



This project is co-funded by
the European Union



Coordination of Sectoral Interests in the Nexus Between Water, Energy and Agriculture

Mechanisms and Interests in Germany

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German Corporation for International Cooperation (GIZ)

Published by
Nexus Regional Dialogue Programme (NRD)



c/o Deutsche Gesellschaft für Internationale
Zusammenarbeit (GIZ) GmbH



Registered offices Bonn and Eschborn, Germany

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The Nexus Regional Dialogue Programme (NRD)
is a programme funded by the European
Union and the German Federal Ministry
for Economic Cooperation and Development.

Place and date of publication

03, March 2017

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LIST OF ABBREVIATIONS

EC	European Community
ECJ	European Court of Justice
EU	European Union
EWFD	European Water Framework Directive
IMC	Inter-ministerial committee
JRP	Joint Rules of Procedure
RIA	Regulatory Impact Analysis

1. INTRODUCTION AND CONTEXT

1.1. Why do we need a Nexus approach?

Water, energy and food are essential to support life and are also essential building blocks for social and economic development. Access to and sustainable use of these resources are prerequisites for development and in fighting poverty. Due to an increasing world population and economic development, **the demand for water, energy and agricultural products is constantly growing**. While all three sectors pose their own challenges, they are also interrelated. Development in one sector can cause unintended effects on another, potentially acting as a negative influence. At the same time, a coordinated approach can offer a potential for synergy.

The interdependencies in the exploitation and protection of natural resources and in the safe provisioning of water, energy and food is of increasing importance in the German context. The political structure to handle these topics is coordinated along subject-specific sectors, **contrary to the Nexus approach**. This structure restricts handling of these topics to the formulation of mostly sector-specific objectives and measures.

Due to the federal structure of the German government system, in addition to sectoral ministries, the federal states also influence political processes. The federal states (through the Federal Council) take part in the shaping of political processes and are key players in the implementation of federal laws. The European Union (EU) has also exerted an increasing influence over many years, and exhibited growing authority in a number of policy areas.

With respect to these horizontal and vertical interdependencies, it is necessary to organise the objectives and actions of various political actors from different sectors and levels through a coordinated policy. The overarching objective of coordination in the political process is to identify and minimise negative impacts arising from activities in one sector that affect other areas as well as to coherently and effectively resolve the combination of challenges that lie ahead in policy areas. An effective coordination is particularly important for the water, energy and agriculture Nexus sectors which exhibits numerous interconnections, to balance the interests of resource use and not exceed ecological capacities

1.2. Report Aim and Structure

The objective of this commissioned study from the GIZ is to investigate the handling of conflicts of interest and potential synergies within the water-energy-food security Nexus in Germany. Principally, mechanisms and instruments are analysed which are made available within legislative procedures and policy-making processes for the coordination of different aims and interests (framework perspective). The interactions between water, energy and agriculture have been increasingly researched in a scientific manner in past years (eg. Graaf et al. 2015). Conversely, the question concerning existing circumstances of intersectoral coordination in the Nexus prism in political processes has rarely been analysed. Against this background, this study prepares a concrete example of Germany that is useable for guidance, consultation and training programmes.

Chapter 2 presents an introductory explanation of various approaches to policy coordination. Chapter 3 presents the first part of the study by outlining the guiding

principles and institutions which guarantee intersectional coordination at the national level. The following processes and institutions are examined in more detail: basic formal procedures as specified in the **Joint Rules of Procedure of the Federal Ministries (JRP)**, the roles of the **Federal Government and the Federal Chancellery** as primary arbitration, mediation and coordinating bodies, the work of **inter-ministerial task forces and committees** as intermediary institutions between discipline-specific ministries; and miscellaneous institutions who enable coordination between federal and state authorities.

Furthermore, Chapter 3 explains procedures that facilitate the **involvement of subject matter experts, relevant stakeholders and the general public** in national policy processes. The participation and involvement of these external parties is essential for successful coordination, to identify the consequences and interconnections of planned political undertakings. The involvement of these parties can in addition contribute to disclose overriding sectoral interests and impart a strong emphasis on public interests.

Chapter 4 presents the second part of the study which looks at the example of **agricultural fertilisation** and the associated nitrogen inputs to the environment in the context of the water-energy-agriculture Nexus. Through the violation of European environmental guidelines, in particular that of the Nitrate Directive, the **amendment of the fertiliser ordinance** was initiated, which necessitated the coordination of numerous and sometimes competing interests between different sectors and actors. After an introductory description of the interactions between water, energy and agriculture, the institutions used for the review process and the instruments for intersectoral (between ministries and sectors) and cross-level (Federal Government and the Federal States) coordination are explained in-depth.

Chapter 5 summarises the overall conclusions regarding instruments available for coordination and their transferability to other national contexts.

2. APPROACHES TO POLICY COORDINATION

Most governments organise different policy areas according to ministerial sectors and this is increasingly performed in decentralised agencies. This sectoral subdivision requires organisational structures and procedures which are capable of guaranteeing consultation and coordination between the different organisational units. This can, among other things, be implemented through **administrative units** (for example inter-ministerial working groups) that enable a collaboration in daily dealings with policies. While this type of coordination is dominant, attempts also exist to establish **coordination structures at strategic levels** (Jordan and Lenschow 2010: 150-151). For example, cross-field policy planning can take place through the merging of ministries or through the formulation of cross-sector strategies (see Box 1).

The scientific literature often differentiates between so-called ‘positive’ and ‘negative’ policy coordination (cf. Scharpf 1993: pg. 20-21, Krax 2010: pg. 82-83). **Positive coordination** describes a form of coordination that is forward-thinking and based on alignment, where all conceivable courses of action for the involved parties are considered in order to generate the maximum possible benefits (the above mentioned “strategic approach” generally corresponds to this positive coordination). This form of coordination generally takes place with numerous units – often coordinated at a superior political level – and accounting for a large number of potential decisions.

By contrast, **negative coordination** is primarily focussed on separate departmental interests. In this case, a department would examine whether a specific decision affects its own entity, and also whether possible interests of other departments are also affected. This form of coordination is mostly found through bilateral coordination between the concerned entities. When employing negative coordination, the coordination effort is generally lower.

Since its formation, environmental policy has played a lead role in the pursuit of achieving stronger policy coordination. The causes of the overutilisation of natural resources and negative environmental impacts largely fall within the competence areas of other policy fields (eg. the agricultural, energy or construction sectors). It has therefore always been important to integrate environmental policy through environmental concerns as cross-sectional tasks in other policy areas (SRU 2007: 30).

Box 1: The national sustainability strategy

The German sustainability strategy was first adopted in 2002 from the then federal government under the title 'Perspectives for Germany'. It drafts long-term and cross-field policy sustainability goals and is therefore authoritative for all sectors. The sustainability strategy was coordinated as a superordinate strategy under the management of the Federal Chancellery. As such, it establishes a "development and implementation centre", which enables cross departmental coordination towards sustainable development, and significantly strengthens the opportunities for implementation (Lindemann and Jänicke 2008: 21). Following a revision in January 2017, the federal government approved a new sustainability strategy.

The sustainability strategy contains general and sector-specific management rules and objectives as well as 63 indicators which all operate as control instruments (Bundesregierung 2016: 33-40). These also comprise of objectives and indicators specific to the water, energy and agricultural Nexus sectors. The sustainability strategy, among other things, frames the following objectives by the year 2030: the nitrogen surplus from agriculture should be limited to 70kg per hectare of agricultural land used; the nitrate threshold value in groundwater of 50mg/L should be adhered to; reduction of the nutrient inputs into coastal and maritime waters; the proportion of organic farming and cultivation to be increased to 20% of the total in Germany; reduction of the eutrophication of ecosystems and the percentage of renewable energy to increase to 30% of the total German energy use.

