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The 2030 Agenda as Agenda Setting Event for Water Governance? Evidence from the Cuautla River Basin in Morelos and Mexico

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Abstract: Policy science has developed various approaches, such as agenda-setting and goal-setting theory, aimed at explaining the emergence of policy shifts and behavioural changes. The 2030 Agenda sets an ambitious vision for human development in times of global environmental change and makes for an interesting subject to study the explanatory power of these approaches. While the Sustainable Development Goals (SDGs) enshrined in the 2030 Agenda resulted from a process of intergovernmental negotiations, they will ultimately have to be implemented by national governments. Using the case of Mexico, we take the governance of water as a starting point to investigate whether the 2030 Agenda has indeed become a focusing event for sustainability transformation. Building on data from 33 expert interviews and findings of a Social Network Analysis of communications between water stakeholders from different sectors in the Cuautla River Basin, we conclude that major paradigm shifts in water governance in Mexico are thus far rather attributable to domestic focusing events and windows of opportunity than to the motivating impact of globally set goals. The Mexican case also illustrates that the implementation of the 2030 Agenda is strongly dependent on political will at the highest level. Ensuring the continuity of its implementation across administrations will, therefore, require mainstreaming and anchoring the SDGs into the sectorial strategies that determine activities at the lower working level of government.

Keywords: water governance; 2030 agenda; SDGs; agenda setting; sustainability; Mexico

1. Introduction

Policy science has seen the development of various theoretical approaches aimed at explaining the emergence of policy shifts and behavioral changes. Agenda setting theory, for example, defines “agenda” as the list of issues that receive a high degree of attention in a polity. Among its central research interests is the question how new issues and new understandings of problems enter the sphere of a political debate, as well as the question what factors facilitate (or hinder) the translation of a political debate into actual policy change [1]. This approach emphasizes the importance of focusing events that trigger or necessitate the adoption of a new mindset, as well as windows of opportunity that are used by progressive actors to initiate major policy changes. Goal setting theory, for another example, was originally developed in the late 1960s in the field of industrial-organizational psychology to explain human behavior in the labor place [2]. Goal setting involves the development of an action plan designed to motivate and guide a person or group toward a goal. More recently, goal setting has become discussed as governance strategy. Young 2017 [3] for example

discusses goal setting as a governance strategy, i.e., a mechanism to steer individuals or groups towards desired outcomes.

Seeing that the 2030 Agenda reflects a new understanding of global development problems, it makes for an interesting subject to explore the explanatory power of the above theoretical approaches. With its 17 Sustainable Development Goals (SDGs) and their 169 associated targets, the 2030 Agenda has set an ambitious vision for human development that differs from the preceding Millennium Declaration and its eight Millennium Development Goals (MDGs) in a variety of ways.

First, an important shift of paradigm lies in the 2030 Agenda's principle of indivisibility that recognizes the interdependence of human societies and socio-ecological systems. The SDGs explicitly aim to integrate and balance the economic, social and environmental aspects of development and to address the interlinkages between them [4] and stand out as particularly demanding in their ambition to become effective across policy domains [5]. It is thus widely recognized that exploiting synergies and mitigating trade-offs between the individual SDGs and related policy domains will require institutional reforms and innovative governance approaches [6,7]. Second, thanks to SDG 16 elements of "good governance" (e.g., transparency, accountability, inclusive institutions, and participatory decision-making) have for the first time become part of a global development agenda [8]. Importantly, governance is not only considered as a stand-alone goal, but also recognized as an enabler for all other SDGs [9]. Third, the 2030 Agenda clearly bears human rights at its heart. By recognizing that the dignity of the human person is fundamental and by pledging to "leave no one behind" (2030 Agenda, articles 3 and 4) the Agenda reflects an increased commitment of member states to break the cycles of discrimination and inequity that leave the most vulnerable behind in development [10,11].

The global goals for sustainable development that are enshrined in the 2030 Agenda resulted from a long process of intergovernmental negotiations between the UN member states. However, the SDGs will ultimately have to be implemented by national governments [12]. Yet, political realists are skeptical about the suitability of goal setting to achieve binding multilateral agreements. On the one hand, it has been noted that the adoption of the 17 SDGs as a package, along with the even wider 2030 Agenda provides sparse guidance for the prioritization of scarce resources and that no hierarchically integrated world governance system exists to enable and enforce their effective implementation [5]. On the other hand, national political systems may react with resistance or "friction" to the innovations and reforms entailed by SDG implementation strategies. This friction can stem from the reluctance of major power holders to admit the need for change due to their commitments to a certain ideology or to vested group interests, or from the resistance of institutions [1]. As Underdal and Rakhyun 2017 [5] point out: "[...] in a five- to 10-year perspective, the impact of the Sustainable Development Goals will depend primarily on their success in being actively pursued by existing institutions [however] most of these institutions will be deeply immersed in their own agendas and will be valued by their members primarily for pursuing the missions for which they were established" [5]. In view of this, the question whether the adoption of the 2030 Agenda has (or will) indeed become an agenda setting event for sustainability transformation at the level of its signatory states is highly relevant. The governance of water provides a crucial starting point to address this question. Water permeates all aspects of human life and is fundamental for the survival and productivity of all life and ecosystems. Ultimately, thus, none of the SDGs can be achieved without water security [13].

In this paper, we adopt a Water-, Energy-, Food (WEF) Nexus lens to explore the potential of agenda setting theory and goal setting theory to explain the development and challenges of water governance in Mexico. We consider this as a particularly suitable approach given that the strongly interdependent character of WEF- resources for the achievement of basic human securities reflects the principle of indivisibility of the 2030 Agenda. The goals of achieving food security (SDG 2), water security (SDG 6), and energy security (SDG 7) are closely interconnected. (Although less obviously, questions of basic human rights and the principle of "leaving no one behind" (LNOB) are also closely related to WEF-resources. SDG 1.4, for example, calls for access to land for all, in particular the poor and vulnerable.) Pursuing one of these securities may produce co-benefits but also detrimental effects

to other securities. Therefore, WEF-nexus thinking focuses on system efficiency, rather than on the productivity of isolated sectors and the related literature criticizes siloed decision-making, and calls for stronger cross-sectorial coordination and multi-level governance [14–17].

We address our overarching research interest of the 2030 Agenda as a potential agenda-setting event for water governance in Mexico both at the federal level, as well as at the sub-national level in the Cuautla river basin in the federal state of Morelos. We conclude that Mexico's SDG governance architecture is still in the making—both at the federal and sub-national level. Consequently, major paradigm shifts in water governance in Mexico are thus far rather attributable to domestic focusing events and windows of opportunity than to the motivating impact of globally set goals. At present, water governance in Mexico is still far from complying with several of the 2030 Agenda's guiding principles, particularly the indivisibility of the SDGs, the inclusive participation of water stakeholders, and the aspiration to “leave no one behind”. The Mexican case also illustrates that the 2030 Agenda process is highly dependent on political will at the highest level. Consequently, ensuring continuity of the process across administrations will require mainstreaming and anchoring the SDGs into the sectorial strategies and policies that determine activities at the lower working level of government. Furthermore, evidence from the Cuautla River basin illustrates, that a hierarchical governance mode can induce social conflict around water resource allocation in the context of large infrastructure projects, which, in turn, endangers the implementation of these projects. Arriving at a sustainable development model that balances the economic, social and environmental aspects of development, as mandated by the 2030 Agenda, will require dialogue-oriented and participatory approaches starting from the earliest stage of national development planning.

2. Explanation of Case Selection and Methods

As the majority of SDGs require natural resources as input for their achievement, countries with scarce natural resources face greater challenges than countries with large availabilities in resources. Scarcity of water, for example, will result in increased competition for its use, both between different sectors (e.g., agriculture and energy) and between user groups (e.g., farmers and energy companies). Mediating these competing demands and avoiding their escalation into social conflict requires complex negotiation processes. In order to promote an integrated implementation of the SDGs, it is necessary to deal with synergies and conflicts of objectives across policy fields. Currently, most countries are still in the process of designing and defining their institutional architecture for the integrated implementation of SDGs. At the same time, however, a number of countries can already draw on experience in cross-sectorial coordination, through the application of integrated water resource management (IWRM). The IWRM approach promotes “the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner and without compromising the sustainability of vital ecosystems and the environment” [18]. IWRM was introduced in Latin America starting from the early 2000s, including Mexico (2005) [19]. It could be hypothesized that countries with experience in IWRM have the potential to achieve an integrated implementation of the water and land-related SDGs quicker or more innovatively than countries that lack such experience.

Against this background, Mexico constitutes an interesting case for the purpose of our study for several reasons.

First, under the administration of Enrique Peña Nieto (2012–2018) Mexico assumed a proactive regional leadership role in the 2030 Agenda process and was among the first countries who presented their Voluntary National Report (VNR) to the UN High Level Political Forum for Sustainable Development (HLPF). Measured by the criteria of international engagement and early reporting, Mexico thus stands out as an early mover in the 2030 Agenda process—at least as far as the external dimension of politics is concerned. Second, Mexico suffers from regional, sectorial and temporal water scarcity. Blue water stress is defined through the ratio of total fresh water withdrawn by all sectors to the renewable water availability. With an indicator value of 25.94% at the national level, the country experiences medium-to-high water stress. In addition, Mexico has regional pockets with

very high levels of physical water scarcity. Mexico's national water commission (CONAGUA) subdivides the national territory into 13 hydrological-administrative regions (

Regiones Hidrológico-Administrativas, (RHA), each of which has its own basin council. Out of the 13 RHA seven are classified as water stressed and one as highly water stressed [20].

Third, in 2004, a reform to the National Water Law of 1992 recognized IWRM as the best way to face water conflicts [21]. Mexico scores relatively high on the IWRM assessment developed by UNEP/DHI. (<http://iwrmdataportal.unepdhi.org/dataoverview.html>) The "Governance of Water Resource Management" indicator number 5 of UNEP/DHI is based on a self-perception survey that asked national water authorities for the existence of at least one of the following mechanisms in their country: (1) river basin management, (2) management of groundwater, (3) management of lakes, (4) cross-sector management of water resources, (5) transboundary water resource management, and (6) decentralized structures for water resources management. The value of the index ranges between 1 = not relevant to 6 = fully implemented. Mexico assessed its state of implementation of water-related governance systems as quite advanced (see Table 1).

Table 1. Selected indicators from UNEP/DHI integrated and sustainable approach to water management (IWRM) Assessment in Mexico, 2011.

Indicator	Indicator Value
Governance systems for WRM	4.3
Stakeholder participation in IWRM	5.4
Sub-national instruments for IWRM	5

Stakeholder participation for example scores 5.4, which would indicate the involvement of the general public, civil society, the private sector and non-governmental organizations (NGO) in water resource management. Sub-national instruments were also assessed as advanced in their implementation.

Within Mexico, we chose the Cuautla river basin, which is mainly located in the Mexican federal state of Morelos, as sub-national research area for our study. The Cuautla river basin is a sub-basin and a tributary of the Balsas river basin, which is confined within the territory of Mexico. The Balsas river basin covers ten states from Oaxaca and Jalisco to Michoacán and belongs to RHA IV. With a renewable water availability of 1.836 m³ per capita per year, RHA IV is less water stressed than the regions bordering with the United States. However, we wanted to avoid dealing with a transboundary river system since this would have added an additional layer of complexity to our research. The Cuautla sub-basin has long experienced water resource competition between the urban and agricultural sector. On the one hand, the Cuautla River provides water to the metropolitan area of Cuautla, which over the past three decades has experienced anarchic urban growth due to a steep population increase (1990: 587.495; 2015: 983.365). On the other hand, the area is used extensively by small-scale farmers, who depend on the river's water for irrigation of their crops. Starting from 2011, conflicts over water in the area further aggravated when the government decided to build a thermoelectric power plant in the municipality of Huexca, Morelos, which requires water from the Cuautla River for its cooling system.

Given the competing water resource demands from diverse sectors and stakeholders, the Cuautla basin represents an emblematic case of WEF-conflicts under conditions of water scarcity. At the same time, in the state of Morelos several institutions have been established for the purpose of implementing and monitoring the 2030 Agenda. These include the Morelos State Council for achievement of the SDGs, the Commission for monitoring the implementation of the 2030 Agenda of the Congress of Morelos as well as several municipal sustainability councils. The Cuautla basin therefore also makes for an interesting case to investigate how SDG institutions relate to the central actors and institutions in the WEF-nexus and if and what impact they have on water governance.

This study uses a mix of qualitative methods to analyze data collected during a five weeks' field research stay in Mexico from May to June 2019, in addition to an intensive review of primary and secondary literature. During field research, we conducted 33 semi-structured expert interviews. Interview partners included civil servants from federal ministries, commissions, and authorities as

well as regional sectorial bureaus; employees of donor agencies; small-scale farmers; members of NGOs, CSOs (Civil Society Organizations) and social movement organizations in the field of natural resource management and protection; as well as members of the academic community. (Interviewees were informed about the study's purpose prior to the start of interviews and were asked for their consent for the publication of the information given by them in an anonymized form, Interviews were anonymized and numbered consecutively. In the remainder of this paper, footnotes indicate the interview number that findings are based on. A summary overview of the interviews by respondent category is given in Table A1 in Appendix A.) The data obtained through literature review and expert interviews mainly inform Sections 3.1.1 to 3.2.3 of this paper that describe and discuss the challenges related to integrated and sustainable water governance in our case.

In addition, parallel to the expert interviews and in order to gain a deeper understanding of the challenges related to water and WEF-Nexus issues in our research region, we conducted a small N ($n = 30$) survey with closed ended questions. The purpose of this survey was to establish a social network of communication between WEF-Nexus actors in the researched area. WE-Nexus literature posits that efficient communication is a prerequisite for efficient resource allocation [15,22]. White, Jones et al. [23] for example identify lack of communication and collaboration as one of four main impediments to decision-making to tackle WEF-shocks. Social Network Analysis (SNA) is a method particularly suited to investigate and illustrate the arguments brought forward by this strand of literature. It is an empirical method to study social relationships between a set of actors. In contrast to other methods that compare the characteristics of individual actors, SNA is a relational approach that focuses on the identification of structural characteristics of actor networks [24,25]. For the purpose of the SNA, we developed a survey questionnaire that asked respondents to indicate whether over the past twelve months they had communicated with other national WEF-actors either at the federal level or at the sub-national level (federal state or municipality) and if so, with what frequency. The resulting network consists of 48 actors, out which 30 personally participated in the survey. The results of the SNA are presented and discussed in Section 3.2.4.

