actors at various levels of governance. While one tends to think of agrifood corporations as global actors and civil society actors as representing the local level, reality is much more complex. This can be more easily observed in the case of civil society actors, where NGOs such as Greenpeace or Oxfam are known to pursue their goals and ideas across borders and at all levels of governance. Large business actors, however, can also come to play the role of "local actors", in India, for instance, global retail chains have found it extremely difficult to get market access and Indian retail chains dominate the market. Even if the latter do not represent "local" forces, as one would associate them with the village level, the role of such national or even regional (sub-national) retail chains needs to be examined in the interplay of local and global forces. Public actors, of course, play a role at all levels of governance as well, from the local to the supranational level.

Next to the complex interplay of global and local actors in the global agrifood system and its governance, a strong influence of a range of norms can be identified. Faced by increasing consumer awareness after various food scandals such as the discovery of BSE or dioxin scandals, public as well as private actors have stressed the need for improvements in agrifood governance in the interest of food safety (Phillips and Wolfe 2001). Simultaneously, public and private actors emphasize the lack of food security in many developing countries as a continuing sustainability deficit of the global food system. Both food safety and food security, in turn, depend on a range of sustainability characteristics of the agrifood system. The definition of the Sustainable Food Laboratory highlights the complexity of social and environmental aspects of sustainability in the food chain:

> "We define a sustainable food system as one in which resources (including natural resources such as soil and water, as well as human resources such as labor) are used at their rate of recovery. As a result, the fertility of our soil is maintained and improved; the availability and quality of water is protected and enhanced; biodiversity is healthy; farmers, farm workers, and all other actors along the supply chain have livable incomes; the food we eat is safe and promotes our health; businesses can thrive; and the carbon and energy footprints of production are within the limits scientists correlate with relative safety" (Sustainable Food Laboratory).

Yet, these different norms underlying governance in pursuit of a sustainable global agrifood system may well be at odds/conflict with each other, or impose different costs and benefits on different parts of the global population. Governance initiatives intended to improve food safety for consumers in the North, for instance, most prominently retail standards such as the GlobalGap, have been found to hold potentially disastrous implications for rural livelihoods in the South (Bachrach and Baratz 1962). Thus, perspectives on what constitute sustainable food production and consumption practices may well differ in different societies and regions.

Even more fundamentally, we can identify democratic ideals and market logic as two normative approaches contesting each other in global agrifood governance:

> "The history of food governance can usefully be understood as a long struggle between two conflicting forces: 'food democracy' and 'food control': the latter suggests relatively few people exerting power to shape the food supply; the policy framework is *dirigiste*; decisions are 'top-down' […] 'Food democracy', on the other hand, gives scope for a more inclusive approach to food policy. Its ethos is 'bottom-up', considering the diversity of views and interests in the mass of the population and food supply chain […]" (Lang and Heasman 2004, 279).

Again, however, while one might be inclined to associate the market logic in food governance (with its global and democratic ideals) with the local level, both norms refuse such a simple dichotomy. After all, supra-national actors such as the United Nations Development Program (UNDP) or transnational civil society actors would tend to also claim democratic norms and/or practices for themselves. Likewise, local economic actors also try to maximize their control over market shares, profits, regulation and the associated distribution of rents.

Both global and local actors and norms, then, seem to be influential factors in the governance of today's global agrifood system. Importantly, they differ in their ability to exercise power and draw their influence from different sources. Global agrifood corporations, especially food retailers or agribiotech companies, have great material resources at disposal, which puts them in an influential position to impact political decisions. Likewise, the state still possesses considerable decision-making power due to its authority in national and international regulation of relevant policy areas. In contrast, civil society actors, especially local ones, tend not to command huge material resources, but their ability to influence political decisions is often enhanced by the public perception of them as legitimate political actors. At the same time, global and local business, state, and civil-society actors are embedded in a setting shaped not only by actor-specific sources of power, but also by forces

existing at the structural level, such as market structures or societal norms and values. In consequence, agrifood governance cannot be easily ascribed to a causal chain between the exercise of power by a specific actor and a specific outcome, but needs to be considered in context of the interaction of different global and local sources and facets of power and their interaction and interconnectedness. Only an analysis systematically conceptualizing the multiple dimensions of power at play in the governance of the global agrifood system, then, is truly able to shed light on the role of global and local forces in it.