The sustainability strategy underlines the close relationship between several objectives and indicators relevant to Nexus. In this manner, the objective of food security is emphasised with the close relationship between the indicator "nitrogen surplus from agriculture" and the indicators "emissions from air pollutants", "nitrate in groundwater", "nitrogen input inflows into the North Sea and Baltic Sea" and "eutrophication of ecosystems". Hence the reduction of nitrogen inputs is of notable importance in the achievement of other objectives.

To drive the cross-sectoral implementation of the sustainability strategy, the institutionalisation of the sustainability strategy has been continually promoted since its inception:

The State Secretary Committee for Sustainable Development, established by the Federal Chancellery, operates as a central management body for the implementation of the sustainability strategy and is responsible for its regular reviewing and continual development. The state secretaries from all federal government departments are represented on this committee. The committee guides the interactions

of ministries through their respective sustainability activities and furthermore provides strategic impetus to the work of the German government (Bundesregierung 2016: 27). The committee thus serves as a panel for intersectoral coordination on sustainability issues.

The Parliamentary Advisory Council on Sustainable Development, operating as a non-partisan parliamentary supervisory body, reviews whether laws and statutes comply with the guidelines of sustainable development. This verification is legally required for all legislative proposals from all departments.¹ Whether a project is orientated to the indicators of the national sustainability strategy must be plausibly and transparently demonstrated by the respective ministry (a formal, not content-related test). The primary objective of the advisory council is to embed sustainability both institutionally and in the political code of practice, and to strengthen the principles of sustainable development in the face of short-term political considerations (Bundesregierung 2016: 29-30, 41).

As an independent advisory body, the Council for Sustainable Development provides advice to the federal government and develops inputs for the implementation of the sustainability strategy. This involves designating specific spheres of activity and implementing activities to further strengthen the approach towards sustainability in the public (cf. Chapter 3.4).

Furthermore, the sustainability strategy enables the future appointments of principal contacts to sustainable development in all government departments. These sustainability officers should ideally be deployed at the level of the departmental heads (Bundesregierung 2016: 44).

Through its influence, the national sustainability strategy has notably contributed in entrenching a stronger culture of sustainable thinking practices in policy and in the public. In addition, it was able to place a set of incentives for more sustainable development, for example through platforms for sustainable procurement and voluntary codes for sustainable construction (Rat für Nachhaltige Entwicklung 2013: 61). Until now, the sustainability strategy has barely influenced the design of sectoral policies and strategies to be streamlined with a more sustainable policy that incorporates the Nexus prism (UBA 2017: 4).

3. INTERSECTORAL COORDINATION IN GERMAN POLITICAL PROCESSES

3.1 Procedures in Accordance with the Joint Rules of Procedure of the Federal Ministries

The JRP forms a pivotal set of rules for the coordination within and between different ministries at the federal level (GGO, 2000). In addition to defining how ministries are structured, the JRP provides **in-depth and precise information regarding collaboration and cooperation with other constitutional bodies.**

The JRP states that an organisational identity (e.g. division or department) who is primarily responsible for a particular concern (the so-called “lead agency”) must engage in a timely manner with those parties that are also affected by this matter. Hence the **JRP mandates an early participation** from other specialist areas and a so-called “joint co-signing” that assigns partial responsibility in the event that another work unit is particularly affected. The lead agency assumes the responsi-

¹ The sustainability assessment was introduced in 2009 and since then has supplemented the process of Regulatory Impact Analysis (see also Chapter 3.1). The process requires that the responsible department

lity for the technical content of a draft, while the affected party is only responsible for the aspects concerning their own party in their field of activity. If the actors are unable to reach a mutual decision, the decision is made by the common supervisor who is one level above the actors (GGO Art. 15-17).

A similar interaction is stipulated at the inter-ministerial level (GGO, Art. 19). To guarantee coordination between different federal ministries, the ministries affected by one of the matters must be involved in a timely manner with the respective responsible ministry in the form of a joint co-signing process. This also applies to all Nexus related issues. For example, in the course of the amendment of the Renewable Energy Act, the Federal Ministry for Economic Affairs and Energy had to involve the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety in the process and reach an agreement on content matter, among other things.

When disputes arise, the responsible ministry is not permitted to take any binding decisions. **The issue must be negotiated until an agreement is reached.** In disputed cases, a party at a higher political level (up to the level of the Federal Chancellery) can be called in.

In addition, the JRP regulates the **involvement between states and associations in the legislative processes**. The intention is that immediately before the formulation of a draft version of a law, the views of states and communal umbrella organisations must be obtained (GGO, Art. 41, 44). As a general rule, this is implemented through consultations in the ministries, and with national and association representatives informing the respective experts and submitting position statements. As soon as a draft law is formed, the ministry is bound to provide the draft to the states and to the communal umbrella organisations (GGO, Art. 47). At this point in time, the respective ministry is also called upon to **involve subject experts and representatives of the affected professional associations in the process** (for example, the German Farmers' Federation or the German Association of Energy and Water Industries). By contrast, consultations with other stakeholders or civic organisations are not foreseen in the JRP.

Lastly, the JRP also covers regulations for **implementation of a Regulatory Impact Analysis (RIA)** (GGO, Art. 44). The RIA stipulates that key impacts (intended effects and unintended side effects) must be outlined in a legislative preamble, in agreement with the professionally responsible federal ministries, before it is submitted to the federal government for resolution. In theory, this examination incorporates all possible consequences, including both long term and ecological consequences. Specified exclusively in the RIA are the costs and implications on government budgets, bureaucratic costs and impacts on consumers (Jacob et al. 2009: 11-12).

At present, it is standard practice that the RIA is first developed when an agreed upon draft law is already prepared. The RIA is then decoupled from the intrinsic political processes of law formation. Negative consequences of as well as regulatory alternatives are generally not considered in the draft law at this stage (SRU 2012: 381).

3.2 Federal Government and Federal Chancellery

As described in the previous section, conflicts regarding varying political themes are generally first negotiated by the departments and ministries concerned. Only when all points of conflict are resolved, the federal government will reach a definitive decision. **Where no agreement can be reached, the federal government**

(chancellery) intervenes in a moderating role and, as the party in charge, assumes the responsibility of the important political affairs (Jacob et al. 2016: 17).

The Federal Government and Federal Chancellery therefore serve important **overriding coordination functions** in the German policy process. According to constitutional law, the federal government is the conciliation body that rules on “disputes between federal ministries” (GG, Art. 65). As such, the federal government constitutes a counterweight to the otherwise dominant “departmental principle”, in which the federal ministries are solely responsible for their respective areas of operations.

Divergent views between separate federal ministries are generally first dealt with through coordinated inter-ministerial bodies. These bodies exist at different levels (from the head of division to the state secretary level) and are briefly described in the following sections. When no agreement takes place at this level, the ministers have to engage in negotiations. If necessary, this type of matter will be discussed and decided upon in the federal cabinet. The federal cabinet meetings are arranged through the ‘Spiegelreferat’ (a unit whose task area corresponds to that of another organisation) in the federal chancellery (GOBreg 1951, Art. 16,17; cf. Knoll 2004: 58-59). Because of their overriding role and their overview of the work of different departments and ministries, “the federal chancellery can contribute in overcoming selective perceptions by the individual ministries on factual issues and hence prevent negative coordination” (Knoll 2004: 57).

3.3 Coordination of Inter-Ministerial Departments

As previously described, the department or ministry responsible for a matter must initiate early contact with affected ministries and is principally responsible for the management of the cooperative work (GGO: Art. 19). The Rules of Procedure of the Federal Government also stipulates that all matters must be negotiated between the involved ministries before they are dealt with in the cabinet. A range of formal and informal institutions exist which help achieve this alignment and coordination between different ministries and disciplines.