3. Results

In the following, we will address the overarching research question of the 2030 Agenda as a potential “agenda setting” or “focusing” event for water governance in Mexico. To do so, the remainder of the paper proceeds as follows: Section 3.1 provides relevant political and socio-economic background information on Mexico as a country case (Section 3.1.1) and then proceeds to present and discuss research results from the federal level including governance mechanisms for implementation of the SDGs (Section 3.1.2) as well as major developments in water governance in Mexico since the late 1980s (Section 3.1.3). Section 3.2 presents and discusses results from our sub-national research area including structural challenges for water security (Section 3.2.1) and challenges of water governance in the Cuautla basin (Section 3.2.2). We then proceed to discuss the social conflict surrounding a thermoelectric power plant in the community of Huexca, Morelos, as an exemplary case of WEF-nexus governance challenges in Mexico (Section 3.2.3) and present a social network analysis of WEF-nexus stakeholders in our research area to illustrate interactions between levels of government and policy fields related to the WEF-Nexus (Section 3.2.4). Section 4 presents conclusions drawn from the discussion of findings and results.

3.1. Governance for SDG Implementation and Water Governance: Mexico as a Country Case

3.1.1. Political and Socio-Economic Background

Mexico is a federal republic with a presidential system of government. For over 71 years, the Institutional Revolutionary Party (PRI) controlled virtually every aspect of Mexican public life. Starting from the 1990s, the party system became more competitive and developed into a stable three-party system with the PRI, the conservative National Action Party (PAN) and the leftist Party of the Democratic Revolution (PRD) as the three major contenders until 2018 [26]. Mexico's protracted democratic transition culminated with the victory of the PAN in the presidential elections of 2000

that represented Mexico's first executive branch alternation since 1929. Yet in 2012, the PRI recaptured the presidency with the victory of Enrique Peña Nieto. In 2018, the political system experienced a major shake-up when Andrés Manuel López Obrador (commonly referred to as AMLO for his initials) of the leftist National Regeneration Movement Party (MORENA) won the presidency and secured a congressional majority in a landslide victory thanks to his pro-social and anti-corruption discourse.

Mexico has long been struggling with challenges regarding the quality of democracy and governance. It is rated as a defective democracy according to the Bertelsmann Transformation Index [27] and as partly free on the Freedom House [28] index. Accountability and transparency of government action, as well as the efficiency of the judicial system, are severely limited. In Transparency International's corruption ranking 2018, Mexico occupies place 138 out of 180 countries surveyed. The confidence of Mexicans' in their political institutions is among the lowest in the region and 90 percent of the population believe that the government is not acting for the good of the majority, but in the interest of a few powerful groups [29]. The state's monopoly on the use of force is severely challenged in different parts of the country, where powerful drug cartels control the economy and politics. Political science studies often characterize Mexico as a captured state, in which state decision-making processes are partly subject to the interests of organized crime [30,31].

Mexico's human rights situation is precarious. A group that is particularly affected by human rights violations are environmental activists. A recent study by the Ministry of Environment (SEMARNAT) and the Autonomous University of Mexico (UNAM) records 560 socio-environmental conflicts (The list is headed by conflicts generated by mining (173 conflicts), followed by water (86), energy (74), mega-projects in tourism (49), urban expansion (38), forestry (37), agriculture (35), toxic and hazardous waste (34), road construction (16), fisheries (10) and biotechnology (8), mostly due to the introduction of transgenic maize and soya in the country [32]. In most cases, these conflicts originate from projects or public policies designed to promote economic growth through private sector development, which are opposed by civil society organizations or affected communities [33]. In 2018 alone, the NGO Global Witnesses [34] documented the assassination of 14 environmentalists in Mexico, which makes it the sixth most dangerous country in the world for defenders of the environment.

Mexico is an upper middle-income country with a GDP per capita of 8208.6 US \$ and a HDI value of 77. However, the overall situation of socio-economic human rights and basic human securities remains unsatisfactory. According to the multi-dimensional poverty index of the National Council for the Evaluation of Social Development Policy (CONEVAL) the share of the population living in poverty has been stagnating for years (2012: 45.5%; 2018: 48.8%) [35] and 20.4% experience moderate or severe food insecurity. The indigenous peoples of Mexico are particularly affected by poverty. According to CONEVAL, almost three quarters (73%) of the indigenous population live below the poverty line (compared to 44% of the non-indigenous population). At the same time, there are strong regional development disparities between the country's richer northern federal states and the southern states, where most of the indigenous population is concentrated. In 2017, 98.6% of Mexico's population had access to electricity. However, in 2016 the share of renewable energy in total final energy consumption stood at only 8.6% [36]. Nearly 10 percent of the Mexican population do not have access to potable water; and out of those who do have access almost 30 percent do not receive it in sufficient quantity or quality and the system of temporary water distribution (*tandeo* in Spanish) sometimes leave people without water inside their home for several months [37].

Doubtlessly, the electoral victory of AMLO in 2018 was facilitated by the inability of the previous PAN and PRI governments to reduce social inequality and corruption and to curb violence against the civilian population in the context of the war on drugs. In light of this, AMLO's government vision promises nothing less than a historical "fourth transformation" (commonly referred to as "4T"). (Independence in the 1810s being the first transformation, the reformative period in the late 1850s being the second, and the revolution of the 1910s being the third transformation.) Central objectives of the 4T are the pacification of the country, the combat of corruption and the reduction of socio-economic inequalities [38]. After taking office, AMLO imposed drastic austerity measures on the

grounds that this was the only way to halt the squandering, corruption and misappropriation of public funds. Recouped funds from these measures are to be reinvested into low-income regions through social programs, crime and violence prevention, scholarships, and infrastructure development. The environmental sector has been hit particularly hard by the austerity measures. Having already suffered drastic budget cuts under previous administrations, the renewed reduction of its budget by more than 11% has left SEMARNAT virtually incapable of action [39]. Overall, SEMARNAT's budget has been reduced by 60% between 2015 and 2019.

To promote economic development and growth, Mexico has been relying on large-scale infrastructure projects for more than three decades. Despite partly massive resistance of civil society and affected indigenous populations as well as strong criticism of environmental experts (including his own environment minister), AMLO resolutely advocates the continuation of several such projects. One of them is the implementation of an Integrated Infrastructure Project (PIM) in the state of Morelos, which we will discuss in more detail in Section 3.2.3. Furthermore, his government is putting strong emphasis on fossil fuels and the national oil company, PEMEX, as a motor of economic development. Putting an end to resource nationalism, in 2013, the government of Peña Nieto had opened the energy sector to foreign investors in an attempt to attract private capital for the rejuvenation of Mexico's oil sector. However, AMLO always strongly opposed these energy reforms, which, in his eyes, reversed the legacy of Mexican revolution: the nationalization of the country's oil wealth in 1938. In 2019, Congress abolished the 2013 energy reform. The wish to achieve energy sufficiency and to restore oil as a driver of the economy is reflected, in a significant tax relief to PEMEX, the recovery of abandoned petrochemical complexes and plans for the construction of a new oil refinery in the president's home state, Tabasco.

Taken together, the above suggests that in the current government agenda socio-economic interests prevail over environmental concerns (Interviews No. 32 and 33) and the collective interests of the indigenous peoples.

3.1.2. Governance for Implementing the SDGs in Mexico

The term "agenda" has been defined as the list of issues that receive serious attention in a polity [40,41]. A distinction can be made between the political agenda (issues that receive attention from decision-makers), and the public agenda (issues that receive attention from 'the general public') [42]. In the context of the UN, public involvement in UN decision-making is very limited and the existence of a common 'public sphere' within the global polity is questionable. Consequently, attention to the 2030 Agenda has largely remained confined to the political agendas of the UN member states. Literature dealing with agenda setting processes differentiates two ideal-typical ways in which an issue can enter the political agenda: through the "high-politics" route or the "low-politics" route [40,43,44]. In the first instance, issues are placed on the agenda "from above" by political leaders who convene in high-level international fora. In the second instance, issues are placed on the agenda "from below" by experts working together in technical committees or working groups. The low politics route is primarily a technocratic one, where issues arise as a result of professional concerns among people working in the same issue area [40].

As is the case with all of its signatory states, the 2030 Agenda entered the political agenda of Mexico through the high-politics route. Under the administration of Enrique Peña Nieto, Mexico assumed a proactive regional leadership role in the process of the implementation of the 2030 Agenda and formed part of the 30-member Open Working Group of the UN General Assembly that was established in 2013 to prepare a draft proposal on the SDGs [11,13]. At the 36th session of ECLAC, held in Mexico City in 2016, the member States adopted the "Mexico Resolution", which established the Forum of the Countries of Latin America and the Caribbean on Sustainable Development as a regional mechanism to follow up and review the implementation of the 2030 Agenda.

In the following, we will provide an overview of the efforts undertaken to support integrated SDG implementation in Mexico following the country's adoption of the 2030 Agenda.

With regard to the determinants of the success of goal setting Young [3] distinguishes between (a) outputs, i.e., the articulation of targets and indicators associate with specific goals as well as the

establishment of organizational arrangements to oversee the effort to attain goals, (b) outcomes, i.e., behavioral adjustment on the part of states and non-state actors in order to promote progress toward goal attainment, and (c) impacts, i.e., progress towards fulfilling the goals themselves. To enable policymakers to face the challenge of implementing the SDGs simultaneously and in an integrated manner, both the emergent scholarly literature on the SDGs as well as practitioner guidelines and toolkits have proposed a variety of outputs that should be delivered in order to support SDG implementation and mainstreaming. In their meta-study of expert publications relating to the SDGs Allen, Metternicht and Wiedmann [45] identify the main recommendations that have been made to this effect. They distinguish between two essential categories of expert recommendations. The first category of “recommended initial steps in national SDG implementation” is comprised of nine steps referring to the establishment of institutional structures and procedures to enable countries to take stock of their current standing, to formulate priorities, and to inform their policy planning cycle. The second category of “recommended evidence- and science-based approaches” covers methodologies to facilitate (a) data-based monitoring and evaluation of the SDGs; (b) the mapping and assessing of SDG interlinkages; and (c) the development of strategies to realize synergies and mitigate trade-offs between the SDGs and their targets.

To assess the status quo of SDG implementation efforts we screened the available legal texts, strategy documents and policy reports related to the 2030 Agenda in Mexico [46–52] for mentions of the outputs identified by Allen et al. [45]. Table 2 summarizes the findings of our analysis. It lists the recommendations identified by these authors and informs about the status of their application in Mexico.

Table 2. Overview of Process steps and evidence- and science-based approaches to support Sustainable Development Group (SDG) implementation in Mexico.

1. Process Steps									2. Evidence and Science-Based Approaches											
1.1 Governance & Coordination Mechanisms	1.2 SDG Multi-stakeholder consultations	1.3 SDG Mapping & Alignment	1.4 Prioritize/adapt targets & indicators	1.5 Mainstreaming into existing/new strategies	1.6 SDG Roadmap of Action Plan	1.7 Assess Interlinkages	1.8 Policy evaluation and design	1.9 Monitoring and review arrangements	2.1 Systematic target gap analysis (e.g. RIA)	2.2 Thematic review (selected SDGs)	2.3 Nexus approach or target clustering	2.4 Data gap analysis	2.5 Indicator-based assessment	2.6 Benchmarking	2.7 Systems thinking & analysis (qualitative)	2.8 Quantitative modeling	2.9 Spatial modeling	2.10 Scenarios, foresight, back casting	2.11 SDG Costs or Needs Assessment	2.12 Multi-Criteria analysis
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗

Source: Own compilation based on Allen et al. [45]. ✓, Step completed or approach applied; ✓, Step commenced or approach to be applied in the future; ✗ Step not taken or approach not applied.

In the following we briefly highlight the most relevant findings of our analysis. A detailed discussion of all identified outputs is provided in Section B1 Appendix B.

The first important step towards SDG implementation is to either create an institutional body to govern and coordinate the process or to confer these tasks on an already existing institution. The Mexican National Council for the Implementation of the 2030 Agenda was created in April 2017 and mandated to coordinate the design, execution, follow-up and evaluation of actions for implementing the SDGs [48]. The Council’s structure is characterized by centralized leadership and management of

the Presidency and a cross-sectorial set up. It is located within Office of the Presidency of the Republic (OPR) and integrated by representatives from all of Mexico's eighteen federal ministries who are entitled to speak and vote at general meetings. Representatives of the federal states and municipalities may join the sessions of the Council upon special invitation but without the right to vote. Non-state stakeholders are not formal members of the main national SDG-implementation body itself. Instead, they participate in permanent, multi-sectorial working groups that formulate proposals and recommendations to the National Council. To promote the implementation of the 2030 Agenda at the sub-national level, in 2017, the National Conference of Governors (CONAGO) installed a *Commission for the Compliance with the 2030 Agenda*. One of the commitments adopted by the commission was to set up one *Organ for Monitoring and Implementation of the 2030 Agenda* (OSI) in each of the country's 32 federal states [47,53]. By the end of 2018, all of the federal states had established the legal bases of their OSI, and 31 of them had already formally installed it [52]. The OSIs are supposed to cover a broad set of functions including the co-creation, monitoring and evaluation of public policies for achieving the SDGs. However, it is questionable whether they actually have the necessary resources to comply with such a broad mandate, particularly in view of the fact that most OSIs will meet ordinarily only once or twice per year [52].

