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Article

Cluster Policy in Poland—Failures and Opportunities

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Abstract: The EU has been leaning towards evidence-based policymaking with the aim of ensuring coherence between industrial, environmental, climate, and energy policy. It focuses on supporting the development of a business environment which would enable sustainable growth, job creation, and innovation. It is generally agreed upon that, at the current level of development, the EU should focus on boosting innovations and theory and practice deliver an array of suggestions on how to achieve this goal. Among them clusters and cluster-led development play a prominent role. Poland inherently follows this belief and has introduced cluster policy to its policy mix by supporting cluster initiatives and cluster organizations. The objective of the paper is to investigate the evolution of cluster policy in Poland, identify its success factors, and propose recommendations for cluster policy. This case study of cluster policy in Poland is based on a series of in-depth interviews as well as secondary data. The conclusions resulting from this case study indicate that adoption by the government of a cluster policy at the national level and implementation of a comprehensive strategy for cluster development at regional and national levels is a basic condition for cluster policy success. Positive results can be achieved if public intervention is continuous and tailored to the needs of cluster organizations at different development stages with particular emphasis on the internationalization of cluster activities, which was a key measure highly evaluated by the respondents. The paper touches upon the timely issue of the future direction of cluster policy. The debate on it is accompanied by another debate on how to build an economic ecosystem capable of reaching sustainability goals.



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Keywords: cluster; cluster organization; cluster policy; competitiveness

1. Introduction

Differences in the level of competitiveness and innovativeness between and within countries prompt governments to develop and implement actions that could potentially aid them in closing the existing gaps. When they engage in their quests to achieve this goal, it becomes evident that they are opting for an interventionist approach. However, government interventions in the economic ecosystem are slippery ground, as they may generate policy failures [1–3]. Undoubtedly, history delivers vast evidence of cases ranging between governments excelling in or failing at their policies [4–7]. When the former materializes, other governments should take notice, deconstruct these cases, and, if plausible, redesign them accordingly and follow warily. Lessons are also to be learnt in the latter case, especially since disentangling the reasons behind policy failures allows to avoid more- or less-evident mistakes.

When deciding on how to address the issue of raising competitiveness and innovativeness, governments around the world have been known to follow in the footsteps of their more successful counterparts. Therefore, thriving economies become guideposts, and their policies are duplicated at different latitudes and longitudes. If theory is hidden behind these policies, all the more arguments work in favor of following their approach. Such was the case of clusters and the emergence of the cluster-based economic policy model [8–10]. Clusters as “geographic concentrations of interconnected companies, specialized suppliers,

service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate" [11] have become the focal point of cluster-led development [12–14]. One of the reasons behind their emergence as a concept around which policy effort is being designed to boost competitiveness and innovativeness [15] was their more-or-less successful implementation in several countries and regions, which included Sweden [16–18], Norway [19], Germany [20], Ireland [21], and the Basque Country [22–25].

With the advent of encouraging evidence on the effects of cluster policy, the European Union decided to add cluster policy into its agenda, and soon the cluster theme was seeded in the minds of policymakers from its member states [26], Central and Eastern European (CEE) countries included. However, the approaches to cluster policy followed in Europe are diverse [27]. Two decades into the 21st century, many of them have gone through various stages of cluster policy development, and today we can learn from their experience while rethinking future paths of development, especially in the times of great economic distress. As "an expression of political commitment, composed of a set of specific government policy interventions that aim to strengthen existing clusters and/or facilitate the emergence of new ones" [28], cluster policy remains, like any other policy, a puzzle consisting of different interventions at governments' disposal. Each government has been putting those pieces together independently, and, as a result, lessons can be drawn by looking deeply into each case and adding conclusions to the already established knowledge.

With this in mind, this paper considers the case of cluster policy in Poland. The evolution of its cluster policy can serve as an example especially for countries and/or regions that start to support clusters. In particular, the failures of the cluster policy in Poland provide the knowledge on how to shape the support measures to avoid mistakes and inefficiencies. This case study of Poland is an illustration of a country that started to implement EU policies almost two decades ago, and the conclusions can be extended to other countries which entered the EU at the same time or later.

The objective of this paper is to investigate the evolution of cluster policy in Poland, identify its success factors, and propose recommendations for cluster policy. The remainder of the paper is structured as follows. Section 2 reviews current literature pertaining to two areas: reasons for policy mishaps as well as clusters and the life cycle of cluster policies that are designed to foster cluster development. Section 3 is devoted to the paper's methodology issues, including the process of data collection. Section 4 presents the authors' research into cluster policy in Poland and is divided into parts whose narrative departs from analysis of its evolution, followed by the tools that were implemented throughout the process of its development and their respective effects. It then leads to the new direction that Poland took with the incorporation of the Polish Key National Clusters program. This section is concluded with the authors' proposal of future cluster policy in Poland as well as a description of the limitations of the study presented in the paper. The last section concludes the narrative in the paper and offers recommendations for researchers and policymakers.

2. Theoretical Background

2.1. Failure to Deliver: The Reasons behind Policy Mishaps

The debate on the pros and cons of government interventions in an economy is a longstanding one [29,30]. It is fueled by shifts in the economic and political landscape which alternately take the wind out of the sails of either supporters or opponents of the approach in which the state adopts an active role in the economic system. The intensity of deliberations or, in other words, the clash over free market versus government intervention fluctuates. However, it is not a matter of choosing only one from a dichotomous set of options. It is rather about choosing the shade of grey within the continuous spectrum between two extremes at which governments can position their policies and the actions that unfold.

As the policy mix undergoes transformations, so too do the policies within it, and as time progresses interventions within every policy can lessen or amplify. Whether the

former or the latter takes place, it is a result of the arguments at the disposal of proponents of either the free market or the interventionist doctrine.