Analyzing Power Relations in the Global Agrifood System

A theoretic framework for analyzing power relations and the role of global and local forces in the global agrifood system is faced by the problem that the existing theoretical approaches in International Relations (IR) theory have approached questions of power from fundamentally different perspectives. Specifically, realist and neoliberal institutionalist approaches focus on the exercise of power by actors, states in the case of realist approaches and state and non-state actors in the case of neoliberal institutionalist approaches. Critical and post-structuralist approaches, however, have highlighted the power of structures, for instance hegemonic blocs and discourses. Barnett and Duvall (2006) criticize the theoretical limitations inherent in this agent-structure differentiation and call for an integrative framework that looks at the interaction and relation of different types of power. They remind us of the frequently made distinction between the two possible ways power can be exercised: “Power over” refers to actions, where actors are able to exercise control over others, while “power to” points to social relations of constitution that define actors as well as their capacities and resources. This conceptual distinction is especially useful when looking at the diverse composition of the global agrifood system, where a focus on actors’ power hides the structural forces that influence an actor’s role and behavior. The mutual constitution of social structures and actors, points to the benefits of an integrative framework of actor-specific and structural forces, which broadens the analytical perspective, enabling it to include a plethora of (in)visible forces and their interaction. A synopsis of a historical analysis of structural sources of power and an analysis of actors’ strategies with regard to attempt to change these structures seems promising in shedding light on the complex interaction of structures and actors, as well as local and global forces.

In addition, it is important to distinguish between different sources of power. The meaning and effects of actions and structural influences depend heavily on their material or

normative nature. Both, actor-specific as well as structural power can be based on material sources such as the distribution of economic or technological resources or on ideational resources such as legitimacy or cultural embeddedness. Ideational power is a form of power that is empirically hard to trace, of course. Yet even material sources of power defy easy interpretation, as their translation into political influence needs to be critically examined (Fuchs 2007; Keohane and Nye 1977). Based on this differentiation between actor-specific and structural forms of power and material and ideational sources, we suggest a two-step analysis of forces in the global agri-food system: Firstly, an assessment of sources of structural power and secondly an analysis of actor's strategies within.

In a first step, then, the analytical framework developed here will focus on identifying structural sources of power. These primary sources of power, material or normative, are composed of three elements each: Force/security, real economy, and financial structures on the material side, as well as information and knowledge, models of communication and ideology, and practices of exclusion on the normative side. In the second step, the analytical framework will take a different perspective and examine actor's power according to material and normative resources and activities. This approach is outlined in an analytical grid (Table 1), presented below:

Table 1: Analyzing Power Relations

	Material	**Normative**
Structural Power	Force/Security	Information and Knowledge
	Real Economy (Production of Goods)	Model of Communication and Ideologies
	Financial Structures	Practices of Exclusion
Actor-specific Power	Information, finance and access as resources	Knowledge and symbolism as resources
	Lobbying, campaigning and funding as activities	Naming, framing, and campaigning as activities

Structural Power

Structural power takes a view on the relationships of power from which the framing conditions under which power develops can be analyzed. Hereby, this perspective seems to be diametrical in relation to an actor-centered perspective. Structural power revolves around the question about which sources (actors') power can nourish itself. A structural analysis therefore considers sources of material and normative power as well as the basic conditions of their coming-about. The basic conditions here are the elements of secondary power structures which will not be considered in detail here. However, they form the basis of material-structural and normative-structural power. Basic conditions refer to structures of social and welfare systems, trade, and market systems and infrastructures. In examining the material and normative sources of power, the basic conditions of structural power need to be considered implicitly in the analysis grid presented in Table 1.

The material structures of power

The material structures of power seem to be a very clear field of the analysis. This is particularly true for the production of goods. To assess the field in its full meaning, three elements of the analysis need to be circumscribed.