Mexico's National Strategy for the implementation of the 2030 Agenda [49] was published in September 2018. First, this document proposes 128 "national priority targets" distributed across the 17 SDGs, this. Next, for each SDG, the strategy formulates a package of measures that will be necessary to achieve these priority targets. Finally, the status quo of target achievement is documented based on indicator measurement. However, it remains unclear to what extent these priorities and indicators actually inform the national planning process. The introduction to the strategy document positioned itself mildly positive on this subject by stating that the priority targets constitute proposals, which "*in due course, may or may not be incorporated into the processes of democratic planning of the next federal administration*" ([49] p. 11). This cautious formulation can be attributed to the fact that the strategy was formulated by a team of outgoing public officials who were aware that continuity in the implementation of the SDGs would largely depend on the political will of subsequent administrations. (Interview No. 32)

According to Young [3] one important determinant for the success of goal setting is to make goals legally binding as this may increase the willingness of actors to live up to their commitments even when there are no formal sanctions or the penalties for non-compliance are modest. In 2018, to ensure the continuity of SDG implementation across administrations until 2030, a reform of the national planning law added a transitory article, according to which administrations for the periods 2018–2024 and 2024–2030 should consider the SDGs in the elaboration of their respective NDPs ([50] p. 27). Yet, the reality of the planning process for the administrative period 2018–2024 turned out differently.

Following the inauguration of AMLO's administration, the Ministry of Finance (SHCP) started to elaborate the first draft of the NDP 2019–2024. Several of our interviewees assessed both the drafting process and its result very positively. For one thing, sub-national governments and selected civil society stakeholders were involved in consultations at several stages of the draft process. For another thing, concrete targets and measurable indicators underpinned the main strategic axes of the draft. However, few days before this draft was to be presented to parliament, AMLO presented a much shorter draft, stating that the SHCP's draft represented a "neo-liberal project" which had made it necessary for him to replace it [54]. The new draft characterized itself by a rhetoric of social justice but at the same time remained vague in the formulation of concrete objectives and did not make any mention of indicators. In the following days, staff of the OPR and the SHCP worked hard towards a compromise whereby the draft submitted by AMLO would be presented to the public as the official NDP and the draft elaborated by the SHCP would be retained as a complementary, technical annex to facilitate its practical implementation. Ultimately, however, Congress only approved the president's plan at the end of June 2019. Due to its vague objectives, the current NDP provides insufficient orientation or clues for sustainable development planning and budgeting. As one interviewed public official put it: "The National Development Plan that we have now does not allow

for an alignment with the SDGs because it is very discursive [but] there is hope that some of what was contained in the original draft, can be recovered at the level of sectorial planning [...] because when the first draft was elaborated, there was a broad participation of all government secretaries and agencies and a lot of time and effort were invested in the process of SDG alignment". (Interview No. 33)

Summing up this section, we found that out of the nine necessary process steps for SDG implementation identified by Allen et al. [45], Mexico has completed six and initiated three of these steps. It can thus be said that the most important *outputs* to coordinate and oversee efforts towards SDG attainment have been produced. Yet, out of the twelve evidence and science-based approaches identified by Allen et al. [45], only four have been applied in Mexico thus far. These are mainly approaches that aim at the data-based monitoring and evaluation of the SDGs and can be applied comparatively easily, provided that the necessary empirical data are available. However, Mexico has not yet applied more sophisticated approaches aimed at mapping and assessing SDG interlinkages or developing strategies to address SDG interdependencies. This is problematic as the continuation of a 'siloed' approach towards development could jeopardize the full realization of the transformative potential of the SDGs. In other words, the groundworks to allow for the *outcome* of behavioral adjustments, which are needed to pursue a more integrated development approach, are not yet in place.

It is only fair to say, though, that Mexico is not an exception in this regard. As Allen et al. [45] show, so far, gaps relating to the assessment of interlinkages and the application of systems thinking and analysis are consistent across most countries, regardless of their level of development. This can likely be attributed to a lack of human and/or technical capacity at the bureaucratic working level of public institutions. The adoption of such approaches is time and labor-intensive and requires highly specialized skillsets [12]. Increasing investment for academic political consulting for SDG implementation could be a possible solution towards bridging this gap. As a further caveat it needs to be noted that most of the abovementioned outputs geared towards SDG implementation were realized under the administration of Enrique Peña Nieto (2008–2012) who, at the time, took office with the election promise to increase Mexico's profile as a regional leader and global player [55]. Meanwhile, AMLO—while pledging a path of continuity on international agreements to which Mexico is a party—has made it clear that his government would prioritize a domestic agenda focused on reducing poverty, violence, and corruption [56]. The Mexican case thus neatly reflects Young's [3] concern that when it comes to living up to international goals "a particularly important challenge arises when a new administration takes office seeking to differentiate itself from its predecessor and looking for ways to free up resources to [...] launch new policy initiatives" ([3] p. 39).

3.1.3. The Evolution of Water Governance since the 1990s

For the past three decades, Mexico has been struggling to work towards a sustainable model of water governance. The policy science approach to natural resource management emphasizes the processes that lead to policy transitions [57,58]. According to this approach, paradigm shifts are facilitated by focusing events that trigger or necessitate the adoption of a new mindset or windows of opportunity that can be used by progressive actors to initiate major changes. Following this approach, in this section, we will provide a brief historical overview of the factors that contributed to the adoption of IWRM as leading paradigm of water policy in Mexico, as well as of the factors that stand in the way of the practical implementation of a truly integrated and participatory model of water governance.

Owing to a series of decentralization reforms that started in the early 1990s, Water governance in Mexico today is highly fragmented with several institutions, agencies and bodies involved in water management at federal, state, municipal and basin levels. Mexico's economic crisis of the mid-1980s left the government with limited resources to address the extensive needs of the country's water infrastructure. It thus acted as the focusing event that paved the way to water governance reform. The political and economic aperture of the 1990s, in turn, presented a window of opportunity for shifting the water management paradigm [58]. On the one hand, the emergence of an organized civil

society during the 1990s necessitated a water law that would facilitate increased user participation. On the other hand, Mexico's joining of NAFTA in 1994 put the country under economic pressure to modernize its water policy framework in a way that would increase industrial and agricultural productivity. However, while in mature democracies the decentralization of water policy is generally expected to result in increased local capacity, this does not necessarily hold true in developing democracies where the development of local capacity may be constrained by lack of financial and technical resources and resistance from entrenched vested interests [58,59].

Reforms to Mexican water policy initiated in 1992 and coincided with the Earth Summit in Rio de Janeiro and the adoption of the Dublin principles, which advocated the privatization of water services as a desirable alternative to traditional state control. In a first step, Mexico's National Water Commission (CONAGUA) was established as a decentralized agency of SEMARNAT and designated as the main body in charge of water planning, financing and strategy development, followed by State Water Commissions (CEAGUA), the Groundwater Technical Committees (COTAS) and the Basin Councils. In the latter, a limited number of civil society organizations participate as representatives of water users [21,60]. In 1995, a further reform shifted responsibility for the provision of drinking water and sanitation services from the level of federal states to the municipalities. However, while these reforms transferred most daily operations and decision-making to the newly created sub-national bodies, CONAGUA retained its oversight role and key strategic and policymaking and financial functions. This contributed to the deterioration of water management for several reasons. On the one hand, the newly created institutions lacked technical staff capacity, resources and experience in water planning, potabilization, and sanitation. On the other hand, considering the huge variations in water availability and water demand of its 32 federal states and Mexico City, the country would obviously have benefited from more context-tailored and place-based responses to water challenges [61].

The election of the conservative PAN's Vicente Fox (former CEO of Coca Cola in Mexico from 1973–1979) in 2000 represented the culmination of the democratic opening process. However, Fox was unable to use his democratic bonus for democratizing structural changes in the water sector. Under his administration, CONAGUA further decentralized water management structures, emphasizing the need for sustainable water use while at the same time underscoring the importance of the private sector for the maintenance of Mexico's water infrastructure. As Tetreault & Gomez Fuentes [62] point out, the continuous decentralization of water management in Mexico did not present an objective in itself, but rather a means for getting private enterprises to be partially responsible for covering the expenses for operation and for the conservation of the resource [62].

In 2004, further reforms to the National Water Law stipulated IWRM as the best way to avoid water conflicts. Water resources and their management were recognized as a strategic resource and potential national security problem and the water basin was determined the primary unit for water planning and management [21]. While Mexico's post-2004 water legislation is one of the most advanced and modern on paper, much of its practical implementation has been obstructed by lack of financial resources and political commitment [58,61,63]. Secondary legislation to regulate the 2004 modification has been stalled in Mexican Congress. As a result, Mexico's legal water framework has several grey areas, particularly regarding the resolution of water-related conflicts and the clear allocation of responsibilities. For example, there is no overarching framework for the provision of water services. According to Article 115 of the constitution, this is the responsibility of municipalities whose levels of capacity and resources vary significantly. (Interviews No. 12, 13 and 30) According to one interviewed expert, out of Mexico's 2,448 municipalities only the hundred richest are capable to comply with their mandate to provide access to clean drinking water and sanitation. (Interview No. 27) As a result, only 64% of the population have regular access to clean drinking water.

In the advent of the 6th World Water Forum in 2011, Mexico presented an ambitious 2030 Water Agenda. The Agenda resulted from one year of consultations among key stakeholders and experts at local, state and national levels in roundtables and thematic discussions, but without including the social sector, the peasantry and indigenous groups. Different from the SDGs, this strategic document can thus be said to have entered the political agenda through the "low politics route" of deliberations

of professionals and stakeholders within one issue area. The Agenda set forth four policy goals to be achieved by 2030: (1) balanced supply and demand for water; (2) clean water bodies, (3) universal access to water services, and (4) the protection of settlements from catastrophic floods. It was also specified that the achievement of these objectives would be monitored annually, and their scope adjusted every six years. However, this seems little likely in the light of CONAGUA's continuously shrinking budget: In 2011, federal investment in water management was MX\$ 58 billion. By 2018, the budget had been cut to MX\$ 23 billion [64]. CONAGUA's budget restrictions seriously jeopardize its technical and monitoring capacity. For example, CONAGUA has insufficient staff to guarantee inspections in invaded federal areas and to fine clandestine extractions and polluting discharges. (Interview No. 29)

In 2012, the PRD fraction of the Senate together with a group of academics were able to promote a constitutional change whereby access to water and sanitation was recognized as a human right. According to Article 4, a new water law will set forth the "[...] modalities for equitable and sustainable access to and use of water resources, establishing the participation of the Federation, the federative entities and the municipalities, as well as the participation of the citizenry [...]". In order to comply with this requirement in 2015 and in 2017, CONAGUA presented two proposals for a new General Water Law. However, both proposals were rejected by academic research centers, social organizations, indigenous people and state and municipal governments, and failed to pass the Chamber of Deputies. Among the main criticisms levelled against these proposals was that they offered insufficient opportunities for civil society participation in water management, insufficiently accounted for environmental concerns and the collective interests of indigenous peoples, and opened the door to private initiative even further with regards to the extraction, distribution and charging for the use of water, which would, in turn, put at risk the human right of access to water [65–67]. However, opposition to a water reform that would facilitate equitable access to water also comes from the private sector. Breweries, soft drink, and water bottling plants hold large water concessions [67,68] and are lobbying in congress to maintain these concessions in form of regional monopolies. (According to the Mexican Public Registry for Water Rights (REPD) out 5,769 concession titles granted by CONAGUA for industrial and agro-industrial use between 1992 and 2019, 30.87 % (1,781) % went to Geo, Ara, ICA, Homex (real estate sector), Bacocho, Sukarne (farms), Danone, Nestlé (water bottlers), FEMSA (Coca Cola), Pepsi, AGA (soft drinks), AB InBev, Heineken (breweries), Lala, Nestlé (dairy), Cemex, Apasco, Cruz Azul, Moctezuma (cement), and Pfizer, Bayer (pharmaceutical) [67].)

Summarizing the above, the entrance of a new paradigm of participatory, integrated and sustainable approach to water management (embodied by the adoption of IWRM) into the Mexican political agenda occurred well before the adoption of the 2030 Agenda and was promoted, at least partly, through the low politics route of domestic stakeholder deliberation. It was induced by a variety of factors including economic crisis and political and economic aperture. However, the necessary reforms to facilitate the practical implementation of this paradigm have thus far been trapped in a triangle of (1) bureaucratic complexity, fragmentation, corruption and legal lacunae induced by decentralization; (2) difficulties to reconcile the vested interests of the private sector with the human right of access to water; (3) austerity measures that have affected the environment sector particularly hard.

3.2. Challenges for Water Governance in the Cuautla River Basin from a WEF-Nexus Perspective

3.2.1. Water Availability and Use in the Cuautla River Basin

The research area of our study, the middle part of the Cuautla River Basin located in the state of Morelos, has long experienced tensions between urban and agricultural water resource demands.

It is located in the center of the country and provides water to the metropolitan area of Cuautla. The river Cuautla originates at 5.426 masl in the former glacier (now snow cap) of the Popocatepetl stratovolcano, which has been erupting since 1995, and reaches the plains through several ravines after a distance of 41.34 km. It runs through parts of the forested municipalities of the mountain area surrounding Popocatepetl where the steep slope has generated significant erosion with the

deposition of particles in the fertile floodplain and deep soils of the municipalities of Cuautla and Ayala. In addition, multiple daily eruptions of volcanic ash continue to fertilize the agricultural soil of the municipalities of Cuautla and Ayala. The location of these municipalities is also privileged, since they have surface and spring water at their disposal throughout the year. These favorable natural conditions induced the indigenous inhabitants to develop extensive systems of canals (*achololes*) to irrigate their crops throughout the year due to the warm climate of the area [69]. The Spanish conquerors transformed these fertile vertisol lands into sugar cane fields, which has been most cultivated crop in the area during the past five centuries.

The Cuautla river basin has an average rainfall of 886.1mm/year and a warm sub-humid climate with temperatures above 22 °C and a poorly defined winter. The basin covers 992 km² [70] and encompasses fifteen municipalities. In the state of Morelos, the basin has a population of 304,744 inhabitants (19% of the total population) in 285 localities. Out of these, 14 are urban areas and 271 rural communities.

