Chapter 3
Administration of Water Resources Management: Key Facts About Water Resources in Poland

Katarzyna Kubiak-Wójcicka

Abstract This chapter reviews and evaluates institutional solutions related to water management. It indicates which institutions have been responsible for water management in Poland in the last dozen or so years and what institutional changes have been introduced since 2018. The study identifies the main problems that over recent years have resulted from water management by various institutions responsible for key issues regarding water quantity and quality. The main problems related to proper water management in Poland include lack of uniform interpretation of water law, lack of a coherent information system, and access to information by both water management employees and water users. In order to deal with these problems, first of all, there should be conducted a series of training for both employees and stakeholders regarding a uniform interpretation of water law. A full assessment of the water management reform implementation in Poland and of all the changes introduced after 2018 will be possible in about 2 or 3 years.

Keywords Water management · Water law · Institution · Organizational chart · Water resource · Governance · Poland

3.1 Introduction

Water is a resource directly relevant to the development of society. It has always been the basis of civilisation. Unlimited use of water resources by humans and their activity has led to their exhaustion or degradation as well as transformation of water conditions.

The extent of these changes and problems caused by them are dependent on various factors, which include the amount of water resources, their availability, and management. Hence, in a number of scientific publications there appear considerations on water resources management in different countries, e.g. the Netherlands [1], Italy [2], Spain [3, 4], Switzerland [5], Ukraine [6, 7] and many others [8–10].

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These studies provide a picture of systemic solutions to water management at the national or regional level, and above all, how they work in practice. Guidance on the strengths and weaknesses of these systems, based on different experiences, show that they are not only important for the areas affected by water scarcity, e.g., Qatar [11], Iran [12], but also regions that have large water resources, such as Canada [13, 14]. The issues of the amount of water, and more and more often emerging issues of its quality, have led to the examination of water resources in many aspects. The key to solving the problems is the appropriate management of water resources [15–17]. In recent years, researchers have been discussing the importance of water management in the face of climate change [18–20], as well as the scale and form of social participation in water resources management [21–25].

The only possibility for rational water resources use is integrated water resources management (IWRM). According to Biswas [26], this was already known at the beginning of the twentieth century, but the return to it occurred only in the 1990s. One definition of integrated water management has been presented by Global Water Partnership [27] as "the process promoting the harmonious development and management of water, space and other resources, in order to maximise social and economic benefits while maintaining healthy ecosystems."

The IWRM concept has been debated by many scholars [28–30]. A new management concept is an adaptive comanagement (ACM). The term "comanagement" indicates the collaboration of a wide range of actors from government and civil society in sharing managing power and responsibilities across local, regional, and national levels [31–33]. In Poland, the problem of integrated systems in water management was considered by many authors [34–37].

This chapter presents water resources management in Poland over the last twenty years. Based on the analysis of official documents (legal acts), literature review, interviews with employees at various levels of offices related to water management and the author's own experiences, the case of water management in Poland has been described. The interviews focus on the determination of roles and efficiency of the organizations responsible for water management at the governmental and municipal levels. The surveys were conducted with 10 persons with at least 5 years of professional experience.

Poland is a country where water resources are one of the poorer in Europe. In the years 1951–2015 the average annual surface runoff from the territory of Poland, including its tributaries from abroad, was 61 km^3. The average specific runoff in the largest basin of the Vistula is between 5.3 and 10 $dm^3 \cdot s^{-1} \cdot km^{-2}$ [38]. This gives the annual water resource size of 1600 m^3 per capita, while in most European countries, freshwater resources are at a level of approximately 5000 m^3 per capita. In addition, surface water resources of Poland are highly volatile in terms of time and space, which causes periodic water excesses and deficits in rivers [39]. Therefore, the management of water resources is extremely difficult. On May 1st 2004, Poland became a member of the European Union and hence must apply the rules of the Frame Water Directive, which obliges the member states to rational use and protection of water resources, following the paradigm of the balanced development. The current scheme of water management is the result of the transposition of rules of the WFD

to the Polish code of laws, mainly through the Water Law act. The integrated water resources management (IWRM) in Poland faces significant problems, which will be presented in this article. Moreover, Poland is in the course of political changes related to government change which occurred at the end of 2015. Significant changes in the scheme of organizational water management were initiated in January 2018.

3.2 History of Water Management in Poland Until 2001

Formal water management in Poland dates back to the early twentieth century when the first bill of Water Law of 19 September 1922 was passed. The bases of the draft were two documents: the Austrian Water Act of 30 May 1869 from which the ownership matters were taken, and the Prussian Water Law of 7 April 1913 from which the issues of water use were taken.