Theory provides arguments on why, when, and how government market interventions should take place [31]. It is generally believed that it should lead to combating existing market failures in a way that brings improvement. If a policy is to work against market failures or inefficient markets, then their causes must be clearly identified (public goods, asymmetric information, externalities/spillovers, coordination problems, etc.) and intervention should be set on fighting the causes and not their consequences. It should be about fighting the root of the problem, not the effects. However, some questions arise. First, when is a market failure significant enough that the market requires intervention? Second, will the designed intervention be impactful enough to bring expected change? Third, will the benefits exceed costs? These questions are important when evaluating any policy's impact, usefulness, and efficiency and putting a label on it as either a success or a failure.

The possibility of governments failing at their policies acts as a fuel in the debate on whether government intervention is necessary in the first place and, if yes, then what its scope should be. Vast research has been published on policy failures, e.g., [32–35], and it seems to be more prominent in numbers than studies on success stories, e.g., [36–38].

Before delving into the issue of why public policies fail, one must decide what constitutes a policy success or failure, as both take many forms. This can be done by way of interpretation and emphasizing meaning [39,40] or by perceiving success as a fact “amenable to positive identification” [41]. The assessment is “a multi-dimensional, multi-perspectivist, and political process” [42]. To rule on policy success or failure one needs to compare its goals and outcomes and confirm to what extent the goals were reached. Goal achievement is related to the tangible aspect of policy success [6]. The goals need to be clear and reachable. Due to these two attributes, policies that follow clear but narrow goals are more likely to succeed than those with fuzzy and broad goals. Too often policy action designed to deal with an important issue falls victim of mistakes made at the very beginning of the policy process, when the goals are defined. The outcomes should be, above all, easily identifiable which might be very challenging when analyzing economic phenomena as targets of the engineering efforts of policy-makers. Isolating causality between factors impacting economic outcomes is a daunting task, as many processes occur simultaneously in the economy.

According to Compton, Luetjens, 't Hart [42] “a policy is successful to the extent that it purposefully creates widely valued social outcomes through rigorous processes and manages to sustain this performance for a considerable period of time, even in the face of changing circumstances”. This definition includes a temporal dimension to assess policy success. Therefore, a policy which responds to changing circumstances and is adapted accordingly can also be deemed successful. Whereas according to McConnell [6] “a policy is successful if it achieves the goals that proponents set out to achieve and attracts no criticism of any significance and/or support is virtually universal”.

There are various reasons for policy failure which include “overly optimistic expectations; implementation in dispersed governance; inadequate collaborative policymaking; and the vagaries of the political cycle” [43]. Many of them stem from the fact that policy is based on people's decisions which are burdened with error even when they are made as a collective effort. Simply put, due to the human factor, policy and government interventions are accompanied by risk, and therefore any policy is prone to failure.

Another issue which may impede governments from reaching their policy goals is that the government may also fall victim to information problems [44] which may lead to ineffective intervention. Without access to information, actions can be misdirected or wrongly designed, and instead of working against market failures, they can result in harmful government failure and misuse of public funds. Moreover, policymakers, in order to overcome market failures, design actions that are supposed to impact human behavior. However, the government can never be sure whether the response it had anticipated before

implementing its policy will eventually materialize. This happens partly due to the fact that individual interests can override public interest.

2.2. Clusters and Cluster Policies

2.2.1. Is It a Bird or Is It a Plane?

Soon after the emergence of the idea that clusters determine the growth and development of economies, various efforts were put in place to acquaint policymakers as well as other entities with this novel concept with the aim of introducing it into the policy debate. The cluster theme has since been adopted in various national and regional policies. However, in the early days some misconceptions arose as to the meaning behind the following terms: cluster, cluster initiative, and cluster organization [45].

Clusters are geographic concentrations of interconnected companies, their suppliers and service providers, as well as related actors from other industries along with associated institutions [11]. Clusters possess many attributes, among which geographical proximity remains the key along with the fact that they bring together a multitude of stakeholders [46]. The linkages established between them allow for an accelerated diffusion of know-how and skills [47]. These structures are organized around core industries located within specific geographic boundaries [48]. They are also closely related to two other concepts—cluster initiatives and cluster organizations. Both concepts are important from an economic point of view, as their occurrence reinforces the chances for a successful cluster development process. Cluster initiatives are “organized efforts to increase the growth and competitiveness of a cluster within a region, involving cluster firms, government and/or the research community” [49], whereas cluster organizations are “specialized institutions that run cluster initiatives” [50]. They are platforms of cooperation whose role is to provide support to clusters and cluster initiatives.

The existing narrative on clusters and their role in economic development provides many instances in which the lines between the three concepts are somewhat blurred. As a result, cluster initiatives or cluster organizations are confused with clusters [51]. This especially occurs at the initial stage of introducing the cluster theme into the policy agenda, and in order to avoid any misconceptions, it is necessary to disentangle the terminology at the early stages of implementing cluster policy. Cluster policy success depends on whether all relevant actors understand and agree on the meaning behind its key concepts as well as their intricacies. This is a necessity but not a sufficiency, as many determinants shape cluster policy outcomes.

2.2.2. Cluster Policy Life Cycle as a Process of Learning How to Engineer Success Stories

Clusters played their role in economic development long before Porter coined the term at the turn of the 1980s and 1990s. Moreover, stories of their emergence, development, and decline—although many of them in no way mention the word cluster—can be tracked back to different times and locations. The same applies to studies on the relations among cluster participants—who compete but also cooperate—which have been closely looked into by various authors, e.g., [52–54].