Historically, the sugarcane area of Cuautla was at the center of Mexico's struggle for Independence and the site of an important battle between the Spanish royalists and the Mexican insurgents under the command of General Morelos, after whom the state is named. It is also home to the legendary peasant leader, Emiliano Zapata, who commanded the Liberation Army of the South during the Mexican revolution. Prior to his assassination in 1919, Zapata managed to achieve his main goal, the redistribution of lands to peasants through the proclamation of the Plan de Ayala in 1911. These historical events resulted in a massive distribution of land previously in the hands of sugar plantation owners to small rural producers of sugar cane, transforming the municipalities of Cuautla and Ayala into an important agricultural center. They produce not only sugar cane, but also all kinds of vegetables and flowers with up to three harvests per year.

These agricultural activities have attracted day laborers from other federal states and over the past years, the metropolitan area of Cuautla has experienced a strong population increase (see Table 3). This forced the municipal authorities to take action against anarchic urban growth as natural river areas and agricultural crops suddenly became invaded urban areas that required public services. In addition, commercial gardeners (nurserymen) and producers of watercress have expanded their activities in the area. This increased demands for water for human consumption and agriculture and forced the government to drill several deep wells, which have reduced the runoff of natural springs.

Table 3. Population growth in the Cuautla area, 1950–2015.

Year	Population	Increase-Intercensal Variation		Rate of Average Annual Increase
		Absolute (Inhabitants)	Relative (%)	
1960	42,601	12,606	42.07%	3.57
1970	69,020	26,419	62.01%	4.94
1980	94,101	25,081	36.33%	3.15
1990	120,315	26,214	27.85%	2.49
1995	142,446	22,131	18.39%	3.43
2000	153,329	10,883	7.64%	1.48
2005	160,285	6956	4.53%	0.89
2010	175,207	14,922	9.30%	1.8
2011	179,955	4748	2.71%	2.71
2012	182,128	2173	1.20%	1.21
2013	184,314	2186	1.20%	1.2
2014	186,508	2194	1.19%	1.19
2015	194,786	8278	4.43%	4.44

Source: INEGI 1950–2015.

In terms of land use, rain fed agriculture covers 47,790.27 ha, representing 40.4% of the total area of the Cuautla river basin. Annual and semi-permanent irrigated agriculture accounts for 5563.00 ha

(4.7%) and another 15.6% is covered by shrub vegetation of low deciduous forest. The rest is fragmented into 19 different types of land use, out of which urban land use is constantly growing.

To limit the negative environmental effects of anarchic urban growth the civil society organization *Salvemos al Río Cuautla A.C.* successfully promoted the establishment of a 152 ha natural protected area [71]. To reduce the tension between watercress producers, human settlements and pollution, the Cuautla City Council built a system of collectors that allows wastewater to be cleaned in a treatment plant.

The peasant organization of irrigation water users of Cuautla (ASURCO) was founded in 1994 as a civil society association and manages 10,216 ha for 4708 users. They have 247.53 hm³ (7859 lps) distributed over 303 km of canals, out of which 55% are coated. However, 80% of the canals are in poor condition and damaged due to lack of maintenance. There are two dams in the municipality of Ayala (General Francisco Leya and El Gigante) that are destined for irrigation and 90% of the water used for irrigation is surface water. Water concessions for the urban and agricultural sector are managed by CONAGUA.

In terms of water security [72], the WEF nexus in the area shows incipient conflicts over the availability of water throughout the year. On the one hand, ASURCO's inefficient irrigation system uses important amounts of water. On the other hand, during the months from June to October, there is abundant rainfall, while the rest of the year there is severe shortage and springs and groundwater pumping need to make up for the lack of rainwater which is needed for domestic use, vegetable production and the consumption of commercial nurseries.

In the face of more erratic climatic conditions and greater demand for water for agricultural production, the extraction of groundwater has become the most viable alternative to rainwater. As can be seen from Table 4, groundwater availability in the Cuautla-Yautepec aquifer has fallen drastically between 2003 and 2015.

Table 4. Evolution of groundwater availability in the Cuautla-Yautepec Aquifer, 2003–2015.

2003	2008	2009	2011	2013	2015
14.8	8.3	7.1	9.6	8.8	6.5

Source [73].

As Figure 1 shows, public-domestic services use 65% of the extracted groundwater, agriculture 25%, industry 4%, and other services 2%.

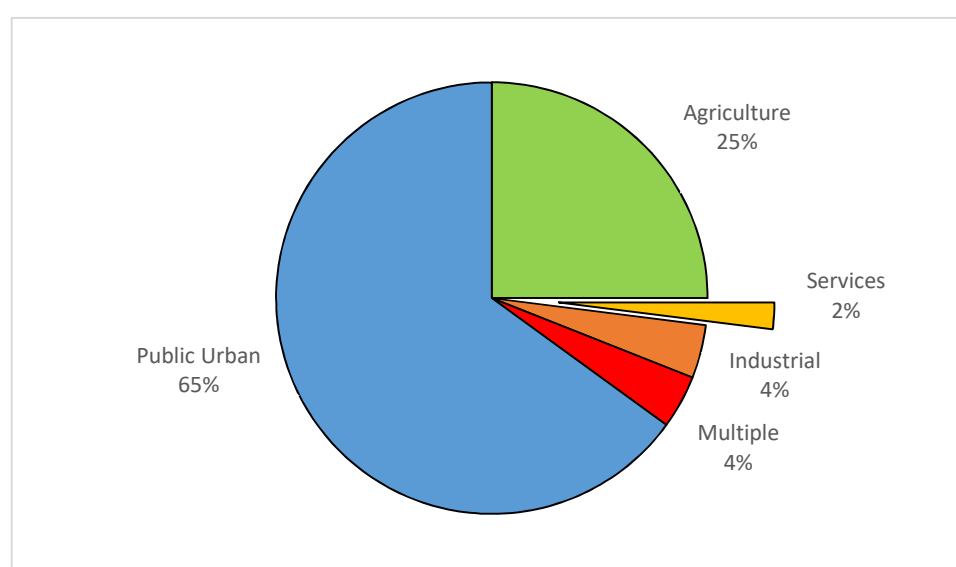


Figure 1. Groundwater use in the Cuautla river basin. Source [73].

3.2.2. Challenges of Water Governance in the Cuautla River Basin

As already pointed out in Section 3.1.3, the decentralization reforms of the 1990s established 25 river basin councils to mitigate conflict and promote the social participation of water users in water governance. The area under responsibility of the council of the Balsas river basin comprises ten federal states [74] and the total hydrological area is 117,406 km². Government participation in the council is disproportionally high: 50 percent of the council's members are state actors representing both federal and sub-national entities (see organizational chart in Figure 2). The remaining 50 percent are representatives of different types of water users groups, such as industrial water users (Coca Cola, beer breweries), agricultural users (represented by ASURCO), urban service providers (represented by the municipal service provider SOAPS) plus two representatives from CSOs and one representative of the academy. So both citizen interests and academic water expertise are clearly underrepresented. Formally, all members have the right to voice and vote and are required to sign agreements reached during sessions of the Council. CONAGUA appoints the council's executive committee, whose tasks include formulating and implementing management programs; managing the financial resources; proposing the agenda of council sessions; presiding the sessions and casting a vote in the event of a tied vote. However, several of our interviewed experts characterized the decision-making processes of the Basin Council as “mock participation” (Interviews no. 15, 27, 29). It is largely perceived that the “real” decision-making and access to funds are pre-determined by CONAGUA at the federal level through the annual budget that it proposes to the national Congress. Moreover, the council's large territorial scope makes periodic meetings difficult since there is no budget to cover members' travelling costs. As a result, businesspersons and producers with the resources to finance their trips attend the meetings more frequently than other members. In addition—with the exception of one academic representative - there are no water specialists among the members of the council which limits its ability to make informed decisions that duly consider environmental concerns.

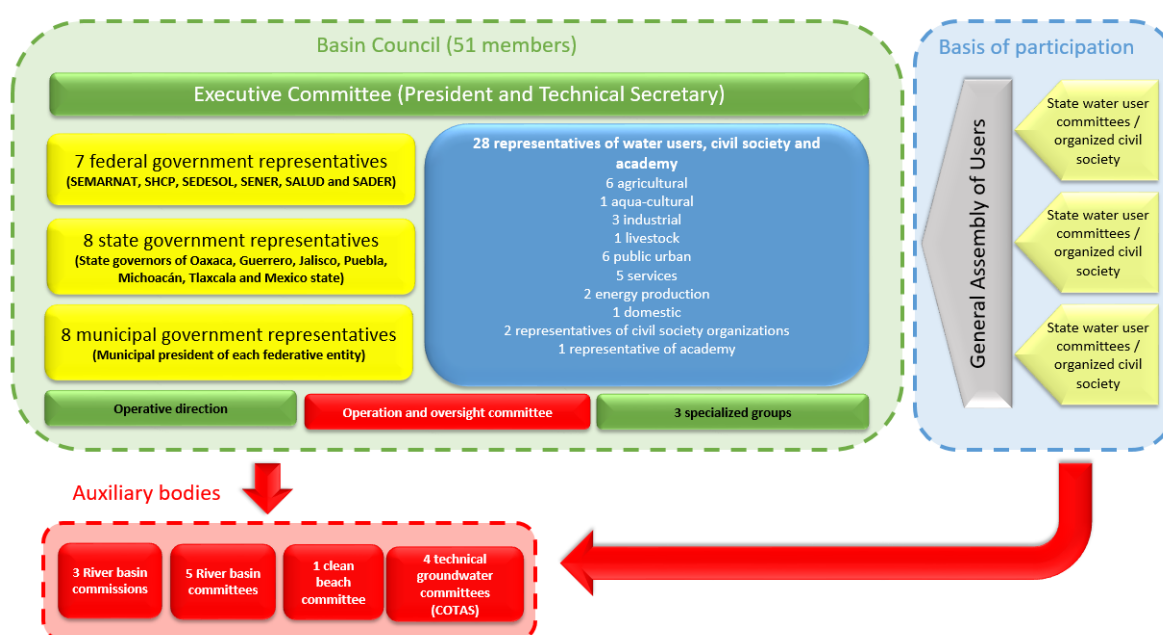


Figure 2. Structure of the Balsas River Basin Council. Source: own compilation.

At the local level, municipalities are responsible for water management through the municipal drinking water and sanitation providers (SOAPS). The SOAPS competences include the management of drinking water plants, groundwater extraction pumps, storage tanks, sewage pipelines and treatment plants. Fulfilling this wide range of tasks requires a high level of technical capacity. However, since the municipal president in turn appoints the head of SOAPS, the latter's duration in office is determined by the 3-year electoral cycle and fluctuation prevents a process of professionalization and technical skills development. Moreover, the SOAPS lack financial resources,

since the collection of authorized tariffs for water and sanitation barely covers the system's maintenance costs but does not allow investments in new infrastructure or major repairs. The combination of these factors limits the provision of clean drinking water and IWRM. Interviewees further bemoaned high levels of corruption both at the level of CONAGUA in processes related to the granting of water concessions, as well as at the level of the state government and the SOAPS. Unlicensed water abstractions on which CONAGUA—due to both corruption and lack of monitoring capacity—turns a blind eye, were mentioned as another serious problem. (Interviews 15 and 27)

In summary, this section shows that main challenges in water governance in our research area are attributable to the lack of autonomy of the River Basin Council as well as the unequal powers of its members on the one hand, and lack of financial and technical skills at the municipal level on the other hand. To overcome these challenges, it would be vital to strengthen the prerogatives of the River Basin Council thus enabling it to prioritize projects and design policy solutions that correspond to the specific context of the territory under its responsibility. This would have to include addressing the underrepresentation of vulnerable and financially weaker groups and aiming for more inclusive and participatory decision-making processes. At the level of the municipalities, strengthening the efficiency, enforcement, and compliance in water service provision would require both capacity building as well as increased financial resources.

3.2.3. The Social Conflict Surrounding the Huexca Thermoelectric Plant: An Illustrative Case of WEF-Nexus Challenges in Mexico

In 2010, the federal government initiated the Morelos Integral Project (PIM) with the objective of developing the infrastructure of central Mexico, increasing the energy efficiency and sustainability of the national capital metropolitan area, and providing incentives for industries to settle in the Cuautla region. The authority in charge of implementing the project is the Federal Electricity Commission (CFE). Core of the PIM is a combined cycle plant in the community of Huexca in the state of Morelos, with a capacity of 640 MW. Since the power plant requires gas and water for its operation, the PIM also involved the construction of a gas pipeline. In total, the gas pipe line affects 3 federal states, 25 municipalities, 32 *ejidos* (system of communal land tenure in Mexico) and 12 private rural properties. Furthermore, the construction of an aqueduct for treated water for and from the plant's cooling system crosses the municipalities of Cuautla, Ayala, and Yecapixtla in the state of Morelos.

From the beginning, the project caused concerns among the affected communities (see Figure 3), particularly due to its proximity to the active Popocatepetl volcano and possible repercussions on the environment and availability of irrigation water. These concerns subsequently escalated into a social conflict of significant magnitude. This is illustrated by the more than 30 complaints about human rights violations received by the National Human Rights Commission (CNDH) in the context of the PIM. (Interview No 14) The majority of these complaints relates to the violation of the rights to participation, information, and consultation of the affected communities as well as to acts of intimidation and aggressions by public security elements [75].