The term "water management" was used for the first time in Poland at the end of the 1920s during the discussion of the subject and organizational assumptions of the First Polish Hydrotechnical Convention. After the Second World War, the issues of water management in Poland were initially entrusted to the Ministry of Transport (Department of Waterways), and in 1948 water management was handed over to the Ministry of Shipping. In 1960, the Central Office for Water Management was established, which was to deal with the entirety of water management in Poland.

Subsequent Water Law acts were passed on May 30th, 1962 and October 24th, 1974 and were related to the socialist system in Poland. Water management in that period was based on the administrative division of the state, according to the division into voivodeships. Changes in water management are related to system transformation in Poland which started in 1989. The administration, maintenance and operation of the State Treasury assets (i.e., rivers of special importance, waterways, water reservoirs, and water infrastructure) were dealt with by the Regional Water Management Authorities. On February 1st 1991, the Ministry of Environment Protection, Natural Resources, and Forestry appointed 7 Regional Water Management Authorities, that borders followed the hydrographic (and not the administrative division) of the country.

Regional Water Management Directorates which were established to maintain waters owned by the State Treasury and Regional Water Management Authorities were functioning in parallel. Pursuant to the Ordinance of the Minister of Environment of November 29, 1999, regarding the reorganization and scope of operation of regional water management boards, changes were introduced in the administrative structure of water management. On January 1, 2000, regional directorates were merged with regional management boards, summing up their existing tasks and assuming further reform of water management based on the new Water Law of 2001. Changes in the field of water management resulted from the administrative reform of the Polish state, which came into force on January 1, 1999. As a result

of the reform, a three-level structure of territorial division was introduced, divided into voivodships, districts and communes. According to this division, 16 voivodships (instead of 49), 308 districts and 2489 communes were created [40]. This division, since its introduction, has undergone minor modifications.

3.3 Water Management in Years 2001–2017

3.3.1 Water Management Organization Structure

The new Water Law act of 18 July 2001, valid until 2017, had a significant impact on the shape of the water management system in Poland.

Water management in Poland was carried out both via the state and local governments. The authority responsible for the proper management of inland waters in Poland, according to the provisions of the Water Law act of 2001, was the President of National Water Management Authority, directors of national parks and Voivodeship Marshals. According to the act, water is the property of the State Treasury, other legal entities, and private persons. Waters that belong to the State Treasury or local government units are the public waters [41].

There was no single ministry which would deal with water management as a whole, which means that competences in water management were divided among different sectors of the national economy. Management of water resources and the related infrastructure was carried out by the Ministry of the Environment, Ministry of Naval Management and Inland Navigation, Ministry of the Interior, Ministry of Agriculture and Rural Development (Fig. 3.1).

The Prime Minister exercised direct supervision over the Government Plenipotentiary for the "Program for the Oder – 2006". The plenipotentiary was appointed by the Act of 6 July, 2001 on establishing a long-term program "Program for the Oder – 2006" (Journal of Laws No. 98, item 1067), which came into force in 2002. The program included the reconstruction and modernization of the Oder Water System, which was destroyed during the flood on the Oder River in 1997. The function of the plenipotentiary was held by the voivode of Lower Silesia. The purpose of this program was to modernize the Oder River to a modernly developed ecological corridor in accordance with the principles of sustainable development. As part of this program, specific statutory tasks were implemented in the area of construction of a flood protection system, protection of the natural environment and water purity, elimination of flood damage and preventive spatial development and restoration of eco-systems. The Government Plenipotentiary for the "Program for the Oder – 2006" served until the end of 2014. He was dismissed by the Council of Ministers, and all his activities were then coordinated by the President of the National Water Management Authority (KZGW) by the end of 2015.

A key role in the management of inland waterways is played by the Ministry of the Environment, which has an extensive organisational structure. The Minister of