At first, we have to take a look at security and force. Force is a central category in political science. Max Weber describes the state as a monopoly-force. This refers to the state's control over the use of force internally and externally. The focus of such an analysis, however, is increasingly less meaningful at the national level. Rather, we need to consider the local and global aspects in the analysis. The second point is security, by which we mean the protection of the population confronted with natural disasters or ensuring the access to clean water. The question of security, therefore, represents a very large field, and includes not only political issues at the macro level, but rather tends to use the individual as the starting point for analysis (Strange 1996). The question of security also reflects societal asymmetries of power. Therefore, one needs to look at not only the production of security and security structures, but also at their allocation within the respective societal formations, i.e. at the question which individuals (and what groups) in society are provided with security. One also needs to consider the relationship between the exertion of force and security in the grey zone between the public and private spheres.

In a second step we take a look at the real economy, i.e. the production of goods. Here, we include all determinants which influence the production of goods. Determinants that deal with rationales of political and economic consequences and ideological determinants

complement each other. The accumulation of wealth within society as well as the possibilities to maximize profit in the production process creates templates for power structures. At the same time, this element is subject to processes of restructuring, which not only bring about shifts in power structures but are also limited through the exertion of power. The analysis of these processes and fractures is the task of a structural view of the real economy. The question of the state's regulation capacity is also located here, just like the exertion of force by transnational corporations. Finally, the analysis of the economy needs to be embedded in the global context of the production of goods. At this point, the barriers between real structures of power relationships and simple appearances become hazy. Their separation is the task of a structural analysis of power relationships.

The third element of the material sources of power is the financial structure. Here we refer to monetary and credit systems. Their importance in the functioning of an all market-based economy has increased since the 1970s. For theorists of political science, the functioning of credit is at the centre of analysis. This was already the case for Adam Smith and his analysis of the founding of the Bank of Scotland in *the Wealth of Nations*. Credits allow the mobilization of productive work and gain without prior profits. At the global level, finance structures are increasingly less likely to coincide with the real economy. The "global casino" (Strange 2000) of finance seems to detach itself from the real economy, where the repercussions of the business located there have a great impact on the functioning of the production of goods. At the local level, we are faced with the question of the conditions of access to credit systems. The idea of micro-credits also recognizes these conditions in development projects. It is therefore decisive for local structures if the credit is offered by, for example, a bank or a profiteer.

The normative structures of power

Normative elements are very diverse and in the field of power often only comprehensible through mechanisms of exclusion. To the extent that the meaning of knowledge and information gains in importance, this element increasingly withdraws itself from a political science analysis due to its complexity. Below is a three-step design for the systematization of the elements of analysis.

First, we have to start with information and knowledge. Information and knowledge are often used synonymously. However, it is useful to establish a clear differentiation for our analysis. Information refers to the presence and acquisition of information. Knowledge refers to the processing of information. This processing can be shaped by a multitude of patterns of

comprehension and interpretation. The second element deals with different models of the communication process and with the meaning of ideologies. Every process of acquisition and interpretation of information is marked by specific patterns, which give members of a society direction. These specific patters intensify to become an ordering principle and can then be used ideologically. The analysis is therefore located at the boundary between public and private. It manifests itself, for example, in debates on public security and the (apparent) need to limit personal freedoms. The term "ideology" here is even more widely applicable. It includes convictions about the lack of alternatives to decisions and self-made practical constraints, which can dictate the behavior of people and groups. For example, governments which decide to create or change a law to change their standing in international competition are exercising normative power. These changes simultaneously retroact with the elements of material structures and, similarly, with traditional and cultural values that influence the transformation of information to knowledge. Last, we have to focus the analysis on the practices of exclusion. Power relationships of the two previous elements are confirmed in practices of exclusion. By this, we mean the exclusion of people and groups within the population from information, as well as the control of communication and patterns of comprehension. The two normative levels of analysis of information and knowledge and model of communication and ideology are joined at this point. An exact analysis of the processes of the development of normative power structures always requires a reflection on both the elements of perception and of structure. Not every practice of exclusion points to an underlying power structure, of course. The process of reflection is therefore necessary to focus the empirical analysis on its essential assertion instant.

Actor-specific power

An actor-specific approach underlines the central role global and local actors have in international and domestic politics and policy, and points to their ability to influence political decision-making. But at the same time, actors are embedded in social structures that enable and constrain their behavioral options. Therefore, actors' interactions reproduce social structures while it also enables them to change these at the same time. From a social-constructivist perspective, this interaction is determined by desires, beliefs, strategies, and capabilities (Wendt 2008), which in turn are the result of existing social structures. From a critical theory perspective, actors are social forces that often transcend state boundaries and whose interaction forms facets of power (Cox 1981). Furthermore, Gramsci's critical

approach stresses the interaction of material and ideational forces and enables a bottom-up analysis of various actors, while at the same time stressing the importance of structural forces.