In most cases, the interdepartmental coordination takes place through ad hoc working sessions between ministries and their subordinate divisions. In addition, there are also institutionalised approaches to cooperative work. Primarily, these forms include **inter-ministerial committees (IMCs) and working groups** (cf. GGO: Art. 20 and see Box 2) at different levels: between head of division, head of department and through to the state secretary level. Some committees only exist briefly while others are created for the long-term.²

Box 2: Inter-Ministerial Committees

Raw Materials Inter-Ministerial Committee

The aims of the Raw Materials IMC are to identify problems relating to the long-term availability of non-energy mineral resources (eg. rare earths, potash, salts or industrial materials), relating to mineral resources in the economy, and to develop interdisciplinary problem-solving approaches. The IMC was established in 2007 by the federal government.

The following ministries are represented in the Raw Materials IMC: Federal Ministry for Economic Affairs and Energy (chair); Federal Foreign Office; Federal Ministry for Finance, Food, Agriculture and Consumer Protection; Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety; Federal

² It is worth noting, that despite the very significant role undertaken by some inter-ministerial committees, there are no (scientific) debates about these institutions. Literature on the subject is consequently very restricted. One of the few works on this topic is from Prior (1968).

Ministry of Education and Research; Federal Ministry for Economic Cooperation and Development as well as the Federal Ministry of Transport, Building and Urban Development and the Federal Ministry of the Interior. Other authorities are represented, such as the German Mineral Resources Agency and Federal Institute for Geosciences and Natural Resources as well as the German Central Bank. Association representatives also collaborate with the IMC (The Federation of German Industries and various other trade associations, among others). There are no representatives from civil society. An interim report on the progress of the Raw Material IMC's work was written in 2009, but it is not available to the public.

Inter-Ministerial Task Force Adjustment

The inter-ministerial task force adjustment was established by the federal government in 2008 and serves in interdepartmental coordination and the advancement of the German Strategy for Adaptation to Climate Change. Almost all of the federal ministries in the inter-ministerial task force are represented under the leadership of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.³ The inter-ministerial task force was set up to develop an “action plan adjustment” that should substantiate and prioritise the German Strategy for Adaptation to Climate Change by means of cross-departmental adaptive measures. Since then, the inter-ministerial task force adjustment is responsible for the periodic evaluation and advancement of the adaption strategy and action plan (UBA, 2014).

Aside from the IMCs, there are also topic-specific **German Parliamentary Committees** which assemble parliamentary representatives from all parties (proportional to the vote ratio in parliament). These institutions are not primarily seen as political coordination institutions, but rather as institutions that principally arrange the actual parliamentary work. Nevertheless, they influence the coordination processes between different departments (at least where draft legislations are involved). In this manner, the parliamentary committees advise on legislative proposals, suggest amendments (GO-BT, 1980. Art. 60) and this process serves as a practical trial as to whether submissions would be accepted in parliament.

The committees can enlist experts, stakeholders and other respondents to familiarise themselves about a situation. This process of information acquisition is used regularly.

3.4 Involvement of Technical Expertise

The involvement of experts from scientific and practical backgrounds is an essential prerequisite in ascertaining a well-founded knowledge base about impacts and interactions of complex projects. Consultation with technical experts is necessary so that the sectors and departments involved in a coordination process can be evaluated. Furthermore, the inclusion of scientific expertise can help to disclose cross-sectoral interests and thereby counteract particular sectoral interests (Jacob et al. 2016: 18).

In the national political environment, there are a relatively large number of advisory boards and expert councils who, as independent panels, provide their scien-

³ The following are represented in the inter-ministerial task force adjustment: The Federal Foreign Office, Federal Chancellery, Federal Ministry of Finance, Federal Ministry of the Interior, Federal Ministry of Labour and Social Affairs, Federal Ministry of Education and Research, Federal Ministry of Food and Agriculture, Federal Ministry of Defence, Federal Ministry for Family Affairs, Senior Citizens, Women and Youth, Federal Ministry of Health, Federal Ministry of Transport and Digital Infrastructure, Federal Ministry for Economic Affairs and Energy and the Federal Ministry for Economic Cooperation and Development. The Federal Environment Agency has a permanent presence.

tific expertise and advice to various ministries and their subordinate bodies. For example, the **Scientific Advisory Council for Fertiliser** and the **Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection** (previously the Scientific Advisory Board on Agricultural Policy) actively advise the Federal Ministry of Food and Agriculture. Both advise the ministry with expert opinions. The advisory council members typically practice their job voluntarily and independent from directives.⁴

Scientific councils are sometimes set up by the federal government and serve directly as an advisory board (see Box 3). A direct connection between the councils and the federal government usually takes place for issues of higher political importance in any regulatory area (Mayntz 2006: 117). Scientific councils summoned by the federal government are often interdisciplinary and deal with cross-sectoral issues. This means that they are particularly suitable to handle cross-policy-field problems and identify approaches to integrated and strategic work.

Box 3: Scientific Councils of the Federal Government

As an example, the German Advisory Council on the Environment was created as an independent scientific advisory board of the Federal Government in 1971. In addition to producing a comprehensive principal assessment report every four years, the German Advisory Council on the Environment develops special reports on specific issues, statements and up-to-date commentaries on environmental policy. These reports are often compiled in close interaction with the implementing authorities (eg. Federal Environment Agency) and address ongoing implementation issues.

The previously described Council for Sustainable Development was established by the federal government in 2001, to provide advice on questions of sustainability. Primarily, the council should advance and help implement the German sustainability strategy. An extra task of the Council for Sustainable Development is to use various projects to promote sustainable development to the public, and to increase public discussion on the topic. The council consists of 15 representatives from the fields of economy, environmental protection, agriculture, social policy, science and development cooperation, as well as representatives from unions and churches, who are all appointed by the Federal Chancellor for a three-year term of office.

3.5 Stakeholder and Public Participation

The involvement of stakeholders and the public can also positively influence intersectoral coordination. Early involvement can contribute to **establish overall social interests (for example the protection of natural resources), and to ensure that positive coordination is strongly considered in the political process.** Furthermore, the involvement of stakeholders and the public can prevent political measures from encountering unseen problems in their later implementation.

The **involvement of state representatives, external experts and interest groups is stipulated in the legislative process** (cf. Chapter 3.1). These actors are comprehensively involved in political processes, so that the impacts of legislative initiatives on different sectors can be assessed. Representatives of these committees are regularly consulted throughout a legislative process and, for example, engage with ministries in the form of hearings and informal discussions.

In contrast, the involvement of the wider public is not stipulated as mandatory.

⁴ The autonomy of the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection is shown through a series of critical statements that they have published. For example, in 2015 the advisory council issued a report titled "Paths to socially acceptable livestock farming" in which the current livestock farming practices were heavily criticised, and which spoke in favour of a strategy for animal welfare and environmentally friendly products with a concurrent reduction in consumption quantities.

Nevertheless, the responsible ministries frequently involve the public in the development of draft legislation, for example by means of hearings or by allowing written statements. In some instances, public involvement through position statements on legislative drafts and draft regulations is legally required.

A significantly **stronger consideration of public input is found at the administrative and planning processes level**. The extent to which the wider public must be included in these processes is governed by underlying sector related laws. The “Law for the improvement of public involvement and standardisation of planning approval procedures” (PIVereinHG, 2012) attempted to achieve a certain standardisation between the subject-specific laws. According to this law, approval authorities should initiate in early discussions with project owners.

3.6 Coordination between federal government and states

Due to the **federal structure of the German system**, as well as coordination mechanisms across horizontal levels, institutions that facilitate **coordination at the vertical level** between the federal government and the states are also necessary. This is needed because approval from the states (through the Federal Council) is required for a number of legislative proposals, and also because most legal requirements are implemented by the states.