The introduction of the cluster theme into the economic discourse resulted in the first attempts of governments at having direct impact on cluster development. Instead of allowing for an “organic” development path, they wanted, and still want, to play an active role. Government intervention has therefore taken the form of cluster policy, which is a set of specific policy interventions whose role is to strengthen existing clusters as well as facilitate the emergence of new ones [28]. Cluster policy is closely related to industrial policy, the objective of which is to “improve economic performance by favoring, either directly or indirectly, certain sectors of the economy” [55].

Until this day cluster policy has been designed and executed in different locations and under different circumstances. Analysis of this amassed collective experience, e.g., [9,56–60], results in the following conclusion: cluster policy is a “made-to-measure” venture rather than a “one-size-fits-all” approach.

If a given approach to cluster policy has been successful in one location, it may not necessarily be successful in others. Moreover, trajectories of cluster policies' evolution can deviate from any model approach. With time, policy undergoes re-examination and redesign, e.g., in order to match the conditions of the changing ecosystem and, therefore, it becomes a complex process.

Research on the development of cluster policies is dominated by multi-stage models. For example, Raines [61] developed a model of cluster policy development comprised of the following four stages: analysis, development, implementation, and evaluation. He also stated that policy making is a multi-stage process in which, at any stage, adaptation can take place which can alter the processes as well as goals and instruments of policy making. At the same time, OECD [62] proposed a multi-stage model of cluster policy development. Soon, proposals by other authors followed. They include a paper by Konstantynova and Wilson [63], who identified seven stages of cluster policy development: discussion initiation, economy and cluster analysis, policy review; policy development, policy implementation, evaluation and monitoring, and policy improvement. The abovementioned stages repeat and evolve as time progresses [64]. The common characteristics of these models is that they describe cluster policy development as a process starting at introducing the idea of cluster-led development and ending with evaluation and improvement of the undertaken actions.

With regard to changes in cluster policy, most authors use the terms 'development' or 'evolution', and only a few employ the term 'life cycle'. Raines [65] was the first author to mention "cluster policy life cycle" in his publication. Ever since then, unlike the concept of "cluster life cycle", it has not been as frequently used. Moreover, Raines' use of the term was aimed at describing the previously mentioned four stages of cluster policy evolution, and his approach was far from the notion of the cluster life cycle model which includes the following stages: emergence, growth, maturity, and decline. Therefore, it is our proposal to define "cluster policy life cycle" as a cycle of transformation that a cluster policy undergoes between its emergence (introduction into the policy mix) and decline (removal from the policy mix). The respective stages/phases of the cycle (emergence, growth, maturity, and decline) are repetitive in nature and can occur in a different order and be of different length between the beginning and the end of the cluster policy life cycle. Moreover, once removed from the policy mix, cluster policy can be reintroduced.

To sum up, cluster policies change over time, and their respective stages influence the economy and, above all, clusters located within it. Depending on how they unfold, their effects differ in magnitude.

3. Methodology

To examine the changes in the approach to cluster policy in Poland the authors analyzed regulations, strategies, programs, reports, and literature on the subject. In particular, the regional development strategies and regional operational programs were studied to identify the instruments of cluster policy at the regional level.

The criteria used for analyzing the cluster policy in Poland were based on the approach taken by the European Commission for the evaluation of cluster policies in European Member States. According to this methodology (presented in the country factsheet), the maturity of a cluster policy is measured by: policy scope, consistency, evidence of performance, and instruments [66].

The policy scope is understood as the dedicated cluster policy or the existence of targeted cluster policies; the consistency of cluster policies is defined as the duration and experience of the country in doing cluster policies. Evidence of performance is described by monitoring and evaluation mechanisms, and the last criterion, instruments, is understood as financial or technical assistance for clusters.

In addition, in-depth interviews (IDIs) with policymakers both at the national and regional levels were conducted. This approach results from the case-study methodology that envisages the collection of mostly qualitative data from various sources. The case study method explores "a real-life contemporary bounded system" over time though in-depth

data collection from multiple sources of information [67]. The case study of cluster policy in Poland is practice-oriented, therefore different perspectives are represented: regional self-government, policymakers at the national level, and cluster managers. The respondents of the interviews representing regional self-government were chosen in order to cover both the regions where cluster policy was implemented (Małopolskie, Pomorskie, Mazowieckie) and less developed regions where no measures supporting clusters were undertaken (Warmińsko-Mazurskie). Cluster policy differs between these regions and ranges from a policy mix including financial support for clusters in Mazowieckie region, to less advanced instruments in Pomorskie and Małopolskie, and to no support in Warmińsko-Mazurskie. The selected regions vary in terms of socio-economic development, number of clusters, and the location of Key National Clusters (Table 1).

Table 1. Selected voivodships' profile.

Voivodeship	GDP at Current Market Prices [2019]	Number of Key National Clusters [as of 1 January 2022]	Regionally Relevant Ecosystem Nodes	Financial Instruments Supporting Clusters (Regional)	Other Regional Instruments
	(1)	(2)	(3)	(4)	(5)
Małopolskie	43,214.82 (p)	3	Energy-intensive industries; Agri-Food		x
Mazowieckie	121,609.75 (p)	1	Digital; Cultural and creative industries; Agri-Food	x	x
Pomorskie	31,567.19 (p)	2	Electronics; Aerospace & Defense		x
Warmińsko-Mazurskie	13,547.82 (p)	0	Agri-Food; Energy-intensive industries		

(p)—provisional. Source: Own elaboration based on (1) [68]; (2) [69]; (3) [66]; (4,5) regional development strategies and regional operational programs.