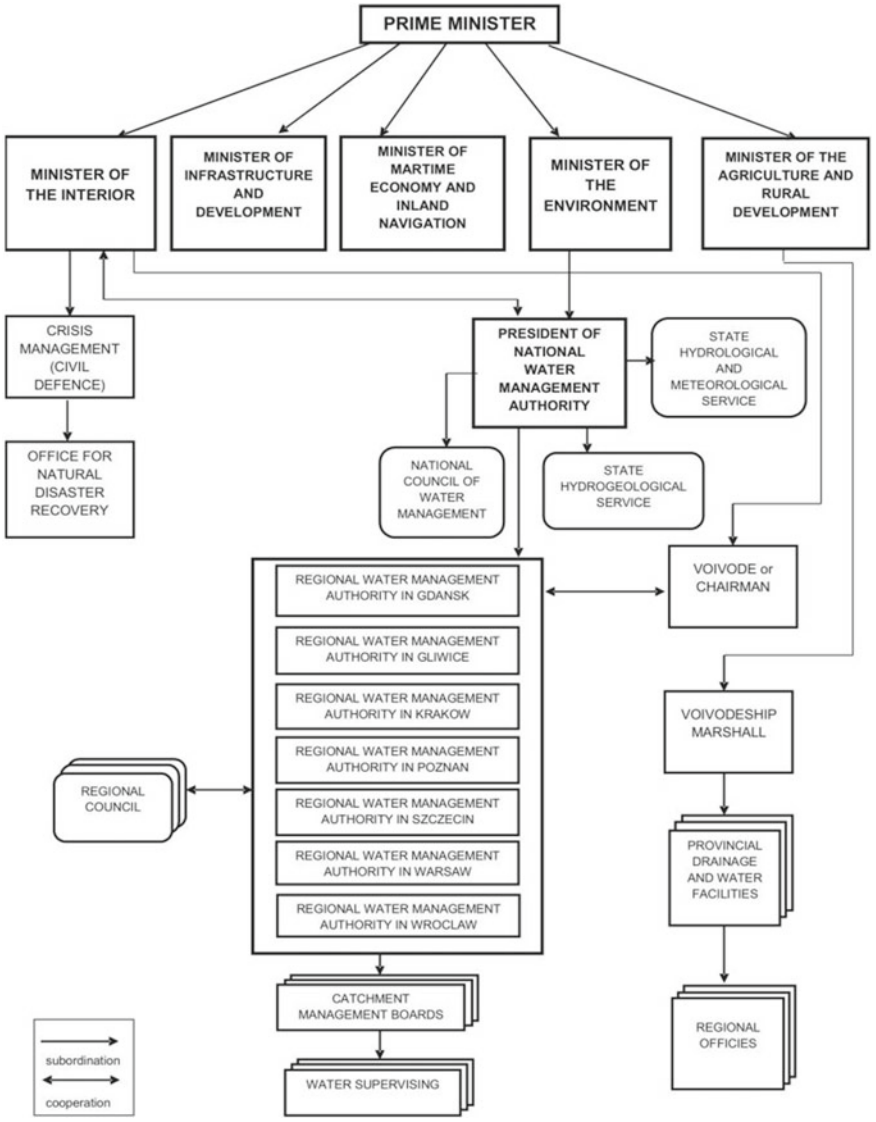

Fig. 3.1 Organisation of water management in Poland (until December 2017) [42]

the Environment manages the government administration departments and oversees the President of the National Water Management Authority (KZGW). In turn, the President of the KZGW plays a paramount function for the Regional Water Management Authorities, the State Hydrological and Meteorological Service and the State Hydrogeological Service. Regional water management authorities are engaged in the maintenance of water and water facilities in individual drainage basins of the

water regions, within which catchment management boards are delimited. Local units called water supervisors operate as part of the catchment management boards (Fig. 3.2).

The functions of the State Hydrological and Meteorological Service were performed by the Institute of Meteorology and Water Management, National Research Institute, which supervised the activities of 6 administrative departments.

Fig. 3.2 Administrative and hydrographical division of Poland

The Minister of the Environment also held direct authority over the General Inspector of Environmental Protection (GIOŚ), the General Directorate for Environmental Protection (GDOŚ) and the Polish Geological Institute (PGI State Research Institute). The GIOŚ performs its tasks using 16 branches of Voivodship Inspectorates for Environmental Protection, which conduct State Environmental Monitoring (including, among others, surface water quality) and supervision of entities using the environment. In turn, the GDOŚ supervises the tasks of 16 Regional Directors of Environmental Protection, which implement tasks related to environmental policy in the field of nature conservation management, supervision of the investment process and provision of information about the environment in the area of the voivodship.

The President of the National Water Management Authority (KZGW – Krajowy Zarząd Gospodarki Wodnej) performed ownership rights in relation to public waters owned by the state, in relation to the waters essential for the development of water resources and flood protection, particularly groundwater and surface inland waters. The inland surface waters are in mountain streams and their sources, in natural watercourses, from the sources to the mouth, with an average multi-year discharge equal to or greater than 2.0 $m^3 \cdot s^{-1}$ at the cross-estuary, lakes and artificial water reservoirs through which referred streams flow, as well as in inland waterways and border watercourses. Administering waters took into account the division of the country into drainage basins and water regions.