Actor-specific material power

Actor-specific power that relies on material resources, describes direct influence of one actor over another, as Robert Dahl's famous statement on individual voluntary action demonstrates: "A has power over B to the extent that he can get B to do something that B would not otherwise do" (Dahl 1957, 201). It stresses the strategic exercise of influence abundant in the political process and a political actor's ability to achieve results such as overcoming opposition by other actors. A focus on the political output allows assessing the direct impact of interests and actions according to actors' present material resources, which are basically made up of informational and financial resources as well as access to political decision makers. Barnett and Duvall indicate, though, that various technologies and mechanisms should be considered as potential sources of an actor's ability to directly influence others (Barnett and Duvall 2006, 15). The prominence of actor-specific material power in today's politics is linked to two empirical developments: actors' political mobilization and policymakers' dependence on outside expertise (Fuchs 2007). Non-state actors, in particular transnational corporations, have realized that involvement in policy processes is a promising strategy to influence political outcomes and have therefore dramatically expanded their political activities since the 1990s. Furthermore, policymakers increasingly rely on non-state actors' specialized knowledge and information, which gives them an incentive to involve especially business actors and NGOs in the policy making process. Here, they are not only represented on the national level, but are also actively involved on the international and supranational level. On the international level, for instance, the development of the Cartagena Protocol on Biosafety supports the case that NGOs and business agents are more and more involved in important political negotiations and decision-making together with traditional governmental actors (Bail et al. 2002).

Actors can take direct influence on the political process in different ways; foremost their power is exercised through lobbying activities, campaigning, and party/candidate funding. But with regard to the material resources which these activities rely on, there is a huge gap between different non-state actors. While business actors are able to accumulate huge financial resources, NGOs do not tend to have the same capacities at their disposal. It is not the mere size of material resources, though, but the ability to successfully convert them into advocacy tools, which determine actor-specific material power (Fuchs 2007, 82). In this

respect, NGOs may not have the same financial resources but their perceived legitimacy may allow them to have a stronger effect when spending a given sum of money.

Actor specific normative power

Actor-specific power based on normative sources highlights the symbolic meaning of social practices and institutions for the exercise of power and how they enable and constrain behavior and action. It refers to the normative dimension as a nonmaterial power resource and an actor's ability to influence the framing of political issues. This "third face of power" (Lukes 2005) points to the discursive power an actor can exercise. In other words, a focus on the normative sources and forms of the power of actors turns the focus on their ability to influence discourses, which Hajer defines as "a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer 1995, 44). This perspective highlights that via the exercise of discursive power, actors can organize "some definitions of issues […] into politics while other definitions are organized out" (Hajer 1995, 42). In a struggle for discursive hegemony on meaning-construction of political issues, actors try to influence the construction of a prevalent perception and definition and to consolidate selected normative assumptions. Knowledge and symbolic capabilities account for actors normative resources and constitute actor-specific normative power.

An actor specific perspective on normative power especially stresses actors ability to instrumentalize discourse to shape norms and ideas by employing symbols and story-lines as well as linking policy issues and actors to established norms and ideas (Fuchs 2007, 60f). At the same time, actors are also part of the overall discursive setting of politics and therefore equally constrained and enabled in their behavior and action. Actors' ability to influence discourses is closely linked to perceptions of their legitimacy, which public actors obtain through formal electoral processes, while non-state actors' legitimacy derives from public trust in actor's willingness to represent the public interest. Especially the authority and legitimacy of NGOs originates in ideal-type assumptions on their non-profitable and non-violent aims and philosophies that found their identities (Holzscheiter 2005, 726). But even business actors' political authority profit from a public change in attitude toward market actors and they enjoy to have public confidence in their problem-solving ability during the height of neoliberalism (Fuchs 2007).[5]