Another view was provided by the policymakers responsible for shaping cluster policy at the national level (Ministry of Economic Development and Technology, Polish Agency for Enterprise Development). The interviews were carried out with directors or deputy directors of departments responsible for regional development in the Marshall Offices (at the regional level) or responsible for cluster policy or support programs (at the national level). The information collected through interviews with policymakers was supplemented by interviews with cluster managers. Altogether, ten interviews were carried out in mid-2019 with the use of a semi-structured questionnaire (four with the representatives of regional authorities—Marshall Offices, four in the national institutions, and two with cluster managers). The IDIs allowed us to build a unique database encompassing a broad set of otherwise unavailable data.

The interviews were complemented by materials (e.g., presentations) from meetings with cluster managers and the Working Group on Cluster Policy. The Group consists of representatives of state institutions, including ministries and governmental agencies, as well as regional self-government, businesses and cluster organizations, and experts. The data from the survey among cluster managers on the needs of cluster organizations was obtained from the Ministry of Economic Development and Technology. The database contains responses from 44 cluster managers, therefore the generalizability of the results is limited (according to the ECCP Platform there are currently 71 clusters in Poland). The information was collected by a professional market survey company with the use of the computer-assisted telephone interview method in 2019. The data is not publicly available but can be obtained from the Ministry on request (Ministry of Economic Development and Technology, 2019). The analysis presented in the paper was supplemented by web scraping.

4. Results and Discussion

Referring to the evaluation criteria of the cluster policy, the policy scope is discussed in this section, the duration and experience of cluster policy is analyzed, and some examples of instruments are presented. There is not much evidence from monitoring and evaluation (the third criterion used for the assessment of cluster policy) as the tools have been implemented only recently.

4.1. Case Introduction

Many European economies throughout the 20th century consecutively went through stages in which the narrative towards government intervention was becoming more or less favorable. However, Poland, due to its political context, did not follow the same sequence. After World War II the country was centrally managed and state ownership was predominant. With time, the socialist economic system in eastern Europe became over-centralized [70], and following a period of social unrest which called for change Poland, started its conversion to an economy of private ownership, market competition, and individual entrepreneurship. During the initial stage of the shift, it followed the ‘shock therapy’ approach as advised by Sachs [71]. However, before it happened, the government was slowly introducing pro-market reforms in the 1980s [72].

Among CEE countries Poland has had a particularly interesting path of development following the 1989 collapse of socialism and the subsequent transition to democracy and market economy under policy prescriptions of the Washington Consensus. During the 1990s the country joined several international organizations (WTO in 1995, OECD in 1996, NATO in 1999). Today the Polish transformation is perceived as a case in which institutions played an important role in the economy becoming a leader in the region [73] despite suffering, just as other post-socialist economies did, rising unemployment and other negative effects in the early stage of transformation [74]. Naturally, the country needed to decide on a new and refined approach to all its policies, including industrial policy, which were supposed to shape the Polish economy moving forward. At that time, government intervention was less visible to demonstrate a break with the past policy focus. As industrial policy is often believed to be leading to unnecessary and uncalled for intervention, during the Polish transformation, it lost its magnitude and only recently has become slightly more prominent which coincided in time with the emergence of the innovation paradigm and innovation policy.

In 1994 the country applied for EU membership. The accession took place ten years later, but before it materialized, Brussels and Warsaw collaborated extensively on Poland adapting its approach to the EU policy agenda in various policy areas. It was during this time that cluster policy actions were first introduced.

Today in Poland there are several mature cluster organizations which have gathered the potential necessary to implement public tasks in the field of education, digitalization, networking, accelerating the growth of innovative SMEs, sustainability, establishing science–business collaboration, and combating the negative consequences of the COVID-19 pandemic. However, they are not evenly distributed among voivodeships (coterminous with NACE 2 regions). Some regions are home to several mature cluster organizations while others do not currently possess cluster organizations of such magnitude (Table 1).

Support for clusters in the Mazowieckie Voivodeship took place as part of the open competition between tenders for the implementation of a public task in the area of “activities supporting economic development, including entrepreneurship development”. It was the only financial instrument at the regional level. In the Małopolskie Voivodeship, in turn, an open tender competition took place for the selection of a cooperation operator who, on behalf of the region, would involve enterprises and clusters in activities carried out under the Avant-garde Initiative, taking into account the necessary development of smart specializations in Małopolska. This activity was focused on supporting smart specializations and the growth of companies and clusters in these areas.

4.2. Cluster Policy in Poland: An Evolutionary Perspective

The history of Polish cluster policy dates back around two decades [75]. Its life cycle can be divided into four stages: inception (emergence), extensive growth (growth), decline, and rebirth. Its emergence unfolded at the beginning of the 21st century. In the years 2003–2007, the promotion of the idea of clustering played a prominent role. Through structural funds, the training of potential animators was carried out to prepare for the effort to consolidate entrepreneurs around the idea of cooperation. This period can be described as time devoted to spreading the idea of clustering. It was accompanied by the first incubations of cluster initiatives in the bottom-up model. In the years 2005–2007, PLN 5.76 million was allocated to the Clustering Training Program.

The second stage started in 2008, when the instruments financed by the EU were commenced. Programs directly dedicated to clusters were implemented with the support of EU funds, and approximately 50 cluster organizations received support. In 2011, a Working Group on Cluster Policy was established. The Group developed recommendations that formed the basis for decisions on future cluster policy at both the central and regional levels. During this time its role was also to serve as a platform that brought together various cluster policy stakeholders. The experience from this stage allows one to state that it is beneficial to engage stakeholders representing different interest groups in the process of developing cluster policy. The policy should be developed in a transparent way, providing enough space for comments, consultations, and discussions.