In addition to the President of the KZGW, the unit responsible for water management was the provincial (*voivodeship*) marshal. As part of the government, this task was performed by the voivodeship government in relation to the water essential for regulating water relations for agriculture in order to improve the soil capacity and facilitate its cultivation. Water management was carried out in line with the state administrative division, within administrative units.

The main bodies responsible for water management at the regional level were Provincial Drainage and Water Facilities, which were subject to the marshal of the province. They performed tasks in the field of water management in agriculture and flood protection. Therefore, they were subject to the Minister of Agriculture and Rural Development.

The Ministry of Naval Management and Inland Navigation carried out the activities related to the administration and operation of inland waterways.

In turn, the Ministry of the Interior was taking over some of the tasks in crisis situations in the field of water management during, e.g., floods or droughts.

The authorities responsible for water management in the context of local government were a municipality leader called *wójt* (mayor or president) and the municipality council as well as the governor and district council. Their tasks were mainly related to water and sewage infrastructure (municipal council) and the issuance of water supply consents.

The commune's own tasks include issues related to water supply, sewerage, water supply, and sewage disposal. Detailed legal regulation in this respect is the Act of June 7, 2001, on collective water supply and collective sewage disposal. Collective supply of inhabitants with drinking water is the commune's own task – this results from the content of art. 7 par. 3.1 point 3 of the Act of 8 March 1990 on municipal

self-government (Journal of Laws 2013 item 594 as amended) and art. 3 section 1 of the Act of June 7, 2001, on collective water supply and collective sewage disposal (Journal of Laws from 2006 No. 123, item 858, as amended). Communes are responsible for providing the community with water supply and sewage disposal which forces the creation of water and sewage companies or entrusts certain obligations to a water and sewage company. In the last 20 years, we have had in Poland the unique development of infrastructure investments, including those related to the concentration of expenditures from local government funds. Although various aid funds from the European Union were widely used, e.g., the Operational Program Infrastructure and Environment, as well as the National Fund for Environmental Protection and Water Management (NFOŚiGW) however, also the own share of communes was high enough. A significant part of the infrastructure was created in rural areas. In the case of low-income communes, where the settlement network is dispersed, and thus the cost of building the infrastructure is high, these investments have no chance for implementation without the support of the state.

As a result of such division of competence, water management takes place in a river basin and administrative system (Table 3.1).

Poland's accession to the European Union on 1 May 2004 meant that Polish regulations and legislation should be aligned to the EU. The most important EU directives on water policy in the European Union is the Water Framework Directive (WFD), which was approved by the European Parliament and the Council of the European Union as the Directive 2000/60/EC, which came into force on 22 Dec. 2000 and introduction to the new EU Water Framework Directive (accessed 24 July 2006). Transposition of the WFD regulations into Polish legislation was primarily through the Water Law and its implementing legislation. Also, the WFD has reflected also in the Environmental Protection Law and the Act on collective water supply and discharge of wastewater with the implementing legislation to these laws.

The EU water policy is based on the principles of Integrated Water Resources Management (IWRM). These principles include treatment of the drainage basin as a primary area of any planning and decision-making action, socialisation of the decision-making process, integrated approach to surface water and groundwater, treatment of water as a fundamental factor influencing the functioning of ecosystems, as well as implementation of economic mechanisms in water management.

As a result of Poland's accession to the European Union in 2004, in order to align the law with the WFD, the Polish Parliament introduced amendments to the existing Water Law act of 18 July 2001. Due to complicated nature of the changes introduced to the existing Water Law, it has been decided to create a new Water Law act, which initially was supposed to come into force in 2015. That act assumed changes in organizational scheme of water management in Poland and in the matter of water usage fees following the rule "the one that uses the water pays." The act has not been introduced because of political changes that took place. In October 2015, as a result of election to the parliament, after 8 years the ruling party stepped down. The existing ministry division has been preserved with one exception. A new Ministry of Naval Management and Inland Navigation has been created. Its competences were previously (until 2015) in the domain of the Ministry of Infrastructure.