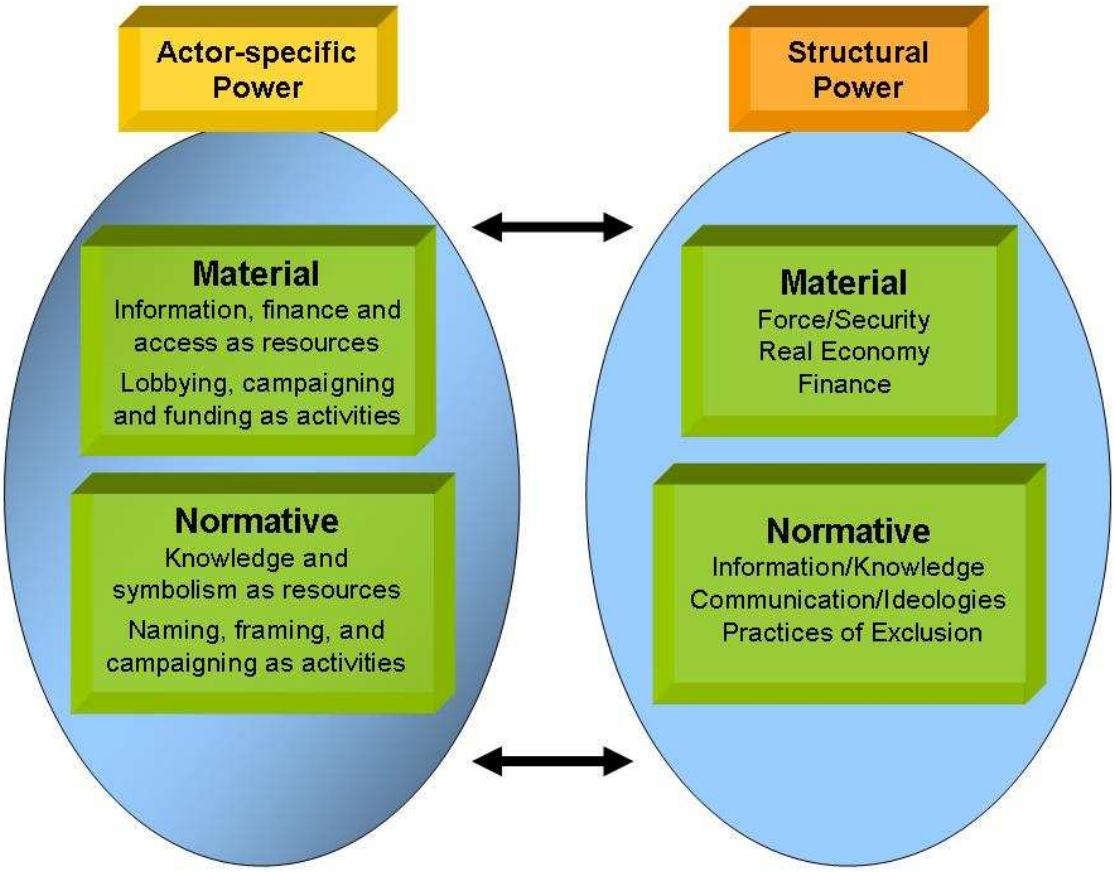
[5] Even in the advent of the global financial crisis, trust in business actor's problem-solving capacity does not seem to decrease, as their ongoing advisory inclusion into national rescue plans has shown.

Shaping other actors' preferences, actor-specific normative power reveals the ability to prevent the emergence of conflict in the first place, e.g. through exercise of authority, manipulation, positive reinforcement, or social conditioning (Galbraith 1984). Various scholars explicitly point to actors' practice of "naming", "framing", and "campaigning" to pursue their interest and often making others "voluntarily" comply with existent norms (Arts 2003; Holzscheiter 2005). In an analysis on corporate politics and climate change, Levy and Egan amplify the argument and refer to advertising and education strategies, print-, radio- and media campaigning, as well as general attempts to influence the scientific and policy debate (Levy and Egan 2000, 147f). But while some norms can be manipulated by actors, others structure social relations so deeply that they are much more difficult to challenge.