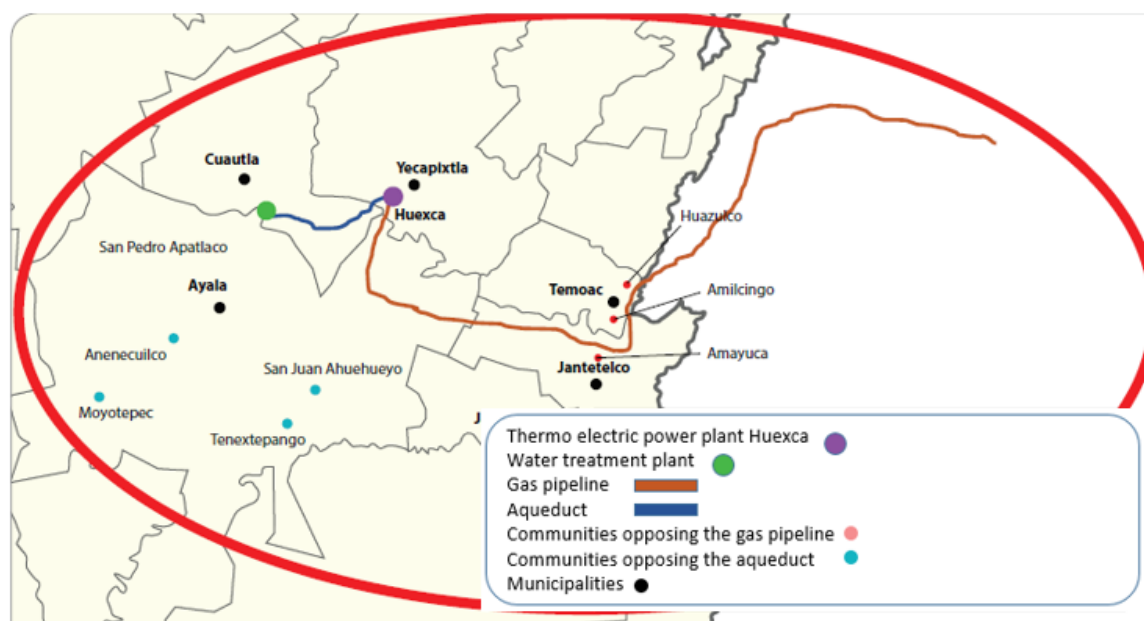


Figure 3. Opposition to the Morelos Integral Project (PIM). Source: own elaboration based on La Jornada [76].

According to Mexican law, the construction of gas pipelines, thermoelectric plants and hydraulic works, requires prior authorization by the environment ministry (SEMARNAT), who is the authority in charge of conducting the environmental impact assessment (EIA), as well as the prior information and consultation of affected populations. In 2011, SEMARNAT authorized the project, concluding that no negative effects on the ecosystem were to be expected. However, both SEMARNAT and CFE failed to conduct the prior consultation of the affected population, particularly the indigenous population, (The area affected by the PIM is inhabited by 960.863 persons out of which 51.030 (5.3%) are indigenous people. 38 communities in the area qualify as indigenous communities (CNDH, 2018)) in a “culturally adequate form” as required by ILO Convention 169, to which Mexico is a signatory state. While the CFE reported to have conducted several explanatory meetings with municipal authorities, ejidos, and community leaders [75], several of our interview partners from CSOs and social movement organizations in the area stated to only have become aware of the project once the construction works started. (Interviews No. 3, 18, 19, 23, 28.) These statements are credible considering that the current official procedure for making such information available has several shortcomings. In fact, citizens stand poor chances to learn about projects that may affect their community unless they have the necessary computer equipment or means of transportation to regularly revise the list of proposed projects either on SEMARNAT’s website or at SEMARNAT’s regional offices. Therefore, while the general right to environmental information about projects is specified, it is very hard to obtain in practice, particularly for vulnerable groups of the population [75]. In 2012, the CNDH started to investigate the case of the PIM. Their investigation found that SEMARNAT had obtained technical opinions from various agencies regarding the risks related to the proximity of the PIM gas pipeline to the highly active Popocatepetl stratovolcano. However, SEMARNAT omitted to convey this information to the affected communities. In 2018, the CNDH thus officially stated that SEMARNAT and CFE had violated the right to prior consultation of affected communities and indigenous peoples.

Beyond the risks posed by the pipeline, the Huexca power plant involves potential risks that affect several dimensions of the WEF-Nexus. Water availability in the area is nil, given that CONAGUA has granted 998 concession titles for 599.5 billion (MM) m³ surface water that benefit 1209 users. (80.5% agricultural use; 10.7% urban; 5% aquaculture and the rest in various uses) Since CONAGUA could not issue water concessions to the plant, the CFE struck a deal with the SOAPS of Cuautla whereby the water treatment plant of the municipality of Ayala will grant 177 l/sec to the plant. However, this is strongly opposed by the peasant population. Water returned from the

treatment plant currently benefits about six thousand members of ejidos (system of communal land tenure) who have concessions to use it for irrigation and fear that water consumption by the power plant could result in scarcity of water during dry season. In addition, inhabitants of the area are also concerned about the quality of water due to the high amount of chemicals involved in the operation, maintenance and water treatment processes of the power plant. (For operation processes: lubricating oil, dielectric oil, hydraulic fluid, hydrogen, sodium hypochlorite. For maintenance: acetylene, argon, paints and solvents, nitrogen, carbon dioxide. For water treatment and cooling: trisodium phosphate dodecahydrate; disodium phosphate heptahydrate; hydrazine hydrate; sulfuric acid; cyclohexylamine; sodium hydroxide.) Finally, the population of Huexca is concerned about acoustic and air pollution. (Interviews No. 3, 18, 26.)

The opaque and exclusive approach of the authorities fueled the social conflict surrounding the PIM. Rural civil society in Morelos is known to be well organized and has a reputation of being particularly defiant and critical. This can partly be attributed to the historical key role of the state of Morelos in Mexico's independence and revolution, which fostered the group identity and collective pride of the region's peasants. To prevent the operation of the power plant, the construction of which was completed in 2017, numerous social movements have formed and peasants have been maintaining a protest camp for several years to impede the connection of the aqueduct to the river Cuautla. (Interview No. 19)

Between 2012 and 2018, the community of Huexca repeatedly saw violent confrontations between police forces and protesters. In February 2019, the conflict culminated with the assassination of Samir Flores, an indigenous leader of the movement opposing the plant, at the hands of unidentified gunmen. To compensate for the lack of prior consultation President López Obrador decided to hold a public vote on the fate of the PIM in the municipalities affected by the project. The referendum, which took place only three days after Flores' assassination, resulted in 59.5% votes in favor of the PIM and 40.5% against. However, the social movement organizations opposing the PIM declared the vote as rigged and filed several judicial complaints against it. (Interview No. 7 and La Jornada (2019).) Given that the opponents of the project have announced to continue their resistance, it is doubtful that the power plant will go into operation in the near future.

Clearly then, the government's attempt to terminate the deadlock and add legitimacy to the PIM by means of majoritarian decision-making through a referendum has failed. Rather than this, harmonizing the larger general interest (energy autonomy and increasing economic prosperity through industrial development) with the particular interests of the affected population (water and environmental safety and the right of minority groups to participate in the planning and implementation of projects) would have required a more dialogue-oriented approach.

Major infrastructure projects are important for the Mexican government to promote industrialization, employment, and prosperity. Environmental and social impact assessments are policy instruments that aim to integrate social and environmental aspects into economic decisions. From a governance perspective, their aim is to provide those in power with the best possible legitimacy for large-scale infrastructure projects by enabling them to credibly demonstrate that these projects can be implemented in a socially just and environmentally non-harmful manner. However, as demonstrated in this section, while these instruments exist in Mexico they are not applied consistently and transparently and furthermore suffer from several design flaws. Avoiding social conflict in the context of large-scale infrastructure projects in the future will require the development of regulatory legislation in order to make the application of these policy instruments more transparent and inclusive.

3.2.4. A Social Network Analysis of Interaction between WEF-Nexus Actors in the Cuautla River Basin

In order to illustrate the water governance challenges described in the previous sections and to examine them in greater detail, in this section, we present and discuss the results of a Social Network Analysis (SNA) among WEF-Nexus actors in our research region. As pointed out in Section 2, SNA is a relational approach that focuses on the identification of structural characteristics of actor

networks [24,25]. SNA investigates and visualizes “links” between “nodes”—with “nodes” representing actors, and “links” representing the relation between these actors. The quality of any network is a function of the attributes of the actors involved, and the strength of their linkages and different structures may have differing implications for the distribution of power and effective communication—as a prerequisite for coordinated and integrated decision-making—within the network [77–79]. One goal of analyzing network structures is the identification of actors who have influence based on their position in the network [80]. Another goal is to detect actors that are well-positioned to act as mediators or coordinators in their network [79].

For the purpose of identifying potential coordination deficits, the most important network features are the existence of “bridging” linkages and the frequency of interaction between actors. To obtain this information, we developed a survey questionnaire that asked respondents to indicate whether over the past year they had communicated with other national WEF-actors either at the national level or at the sub-national level and if so, with what frequency. The resulting network consists of 263 links between 48 actors.

In communication networks, two central measures indicate the influence of an actor: degree centrality reports the number of links incident upon a node (i.e., the number of ties that a node has). In essence, this indicates how well connected an actor is to others in the network. Betweenness centrality, in turn, measures how often a particular actor functions as a ‘bridge’ or shortest path between two other actors that would be otherwise disconnected. High betweenness centrality may, for instance, indicate an actor’s potential to perform a role as coordinator who channels information from one subgroup to another in order to mediate between the interests of these subgroups. However, there is also a risk that a central actor, who cannot properly fulfil its role due to certain constraints, becomes a bottleneck that prevents the efficient flow of communication, thereby hampering coordination and the reconciliation of diverging interests [79–81].

The below network graph (Figure 4) consists of two major components: *nodes* (circles) representing actors and *edges* (connective lines) representing the communication between actors. The thickness of an edge increases with the frequency of communication with other actors as stated by the respondent. For the purpose of our analysis, we distinguished between the six actor types indicated by different colors in the legend of Figure 4. The structure of the network graph is determined by an algorithm of the visualization software that places better-connected actors with higher degree centrality in central positions and less well-connected actors around the periphery of the network. The same algorithm clusters together those actors who interact closely with each other. The size of nodes and their descriptive labels (For better readability, the names of some actors have been shortened. A table with full names that ranks actors according to their betweenness centrality is given in Table 5.) increases with the degree of actors’ betweenness centrality. Table 5 lists the actors ranked by their influence in descending order based on betweenness centrality values and degree centrality values.

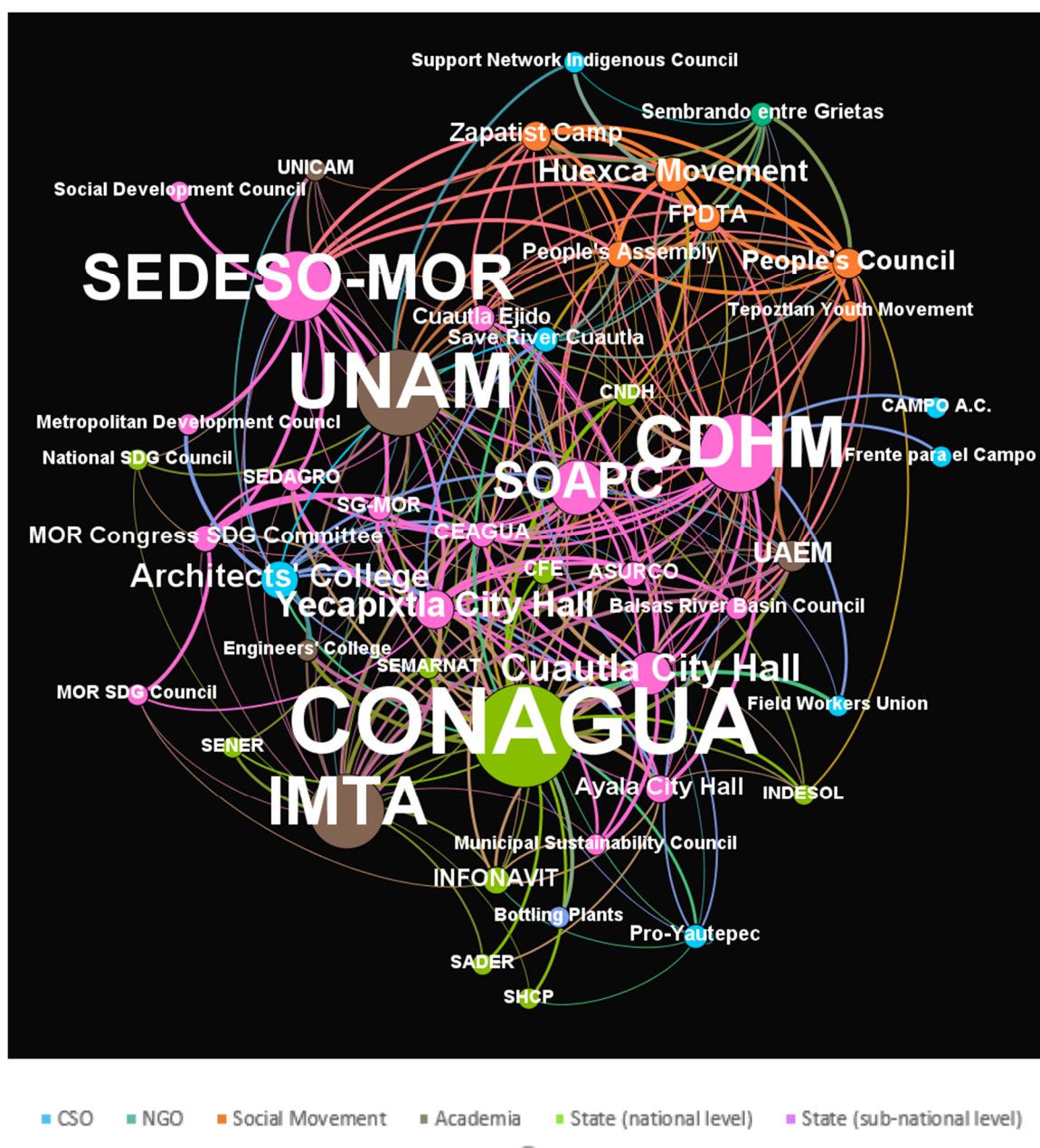


Figure 4. Network of communication between Water-, Energy-, Food (WEF)-Nexus actors.

Table 5. WEF-Nexus actors in the research region ranked by influenced (based on betweenness and degree centrality values).