Table 3.1 List of water management authorities in Poland (until December 31, 2017)

Authority	Competences	Area
Regional Water Management Authority	Managing waters with discharge greater than 2 m^3 per second (water management plans)	Basin
Provincial Drainage and Water Facilities	Managing waters with discharge less than 2 m^3 per second and waters agriculturally significant, lakes, ditches, and canals	Voivodeship
Provincial Environment Protection Inspector	Water quality in rivers and lakes	Voivodeship
Regional Environment Protection Management	Nature protection as a part of assessments of environment impact, protection, and management of various sorts of nature protection	Voivodeship
Local municipal government, city mayor or president	Issuing water law consents for special water use	Administrative area of a commune or a city
Provincial crisis management centre	Facilitation of cooperation of all governmental and municipal administration units in the scope of prevention of environmental diseases or environmental threats, e.g., floods Monitoring of threat degree, e.g. from surface waters	Voivodeship
Institute of Meteorlogy and Water Management National Research Institute	Conducting systematic measurements and observations with the use of the network of meteorological and hydrological stations Creation and distribution of hydrological and meteorological forecasts	Administrative departments

In the meantime, the new government has created a new Water Law Act that was announced on July 20, 2017. The Act introduced significant changes in the field of water management, which entered into force on January 1, 2018.

3.3.2 Assessment of the State of Water Management in Poland

The decentralized (or polycentric) system of water management that existed in years 2001–2017 in Poland has faced criticism from society, scientists and users of water resources in the recent years. Among the causes of poor water, management state

were scattered management at central and regional levels and lack of strict definition of competences, rules and cooperation forms between state and municipal authorities that were engaged in water management. Based on document analysis and authors own observations, endogenous, and exogenous factors of integrated water management following the idea of the Framework Water Management have been identified. Strong and weak sides as well as opportunities and threats to decentralised water management in Poland have been analysed. The main administrators of waters in Poland were: Voivodeship Marshalls, which did their duties through the regional drainage managements (16 voivodeships) and Country Water Management Authority, which did its duties though 7 Regional Water Management Authorities.

In light of the above mentioned division of water management, SWOT analysis of the scheme of water management in Poland has been conducted (Table 3.2).

Both endogenous and exogenous factors listed in the SWOT analysis are mutually correlated. For example, lack of mutual information exchange between the institutions responsible for water management and condition of geographic environment influence overall knowledge about conditions and users in a whole basin. On the other hand, the participation of all stakeholders in the decision making process related to water management in a region may lead to a slowdown of projects implementation due to a long decision making and agreement procedures. The consequences may be incomplete exploitation of the EU-provided funding.

In order to verify endogenous and exogenous factors of integrated water management in Poland, there have been 10 interviews conducted with persons employed by the institutions responsible for water management in Poland. Those were: Regional Water Management Authorities, Provincial Drainage, and Water Facilities Authorities and civilian officers responsible for issuing water law consents in district offices. During the interviews, attention was paid at practical functioning of the organizational scheme of water management in Poland and to pointing out the strengths and weaknesses of the water management system in Poland. The results were grouped into a few topics. Five issues, which were important from the point of view of state and municipal administrations and may comprise a source of conflict have been noted.

- Lack of Information Flow Between Local and National Government Units

The division of competence at government level between different ministries, as well as vertically in different areas of activity (basin, region, country) mean that the proper implementation of some tasks in water management becomes almost impossible. The main source of conflict, therefore, is the lack of information flow (bad system of communication and coordination between various levels of administration).

- Lack of Cooperation on Planning River Basin Management

The implementation of the Water Framework Directive into national law meant that public participation in water management finally became possible. During the determination of drainage basin management plans, public consultations are organised with the invited local government institutions responsible for water management in the area and environmental groups. Residents of the region (local community) can

Table 3.2 Endogenous and exogenous factors water resources management in Poland on the basis of the SWOT method

Endogenous factors	
Strengths	Weaknesses
– Separation of authority at state and municipal levels (decentralisation) – Management based on catchment of large rivers (hydrographic division) – Fulfilment of tasks at state, regional and local levels – Plans and planning documentation at the state level and for the EU	– Fragmented small watercourse management (administrative borders) – Lack of mutual information exchange between the institutions responsible for water management and geographic environment state – Overlapping competences of the employees of the institutions related to water resources management – Lack of a coherent database containing information on the geographic environment that would be available to all institutions responsible for water management, to the society and to water users – Lack of coherent interpretation of provisions of Water Law and other acts – Setting public consultations for local groups at locations far from the place of residence of the people interested in a given problem and lack of information about such consultation at the local level – Poor hydrotechnic infrastructure state on small watercourses resulting from lack of funding in the budgets of small municipal units (e.g., communes)
Exogenous factors	
Opportunities	Threats
– Comprehensive knowledge about conditions and users in the whole catchment – Increased involvement of local societies – Enhancement of hydrotechnic facilities – Easier implementation of large investments – Enhancement of the natural environment state with cooperation of local, municipal and state authorities – Inland navigation development – Development of tourism and recreation – Complete implementation of the assumptions of the WFD	– Competition between organisations in the area of decision making, which makes cooperation more difficult – Too long decision making and agreement procedures, which results in a slowdown in projects implementation – Too many individuals taking part in decision making – Reduction of biodiversity and fragmentation of biologically active areas – Incomplete usage of funding from the EU – Penalties imposed by the EU due to incompliance with the WFD

– and in principle should – participate in these consultations, but information about meetings does not always reach them on time, or they do not know where to look for such information, or the consultations are located in the significant distance from the place of residence. However, there is a chance that with time, social awareness in this regard will be higher, and interest will increase.