Forming an integrative framework

The presented framework takes two very different perspectives in order to fully understand the opaqueness of the global agri-food system and the salient global and local forces. We argue that a focus on actor-specific power and actor activities forgets to ask questions that go beyond established knowledge in that policy-field. Therefore, a critical approach to structural origins of power is necessary before analyzing activities that reside in these structures. It is the interaction and mutual influence of these two approaches to power, which makes an analysis especially fruitful, since the combination of both approaches gives us a deeper knowledge on a special policy field such as GMO policy in India and how global and local forces interact. The following table illustrates how the perspectives interact (Table 2):

Table 2: An integrative framework



Determinants of GMO Policy in India

Biotechnology in general and agricultural biotechnology in particular demonstrate a range of risks to environment and health that are closely connected to a general inability to overcome scientific uncertainty about genetically modified organisms (GMOs). Still, this technology represents an opportunity for countries to assure a reliable food supply and, for developing countries in particular, to overcome food security problems. Significantly, India is already the fourth largest producer of biotech crops, planting an area of 7.6 million hectares (James 2008). This section aims to illustrate the above laid out framework of power relations to show some of the structural origins of power and actors strategies in India's GMO policy. It intends to take different perspectives on agricultural biotechnology and illustrate how a further in-depth analysis could be build up, drawing a greater picture of global and local forces when taking two differing perspectives. This picture will by no means be complete, but serves as an illustration to trace power relations.

Structural origins of power

Since security as a structural origin of power focuses on the individual level, the role of the Indian peasant is of special importance in this part of the paper. A large 72 % share of the Indian population lives in rural areas and one may think that they already play an important role in the political process due to their mere size. But, there is also a stark connection between rural livelihoods and poverty, whereas rural poverty is mostly a phenomenon among small farmers. Looking at the origins of this demographic structure, a critical analysis has to start asking questions about the historic formation of this constellation. What structures have influenced this particular difference between rural and urban space and to what extent are the interests of rural farmers represented in the political processes? Historically, the impact of colonial and capitalist rule reveals further indicators of historical inequality. Next to a rural/urban divide, there is also inequality in rural areas with regard to caste. For instance, in a study on the region of Alipur it was found that only three upper castes controlled 90 percent of all agricultural land (Gupta 1998, 130). Asking about the coming about of these structural components may ultimately give insights on forms of (governmental) authority but also how food security is enhanced and what power asymmetries may become visible.

Looking at the real economy and production of goods in India, it is striking that the agricultural sector makes up with 18.6 % for a large share of India's GDP and represents the most important economic sector in the country. 60 % of the total workforce is employed in agriculture, which points to the outstanding role of agriculture for socio-economic development in the Indian Union. Considering the historic origins of this structure, namely the rise of food production since the Green Revolution in the 1970s and a subsequent demand for rural labor, took their part in influencing this development. Furthermore, India's economy and the production of agricultural goods are marked by the introduction of trade liberalizations since 1991. This political development changed Indian peasant integration from mainly local markets of production to an integration in global markets, producing food not in a self-sufficient manner, but producing for global markets and export. This trend has further implications on the position of Indian farmers in the global economy and makes individuals and societies increasingly dependent on food imports. Looking at this power asymmetry, a critical analysis even has to go one step further and ask questions about the emergence of a globalized trade structure, which seems to benefit industrialized countries, while at the same time local markets in the global South and therefore in India are increasingly at stake. Harriet Friedman sees the origins of this inequality in historic food regimes such as the so-called

"settler-colonial food regime", which centered on the trade between England and the Americas at the end of the 19th century and also included settler regions such as Punjab and Danube Basin in British India (Friedmann 2004). Here, specialized export regions were established and certain policies reinforced, that included "emigration from Europe, settlement of land converted from indigenous use to commodity production of European staple foods, and long-distance shipment of low priced wheat and meat" (Friedmann 2004, 127). Importantly, wealth and power in this regime resided in the importing countries. The follow up "mercantile-industrial food regime" under US hegemony further enhanced this structure, pursuing mercantile principles, which included the governmental setting of prices for domestic farmers, control of the distribution of food to the poor, and managing imports and exports, which lay the grounds for corporate and regional dominance (Friedmann 2004).

Next to the material economic structures, the link between India's financial structure and agriculture is also strong and influenced by historic developments. India's agriculture is highly dependent on seasons, especially the monsoon, which traditionally made agriculture a risky business and is responsible for special credit needs of the peasants in order to secure their harvest.