Label	Full Name	Actor Type	Betweenness Centrality	Degree Centrality
CONAGUA	Comisión Nacional del Agua	State national	157.5153	31
UNAM	Universidad Autónoma de México	Academia	125.3743	28
CDHM	Comisión de Derechos Humanos del Estado de Morelos	State subnational	110.2744	22
IMTA	Instituto Mexicano de Tecnología del Agua	Academia	103.9018	26
SEDESOMOR	Secretaría de Desarrollo Social del Estado de Morelos	State subnational	95.6585	20

SOAPC	Sistema Operador de Agua Potable y Saneamiento de Cuautla	State subnational	65.4599	26
Cuautla City Hall	Ayuntamiento de Cuautla, Administración del Area Natural Protegida	State subnational	41.1358	23
Yecapixtla City Hall	Ayuntamiento de Yecapixtla	State subnational	33.9171	20
Architects' College	Colegio de Arquitectos de Morelos Sección Cuautla, A. C.	CSO	30.8727	15
Huexca Movement	Movimiento Huexca en Resistencia	Social Movement	25.7471	15
UAEM	Universidad Autónoma del Estado de Morelos	Academia	19.0968	15
People's Council	Consejo de Pueblos del Estado de Morelos	Social Movement	18.1530	18
Zapatist Camp	Campamento Zapatista en Defensa del Río Cuautla	Social Movement	15.8737	18
Ayala City Hall	Ayuntamiento de Ayala	State subnational	13.2644	12
FPDTA	Frente de Pueblos en Defensa de la Tierra y el Agua de Morelos, Puebla y Tlaxcala	Social Movement	10.8446	17
INFONAVIT	Instituto del Fondo Nacional de la Vivienda para los Trabajadores	State national	10.7594	9
MOR Congress SDG Committee	Comisión de seguimiento al cumplimiento de la Agenda 2030 del Congreso de Morelos	State subnational	10.3980	10
Cuautla Ejido	Comisariado Ejidal de Cuautla	State subnational	9.6347	16
People's Assembly	Asamblea permanente de los pueblos	Social Movement	8.8298	15
CEAGUA	Comisión Estatal de Agua de Morelos	State subnational	8.7453	15
Save River Cuautla	Salvemos el Río Cuautla A.C.	CSO	6.7918	13
ASURCO	Asociación de Usuarios del RÑo Cuautla	State subnational	6.3413	12
CFE	Comisión Federal de Electricidad	State national	5.1276	11
Pro-Yautepec	Pro-Yautepec A. C.	CSO	4.7060	10
Sembrando entre Grietas	Sembrando entre grietas	NGO	4.5651	9
SG-MOR	Secretaría de Gobierno de Morelos	State subnational	3.9780	11
Balsas River Basin Council	Organismo de Cuenca del Río Balsas	State subnational	2.7529	10
SEDAGRO	Secretaria de Desarroll Agropecuario	State subnational	2.6982	9

CNDH	Comisión Nacional de Derechos Humanos	State national	2.4724	10
UNICAM	Universidad de Campesinos del Sur	Academia	1.4116	7
INDESOL	Instituto Nacional de Desarrollo Social	State national	0.7461	6
MOR SDG Council	Consejo Estatal para el cumplimiento de los ODS de Morelos	State subnational	0.6011	4
Support Network Indigenous Council	Red Morelense de Apoyo al Consejo Indígena de Gobierno	CSO	0.3151	3
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales	State national	0.3071	6
National SDG Council	Consejo Nacional de la Agenda 2030 para el Desarrollo Sostenible	State national	0.2569	4
Municipal Sustainability Council	Consejo Municipal de Desarrollo Urbano Sustentable de Cuautla	State subnational	0.1428	5
SHCP	Secretaría de Hacienda y Crédito Público	State national	0.125	3
SADER	Secretaría de Agricultura y Desarrollo Rural	State national	0.1111	3
Engineers' College	Colegio de Ingenieros de Cuautla	CSO	0.0921	4
Field Workers Union	Unión de Trabajadores del Campo y la Ciudad Ruben Jaramillo	CSO	0	3
Tepoztlan Youth Movement	Movimiento Juvenil de Tepoztlan	Social Movement	0	3
SENER	Secretaría de Energía	State national	0	3
Metropolitan Development Council	Consejo de Desarrollo Metropolitano	State subnational	0	2
Frente para el Campo	Frente para el Campo de Morelos	CSO	0	1
CAMPO A.C.	Coordinadora Agropecuaria Morelense de Productores Organizados	CSO	0	1
Bottling Plant	Empresa Embotelladora	Private Sector	0	1
Social Development Council	Consejo de Desarrollo Social	State subnational	0	1

In the following, we will discuss the most noteworthy characteristics of the network.

Not surprisingly, the most influential actor in the network is the federal water commission (CONAGUA), which confirms its central and hierarchical position. As convener of the Balsas river basin council CONAGUA maintains regular institutionalized communication with representatives

of the federal ministries and agencies (SEMARNAT, SHCP, SEDESOL, SENER, SE, SALUD, SADER, CFE) and representatives of the state and municipal governments within the territory of the basin, as well as with representatives of different water user groups and registered civil society organizations with a stake in water. Theoretically, CONAGUA is thus well positioned to coordinate the vertical flow of information between the national and the sub-national level and to mediate between the interests of different stakeholder groups. However, and as already pointed out in Section 3.2.2, the ability of the basin council to function as a broker is constrained by its lack of autonomy from federal level decision-making and the imbalance of financial and political power of its members. This may skew decision-making towards the interests of those actors with larger financial resources and political influence at the federal level. Furthermore, CONAGUA is only weakly connected to the informal non-state actors in our network: only two social movement organizations (FPDTA and Asamblea de Pueblos) reported to have been in contact with CONAGUA over the past year.

In comparison to CONAGUA, the position of the Federal Energy Commission (CFE) is remarkably weak, considering that it is the dominant player in the energy sector and is responsible for project development for the national electric industry. Ideally, this mandate should include engaging with affected populations and ensuring their participation in the early planning phase in order to reduce the risk of resistance which could endanger the implementation of such projects. However, none of the non-state actors in our research region reported any communication with the CFE over the past year and vice versa. In interviews, public officials indicated this lack of communication between CFE and the affected populations as one of the main factors that contributed to the conflict escalation surrounding the PIM. (Interview No 10 and 11)

A noteworthy characteristic of the network is the strong role of social movements. Out of the twenty most influential actors in the network, five are social movements, which are closely interconnected. The fact that all social movements in our network engage in the defense of water and land rights, suggests that social conflicts surrounding the allocation of natural resources have an important impact on the communication flow around WEF-Nexus issues in the researched area. The strong and central position of the Human Rights Commission of Morelos (CDHM) reinforces this suggestion. The CDHM links many of the social movements and CSOs to sub-national state actors but also to CONAGUA and the National Human Rights Commission (CNDH) as national-level state actors. In fact, as one interviewee explained, (Interview No. 30) in the context of water-related projects it has almost become a standard procedure that social movements will file a complaint on human rights violation. If the violation is attributed to a public institution at the municipal level or Morelos state level, it will be addressed by CDHM. In cases where the alleged human rights perpetrator is a national level institution, or in which both sub-national and national level institutions are involved, the complaint will be addressed by the CNDH (Interview No. 14). In either case, the human rights commission in charge will undertake a joint inspection of the project in question together with the accused public institution, in order to determine if the complaint is justified and whether it can be settled by means of conciliation and without going public. Where this is not possible, the human rights commission will issue a public recommendation for corrective action. Both the national and the sub-national human rights commissions thus play an important role in mediating conflict but also in raising broader public awareness of conflicts related to WEF-Nexus issues.

Another noticeable feature is the relatively prominent role of academic institutions in the network. Out of the four academic institutions that belong to the network, three figures among the top 20 actors with the highest betweenness centrality values. Both the Institute of Water Technology (IMTA) and the Autonomous National University of Mexico (UNAM) act as bridges between important WEF-related state actors at the national level and state and non-state actors at the sub-national level. The Autonomous University of Morelos State (UAEM), in turn, provides unique links between several sub-national state actors and social movements. Researchers dealing with environmental or resource competition issues often maintain close contact with social movements on the ground for the purpose of data collection, or even participate themselves actively in such movements. Occasionally, such contacts facilitate the emergence of trust relationships between these two distinct actor groups. (Interview No. 11) At the same time, academic researchers maintain

institutionalized relations with state actors related to WEF-issues, for example in the function of consultants. (Interview No. 29 and 28) Academic institutions are thus well positioned to mediate conflicts between state and non-state actors related to WEF-issues. (Interview No. 11)

Finally, yet importantly in the context of this study, our network analysis reveals a very weak position of the state institutions created for the purpose implementing and monitoring the SDGs. Only four communication interactions were reported between the National SDG Council and other actors in the network. The SDG Council of the state of Morelos does not fare better in terms of connectedness. For this institution, as well, only four interactions with other actors were reported, all of which must have dated back six months or more. The SDG Council of Morelos was first established in June 2017 by decree of the then incumbent governor [82]. However, the performance of this council was rated as deficient and it did not deliver the expected results [83]. Following the elections of December 2018, which led to a change of government in Morelos, the SDG council stopped working altogether. It was only in May 2019 that the new governor established a new executive body responsible for the SDGs at state level. Several interview partners attributed this period of inactivity in matters relating to the 2030 Agenda to the fact that the government simply had other priorities during its consolidation phase. According to our network analysis, compared to the SDG council under the control of the state executive, the Special Commission for Monitoring the Accomplishment of the 2030 Agenda of the Congress of Morelos is better connected and appears to have been more active so far.

To gain insight into the frequency of interaction between actors in the network, numerical values were attributed to the different response options regarding the frequency of communication. The thickness of an edge in the network graph in Figure 4 thus represents the frequency of communication between two actors, with thicker edges indicating more frequent communication.

The total number of links, representing communication interactions, in the network is 263 and the average interaction frequency 2.4. However, as can be seen from Table 6, there is considerable variation regarding the frequency of interaction and more than half of the actors that do communicate with each other do so only once or twice per year. To illustrate this phenomenon, we created a fresh graph, in which infrequent interactions (annually to six-monthly) were suppressed (see Figure A1 in Appendix C). Eliminating infrequent interactions delivers a network that is far less dense and about which two features deserve highlighting.

Table 6. Frequency of communication interaction between WEF-Nexus actors.

Frequency of Communication Interaction	Numerical Value	Occurrence
Monthly	4	64
Quarterly	3	58
Six-monthly	2	60
Annually	1	81
Total Number of Communication Interactions		263
Average interaction frequency	2.4	

First, in the new network, the National SDG Council is totally disconnected from all remaining actors. Second, the disconnect between state and informal non-state actors becomes even more obvious. While state-actors at the sub-national level maintain regular and frequent communications among themselves and with registered CSOs, most of their links to the cluster of social movement organizations in the upper right corner of the graph disappear when infrequent interactions are dropped.

In summary, two central conclusions can thus be drawn the social network analysis with regard to our overarching research interest:

First, the process of localizing the 2030 Agenda at the sub-national level in Mexico is at best incipient. As of yet, state institutions created for the purpose of supporting SDGs implementation are only very weakly connected to the relevant WEF-nexus actors in our researched area. As a result, the 2030 Agenda has remained at the periphery of the sub-national political agenda. This finding is also

supported by our qualitative interviews. Hardly any of the experts we interviewed at the sub-national level qualified the 2030 Agenda as a relevant frame of reference for their work. As one interviewee pointed out, political elites at the municipal level continue to be insufficiently informed about the principles and goals of the Agenda and are therefore skeptical about it: *“they don’t understand how it works and since they don’t understand it they are afraid of it”*. (Interview No. 22) The question of whether the adoption of the 2030 Agenda has acted as a focusing event for water governance at the sub-national level must, therefore, be answered clearly in the negative.

Second, the disconnect (and resulting mistrust) between state and non-state actors (particularly social movements that engage in the defense of water, land and indigenous rights) reduces the likelihood that projects, which involve water consumption projects necessary for economic development of Mexico, will be implemented in a way that complies with the principle of the 2030 Agenda of integrating social, environmental, economic and human rights aspects of development.

4. Conclusions and Recommendations

The Mexican case offers slightly discouraging, though important insights regarding the potential of the 2030 Agenda to act as an “agenda setting” or “focusing” event for the transformation of water governance. Our research has identified several challenges that stand in the way of Mexican water governance to adequately address the 2030 Agenda’s guiding principles, specifically the indivisibility of sustainable development goals, the inclusive participation of stakeholders, and the aspiration to “leave no one behind”. First, while important process steps for SDG implementation have been completed or at least initiated at the federal level, data and science-based approaches aimed at addressing interdependencies between the SDGs and overcoming “siloed” decision-making have not been undertaken this far. Second, the case of Mexico illustrates that the 2030 Agenda process is strongly dependent on high politics, i.e., the commitment of the federal government of the day. Third, evidence from our sub-national research area, the Cuautla river basin, suggests that the process of localizing the 2030 Agenda in Mexico is in an incipient state at best. Institutions created for supporting SDG implementation are still in the making and insufficiently connected to the relevant social, political and economic actors. As a result, the principles of the 2030 Agenda have remained at the periphery of sub-national level WEF-Nexus management and policy-making. This is particularly problematic with a view to the need of natural resource management to develop context-specific responses. Fourth, the evolution of water governance in Mexico suggests that, thus far, major shifts in the policy paradigm can rather be attributed to domestic factors than to the motivating impact of globally set goals. The first major transformation consisted in decentralization and the adoption of IWRM as the leading paradigms for water governance. Economic crisis and political aperture functioned as “focusing events” and “windows of opportunity” that facilitated this paradigm shift. However, almost 30 years later many of the necessary related reforms continue to exist mostly in paper. The second major change occurred in 2012 with the constitutional reform that recognized the access to water and sanitation as a human right. This change was mainly promoted via the route of “low politics”, i.e., deliberations between academic experts, bureaucrats and stakeholders in Mexican water management. However, seven years later, the General Water Law that is needed to regulate the newly defined constitutional right has still not been adopted. These delays in the development of vital legislation for the practical implementation of integrated, inclusive and participatory water governance suggests a lack of political commitment which has thus far hindered the translation of shifts in the political debate into actual policy changes. Fifth, austerity measures in the environment sector and vested interests of the high-water-consumptive industries act as major obstacles to the full realization of an integrated water governance approach. Finally, the Mexican case illustrates that a hierarchical governance mode and majoritarian decision-making in the context of large-scale infrastructure projects is likely to induce social conflict which, in turn, endangers the implementation of such projects.