- Inconsistency of Databases and Unified Information System as Well as Access to Information

In Poland, there was no integrated information system of water management. Every Regional Water Management Authority had its own system, which was not consistent with that in other water regions. This prevented potential users and decision-makers from using full information about the state of the environment in drainage basins, analysing and assessing the environment as well as examining their impact on the state of various alternative investment and organisational solutions. On the other hand, the lack of direct access to basic hydrological data by users, but also local governments, shows that the information contained in different types of studies is inconsistent.

- No Precise Description of Powers and Tasks for Individual Institutions

This is evident in the context of issuing water supply consent for special use of water. Each of the institutions involved in the procedure had different guidelines, and thus in many issued decisions, there is no relevant hydrological information, or the decisions were issued illegally. It was, therefore, necessary to introduce a provision relating to the substantive scope to be met by water supply consent.

- Inconsistent Interpretation of Laws by Individual Institutions

According to the interviewees, this factor was the major source of conflicts. Often different interpretation of the regulation by different institutions led to issuing different decisions in the same subject. It seems essential to introduce appropriate training for employees of institutions on each level, starting from communes up to voivodeship (regional) and as well within Regional Water Management Authorities and Provincial Drainage and Water Facilities authorities. Such training may comprise a point of experience and knowledge exchange in the area of proper management and may be a stage for determination of proper task coordination at various levels.

3.4 Water Management After 2018

Water management in Poland is still carried out both through the state and local governments. The management of water resources after the introduction of changes in the organizational structure is carried out mainly by the Ministry of the Environment and the Ministry of Maritime Economy and Inland Navigation.

The main entity responsible for national water management is Państwowe Gospodarstwo Wodne Wody Polskie. It operates based on the provisions of the Act of 20 July 2017 – Water Law (Journal of Laws, items 1566 and 2180), and the statute

granted by the Regulation of the Minister of the Environment of December 28, 2017 (Journal of Laws 2017, item 2506).

Changes in the organizational structure in water management were introduced on January 1, 2018. As a result of these changes, the Boards of Melioration and Water Facilities were liquidated. The entire water management was taken over by the "Wody Polskie", which was established based on the existing Regional Water Management Boards. It is a state legal entity (Article 9, point 14 of the Act of August 27, 2009 on Public Finance, Journal of Laws of 2016, item 1870, as amended), which includes the following organizational units (Figs. 3.3 and 3.4):

1. The National Water Management Authority with headquarters in Warsaw;
2. Regional Water Management Authorities with headquarters in Białystok, Bydgoszcz, Gdańsk, Gliwice, Kraków, Lublin, Poznań, Rzeszów, Szczecin, Warsaw, and Wrocław;
3. 50 catchment management boards;
4. 330 water supervising committees.