> "With the intermittent failure of the monsoons and other customary vicissitudes of farming, rural indebtedness has been a serious and continuous characteristic of Indian agriculture. Because of the high risk inherent in traditional farming activity, the prevalence of high interest rates was the norm rather than an exception, and the concomitant exploitation and misery that often resulted" (Mohan 2006, 993).

In order to meet the special needs of the peasantry, commercial banks extended their reach to rural areas. Nonetheless, a report of the World Bank states that rural poor have little access to credit, even though India holds a wide net of rural finance institutions, due to "inefficiencies in the formal finance institutions, the weak regulatory framework, high transaction costs, and risks associated with lending to agriculture" (World Bank 2009). These structural constraints on credit lending to rural peasantry need to be scrutinized, asking for instance how these financial structures relate to the global and national food crisis, the development of GM foods, and how they are connected to origins of economic structures and security and force.

A normative analysis of the origins of structural power illustrates existing patterns of knowledge and information. Here, the historic experience of colonialism, where the Indian continent was widely controlled by the British Empire, had an important impact on collective

national thinking until today. Commercial interests were closely connected to political interests, which enhanced the superior position of the East India Company, which can be considered an early form of multinational corporation. This experience made India sensitive to foreign corporations and "the fear of multinationals and a mistrust of business and trade would get etched in the collective memory of India" (Basu 2001, 3838). The Gandhian anti-colonialist perspective, for instance, highlights the Indian people's favor of self-sufficiency and suspicion of Western interests. Furthermore, next to Ghandian ethics, Hinduism also stresses the mutual relationship between humanity and the environment and the value of all life (Gosling 2001).

Illustrating knowledge structures, Vandana Shiva points to the traditional free exchange of seeds among farmers, which reflects certain knowledge, culture and heritage as an essential component of Indian people's livelihoods in rural areas (Shiva 2000). But growing interconnectedness between global and local markets puts this traditional knowledge, but also crop diversity, at stake, enhancing an increasing trend to grow monocultures. This development is further enhanced by a sense of underdevelopment that is a constitutive feature of large parts of social and political life in India, as Akhil Gupta argues. This assumption makes plans to modernize or develop the agricultural sector a desirable goal for a modern nation (Gupta 1998). However, the question arises of who actually ascribes this identity of backwardness. Again, the colonial experience and a stark rural/urban divide serve as historical explanations for this knowledge structure, which influenced rural identity in India to the extent that the discourse of underdevelopment is already deep-seated in Indian thinking.

Actor's power in a structural setting

Looking at GM food policy in India from an actor's perspective, an assessment of material resources of power, such as actor's access to information and political-decision makers as well as disposal of financial resources, is necessary to analyze the strategies actors are able to pursue in that context. The plethora of involved actors, such as transnational corporations, civil society, science networks, and governmental agencies and their ability to actively pursue their goals, implies the need to analyze their power systematically according to the proposed analytical grid.

Considering the material resources of actors at first, the general composition of the global agri-food system is an indicator of the distribution of financial resources among actors. The system is coined by a widely centralized control over the production and distribution of

foods. More precisely, the global agricultural biotechnology sector is dominated by a monopolized market of corporations. Corporations such as Monsanto, Syngenta, Bayer, Dow and Du Pont accumulate so much power that they are able to exercise oligopolistic control over the distribution of GM crop varieties, whereas Monsanto already controls 90 % of global biotech acreage. The magnitude of private-sector involvement becomes clear when comparing the annual R&D expenditures of the top ten bioscience corporations, which account for nearly 3$ billion, to the largest public agricultural research programmes of the developing world - China, India and Brazil - that have an annual budget of half a billion dollars each (FAO 2004, 32). This structural market control is not only reflected in high economic revenues, but is also further enhanced by corporate ability to control intellectual property rights on genetically modified foods. This dominant position of corporations is also visible in India, where three out of ten private-sector companies working on GM crop development in 2004 were foreign multinationals with wide access to élite science (Newell 2007, 186). Corporate funds and capital mobility strengthen firm power over governments, who rely on stable taxation and employment. Furthermore, biotech corporations' access to government institutions involved with biosafety issues that played a proactive role in advising on policies and measures has even enhanced Indian pro-industry bias (Newell 2003, 28). But corporate control over financial resources is even more extensive when considering that credit grantors hold important and powerful positions. Since most peasants from the country side do not have the financial means to buy technologically enhanced seeds, they are only able to buy seeds and the required pesticides from the same company on credit, constructing a firm state of dependence from business actors. Although Indian civil society is highly mobilized with regard to GM crops, they still do not have the same financial means and access to political decision makers to win recognition of their position. Potential command Access to these material resources is necessary though, in order to perform lobbying, funding and campaigning activities successfully.