Coordinating bodies are important for several reasons in this context. Regarding legislative proposals that are subject to approval, cooperation to develop these initiatives is critical, so that they that will be supported by the states and that no political stalemate is expected with the Federal Council. In addition, early coordination with the states can prevent later problems arising from the implementation of legislative proposal. Lastly, the EU demand increasingly consistent reporting on, and implementation of policies, and therefore a coordination between the federal government and states is needed (Zimmer, 2010: 677).

There are numerous formal and informal institutes who promote vertical coordination between the federal government and states. Of these institutions, only the most important can be named here.

At the level of the line ministries, **special ministerial conferences (eg. the Conference of Environmental Ministers)** are held several times per year. Although these primarily serve to allow consultation and coordination between federal states, representatives from the federal ministries also often participate. Common agreements between federal states about subject-specific issues stand at the heart of negotiations. In the case of the Conference of Environmental Ministers, the federal states discuss common approaches, determine their official position when dealing with the federal government and seek mutual solutions. In addition, an aim of the Conference of Environmental Ministers is to coordinate so that existing and environmentally relevant laws are uniformly implemented in the federal states.

In the **federal government and federal states working groups**, procedures in the enforcement of laws are discussed and agreed upon, implementation problems are discussed, and guidelines for the implementation of legislation are established. While these groups mainly serve to enable coordination between states, they also represent the interests of the states to be discussed with the federal government.

Illustrating this point is the German Working Group on Water Issues who have operated for many decades. In this working group, the technical administrators responsible for water management and water law meet regularly.⁵ The German Working Group on Water Issues is a working body of the superordinate Confe-

⁵ The German Working Group on Water Issues was formed in 1956 from the merger of the state and federal ministries responsible for water management and water law. Since 2005, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety also represents the German Working Group on Water Issues as a permanent member.

rence of Environmental Ministers. At the level of the departmental head, state and federal representatives meet at least twice per year, prior to the Conference of Environmental Ministers. They discuss cross-border water legislation and economic issues, work toward common solutions and come up with recommendations for implementation.

Apart from formal structures, there are numerous **informal institutions**. For example, informal political top-level talks, in the form of **federal and state discussions**, often take place in legislative processes. Such talks are often held from an invitation of a federal minister to the state level specialist ministers or other members of state authorities. The talks serve to discuss political projects (such as legislative drafts) and if necessary to work towards enacting amendments.

4. INTERSECTORAL COORDINATION AND THE EXAMPLE OF THE FERTILISER ORDINANCE AMENDMENT

4.1 Introduction to the Water, Energy and Food Security Nexus in Germany

Agricultural activities and food production feature a number of interdependencies with different environmental resources, such as soils, water, air and climate. Through the production of food items, agriculture contributes a significant share to food security and human development. For food production, **agriculture is dependent on environmental resources**, though at the same time has a number

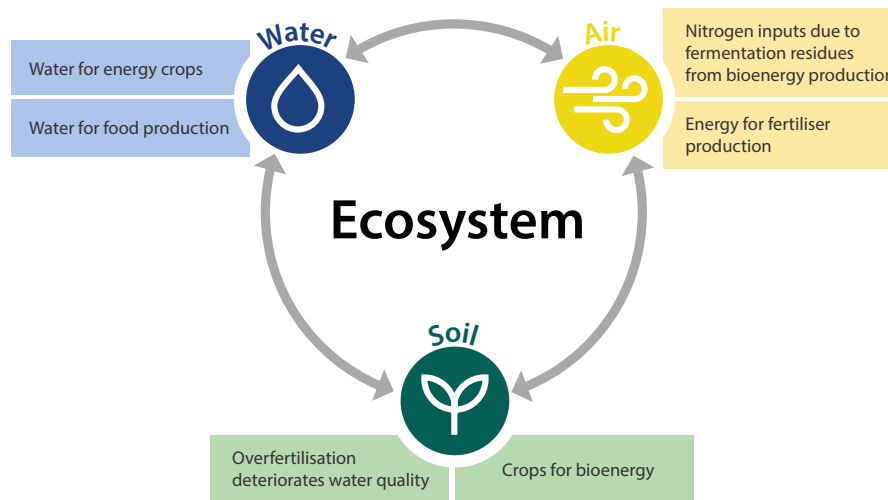


Figure 1: Nitrogen in the Water-Energy-Food Security Nexus. Source: own research

of unintended negative effects on these resources, especially through the input of various nitrogen compounds (see Figure 1).

Agriculture is currently the largest culprit of excessive **nitrate concentration (NO₃)** in groundwater and surface waters in Germany. Nitrogen is released into the soils and water bodies through excessive nutrient inputs (from fertilisation with manure, digestates or mineral fertilisers). Approximately 28% of the aquifers

in Germany exhibit a nitrate concentration above the allowable limit of 50 mg/L (BMUB and BMEL, 2016: 40). An increased nitrate concentration compromises the water ecology and potable water quality, as well as harbouring health risks.

In addition, the agricultural sector is responsible for the largest percentage of **ammonia emissions** (NH₃). Ammonia reacts with other atmospheric gases to form substances that are harmful to health (eg. particulate matter) or deposits itself in ecosystems, leading to eutrophication. Therefore, nitrogen emissions also contribute to the loss of biodiversity.

Nitrogen oxide emissions (NO, NO₂), though primarily caused by road transport and the industrial sector, are also partly caused by agriculture. A portion of the nitrogen oxide reacts to form nitrous oxide (laughing gas), hence this is also connected to climate change.

The Nexus issues are further intensified by the **energy sector** and the increase in renewable energies. With the promotion of renewable energies, the cultivation of

Nitrogen compound	Main source	Significant effects
Nitrogen (N ₂)	78% of the air	None
Nitrate (NO ₃)	Agriculture Industrial and municipal wastewater Fermentation residues from bioenergy production	Pollution of groundwater and surface waters Pollution of marine and coastal ecosystems Health problems due to heavily polluted drinking water (nitrosamine, methaemoglobin) Eutrophication of ecosystems Displacement of species
Ammonia and ammonium (NH ₃ and NH ₄)	Agricultural livestock farming (also associated with farm manure) Fertiliser production and use Wastewater discharge in surface waters	Acidification and eutrophication of soils and ecosystems (threat to biodiversity and species displacement) Formation of particulate matter (deterioration of air quality)
Nitrous oxide (N ₂ O)	Microbial transformation processes in soil and water (denitrification) Agriculture (fertiliser use) Nitrogen loaded near-natural ecosystems Soil compaction Industrial processes	Greenhouse effect, greenhouse gases and deterioration of ozone layer in the stratosphere
Nitrogen dioxide (NO ₂)	Traffic Energy conversion Combustion processes Industry	Formation of ground level ozone from chemical reaction with NO ₂ Respiratory irritation from NO ₂ Contribution to the eutrophication and acidification of ecosystems

Table 1: Environmentally significant nitrogen compounds: main sources and effects, Source: Based on Federal Environment Agency (2009, 9)

crops (eg. maize) for biogas production has steadily increased over previous years. The remaining waste products (fermentation residues) are brought out to the fields, and agricultural nutrients enter the soil and water bodies.

These interactions and externalities result in some intersectoral conflicts (see Figure 2). The objective of water and environmental policies are to achieve a reduction in fertiliser use in agriculture, to protect natural resources and reduce the costs involved in water treatment. To an extent, these objectives conflict with

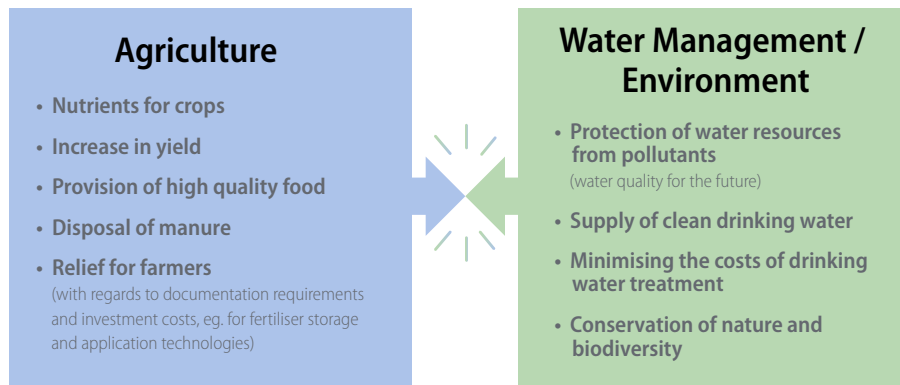


Figure 2: Aims and conflict in aims between agriculture and water management / environment. Source: Own research

those of the agricultural sector, who strive to achieve the most effective land use for food production (maximum possible output per unit area) without burdening farmers with extra restrictions and associated costs.