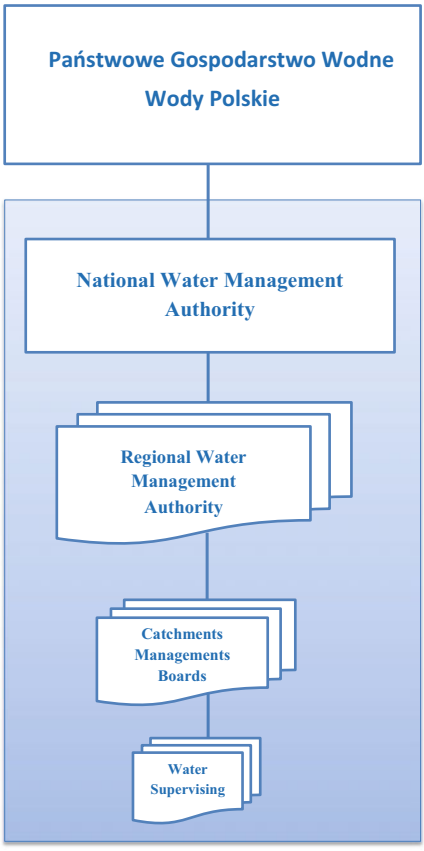

Fig. 3.3 Organizational structure of Państwowe Gospodarstwo Wodne Wody Polskie

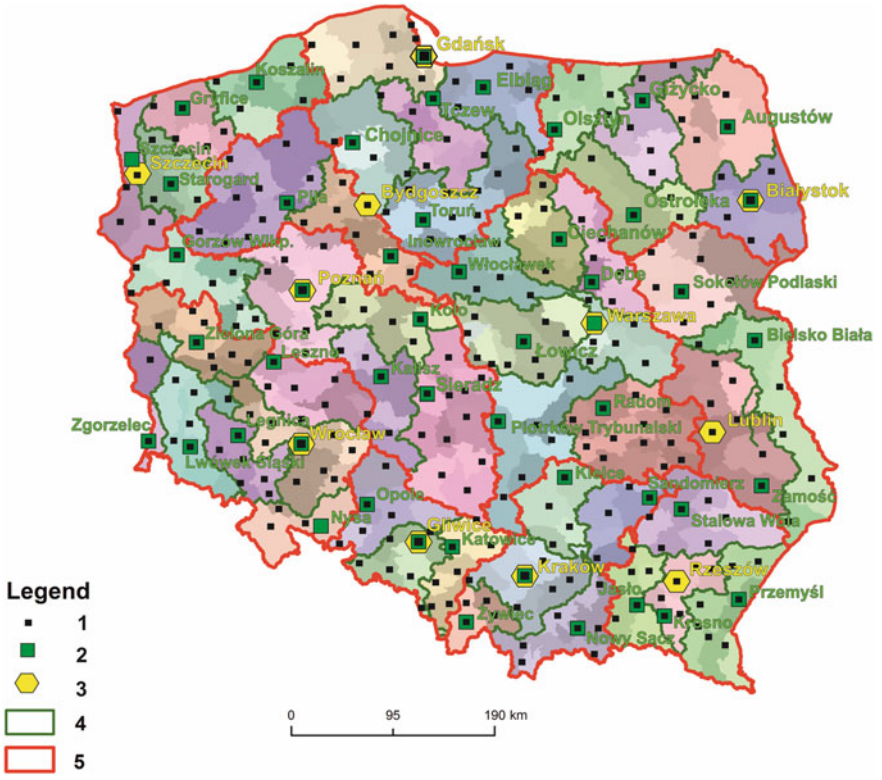

Fig. 3.4 Map of areas of operation of Regional Water Management Authorities, Catchments Management Boards and Water Supervising (as of July 6, 2018) [43]. Explanations: 1 – Water Supervisings headquarters, 2 – Catchments Management Board headquarters, 3 – Regional Management Authorities headquarters, 4 – boundaries of Catchments Management Boards, 5 – boundaries of Regional Water Management Authorities

Regional Water Management Authorities were established based on the previously existing 7 RZGW (Gdańsk, Szczecin, Poznań, Warsaw, Kraków, Gliwice, Wrocław). As a result of the reduction of the area of operation of the existing RZGW units, additional 4 new units have been created, i.e., Bydgoszcz, Lublin, Rzeszów, and Białystok.

The new institution responsible for water management in Poland has taken over from local governments the tasks of issuing water law consents for special use of water and establishing fees for water usage. These tasks are currently carried out by the management of the catchment. Collective water supply and collective sewage disposal is still the communes' own task. The changes concerned issues related to the setting of water tariffs charged by municipal or commune's water and sewage companies. The rates of water fees are subject to approval by the Director of Regional Water Management Authority and not, as before, by the municipal council.

Supervision over the Institute of Meteorology and Water Management from January 9, 2018 is held by the Minister of Maritime Economy and Inland Navigation, and not as previously the Minister of the Environment.

Despite the establishment of a new institution dealing with water management in Poland, which is Państwowe Gospodarstwo Wodne Wody Polskie, already in the first months of its functioning, there were problems with the implementation of its tasks. Starting from technical issues related to the creation of new regional water management boards and river basin management boards, appointing new directors, employing staff from former melioration boards and from local governments, creating new posts for issues related to the timely processing of applications for the issue of water law consents. Some of these problems have already been resolved and resulted from the lack of a transitional period when transferring assets, documentation, and arrangements that were previously in the remit of the melioration boards or local governments. The problems related to the interpretation of the provisions of the Water Law Act, as well as the lack of a common database and a unified information system remain valid. The solution to these problems should in the first place be the creation of a training system for the employees, but also for the stakeholders. This will avoid conflicts between officials and the public. Doubts about the special use of water, management principles in catchment terms should be determined and consulted as part of regular meetings of officials with the local community. The creation of a shared database is necessary, but it requires a systematic approach that takes into account the interests of all institutions dealing with water management in Poland. This requires a solution at the central level, taking into account the scope of data and the form of making it available. Proper assessment of the functioning of the current structure of institutions responsible for water management in Poland should be prepared in a few years.