During this stage, cluster organizations received intensive support both for the creation and the development of clusters. As a consequence, many cluster organizations were formed mainly to receive resources from the EU structural funds, and after the end of support programs they ceased their activity. During this period, additional support was launched for cluster initiatives in Eastern Poland under the Eastern Poland Operational Program. Moreover, a number of supra-regional cluster organizations were created, some of which have been operating to this day. However, a significant proportion of them have either collapsed or are in hibernation by now [76].

At the end of 2014, conceptual work was completed related to the development of a system for selecting Key National Clusters (KNC). To this day, the selection of KNC is one of the pillars of the cluster development support system in Poland. The KNC selection system has enabled the identification of clusters of the greatest importance for the Polish economy.

Following that, cluster policy entered its third stage—decline—during which there were no instruments dedicated to clusters except for one measure for cluster internationalization, which was available just to KNCs. Due to the small amount of funds for clusters, there was a need to focus on the most promising ones. Only those clusters that received the status of KNC could apply for funding under the dedicated instrument for internationalization, under the Smart Growth Operational Program (SG OP). Thanks to the concentration of cluster policy on the KNC, there was a gradual professionalization of management in clusters, and leaders have emerged in the group of highly developed clusters. The concept of leading clusters/cluster organizations introduced in Poland and the way the KNC have progressed, form the basis for drawing the conclusion that selecting a group of clusters (cluster initiatives/cluster organizations) that are promoted and visible in the economy helps to share good practice and provides a benchmark for developing or emerging ones.

2020 brought a new outlook for the future of cluster policy in Poland (rebirth). From this point on it is supposed to play a more prominent role in economic development as new instruments dedicated to clusters are being introduced. A summary of the discussed stages of cluster policy evolution is presented in Table 2.

The historiography of cluster policy in Poland is a topic raised mainly by Polish authors. In one of the most recent works published, Kuberska [50] proposes a framework of three stages of cluster policy evolution: “the embryo phase”, “the golden age”, and “the decline and reinvention”. However, the evolution proposed in that paper is solely descriptive, based on secondary data, and few aspects of regional cluster policy are mentioned. Similarly, Haberla [77] also divides the history of cluster policy in Poland in stages but does

not employ a theoretical model approach to the conducted analysis. The obtained results expand the knowledge on the evolution of cluster policy life cycle in Poland.

Table 2. Stages of the Polish cluster policy life cycle.

Stage	Inception	Extensive Growth	Decline	Rebirth
Period	2003–2007	2008–2014	2015–2020	2020–
Characteristics	Promotion of clustering Incubation of cluster initiatives Cluster managers' training	Financial support—the EU funds directly dedicated to clusters Rapid increase in the number of cluster organizations	Very limited public support for clusters Gradual extinction of cluster organizations Professionalization of several clusters	Cluster-based economic development policy New instruments dedicated to clusters

Source: Own elaboration based on literature review and conducted interviews.

4.3. Tools Implemented and Their Effects

In each stage of cluster policy implementation in Poland, specific instruments were dedicated to clusters. Poland, like most post-communist countries, had a limited tradition of cooperation and an exceptionally low trust level [78]. Support for clusters from the administration was very limited. After 1989, companies lost many contracts (mostly contracts from the state and the Soviet Union). Many employees who lost their jobs started to establish their own small, yet innovative, companies. For many years after the collapse of communism, their business activities were still of a very small scale. Soon they recognized that they have to start cooperating in order to become stronger. The beginnings were very difficult due to various cultural aspects. The EU funds for clusters were an incentive that helped to alter this attitude. In this respect, the first period of cluster policy in Poland focusing on spreading the idea that clustering was successful. It resulted in the first incubations of cluster initiatives in the bottom-up model. With time, new policy measures were introduced to the cluster policy portfolio. The main policy instruments available for clusters are presented in Table 3.

In the stage of extensive growth there were a number of instruments available to cluster organizations, representing both mature clusters and emerging clusters. The most important among them are presented below.

Co-financing under Measure 5.1. Support for cooperative links of supra-regional importance of IE OP was granted for: (a) the early stage of development of technological or industrial cooperation links, (b) the phase of development of cooperative relations for the joint preparation of an innovative product or service and their launch. This instrument allowed for investment and was very well evaluated by cluster managers.

Cluster managers operating in Eastern Poland had the opportunity to apply for funds under the Eastern Poland Operational Program. This instrument was targeted at managers of emerging clusters. The goal of the measure was to build a permanent cooperation platform between regions of Eastern Poland by: creating and developing clusters, and creating a regional development policy strengthening cooperation between science and business as well as local government within cooperation networks.

The results of this policy stage were unsatisfactory, and this period ended with consuming too much funding without significant results as the majority of cluster organizations ceased their activities soon after the termination of financing. The experience stemming from this stage allows one to conclude that public support should target clusters/cluster initiatives/cluster organizations that have reached a critical mass.

It is difficult to measure the scale of the changes in the number of clusters as there is no register and it is not obligatory for a cluster to report to any public institution or statistical office. This does not apply to the Key National Clusters, because the status of KNC is formally acknowledged by the Ministry of Economic Development and Technology. According to research carried out by the Polish Agency of Enterprise Development in 2015, there were 134 clusters in Poland. 106 clusters emerged in the stage of “extensive growth” in the years 2008–2014 [79]. The same number (106) were classified as “potential clusters”

which received a grant for starting the activity but did not develop enough to enter into the operational phase or ceased their activity. Currently, there are 71 Polish clusters registered at the portal of European Cluster Collaboration Platform [80].

Table 3. Policy measures in the identified stages of the cluster policy life cycle in Poland.