Based on our findings, a number of recommendations towards overcoming these challenges can be formulated. To begin with, in order to account for the holistic and integrated nature of the 2030 Agenda, Mexico should invest in the development of scientific and data-based strategies aimed at

systematically mapping, assessing and addressing SDG interlinkages and interdependencies. In addition, to make SDG implementation efforts less dependent on high politics and ensure their continuity across federal administrations it will be necessary to mainstream and anchor cross-sectorial approaches into the sectorial strategies and policies that determine activities at the day-to-day working level of government, i.e., low politics. Moreover, the successful localization of the 2030 Agenda is unlikely unless its principles are understood, endorsed and owned by the relevant local actors. This will, on the one hand, require a strengthening of the ties between state institutions created to support SDG implementation at the sub-national level and relevant WEF-actors at the local level. On the other hand, it is paramount that sub-national water governance bodies, such as River Basin Councils, receive a degree of autonomy from the federal level that enables them to flexibly develop solutions that correspond to their geographical, environmental and social context. This will also require strengthening the role of vulnerable and financially weaker groups in the decision-making processes of these bodies. Furthermore, in order to arrive at a truly participatory and integrated water governance approach, it will be necessary that existing policy instruments, which aim at balancing economic, social, and environmental concerns, such as Environmental Impact Assessments (EIA), are applied more consistently. This will require legal reforms to make these instruments more inclusive and transparent and to regularize their application. Finally, more dialogue-oriented approaches are needed to (re-) establish trust between the Mexican state and society and to reduce the risk of social conflict in the context of the implementation of large-scale infrastructure projects. A first step towards this direction would be to not only conduct EIAs at the stage of project planning, but to make mandatory the conduction Strategic Environmental and Social Assessments (SESA) at earlier stages of policy-making, planning, and programming.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. List of interview partners by actor category.

Interview No.	Actor Category
No 1	state actor, federal level
No 2	State actor, federal level
No 3	Social movement organization
No 4	donor
No 5	academy
No 6	donor
No 7	donor
No 8	donor
No 9	academy
No 10	state actor, federal level
No 11	state actor, federal level
No 12	state actor, federal level
No 13	NGO
No 14	state actor, federal level
No 15	Civil society organization
No 16	state actor, federal level
No 17	state actor, federal level
No. 18	Social movement organization
No. 19	Social movement organization
No 20	Civil society organization
No 21	State actor, sub-national level
No 22	State actor, sub-national level
No 23	Social movement organization
No 24	Civil society organization
No 25	academy
No 26	State actor, federal level
No 27	academy
No 28	academy
No 29	academy
No 30	State actor, federal level
No 31	State actor, sub-national level
No 32	donor
No 33	State actor, federal level

Appendix B

B.1. Detailed Discussion of Process Steps and Data-Based and Scientific Approaches to Support SDG Implementation in Mexico

Literature dealing with agenda setting processes in the European Union has differentiated two ideal-typical ways in which an issue can enter the political agenda: through the “high-politics” route or the “low-politics” route [43,44]. In the first instance, issues are placed on the agenda “from above” by political leaders, who convene in high level international fora. Issue initiation is driven by high-ranking political figures whose reason for placing an issue on the agenda is the occurrence of a shared political problem. In the second instance, issues are placed on the agenda “from below” by experts working together in technical committees or working groups. The low politics route is primarily a technocratic one, where issues arise as a result of professional concerns among people working in the same issue area [40]. Obviously, as is the case with all of its signatory states, the 2030 Agenda entered the political agenda of Mexico the high-politics route.

Under the administration of Peña Nieto, Mexico assumed a proactive regional leadership role in the process of the implementation of the 2030 Agenda. Active support by UN agencies and increased coordination between the UN and the Mexican Government were undertaken to strengthen the country's role as a regional leader in South-South Cooperation in the context of the 2030 Agenda. At the 36th session of the Economic Commission for Latin America and the Caribbean (ECLAC), held in Mexico City from 23 to 27 May 2016, the member States adopted resolution 700 (Mexico Resolution). The Mexico Resolution established the Forum of the Countries of Latin America and the Caribbean on Sustainable Development (Forum of the Countries of Latin America and the Caribbean on Sustainable Development, 2018. Retrieved from: <https://foroalc2030.cepal.org/2018/en> (Last Accessed on 4 October 2018)) as a regional mechanism to follow up and review the implementation of the 2030 Agenda and the Addis Ababa Action Agenda. The UN Economic and Social Council subsequently endorsed the establishment of the Forum in its resolution 2016/12. (Sustainable Development Knowledge Platform, 2017. Retrieved from: <https://sustainabledevelopment.un.org/hlpf/2017/eclac> (Last Accessed on 04 October 2018).) Furthermore, the German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ) supports the office of the President of Mexico (OPR) in implementing the 2030 Agenda in the country. (See GIZ 2030 Agenda initiative in Mexico: <https://www.giz.de/en/worldwide/60361.html>) In the following, we present discuss the steps that have thus far been undertaken in Mexico to support integrated and coherent SDG implementation. With the change of government of López Obrador in December 2019, agenda setting priorities shifted towards austerity, public security and the combat of corruption at the highest levels.

To enable policymakers to face the challenge of implementing the SDGs simultaneously in a coherent and integrated manner, both the emergent scholarly literature on the SDGs as well as practitioner guidelines and toolkits have proposed a variety of measures that should be undertaken to support SDG implementation and mainstreaming. In their systematic review of 40 academic or expert publications relating to the SDGs and 15 SDG guidelines or toolkits Allen, Metternicht and Wiedmann [45] in a first step identify the main recommendations that have been made to support integrated and coherent SDG implementation. In a second step, they go on to analyze the degree to which recommendations made by the expert community have been applied to support national SDG implementation in 26 countries.

Allen et al. [45] identify and distinguish between two essential categories of expert recommendations. The first category of *recommended initial steps in national SDG implementation* is comprised of nine steps referring to the establishment of institutional structures and procedures to enable countries to take stock of their current standing, to formulate priorities, and to inform their policy planning cycle. The second category of *recommended evidence- and science-based approaches* covers methodologies to facilitate (a) data-based monitoring and evaluation of the SDGs; (b) the mapping and assessing of SDG interlinkages; and (c) the development of strategies to realize synergies and mitigate trade-offs between the SDGs and their targets. The twelve recommendations in the second category include both qualitative approaches (e.g., systems thinking, nexus approaches, and scenario development) and quantitative approaches (e.g., quantitative modelling, benchmarking, indicator-based assessment). The review by Allen et al. [45] provides a useful framework to discuss national progress in SDG implementation. We will, therefore, use it throughout this section to structure our discussion of the status quo of SDG governance, planning and monitoring in Mexico.

Table A2 lists the recommendations identified by Allen et al. and informs about the status of their application in Mexico.

Table A2. Overview of national implementation of the SDGs in Mexico—Process, Approaches and Gaps.

1. Process Steps Taken									2. Evidence and Science-Based Approaches Applied											
1.1 Governance & Coordination Mechanisms	1.2 SDG Multi-stakeholder consultations	1.3 SDG Mapping & Alignment	1.4 Prioritize/adapt targets & indicators	1.5 Mainstreaming into existing/new strategies	1.6 SDG Roadmap of Action Plan	1.7 Assess Interlinkages	1.8 Policy evaluation and design	1.9 Monitoring and review arrangements	2.1 Systematic target gap analysis (e.g., RIA)	2.2 Thematic review (selected SDGs)	2.3 Nexus approach or target clustering	2.4 Data gap analysis	2.5 Indicator-based assessment	2.6 Benchmarking	2.7 Systems thinking & analysis (qualitative)	2.8 Quantitative modeling	2.9 Spatial modeling	2.10 Scenarios, foresight, back casting	2.11 SDG Costs or Needs Assessment	2.12 Multi-Criteria analysis
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗

Source: Own compilation based on Allen et al. [45]. ✓, Step completed or approach applied; ✓, Step commenced or approach to be applied in the future; ✗, Step not taken or approach not applied.

B.1.1. Process Steps to Support SDG Implementation Undertaken in Mexico

The first step towards SDG implementation is to either create an institutional body to govern and coordinate the process or to confer these tasks on an already existing institution (step 1.1). The Mexican National Council for the Implementation of the 2030 Agenda (*Consejo Nacional de la Agenda 2030 para el Desarrollo Sostenible*) was created in April 2017. (Decree DOF: 26 April 2017 of the Presidency of the Republic, Retrieved from: http://www.dof.gob.mx/nota_detalle.php?codigo=5480759&fecha=26/04/2017 (Last Accessed on 4 October 2018).) Its mandate is to coordinate the design, execution, follow-up and evaluation of actions implementing the SDGs.

The Council's structure is characterized by centralized leadership and management of the Presidency and a cross-sectorial set up. It is chaired by the Federal Executive. Its Executive Secretary is the Head of the Office of the Presidency of the Republic (OPR). The Council is integrated by representatives from all of Mexico's eighteen federal ministries who are entitled to speak and vote at general meetings. Representatives of the federal states and municipalities may join the sessions of the Council upon special invitation but do not have the right to vote. The Council is supported by a Technical Committee on Sustainable Development Goals (CTEODS), which is presided by the OPR and brings together representatives from 32 federal states. The CTEODS has been designated as the body in charge of statistically monitoring progress on the SDGs.

Non-state stakeholders are not formal members of the main national SDG-implementation body itself. Instead, they participate in permanent, multi-sectorial working groups that group the 17 SDGs into four thematic axes. The task of these working groups is to formulate proposals and recommendations to the National Council. According to government officials, the decision not to formally include non-state stakeholders into the national SDG-implementation body itself was based on legal concerns. Legal advisors to the Presidency raised the point that the Executive does not have convening power over non-state actors.

As a general criticism, it could be noted that, given that the Council has no independence from the government, its ability to exercise a control function is limited.

To promote the implementation of the 2030 Agenda at the sub-national level, in 2017 the National Conference of Governors (CONAGO) installed a Commission for the Compliance with the 2030 Agenda. The purpose of the commission is to serve as an organizational space through which state governments join in national efforts for the implementation of the SDGs, exchange experiences,

coordinate actions and develop monitoring and follow-up mechanisms. One of the commitments adopted by the commission was to set up one *Organ for Monitoring and Implementation of the 2030 Agenda* (*Órgano para Seguimiento e Instrumentación de la Agenda 2030*, OSI) in each of the country's 32 federal states and Mexico City [47,53]. By the end of 2018, all of the federal states had established the legal bases of their OSI, and 31 of them had already formally installed it. While the majority of the states opted to establish entirely new bodies, some decided to set up their OSI within the framework of an existing institution, such as for example state planning committees [84]. The OSIs of several federal states differ from the National SDG Council in that they grant representatives from civil society, private sector and academy the right to voice and vote (Colima, Guanajuato, Jalisco, Michoacán, Morelos, Nuevo León, San Luis Potosí and Yucatán). In a review of the current state of localization of the 2030 Agenda UNDP [84] notes that the OSIs are supposed to cover a broad set of functions including the in co-creation, monitoring, and evaluation of public policies aimed at achieving the SDGs. However, it is questionable whether they actually have the necessary resources to comply with such a broad mandate, particularly in view of the fact that most OSIs will meet ordinarily only once or twice per year ([84] p. 18).

Table A3. The Mexican SDG-Implementation body.

SDG Governance Mechanism		
New organization	Yes	National Council for the Implementation of the 2030 Agenda/Consejo Nacional de la Agenda 2030 para el Desarrollo Sostenible
Previously existing organization	No	
Year of foundation	2017	
High Level Political Leadership		
Leadership by Center of Government (CoG)	Yes	Head of the Office of the Presidency of the Republic
Leadership by line ministry	No	
Horizontal Coordination		
Membership of line ministries in SDG implementation body		
Ecology	Yes	Ministry of Environment and Natural Resources
Economy	Yes	Ministry of Finance
Social Affairs	Yes	Ministry of Social Development
Sustainability	No	
Foreign Affairs	Yes	Ministry of Foreign Relations
Other	Yes	Ministries of: Interior; National Defense; Navy; Energy; Economy; Agriculture, Farming, Rural Development, Fisheries, and Nutrition; Public Service; Education
Membership of Technical Bodies	Yes	National Institute of Statistics and Geography (INEGI)
Vertical Integration		
Formal representation of sub-national governments in SDG implementation body?	No	
Are sub-national governments organized in permanent working groups reporting to SDG implementation body?	Yes	Specialized Technical Committee on the Sustainable Development Goals (CTEODS); CONAGO
Stakeholder Engagement		
Formal representation of non-state	No	

stakeholders in SDG implementation body?		
Are non-state stakeholders organized in permanent working groups reporting to SDG implementation body	Yes	Stakeholders from CSOs, the academic and scientific Communities and the private sector participate in 4 multi-sectorial working groups

Source: own development based on [85].

So far, stakeholder consultations in the context of the 2030 Agenda (**step 1.2**) have taken place in different formats and at different points in time. According to the 2016 VNR [46], civil society organizations (CSO) contributed to the country's positions at the international level throughout the negotiation process of the SDGs and some of their members attended as part of the Delegation of Mexico in the negotiations. Stakeholders from the academic community participated in the preparation of the first VNR in 2016 in the form of a workshop organized by the government in collaboration with the UNDP. The input of the private sector, in turn, was collected through the Alliance for Sustainability (AxS) created by the Mexican Agency for Development Cooperation (AMEXCID).