A central instrument for the achievement of agricultural and environmental aims is the fertiliser ordinance. The ordinance aims to optimise the utilisation of nutrients (needs-oriented fertiliser), though it also acts as an environmental policy instrument which targets the reduction of both nutrient inputs into soils and water bodies as well as pollution emissions into the air. The fertiliser ordinance is the central component in the execution of EU Nitrates Directive (Directive 91/676/EWG, see Chapter 4.2).

The fertiliser ordinance principally covers regulations for the use of fertilisers, soil additives and plant aids or fortifiers. Fertiliser must be administered as part of “good professional practice”, so that nutrients from the crops can be used to the greatest possible extent and nutrient losses are avoided. The fertiliser ordinance supplements both the Fertiliser Act (which regulates putting fertiliser into circulation and the utilisation of fertiliser) and the Fertiliser Regulation (which determines the approval, classification and labelling of fertiliser).

The **fertiliser ordinance has been undergoing changes since 2012**, because Germany did not adequately comply with their obligations regarding the reduction of nitrate pollution (according to the European Commission). There was an infringement procedure in 2013 and **Germany was sued before the European Court of Justice (ECJ)** in 2016.

The connections between agricultural food production and protection of environmental assets are examined below, based on the example of the political process of revising the fertiliser ordinance. There is a focus on the connections between the protection of groundwater and surface water, as well as interests that are to some extent contrary between the sectors.

4.2. European Legal Framework

Within Germany, the federal state assumes the responsibility for environmental protection and for utilisation and protection of water resources. Since the reform of the federal system in 2006, water management is a legal component of the so-called “concurrent legislation”. Under this legislation, the federal government has the possibility to enact comprehensive rules regarding water management. As long as the federal government does not exercise its legislative power, the states can enact their own laws in areas that are not regulated.

However, the management of water resources and protection of water bodies in Germany is strongly dictated by EU legal guidelines. The **European Water Framework Directive (EWFD)** from 2000 contains strict guidelines on the protection of European waters. The overarching aim of the EWFD is to improve the ecological and biological condition of the water bodies and to restore them as close as possible to their natural structures.

The **European Community (EC)-Nitrates Directive** is a key instrument in improving the groundwater quality.⁷ The directive targets the prevention of groundwater and surface water contamination caused by nitrate pollutants from agricultural practices, especially from fertilisers. All EU Member States are thus obliged to monitor nitrate pollution into their water bodies and identify waters that are threatened by excessive pollution. In addition, they must establish action plans to reduce nitrate pollution. In Germany, these guidelines are mainly implemented through the fertiliser ordinance and through the Nitrate Reports, which are published every four years.

According to the European Commission, Germany had repeatedly violated the EC-Nitrates Directive in recent years.⁷ The EU then commenced an infringement proceeding against Germany in 2013. Germany was then forced to revise their existing fertiliser ordinance. Since then, the responsible ministries at the national and state levels have strived to adapt the ordinance so that it complies with the European guidelines. The urgency for such a revision was again reinforced with the filing of **a legal action by the European Commission that was brought to the ECJ in October 2016.** (Europäische Kommission, 2016).⁸

The revision of the fertiliser ordinance was prompted by both the alleged failure to comply with the European Nitrates Directive and the impending legal action by the European Commission before the ECJ.⁹ **The influence of the European Commission raised the negotiation pressure on the involved national actors**, especially on the Federal Ministry of Food and Agriculture, who were responsible for the matter. The positions of actors who had had long called for greater effort against agricultural nitrogen emissions were also strengthened. For example, that of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

The EU's strong environmental role matches past experiences, where European institutions have often been driving forces for environmental endeavours in the member states (cf. Hey, 2005; Jacob et al., 2016: 14).

As well as complying with the EC-Nitrates Directive, the fertiliser ordinance is also an important instrument in complying with EC guidelines on national emission ceilings for specific air pollutants (National Emissions Ceiling Directive).¹⁰ According to the National Emissions Ceiling Directive, Germany has a current limit for ammonia emissions of 550,000 tonnes per year. Germany has exceeded this cap for several years. The amendment of the fertiliser ordinance should **contribute to the reduction of agricultural ammonia emissions, and in doing so, should achieve air pollution control and climate protection.**

⁶ Council Directive 91/676/EEG from 12 December 1991 concerning the protection of water bodies from contamination caused by nitrates deriving from agricultural sources.

⁷ Numerous groundwater and surface water bodies have been exhibiting increasingly higher nitrate pollution levels for several years. This breaches the "no deterioration" requirement specified in the Water Framework Directive. During this time, Germany had neglected to introduce stronger measures to counteract nitrate pollution.

⁸ Since the opening of the infringement proceeding, there has been continuous interaction between Germany and the European Commission, Directorate-General for Environment (Civil Protection Unit). Regular meetings have taken place at the specialist and political levels. During these meetings, German representatives (from the Federal Ministry of Food and Agriculture and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) informed the Directorate-General on the progress of the amendment process. Furthermore, the European Commission's expectations of a new fertiliser ordinance were discussed. With the lodging of the legal action, these discussions have stopped for the time being.

⁹ Other EU member countries have been previously sued in front of the ECJ and had to make high penalty payments to the EU.

¹⁰ Directive 2001/81/EG of the European Parliament and Council from 23 October 2001 on national emission ceilings for specific air pollutants.

European Commission Water and Agriculture Task Force:

The Nexus between water and agriculture, particularly the impacts of agricultural production on water resources, is also comprehensively discussed at the European political level. High nitrate and pesticide loads in water resources are observed in some European countries and regions. While this is attributed to a lack of implementation of existing European environmental regulations, weaknesses on the part of European environmental and agricultural policies are also evident. The Director-Generals for Environment and Agriculture in the European Commission have tackled the issue by creating the Water and Agriculture Task Force in the past year. This task force aims to achieve stronger coordination between different sectors at the European level and to design agriculture in Europe to be simultaneously economical and environmentally friendly (Castell-Exner, 2017).¹¹

Key objectives of the task force are to determine why a greater consideration and focus on environmental aspects was not achieved by the agricultural sector through the existing cross-compliance system, and how the implementation of existing regulations can be improved at the national level.

While the task force meetings are not public, relevant stakeholders should still be involved in the process. In October 2016, the first workshop on the topic was organised in Bratislava. Representatives from national ministries, professional authorities and associations were invited. One of the German participants was the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. Similar further meetings are expected to follow, where possible approaches to better coordination of European environmental and agricultural policies will be discussed.

4.3 Coordinating Institutes

Due to the thematic complexity and the numerous interconnections to other issues, the process of the amendment of the fertiliser ordinance involved many political and social actors at various levels. The following subsections present summaries of the most important formal institutions in this process (cf. Figure 3). In cases where informal institutions or personal processes are known to have played a role, these are also included in the analysis.