Stage	Measures
Inception	Training program promoting clustering: PLN 5.76 million Promotion of clusters and clustering: PLN 134 thousand
Extensive growth	Support for cluster development—the first pilot program for clusters in Poland: PLN 1.64 million Innovation Express—the first support in Poland of cluster internationalization: PLN 1.8 million Support for cooperative links of supra-regional importance (Measure 5.1.) Innovative Economy Operational Program (IE OP): over PLN 440 million Measure 1.4.3 Eastern Poland Operational Program: PLN 53 million
Decline	Internationalization of Key National Clusters, Measure 2.3.3. Smart Growth Operational Program (SG OP)—ca. EUR 57 million
Rebirth	Strengthening the potential—human resources, infrastructure etc. Testing new services Internationalization

Source: own elaboration based on literature review and conducted interviews.

After the disappointing second stage, the number of instruments was limited. In the third stage of cluster policy in Poland, the only instrument dedicated to clusters was the support for international expansion of a cluster (Measure 2.3.3. Smart Growth Operational Program). The aim was to increase the internationalization of clusters' research, development and innovation activity, marketing, branding, and national and international networking. The instrument was dedicated exclusively to clusters of significant importance for the country's economy and high competitive potential, which, as a result of the open competition, receive the status of Key National Clusters. The procedures related to the selection of KNCs are conducted by the Ministry of Economic Development and Technology.

The measure was supposed to contribute to the increase in the number of Polish clusters that are competitive and recognized internationally by participating in trade exchange and in international value chains. As part of this measure, comprehensive advisory activities are provided to support the launch of cluster services/products on foreign markets, with particular emphasis on technologically advanced products. The early outcomes from this stage show that scaling up initiatives can create successful exporters and innovation hubs.

There were no instruments dedicated directly to clusters in the regional operational programs. Only three regional governments (out of 16) had additional funds from their own budgets to support clusters. In the case of the Mazowieckie Voivodship (where the capital—Warsaw is located), the regional government conducted a competition of offers for clusters with specific legal forms for performing public tasks. Based on this experience and the interviews conducted, it can be concluded that as most clusters operate locally and contribute to the regional economic development, some instruments at the regional level are needed to create groups offering complete solutions to the regional self-government and private contractors thanks to the cooperation of interconnected firms, suppliers, and research institutions.

4.4. Factors Influencing the Results of Cluster Policy

One of the most important factors indicated by the respondents (policymakers at the central and regional levels) was the creation of the Working Group on Cluster Policy. The Group formulated several recommendations included in the report "Directions and assumptions of the Polish cluster policy until 2020". One of the recommended instruments of cluster policy was the Key National Clusters certification. One of the respondents emphasized that even when their cluster failed to succeed in the first public call for Key

National Clusters, they started working harder and lobbying national authorities to support the cluster in establishing the first Virtual Research Institute. Currently, the cluster's activities are driven mostly by innovation.

The areas that are evaluated in the competition for Key National Clusters status reflect the key areas of development of cluster policy and support for clusters in Poland. These are:

- human and organizational resources (cluster management staff, cluster management structure, and cluster management quality);
- infrastructure and financial resources (tangible and intangible resources of the cluster manager, resources made available by entities other than the cluster manager, financial resources and financial stability of the cluster manager, and the share of non-public funds in financing the cluster's activities);
- economic potential (value of sales in enterprises within the cluster, members of the cluster conducting export activities, export intensity of enterprises, and joint international projects);
- creation and transfer of knowledge (cluster members conducting R&D activities, joint research and development projects, patents, industrial designs and trademarks of enterprises operating in the cluster, participation of the cluster in industry events and fairs in Poland and abroad, and services provided by the cluster manager to cluster members);
- activities for public policies (involvement in the implementation of the National Smart Specialization, the cluster's involvement in education in the dual system, cluster digital transformation, and cooperation of technological start-ups with large enterprises);
- customer orientation (the number of joint cluster products/services; participation of cluster members in missions, meetings with potential partners, and other similar events aimed at acquiring potential clients; and quality certification).

The respondents of the interviews also emphasized the increasing distance between the level of development of Key National Clusters and the level of development of other clusters in Poland. On the one hand, this may prove the effectiveness of the KNC selection system, but also the lack of support for clusters and cluster managers at the initial stage of development. Maintaining this state of affairs over a longer period of time may result in the decrease in number of cluster organizations in Poland, with a simultaneous diminishing of natural competitive pressure between the KNCs.

The summary of the factors influencing the results of cluster policy is presented in Table 4. One of the factors influencing the results of cluster policy is a noticeable low level of intra-cluster cooperation in R&D in the population of clusters in Poland and insufficient cooperation of cluster entities with R&D entities serving the increase of innovation.

The success factors identified in the study are consistent with the conclusions of researchers who analyzed the effects of cluster policy in Germany. In Germany, funding has been provided for clusters for over 20 years; since 1995 there have been no periods when some cluster support programs were not available. Thanks to this, clusters can develop and contribute to economic development. The German experience shows that the predictability of financing is important—clusters can plan their activities in the long term and mobilize their own funds. In Germany, it has been noticed that support is more effective if funds for clusters are awarded on the basis of competitions (in which certain criteria must be met). At the country level, two go-clusters and Leading-Edge Cluster programs supported world class clusters and clusters in emerging industries [81,82].

Polish cluster policy failures can be compared to cluster policy in Bulgaria. Financial mechanisms supporting the development of clusters lead to the artificial creation of clusters. Thus, similarly to the previous programming period in Poland, some of the clusters created ceased activities after the termination of financing. Therefore, the impact of the cluster policy cannot be assessed positively. It can be concluded that over the last decade, Bulgarian cluster policy has proven to be ineffective. It showed a lack of focus and strategic priorities, scattering resources that did not allow it to reach a critical mass [83,84]. The study confirmed some observations by other authors; for example, Citkowski notices that a small scale of

cluster policy and a universal set of instruments (instead of “made to measure”) diminishes the competitiveness of enterprises and whole regions [85], and therefore can be classified as a failure. Frankowska et al. considered an inconsistency in cluster policy planning as one of the weaknesses [86]. This lack of long-term policy prevented long-term planning at the cluster level, which resulted in lower than expected effects of cluster policy.