An investigation of normative aspects of actor's power provides further insight into the strategies actors can pursue with regard to their normative resources of knowledge and symbolism. It serves as an in important analytical lens to explain a particularly hot debate on the approval of large-scale commercialization of GM crops in India. The ability to influence this discourse is strongly connected to symbols, such as the perception of legitimacy. Although corporate actors have far more financial capabilities at disposal, nongovernmental organizations are perceived as legitimate actors when the public perceives them as representing the right cause. This perception enhances their ability to transform symbolic

resources into power. In terms of GM food policy, NGOs in India that are well organized and supported by the public, are therefore able to frame discourses and try to utilize existing patterns of thought. For instance, civil society movements such as Farmers Associations draw on strong symbols, when calling one of the major global biotech firms, Cargill, the West India Company, which reproduces at the same time a discourse on imperialism (Gupta 1998). Using powerful symbols of India's colonial history, civil society movements are able to keep up a threat from Western control over seeds and their intellectual property rights via "shaming" and "naming". On the other side, corporate actors promote the benefits of biotechnology with newspaper advertisements, open days, videos and workshops as part of a public relations strategy (Newell 2007, 187). Furthermore, they use media and advertising campaigns in order to sell their GM products and revert on local beliefs to enforce their campaigns: "Even gods, goddesses, and saints were not spared: in Punjab, Monsanto sells its products using the image of Guru Nanak, the founder of the Sikh religion" (Shiva 2000, 10). But also the framing of public discourse through the construction of agricultural biotechnology as the next future technology after the successful decade of information technology (IT) serves corporate interests. Slogans such as "from IT to BT" are strategically used to construct a certain idea of technological development in India (Scoones 2006). The Indian government, as the final authority to implement and regulate agricultural biotechnology, is highly influenced by framing activities from different sides. But their continued policy of development and commercialization points to the preponderance of pro-biotech framing activities.

Conclusion

This brief illustration of an analytical grid to assess global and local forces in India's agricultural biotechnology sector reveals the strong interconnectedness of material and normative dimensions of power as well as the connection between structural and actor-specific power. It highlights that there always is an interchange between these forces. Furthermore, our integrative framework, that allows taking two different perspectives on an issue area, leads to additional benefits for an analytical assessment. Considering the origins of structural power at first and examining actor's power in a second step has given additional insights on GMO policy in India. For instance, understanding the coming about of the special economic structures and the position of the rural population has influenced government politics and their activities to a certain degree. Since the rural population makes up such a big part of the Indian population, securing the rural populations access to food and water as well

as protecting their incomes from natural disasters is an important governmental challenge. Furthermore, the stark connection between rural livelihoods and poverty may have influenced Indian government thinking on reducing poverty by raising agricultural productivity (World Bank 2009). As another example, the development of the financial sector and its historic constraints are the setting in which peasantry got increasingly indebted when buying new technologically enhanced crops. If nothing else, normative origins of structural power are strongly connected to actor's possibilities to influence GM food discourses. The fact that corporations as well as civil society movements relate to deep-seated historic symbols of indigenous knowledge or the colonial past points to the power normative structures have on the ability of actor's to actively influence and shape discourses. Although India's GM food policy only served as an illustration of the proposed power framework, its results on power relations and the interplay of global and local forces are certainly practical for science and politics.

Pointing to the strong interchange of forces, this integrative framework enables us to analyze the formation and the relation of power from a very differentiated perspective. Scientifically a more differentiated concept of power provides a better insight into the overall picture of power relations and how political outcomes are generated. A better understanding how global and local forces interact and how power is exercised opens possibilities for politics to establish fitting checks and balances in a policy field which is difficult to govern. Deeper knowledge on power relations in the global agri-food system allow a more systemized assessment of policy options and an opportunity for politics to find suitable governance solutions to regulate powers in that sector.

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