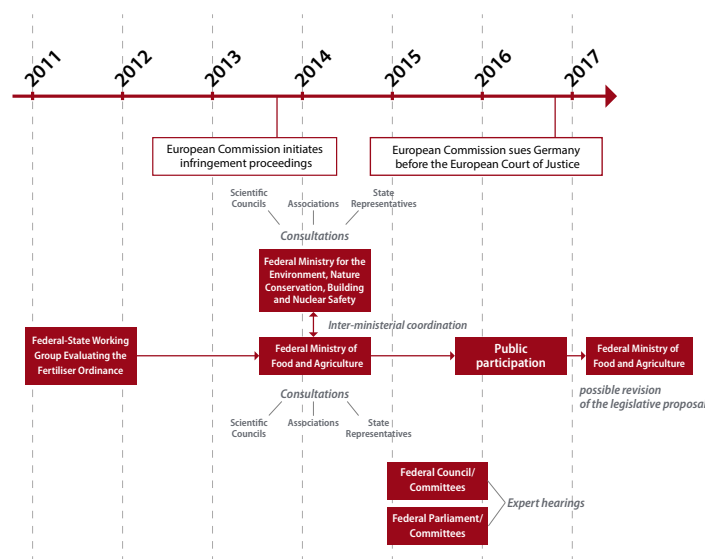


Figure 3: Coordination Process as Part of the Fertiliser Ordinance Amendment. Source: own research

¹¹ Cross-compliance describes the connection of EU agricultural payments to compliance with environmental protection requirements, health and animal welfare. For example, the agricultural payments commitment regulation is a prerequisite for receiving EU premium payments. There is a specification that states: “Anyone who cultivates agricultural areas along watercourses must comply with the requirements of the fertiliser ordinance, in order to maintain good agricultural and ecological conditions.”

4.3.1 Federal-State Working Group Evaluating the Fertiliser Ordinance

The Federal Ministry of Food and Agriculture is responsible for the formulation of a new draft legislation for the fertiliser ordinance. They are tasked with being the lead party in this process. **The fertiliser law still requires the Federal Ministry of Food and Agriculture to cooperate with the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety and the Federal Ministry for Economic Affairs and Energy** (see also Chapter 3.1).¹²

In order to evaluate the fertiliser ordinance, the Federal Ministry of Food and Agriculture employed a Federal-State Working Group as a first step in 2011, and this group operated from May 2011 to March 2012. This working group served to enable both vertical and horizontal coordination, so that actors from various national sectors at both the federal and state levels were integrated and their interests were accommodated.

Aside from representatives of the Federal Ministry of Food and Agriculture and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, crop production experts from various state ministries were also part of the working group.

Furthermore, there was involvement of experts from state agricultural research institutes, Chambers of Agriculture, the Federal Environment Agency and the federal research institutes Julius Kühn Institute and Johann Heinrich von Thünen Institute. The tasks of the Federal-State Working Group were coordinated and supervised in a scientific manner by the Johann Heinrich von Thünen Institute.¹³

Individual topics were assigned to six working groups, with each group responsible for different topic areas related to the fertiliser ordinance.¹⁴ Proposed modifications established by the working groups were discussed and evaluated at regularly held Federal-State Working Group meetings (BMEL, 2016: 17). **The Federal-State Working Group Evaluating the Fertiliser Ordinance established that almost all areas of the fertiliser ordinance had a considerable need for change**, and they summarised proposals for improvement and innovation in a final report (BLAG-DüV, 2012). The changes suggested by the Federal-State Working Group Evaluating the Fertiliser Ordinance formed the basis for the development of a draft regulation by the Federal Ministry of Food and Agriculture, in consultation with the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (see Chapter 4.3.2).

The work of involved experts was strongly restricted to factual issues and exchanges of expertise, and the overall process was predominantly consensus-driven. A reason for this consensus is that specialised subjects and topics were discussed, without political and objective interests playing a significant role.

4.3.2 Coordination of Inter-Ministerial Departments

Based on the report by the Federal-State Working Group Evaluating the Fertiliser Ordinance and its contained proposals for amendments, **a first draft of a new fertiliser ordinance was prepared in the Federal Ministry of Food and Agriculture**, and this was then introduced into the coordination process between departments. Due to the numerous environmental implications and the legal commitments imposed by the fertiliser law, close interdepartmental coordination with the

¹² The fertiliser law provides a legal basis for the fertiliser ordinance.

¹³ The Julius Kühn Institute, which is a federal research institute for cultivated plants in Germany, belongs to a business division of the Federal Ministry of Food and Agriculture as an independent higher federal authority. The Johann Heinrich von Thünen Institute, which is a federal research institute for agricultural areas, forests and fisheries, similarly belongs to a business division of the Federal Ministry of Food and Agriculture.

¹⁴ The working group topics comprised: 1) fertilisation planning; 2) location and soil additive specific restrictions; 3) timing of fertiliser application and fertiliser storage period; 4) fertiliser application technology; 5) nutrient comparisons: methods and balances; 6) fertiliser application upper limits.

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety was necessary.¹⁵

The **coordination between both ministries took place at all levels: from the unit level, across the managerial level, up to the state secretary and minister levels.** At the initiation of the intensive coordination process at the end of 2014, a meeting was called with the participation of the ministers and selected parliament representatives, and framework conditions for further action were set.

The strict European requirements and the impending infringement proceeding before the ECJ acted to motivation the participants to swiftly agree on a common draft.

Aside from the numerous discussions at the ministerial level, a **permanent work group was established to revise estimates of nutrient quantities in soils.** This was done under the direction of the Federal Ministry of Food and Agriculture. State representatives and science representatives were also included in the working group, alongside representatives of the Federal Ministry of Food and Agriculture and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

Throughout the interdepartmental coordination processes, numerous **affected parties were also involved in the process by means of official hearings.** Hearings from the state and professional association representatives (eg. the farmers' association) were mandated by the JRP. **Hearings also took place involving environmental organisations and scientists,** and although not being essential in a formal sense, they were deemed to be necessary due to the high environmental importance of the fertiliser ordinance. There were also informal meetings with state secretaries from all states.

Alongside these actors, **parliamentary representatives** were also involved in negotiations. Parliamentary rapporteurs from all parties responsible for the fertiliser ordinance were summoned to discussions in the Federal Ministry of Food and Agriculture. Representatives from the scientific community and other associations also attended these discussions. Similar to what was experienced in the parliamentary committees, these discussions showed that some states thought that the rules of the new fertiliser ordinance went too far, while other state representatives demanded stricter measures to reduce nitrogen inputs. There was strong criticism from the agricultural sector, who believed that some regulations were not practical and that farmers would be burdened with excessive costs (eg. Deutscher Bauernverband 2016).

Despite these differences, a joint draft regulation was written up at the end of 2015, and was passed by the federal cabinet in December. Concurrently, the fertiliser ordinance draft was sent to the EU Commission for approval, who classified it as unsatisfactory.

4.3.3 Scientific Councils

The Scientific Advisory Council for Fertiliser and the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection (both appointed by the Federal Ministry of Food and Agriculture) as well as the German Advisory Council on the Environment (appointed by the Federal Government) were all actively involved in the process of the amendment of the fertiliser ordinance.

Representatives of the councils were summoned to various hearings in the ministries. In addition, all three scientific councils have **released a joint statement**

¹⁵ The Federal Ministry for Economic Affairs and Energy was hardly involved in this process. However, they were objectively affected by the planned inclusion of fermentation residues in the fertiliser application upper limit of 170 kg of nitrogen matter.

regarding the proposals from the Federal-State Working Group Evaluating the Fertiliser Ordinance. It is to be emphasised that a close cooperation between different councils is seldom encountered in ongoing political processes. One reason for the common stand is the relatively good available data and scientific understanding about the connections between nutrient inputs and water quality.