Furthermore, for the purpose of developing Mexico's National Strategy for the implementation of the 2030 Agenda [49], several regional dialogues were held with CSOs in order to help define national priorities. A first draft of the National Strategy was made available on the government's online participation portal where the public was invited to provide their comments and suggestions in an open online consultation. (<https://www.participa.gob.mx/consulta-general-de-la-estrategia-nacional-de-la-agenda-2030-113>) The consultation received 438 citizen comments [49]. However, at the time of writing this study, the results of the consultation were not yet publicly available and it was unclear, how citizen input was integrated into the National Strategy.

Mexico's academic community is involved in the 2030 Agenda process in a variety of ways. A Mexican chapter of the Sustainable Development Solutions Network (SDSN) has been installed at the National Autonomous University of Mexico (UNAM) to support the collaboration between science, government, private sector and civil society. The Center for Research and Teaching in Economics (CIDE), in turn, has been engaged in the development of local development indicators.

In June 2016, the National Institute of Statistics and Geography (INEGI) carried out a mapping exercise (step 1.3), in order to determine which of the 2030 Agenda's indicators are applicable in Mexico and which government agencies will be responsible for delivering for this information. The study concluded that out of the Agenda's 232 indicators, 169 indicators could, in principle, be tracked domestically, while the other 63 indicators either do not apply domestically or require additional regional or global calculations. However, out of the 169 indicators that apply domestically, thus far only 83 are measured periodically but partly present challenges regarding the required level of disaggregation. The remaining 36 indicators are either not measured periodically or no methodology for their measurement has yet been established.

Mexico's National Strategy for the implementation of the 2030 Agenda (OPR, 2018) was published in September 2018 (step 1.6). First, for each of the 17 SDGs, this document proposes "national priority targets" (128 in total) (step 1.4). Subsequently, for each SDG, the strategy formulates a package of measures that will be necessary to achieve these priority targets. Finally, the status quo of target achievement is documented using the 169 domestically measurable indicators identified plus 49 additional indicators proposed by the CTEODS for specific follow-up in Mexico (approach 2.5). At the time of writing this study, it is unclear to what extent these priorities and indicators will actually be incorporated into the national planning process. The introduction to the strategy document positions itself mildly positive on this subject by stating that the priority targets constitute proposals, which "*in due course, may or may not be incorporated into the processes of democratic*

planning of the next federal administration" ([49] p. 11). This cautious formulation can be attributed to the fact that the strategy was formulated by a team of outgoing administrators that was well aware that continuity in the implementation of the SDGs depends, to a large extent, on the political will of the respective incumbents.

Mexico's previous National Development Plan (NDP) for the period 2013–2018 was based on five pillars entitled *Mexico in Peace*, *Inclusive Mexico*, *Mexico with Quality Education*, *Prosperous Mexico* and *Mexico with Global Responsibility*. In order to facilitate mainstreaming the SDGs into sectorial programs, national programs and special programs, Mexico conducted a mapping exercise using UNDP'S Rapid Integration Assessment Tool (RIA) (approach 2.1). The analysis concluded that there was a reasonable degree of alignment between the NDP 2013–2018 and the SDGs but that a review of indicators and their sources would be necessary to determine the effectiveness and relevance of existing public policies concerning the SDGs.

To ensure the continuity of the implementation of the Agenda across administrations until 2030, the national planning law was reformed in 2018. The reform added transitory article 5, which states that the Federal Public Administrations for the periods 2018–2024 and 2024–2030 should consider the SDGs in the elaboration of their respective NDPs and that proposals submitted by the National SDG Council should be integrated into the drafting process ([50] p. 27). Yet, the reality of the national planning process for the administrative period 2018–2024 turned out differently.

Following the inauguration of the new administration, the Ministry of Finance (Secretaría de Hacienda y Crédito Público, SHCP) started to elaborate the first draft of the NDP 2019–2024. Several of our interviewees assessed both the drafting process and its result very positively. For one thing, sub-national governments and selected civil society stakeholders were involved in consultations at several stages of the draft process. For another thing, concrete targets and measurable indicators underpinned the main strategic axes of the draft plan (step 1.5). However, few days before this draft was to be presented to parliament, AMLO surprisingly came forward with a much shorter draft, stating that the SHCP's draft represented a "neo-liberal project" which had made it necessary for him to replace it by document elaborated by himself [54]. The new draft characterized itself by a strong social rhetoric, but at the same time remained much vaguer in the formulation of concrete objectives than the draft elaborated by the SHCP and did not make any mention of indicators. In the days following the release of this new draft, staff members of the OPR and the SHCP worked hard towards a compromise whereby the draft submitted by AMLO would be presented to the public as the official NDP and the draft elaborated by the SHCP would be retained as a complementary, technical annex to facilitate its practical implementation. Ultimately, however, only the president's plan was approved by Congress at the end of June 2019. The sudden resignation of the Minister of Finance, Carlos Manuel Urzúa, at the beginning of July 2019, is widely attributed to a fall out between him and the president regarding the NDP. In its current form, due to its vague objectives, the NDP provides insufficient orientation or clues for sustainable development planning to planning authorities at the national and sub-national level.

By ratifying the Paris Agreement in September 2016, Mexico committed to contribute to its fulfillment through a series of mitigation and adaptation goals, condensed in its Nationally Determined Contribution (NDC). To promote the integrated implementation of the Paris Agreement and the 2030 Agenda, and avoid trade-offs and duplications of policy efforts, the OPR and the Ministry for the Environment and Natural Resources (SEMARNAT), with support of GIZ, commissioned a study on NDC-SDG interlinkages and co-benefits (step 1.7). Based on expert interviews and review of scientific literature, SDG interlinkages and co-benefits existing between NDC measures and SDG targets were systematically mapped. The data obtained through this mapping exercise were then analyzed using network analysis methodology in order to produce policy recommendations for each sector.

The 2018 Reform of the National planning law suggested the consideration of the SDGs in the elaboration of the NDPs for the periods from 2018–2024 and 2024–2030. Motivated by this reform, in 2019 the Mexican office of UNDP published a guideline that proposes a systematic methodology for the evaluation of public plans and programs [51] (step 1.8). The 80 pages long document is explicitly

targeted at public institutions whose tasks involve the management of public government plans and programs, the results of which are intended to lead towards the principles and objectives of Agenda 2030. At the time of writing this study, it was unclear to what extent the targeted institutions were already making active use of these technical guidelines.

At the national level, the Follow-Up and Evaluation Committee, which is integrated into the National SDG Council, has been designated as the body responsible for monitoring the development and progress of policies related to the SDGs (step 1.9). The committee is constituted by staff members of INEGI and the National Council for the Evaluation of Social Development Policy (CONEVAL, as well as representatives of higher education institutions from every region of the country and members of CSOs. To facilitate public access to the global and national SDG indicators, the CTEODS, in collaboration with the OPR's National Digital Strategy Department, have designed an open data platform. (www.agenda2030.mx) The platform entitled, Information System of Sustainable Development Goals (SIODS), reports on 66 indicators corresponding to 16 SDGs. Data are made available by various government departments and agencies. The platform provides a variety of tools to analyze and visualize this information. For example, it includes a geographic search function that allows users to view SDG data for each of the federal states [86,87].

At the subnational level, monitoring and review is expected to be carried out by the OSI created by each of the 32 federal states [84]. Due to different size and needs of each state, there are major variations in terms of the number of members of each OSI, as well as which sectors and government agencies are represented in them. Variation can also be found in the formulation of the decrees that establish the OSI and define their mandates and functions. In general terms, the decrees indicate that the OSIs are established as auxiliary monitoring (or planning) bodies and as links between the State Government and the Legislative and Judicial branches, municipalities, the private sector, academia, and civil society. However, only 78% of the decrees explicitly indicate the elaboration of annual or periodic SDG progress reports as a function of the OSI [84]. Furthermore, almost all of the decrees envisage the creation of a technical committee (or working group) to provide technical follow-up. However, given the wide range of responsibilities assigned to the OSIs it is questionable whether the OSIs will have the capacities to fulfill these responsibilities. Particularly in view of the fact the majority of decrees establish that the OSI will hold ordinary sessions only once or twice per year.

B.1.2. Evidence and Science-Based Approaches Applied in Mexico to Support SDG Implementation

Thus far, Mexico presented Voluntary National Reports at the HLPF in 2016 and 2018. The 2016 VNR mainly informed about newly created institutions and process steps undertaken for the implementation of the 2030 Agenda. The 2018 VNR presented a thematic review of the goals under review at the 2018 HLPF (SDGs 6, 7, 11, 12, 15) in the form of a text-based narrative review highlighting some few selected indicators (approach 2.2). An indicator-based assessment (baseline) was carried out in the context of the launch of the National Strategy for SDG implementation in 2018 (approach 2.5, see also step 1.4)

SDG benchmarking (approach 2.6) can be understood as a transnational practice that goes beyond the jurisdictions of individual states. It may encompass different forms of comparative assessment. For example, the comparative assessment of design, i.e., how well have specific policies, laws or institutions been adapted to SDG needs; or for example the comparative assessments of outcomes, i.e., how well activities in specific policy areas aligned with the SDGs. There are several regional and international initiatives that pool data on countries' SDG action (E.g., ECLAC's Regional Observatory for Development Planning <https://observatorioplanificacion.cepal.org/en/sdgs> or the OECD's (2016) OECD Survey on Planning and Co-ordinating the Implementation of the SDGs <https://www.oecd.org/gov/cob-sdg-survey-overview-of-results.pdf>) and could thus serve as a base of comparative benchmarking. However, we could not obtain information about the extent to which the Mexican government is making active use of this information in order to benchmark its own performance against external criteria.

In 2017, to ensure the alignment of national investments with the SDGs, the Ministry of Finance partnered with UNDP to conduct first SDG costs and needs assessment (approach 2.11). Applying a

results-based management approach, this study set forth to identify the government programs and specific budget items that would contribute to progress on the SDGs. It concluded that, for 10 SDGs, there was full (100%) coverage of targets linked to a budgetary program. For the remaining SDGs coverage oscillated between 86% and 92%, except for SDG 14 that achieved only 60% coverage. At the time of writing this study, it was unclear, whether this exercise would be repeated for the budget that will be derived from the NDP 2019–2024.

Appendix C

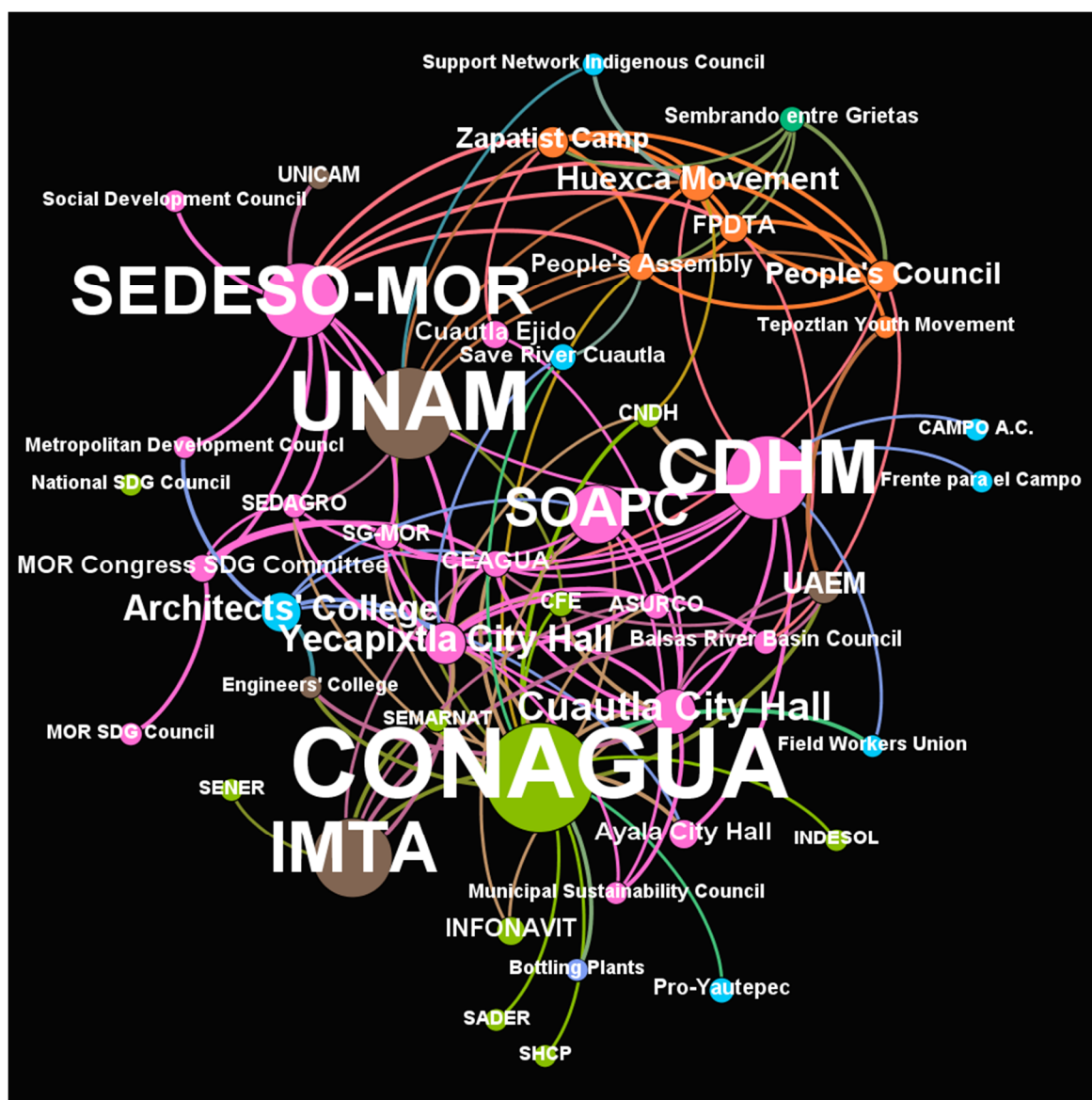


Figure A1. Network of frequent (monthly to quarterly) communication between WEF-Nexus actors.

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