3.5 Discussion

The problem of proper water management is not Poland-specific. It pertains to other countries as well [44–47]. Lack of coordination between state government and municipal governments, data sharing and informing the society are the problems of, among others, Canada [48] and Germany [49]. German experience shows [50, 51] that determination of introduction of the WFD requires an analysis of the efficiency of new law regulations introduced in the administration. Similar conclusions were made on the implementation of the first stage of the WFD introduction in Sweden [52].

Integrated water management is characterized by the consistency between various aspects of water management [53]. As indicated in this paper, integrated water management in Poland did not fully comply with the assumptions.

Water resource management in Poland at the catchment level was introduced yet in the 1990s. However, the other matters of integrated water resource management like participation of society and all stakeholders have been introduced by the Framework Water Directive. An important part of water management on the state or municipal

level is the issue of interactions between all users of a basin. According to van den Brink and Meijerink [54], it is important to shape dependencies between various entities. Relatively independent actors have to work together in one way or another while possessing different bits of information, representing different interests and pursuing different interests through separate, often conflicting courses of action. In addition, as indicated by Bakker and Cook [48], an active approach to sharing the experience among various level officials will allow introducing efficient innovations throughout the whole country.

As written by McDonnell [55], independent on the water management system type, decentralised or governmental, conscious decision making in water management should be based on thorough and up to date information, which must be available to all the stakeholders within a basin [56]. Only providing access to historical and current hydrological data allows for a full understanding of water management in environmental, social, cultural, and economic aspects. According to Franzen et al. [57], access to information should be adapted to various integration levels, from passive information access towards higher integration levels, such as consultations and common planning, up to local involvement. Information and consultation are a passive form of participation, while the third level encourages active involvement.

There is a need for cooperation between various levels of authority, political sectors, and public and private entities on local, regional and country levels. It is possible through the application of a coordinator role, whose responsibility is cooperation between various organisations involved in the creation and implementation of climate adaptation strategies. Most often, the governmental agencies are the ones who play a key role in adaptive projects implementation. Establishing connections between various levels of state administration, politics, science, and private investors may consist in, e.g., initiating meetings, establishing workgroups, including additional people into existing networks [58].

Integrated water management underlines the joint functioning of various institutions responsible for water management within a river basin. The analysis showed that in practice such activities in Poland were far from being integrated, and the levels of mutual cooperation differed.

The introduction of the new Water Law Act of July 20, 2017 and organizational changes in water management in Poland after January 1, 2018 led to the creation of one institution responsible for the management of waters in scope catchments. The current structure of water management in Poland has been functioning for less than two years, and it is difficult to assess the extent to which the situation in water management has improved. However, there is a chance that thanks to such an organization of water management in Poland, with fewer institutions deciding on the fate of water management, we get a quicker response and exchange of information, better communication between the watercourse administration and stakeholders and public participation.

3.6 Conclusions

The organizational structure of water management, which operated in 2001–2017 in Poland, was not conducive to the sustainable development of water management. It resulted mainly from 2 institutions dealing with water management, which functioned in the administrative and sub-basin divisions. Despite the introduction of the WFD and its functioning in Poland for over 15 years, there were many problems that were not completely resolved. The new institution dealing with water management, Państwowe Gospodarstwo Wodne Wody Polskie, has been operating since 2018 and its focus is only on the catchment area. It is subordinate directly to the Ministry of the Environment. Despite the reform, some of the problems related to water management are still valid. The most important issues to be dealt with in the near future are the training of employees at various levels and stakeholders in the interpretation of water law. Systematic meetings of officials responsible for water management with the local community, directly in the field, constitute an important element of integrated water resources management. The lack of a common database and access to information for all authorities at local, regional, and public level causes misunderstandings. This database should be implemented as part of interdisciplinary national projects, which should be coordinated at the government level. The problems mentioned above are not new. They have already appeared before. As the time of functioning of the new institution responsible for water management is short, there is a hope that in the coming years these problems will be solved in a systematic manner, which will allow for the integrated management of water resources. Therefore, the time for a full assessment of the activity is still ahead, in the future.

3.7 Recommendations

This chapter presents institutions responsible for water management in Poland and their responsibilities. In the future, the focus should be on research showing current water management in Poland in the opinion of officials, local government officials, stakeholders and society. It will be particularly important to pay attention to the development of effective communication schemes between various institutions. The method of communication plays a key role in making decisions, especially in crisis situations.

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