In the aforementioned statement, all three councils fundamentally support the Federal-State Working Group's proposals; however, on some points they consider it necessary to adopt more extensive measures (WBA et al., 2013). One recommendation is that fertiliser application upper limits for farm manure be extended to include all organic fertilisers, including fermentation residues (from biogas installations), which were not previously considered. In their statement, they also called for the (re)introduction of a method to balance the nutrient flows (called the "Hoftorfbilanz" in German). Both recommendations would require another change of the fertiliser law. Concerning the requirements of the fertiliser application technology for organic fertilisers (as well as its control and sanctioning), the proposals from the scientific councils and the advisory councils go beyond those of the Federal-State Working Group.

In an open letter from February 2016, the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection, the German Advisory Council on the Environment and the Scientific Advisory Council for Fertiliser welcomed that numerous proposals were adopted in the new draft legislation, though they criticised still-existing shortcomings (eg. long transition periods of up to 10 years, generous fertiliser storage periods for liquid manure and fermentation residues, exemption clauses for fertiliser application upper limits of nitrogen from fermentation residues). Overall, they judge that: "The present draft is a long overdue and a step forward for law regarding fertiliser. Though in the future, further adaptations will be required" (SRU et al. 2016: 3).

It is difficult to estimate the extent to which the alignment of the three councils served the coordination between the ministries in this case study. However, it should be noted that the joint statement from the three scientific committees was embraced by numerous actors, including environmental and water associations as well as involved ministries. Parts of the statement are also included in the new fertiliser ordinance. The statement is therefore assumed to have influenced the political process.

The German Advisory Council on the Environment has called for a stronger interdisciplinary and strategic handling of nitrogen related problems.¹⁶ In their special report "Nitrogen: Solution Strategies for an Urgent Environmental Problem" (2015), they urge the federal government to establish an **integrated national nitrogen strategy** with overarching objectives to reduce nitrogen inputs. The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, who are working on such a government strategy to be agreed on by all involved ministries, also agree with this strategy.

In summary, the **scientific councils** (particularly the German Advisory Council on the Environment with their recommendations for the formulation **of a national nitrogen strategy**), **were important** driving forces in the discussion. The relatively strong scientific consensus, expressed in the form of a joint statement from the councils and as consensus-driven work within the Federal-State Working Group, resulted in all parties accepting the scientific basis of the issues, which somewhat facilitated a framework for coordination.

¹⁶ This is worth considering given the coordination difficulties in the fertiliser ordinance review process.

4.3.4 Expert Hearings in Parliamentary Committees

In some ways, the revision of the fertiliser ordinance also required the adjustment of its underlying fertiliser law. Parliamentary committees from both the German Parliament and the Federal Council were therefore involved in the amendment process.¹⁷ The amendment of the fertiliser ordinance was repeatedly the topic for discussion for the German Parliamentary Committee for Food and Agriculture and the Committee for the Environment, Nature Conservation, Building and Nuclear Safety.

In March 2016, a public **expert hearing was called in the German Parliamentary Committee for Food and Agriculture**. The hearing took place upon the requests of Die Linke (a leftist political party) (request: “Ensuring future water quality: adaptation of fertiliser law”) and the Alliance 90 / The Greens parliamentary group (request: “Adapting the handling of nutrients to conform to the environment”). With the amendment of the fertiliser ordinance, a fraction of Die Linke wanted to accomplish a reduction in nutrient inputs into groundwater and surface waters. The Green Party demanded that the fertilisation of agricultural surfaces be aligned with the needs of plants and soils. Members of the federal government (committee members) and representatives from the Federal Ministry of Food and Agriculture participated.

The invited experts comprised scientists with agricultural and crop expertise, as well as representatives from agriculture and water management (Deutscher Bundestag, 2015).

Expert hearings also took place in the **Committee for the Environment, Nature Conservation, Building and Nuclear Safety**. In addition to these hearings in the German parliament, the Federal Ministry of Food and Agriculture also held regular hearings with association representatives, state representatives and scientists. However, no records are available to the public.

4.3.5 Public Participation

In the event that a revision of the fertiliser ordinance takes place, a strategic environmental assessment is required. In this example, involvement from the public and from actors affected by the project was needed in the form of position statements (UVPG: Art. 9).¹⁸ The fertiliser law also stipulates that the public are to be consulted regarding any changes to the fertiliser ordinance. The involvement process for commenting on the fertiliser ordinance and the strategic environmental assessment were run in parallel in October and November 2016. The public was thus provided with the opportunity to submit statements on both documents.

The Federal Ministry of Food and Agriculture considered and evaluated the statements they received. Upon completion of the evaluation process, the draft regulation was then passed to the Federal Council (BMEL 2016: 18).

At the time this report was written, some of the received statements were already publicly available, as they were mostly published by the actors themselves. It appears that agricultural sector representatives (eg. the farmers’ association) are calling for the draft regulation to be adopted in its current form and implement

¹⁷ Laws are decided upon by the parliament and, as per the subject area, with the consent of the Federal Council. In contrast, ordinances are not issued by the parliamentary legislator, but rather by the government on the basis of a granted legal authorisation. In many cases, the approval of the Federal Council is also needed to issue an ordinance (as in the case of the fertiliser ordinance). However, a number of states insisted that both the fertiliser law and the fertiliser ordinance should have been negotiated in the federal government.

¹⁸ The strategic environmental assessment (SEA) complements the environmental impact assessment (EIA). While the EIA is first used in the authorisation stage of environmentally significant projects (eg. the realisation of infrastructure projects), the SEA is first carried out at the planning stage. This is because environmentally important course-setting is often first made as part of initial planning and programmes (this includes legislation). The objectives and approaches of both investigation procedures are the same. Both investigation procedures identify and characterise the expected consequences that a measure has on the environment and on people. Members of the public and affected professional authorities can provide their views on the report.

it as quickly as possible. This is due to the ongoing legal action by the EU against Germany. Meanwhile, the water management sector and environmental representatives demand more far-reaching measures to reduce nitrogen inputs.

A statement by the German Association for Water, Wastewater and Waste summarises that the specifications laid out in the European Nitrates Directive will unlikely be achieved through the foreseen changes under the current draft of the fertiliser ordinance (DWA, 2016).

Despite these critical opinions, including that of the European Commission that inadequate additional measures against excessive and growing nitrate contamination would be realised in the process of the revision of the German fertiliser ordinance, they did not alter the **draft of the new fertiliser ordinance**. The draft was finally passed to the Federal Council, and **approved on 31 March 2017**.¹⁹

4.4 Conclusion and Evaluation

In the investigated case study, it is evident that existing obligations for joint cooperation have effectively assisted in the balancing of interests between the affected sectors. These cooperative requirements led to the **comprehensive consideration and handling of the impacts of higher nitrogen inputs on water resources and the environment**. If the work had been solely undertaken by the agricultural sector, in this case by the Federal Ministry of Food and Agriculture (the lead actor), they would not have adequately addressed the numerous interactions between the environmental assets of water, air and soils, as well as the influence of renewable energy. The intersectoral approach doubtlessly requires a **significant coordination effort** in the amendment process, and this was laborious process.

The **EU played a particularly influential role** with their binding European environmental directives. Without this strict regional regulative framework and pressure from the EU, a revision of the fertiliser ordinance would probably not have been achieved by this point in time. The EU backed up the demands from the scientific community and environmental representatives, who for a long time have advocated a stronger focus on environmental objectives in agriculture in general, particularly regarding the fertiliser ordinance.

The roles of professional scientific expertise and scientific councils should also be highlighted. A relatively large **interdisciplinary scientific consensus** exists on the impacts of nitrogen pollution on the environment, and on the steps required to minimise these impacts. This interdisciplinary scientific consensus created a setting which encouraged coordination between sectors.

Despite these positive points, the **amendment process of the fertiliser ordinance was not trouble-free**: the revision process extended over five years and legal action by the European Commission in front of the ECJ could not be prevented.

A major cause for the process not always running smoothly is the **complex problem structure** of this issue. **Numerous stakeholders, often with very divergent interests and concerns**, had to be involved in the process because of the technical complexity of the issue and the many interactions between sectors (horizontal interdependencies) and political levels (vertical interdependencies). Various conflicting objectives emerged, which were often difficult to bring together.