Table 4. Factors influencing successes and failures of cluster policy in Poland.

	External Factors		Internal Factors
	National Level	Regional Level	
Success	Key National Clusters certification Establishment and operation of advisory bodies for cluster policies (Council of Key National Clusters, Working Group on cluster policy, Cluster Policy Team consisting of the representatives of Marshall Offices) Establishment of linkages between the key actors of national innovation system within clusters	Active platforms for cooperation (e.g., Wielkopolskie Centrum Klasteringu or the Polish Clusters Association which bring together cluster animators from all over Poland)	Leaders—people motivating clusters members Active cluster members Professionalization of management in clusters, certificates (Cluster Management Excellence and others)
Failure	Low level of implementation of the assumptions and goals of cluster policy before 2020 Short-term cluster policy Dependency on the EU structural funds The “disappearance” of cluster policy and financing in 2014–2020	Insufficient involvement of regional authorities in cluster policy implementation Lack of information on the operation of clusters and cluster initiatives at the level of socio-economic diagnosis and instruments dedicated to clusters Little use of clusters to implement the concept of smart specialization and the entrepreneurial discovery process Unsuccessful criteria for selecting entities that received public support in 2007–2013	Inability to raise funds for investment and administration Insufficient cooperation with research organizations
	Poor coordination of cluster policy between the national and regional level No instruments for supra-regional clusters that have not obtained the status of Key National Clusters		

Source: own elaboration based on literature review and conducted interviews.

4.5. Cluster Policy 2.0

Cluster policy after 2020 is being designed to help clusters in their development on the one hand, and to involve them in the implementation of tasks under various development policies on the other. Clusters, thanks to connecting different types of entities and experience in mutual cooperation, are able to carry out tasks usually assigned to the public sector. Research commissioned by the Ministry of Economic Development shows that a significant number of cluster organizations in Poland declare readiness to participate in the implementation of public tasks based on the competences accumulated in them. In this way, the broad competences of companies and research entities may be used [76].

Therefore, two components can be distinguished in cluster policy:

- policy focused on cluster development, whose primary task is to stimulate the development and activities of individual cluster organizations—an actor-centric approach;
- economic development policy based on clusters, where there is a shift away from financing clusters themselves in favor of “using” clusters in the implementation of innovation and development policies—a functional approach [87].

The areas in which clusters will be included in the implementation of public tasks are primarily: digitalization, adaptation to the needs of industry 4.0, the circular economy, the low-carbon economy, education, economic promotion, and networking.

Unlike the previous stage, support will be available to clusters at various stages of development. In order to adapt support instruments to the needs of clusters at a specific stage of development, they are being divided into three groups: (1) emerging clusters, (2) growing clusters, (3) Key National Clusters.

The variety of clusters' needs means that programming of a uniform public intervention, which would take into account the situation of all clusters, is in principle impossible and inadvisable. Depending on the degree of development, a given cluster type (emerging cluster, growing cluster, or key cluster) should be treated individually due to its objective development possibilities, the possibility of achieving synergistic effects from cluster cooperation, as well as the possibility of generating external effects for the economy of the country and the region [87].

The lessons from the second stage resulted in excluding new cluster organizations which have been operating for less than 18 months from public support.

In order to implement the new actor-centric and functional approaches to the cluster policy mentioned above, the identification of public policy areas in which clusters can be engaged is needed. Therefore, an analysis of cluster's attitudes towards their engagement in public tasks was carried out. For this purpose, a database of responses to a survey was obtained from the Ministry of Economic Development and Technology. According to the survey, clusters are willing to participate in a number of activities assigned to the members of the public sector, as presented in Figure 1.

In the field of education, some activities are already provided by clusters. These are mainly focused on training workers and raising technical skills. Clusters provide on-the-job training and offer internships. Clusters have the potential for scaling-up these kinds of activities, as they employ a large number of professionals and experts who are able to share their know-how. They have practical skills and knowledge which is missed in technical schools and universities. Clusters are also involved in labor market services, acting as labor agencies in a small scale. Their experience and direct linkages to companies and knowledge about the current demand for skills constitute a base for cooperation with regional labor offices (public institutions). Clusters' roles in the incubation of start-ups is justified by the fact that they create a natural environment for the development of start-ups. Clusters offer access to value chains, direct contacts with suppliers and clients. The mentioned examples show that cluster-based economic development policy can be effective, as some tasks implemented by public institutions or public agencies are natural processes occurring in clusters. Scaling-up this kind of activities may be cost-effective and result in a higher quality (for example in the case of dual studies).