Numerous informal institutional and personal agreements were also reached alongside the formal coordination processes, and these could only be briefly presented in this report. **Many actors were involved, without there always being a clear procedure for coordination**.

¹⁹ It should again be mentioned that the fertiliser ordinance did not require approval from the German parliament.

5. CONCLUSIONS

The aim of the study was to investigate the handling of conflicts of interests within the water-energy-agriculture Nexus in Germany, and to identify mechanisms and instruments available within policy making processes that can be used to coordinate different objectives and interests. The following conclusions can be drawn from the study:

- In Germany's political procedures there are **a number of mechanisms at different levels which enable Nexus related issues to be addressed**. The processes and instruments needed to coordinate disparate interests within and between departments, as stated in the JRP, not only serve as a possibility for intersectoral communication, they also oblige the departments to undertake this coordination. If a political project in one of the water, energy or agricultural sectors is expected to have an influence on one of the other sectors, the appropriate sectoral ministries must cooperate and negotiate with each other until a compromise is reached.
- **Coordination through negotiation processes between the affected sectors** and the respective responsible organisational units is a dominant approach within the German political system. However, the responsibility primarily falls upon the department or ministry whose subject area coincides with a particular topic. In addition, an increasing number of approaches to **strategic intersectoral coordination** have been observed in Germany over recent years. This intersectoral coordination defines joint and cross-policy-field objectives and measures in all relevant sectors. This particularly applies to matters of environmental policy, such as biodiversity and climate protection, which exhibit a multitude of interconnections to other sectors. With the recently announced nitrogen strategy by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, this strategic approach should also be implemented.
- Political projects which feature **many interactions between different sectors** are especially suitable for a **strategic form of coordination**. Contrary to this, in situations with a large number of involved actors, the negotiation of compromises with negative coordination leads to suboptimal results. Such a strategic response can also present a possible approach to solving Nexus issues in the absence of strict regulatory frameworks (national or regional). However, this assumes that **political will exists at a higher political level**. Such a political will can be sparked into action by an extremely pressing problem or specific crisis.
- Early **coordination between different political levels** (vertical coordination) is needed alongside horizontal coordination to guarantee a conflict-free implementation of policy projects. In federally structured systems where subnational governments are involved at the national level in legislative processes, vertical coordination is a prerequisite in the realisation of political projects.

- In situations **where democratic legitimacy is low or absent**, scientific expertise can generate an important legitimising basis for political plans. An example of this is if scientific councils can be established. When dealing with Nexus issues, scientific expertise can legitimise a stronger orientation of legal and policy framework, for example when the agriculture and energy sectors deal with environmental concerns.
- **In principle**, the available instruments for intersectoral coordination in Germany are **transferable to other countries**. Implementation is made easier when there is a high level of institutionalisation of the processes, for example through the use of participatory procedures. Furthermore, mechanisms and processes must be aligned with the respective institutional structures as well as with the political culture. For example, it would be expected that in rigid hierarchically organised political systems, a coordinated approach towards Nexus issues should be initiated by strategic approaches through superordinate political structures (“from above”).
- A **binding regional regulative framework** (such as the EU’s environmental regulations) can act as an important driving force for coordination at the national level. Additionally, this can strengthen the weaker stakeholders (eg. water management versus the agricultural sector), and assist in putting them on equal footing for negotiations.

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GLOSSARY

Names of official departments / documents / laws

GERMAN

Bundesministerium für Wirtschaft und Energie

Auswärtiges Amt

Bundesministerium für Ernährung und Landwirtschaft

Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB)

Bundesministerium für Wirtschaft und Energie

Gesetzesfolgenabschätzung (GFA)

Bundesministerium für Bildung und Forschung

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ)

Bundesministerium für Verkehr, Bau und Stadtentwicklung (BMVBS)

Bundesministerium des Innern

Deutsche Rohstoffagentur

Bundesanstalt für Geowissenschaften und Rohstoffe

Bundesbank

Bundesverband der deutschen Industrie

Deutschen Anpassungsstrategie an den Klimawandel

ENGLISH

Federal Ministry for Economic Affairs and Energy

Federal Foreign Office

Federal Ministry of Food and Agriculture

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Federal Ministry for Economic Affairs and Energy

Regulatory Impact Analysis (RIA)

Federal Ministry of Education and Research

Federal Ministry for Economic Cooperation and Development

Federal Ministry of Transport, Building and Urban Development

Federal Ministry of the Interior

German Mineral Resources Agency

Federal Institute for Geosciences and Natural Resources

German Central Bank

the Federation of German Industries

German Strategy for Adaptation to Climate Change

GERMAN

Bundesministerium der Finanzen

Bundesministerium für Arbeit
und Soziales

Bundesministerium der
Verteidigung

Bundesministerium für Familie,
Senioren, Frauen und Jugend

Bundesministerium für
Gesundheit

Bundesministerium für Verkehr
und digitale Infrastruktur (BMVI)

Bundesministerium für Wirt-
schaft und Energie (BMWi)

Umweltbundesamt (UBA)

Wissenschaftliche Beirat für Dün-
gungsfragen (WBD)

Wissenschaftliche Beirat für
Agrarpolitik, Ernährung und
gesundheitlichen Verbraucher-
schutz (WBAE)

Sachverständigenrat für Umwelt-
fragen (SRU)

Rat für Nachhaltige Entwicklung

Bund-Länder Arbeitsgemein-
schaft Wasser - LAWA

Gesellschaft für Internationale
Zusammenarbeit (GIZ)

Gemeinsamen Geschäftsordnung
der Bundesministerien (GGO)

Novellierung der
Düngeverordnung

ENGLISH

Federal Ministry of Finance

Federal Ministry of Labour and
Social Affairs

Federal Ministry of Defence

Federal Ministry for Family
Affairs, Senior Citizens, Women
and Youth

Federal Ministry of Health

Federal Ministry of Transport and
Digital Infrastructure

Federal Ministry for Economic
Affairs and Energy

Federal Environment Agency

Scientific Advisory Council for
Fertiliser

Scientific Advisory Board on
Agricultural Policy, Food and
Consumer Health Protection

German Advisory Council on the
Environment

Council for Sustainable
Development

German Working Group on water
issues of the Federal States and
the Federal Government

German Corporation for Interna-
tional Cooperation (GIZ)

Joint Rules of Procedure of the
Federal Ministry (JRP)

Amendment of the Fertiliser
Ordinance

GERMAN

Perspektiven für Deutschland

Staatssekretärsausschuss für Nachhaltige Entwicklung

Parlamentarische Beirat für Nachhaltige Entwicklung

Geschäftsordnung der Bundesregierung (GOBreg)

Interministerielle Ausschüsse

Interministerieller Ausschuss Rohstoffe

Umweltministerkonferenz (UMK)

Geschäftsordnung der Bundesregierung (GOBreg)

Europäische Wasserrahmenrichtlinie

EG-Nitratrichtlinie

Europäischen Gerichtshof

Düngeverordnung (DüV)

Ausschuss für Umwelt, Naturschutz, Bau und Reaktorsicherheit.

Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V.

NEC-Richtlinie

ENGLISH

Perspectives for Germany

State Secretary Committee for Sustainable Development

Parliamentary Advisory Council on Sustainable Development

Rules of Procedure of the Federal Government

Inter-ministerial committees

Raw Materials Inter-ministerial Committee (Raw Materials IMC)

Conference of Environmental Ministers

Rules of Procedure of the Federal Government

European Water Framework Directive

European Community (EC)-Nitrates Directive

European Court of Justice (ECJ)

Fertiliser ordinance

Committee for the Environment, Nature Conservation, Building and Nuclear Safety

German Association for Water, Wastewater and Waste

National Emissions Ceiling Directive