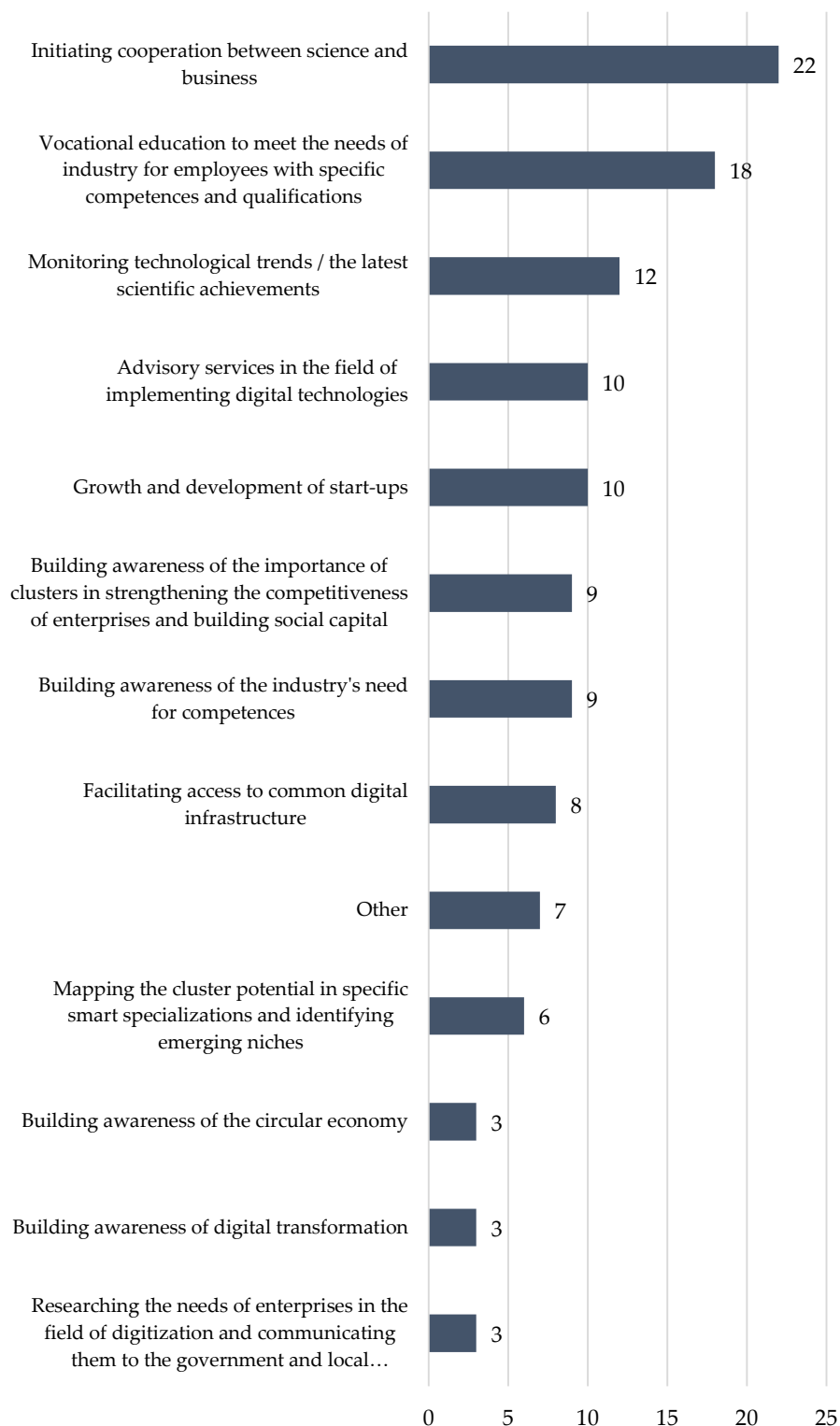


Figure 1. Public tasks in which clusters are willing to be involved ($N = 44$). Source: own elaboration based on [88].

Previous studies on cluster policy in Poland (conducted about a decade ago) concluded that the scarcity of financial resources and dispersed funding brought poor results of cluster policy. The authors claim that there is no evidence on the effects and on the efficiency of cluster policy in Poland [89]. The situation changed over the last decade, which is visible

both at the micro-level (e.g., the effects of the activity of the Key National Clusters) and at the macro-level (e.g., the highest possible score in the assessment of cluster policy in Poland by the European Commission).

5. Conclusions

Following the proposed definition of the cluster policy life cycle, this paper identifies the following stages of the cluster policy life cycle in Poland: (1) inception, (2) extensive growth, (3) decline, and (4) rebirth. After a promising start, the policy underwent a period of decline during which its significance lessened. However, the most recent developments prove that it has rebounded and once again it is gaining pace while providing more instruments of support.

It can be concluded that throughout all these stages supporting cluster organizations in Poland has evolved. Better results were achieved by supporting cluster organizations that have attained a certain level of development and have established themselves as a formal initiative. These cluster organizations create links between cluster members strong enough to maintain a presence after the cessation of public funding.

The results of the analysis of cluster policy development in Poland show that positive results can be achieved if public intervention is continuous and tailored to the needs of cluster organizations at different development stages. The development of cluster assessment criteria in order to categorize cluster organizations and establish an accreditation system is considered as good practice. Furthermore, adoption by the government of a cluster policy at the national level and implementation of a comprehensive strategy for cluster development at regional and national levels is a basic condition for cluster policy success. Supporting the innovative activity and internationalization of clusters is an important element of public intervention.

In the Polish case, key success factors include: an implemented system for selecting Key National Clusters, the development of cooperation (mainly in the most developed cluster organizations), and the possibility of using support instruments simultaneously at the national and regional level. Moreover, cluster leaders who convinced various participants to cooperate and found initiatives and funding opportunities to ensure the development of the cluster were identified as another success factor.

Interviews with cluster managers and the conducted case study have shown that cluster organizations want to be engaged in public tasks. They already conduct dual studies in cooperation with universities, play the role of incubators for start-ups, and are an operational tool for implementing smart specializations in the context of building cooperative relationships.

The results of the study confirm the legitimacy of the introduction of the model, which assumes, on the one hand, supporting the potential of clusters, and on the other, calls for engaging clusters to perform public tasks in specific areas, such as: education, digital transformation and preparation for the needs of industry 4.0, the circular economy, regional development, and economic promotion.

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