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Polish Cittaslow Local Governments' Support for Renewable Energy Deployment vs. Slow City Concept

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Abstract: The slow city concept is associated with great care for the protection of the natural environment and the use of renewable energy sources. Thus, the study aimed to discuss the potential of the slow city model and the actual role of Cittaslow local governments in deploying renewable energy, based on the case study of the Polish Cittaslow Network. To achieve this aim, we carried out qualitative and quantitative data analyses, based on literature review and data for all 35 Polish Cittaslow municipalities, retrieved from: (i) development strategies (ii) a survey (iii) the Local Data Bank of Statistics Poland, (iv) the Quality of Life Synthetic Index (QLI). To process the data, we applied descriptive statistics, the Shapiro-Wilk test, the non-parametric Kruskal-Wallis test, and the Spearman's rank test. Findings showed that the support for renewable energy deployment was not at a high level and did not correlate with the goals set in the Cittaslow development strategies. This was the result of a cumulation of pressing social and economic problems, which the local authorities in Poland are legally obliged to solve, while the implementation of renewable energy is not obligatory. The QLI for these municipalities was low and renewable energy was not a significant element in improving the quality of life of citizens.

Keywords: renewable energy; Cittaslow; slow city; local governments; Poland

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1. Introduction

The European Union's policy on renewable energy is precisely defined in many documents, of which the most important [1–3] established a framework for achieving the overall goals by applying effective strategies which were based on a close collaboration between the EU and its member states [4–8]. The principles of this collaboration assume that actions aimed at the deployment of renewable energy need to be implemented at the national, regional, and local levels. It has been proved that the effective deployment of renewable energy particularly needs to be supported at the local level [9], and many concepts and models have been proposed to achieve it. Networking within the slow city concept can be considered as one of them.

The slow city concept, currently evolving into a green slow city concept, is fully in line with the need to support the deployment of renewable energy at the local level, and thus to help in achieving the green growth of Europe. It concentrates on endogenous resources, including natural ones, the needs and development of local communities, their cultural heritage, and the quality of life of present and future local generations [10–12]. It assumes the protection and prudent use of natural resources, ecological education, social justice, and the cultivation of local production, often using traditional and ecological technologies [13].

The slow city concept has been adopted by the Cittaslow Network, established in 1999 and still undergoing development. At present, the network includes 278 municipalities in 30 countries (as of 30 June 2021). The Polish network of 35 Cittaslow municipalities is the second largest, while the Italian network is the largest of all [14]. However, in the dispute on

renewable energy deployment at the local level, there has so far been no reports regarding the Cittaslow Network attitudes and achievements in this field, leaving a gap in research. Therefore, we intend to fill this gap by exploring and explaining the renewable energy attitudes and activities of Cittaslow municipalities, based on answers to the following research questions (RQ):

RQ1. Is the deployment of renewable energy included as a goal in the Cittaslow municipalities' development strategies?

RQ2. Do the local governments of Cittaslow municipalities support the deployment of renewable energy?

RQ3. Is there any relation between the goals included in the development strategies and the practical deployment of various types of renewable energy in Cittaslow municipalities?

RQ4. Is there any relation between the deployment of renewable energy in Cittaslow municipalities and their social and economic profiles?

RQ5. Is there any relation between the deployment of renewable energy in Cittaslow municipalities and the living standards determined by the Quality of Life Synthetic Index?

The study aims to contribute to the scientific field by presenting findings and conclusions on the analysis of the potential of slow city model and the actual role of Cittaslow local governments in deploying renewable energy, as well as by giving recommendations on further developments in this field. The fact that Polish Cittaslow Network is the second largest in the world, after Italy, and is still fast developing, makes rationale for choosing Poland as a case study.

The rest of the paper is structured as follows: Section 2 presents the literature review on slow cities concept and the Cittaslow network. Section 3 describes the research materials and methodology for this paper. Section 4 outlines the results, while Section 5 includes discussion and limitations. Finally, Section 6 concludes the paper and provides recommendations.

2. Literature Review

The slow city concept seems to be gaining more and more importance due to its goals and its relevance in solving pressing problems of the European Union. One of these problems is the too slow deployment of renewable energy [15–17].

The active debate in the European Union and in its member states, at all decision-making levels, indicates that despite the many threats related to fossil fuels energy use and the benefits of using renewable energy, the development of the latter neither occurs on its own nor fast enough [18–21]. Consequently, the increase in the use of renewable energy sources must be supported by appropriate international and national strategies as well as by public aid and incentives [22–25] addressed to the appropriate beneficiaries. Local governments are one of the most important entities in the process of increasing the production and use of renewable energy at the local level. They can play a key role in promoting renewable energy, its production and use [26–30]. They can initiate, invest, produce and be the end-users of renewable energy [31–34]. To obtain these aims, local authorities can adopt different development and management strategies based on different concepts and models, including slow cities.

Among the pillars of the concept of slow city, the literature most often reports on: the appreciation of the quality and creativity in unhurried and reflective activity of people in all areas of their lives, the circular economy (consuming less, recycling and reusing), resilience, social justice, local culture and heritage, sustainability and cooperation [35–39]. Jeong et al. [40] defined slow city goals in five areas, i.e., the quality of life, sustainable development, place-making, locality, and conviviality. Documents of the International Cittaslow Network define the network as a cluster of resilient microeconomies that extend the commitment to sustainable development through actions for integration and shared responsibility [41].

The establishment of the Cittaslow network in 1999 was related to the growing popularity of the idea of slow food and the initiative of the mayors of four small Italian towns:

Bra, Greve in Chianti, Orvieto and Positano. The name 'Cittaslow—International Network of Good Living Cities' comes from the Italian word 'citta' meaning 'city' and the English word—slow. Therefore, the main goals of the Cittaslow municipalities include: specific valuation of time, appreciation of the quality of life through reflective and unhurried activities, sustainable development based on endogenous resources, improvement of the quality of life of residents, e.g., by creating appropriate urban infrastructure as well as places of leisure and recreation, environmental protection and promoting ecological attitudes, caring for the historic urban heritage, renovation and aesthetics of municipalities, promoting the culture of hospitality, providing a rich cultural and recreational offer, promoting local products, crafts and cuisine, eliminating architectural barriers and improving the work of local administration and institutions [42].

Cittaslow is an association that brings together municipalities with up to 50,000 residents. To join the Cittaslow network, a municipality must complete the certification process and meet 50% + 1 of the assessment criteria, relating to 7 areas: energy and environmental policy, infrastructure policy, quality of urban life policy, agricultural, touristic and artisan policy, hospitality policy, awareness and education, social cohesion, and partnerships. It is worth noting that the vast majority of the 72 criteria of the so-called Cittaslow certification strictly relates to the environmental sphere of the municipality's functioning, e.g., energy production with the use of renewable sources, air quality protection, water protection, selective waste collection, reduction of pollution resulting from car traffic, noise reduction, reduction of public light pollution, protection of biodiversity, development of organic farming, ban on the use of GMOs, education of taste and promotion of the use of local and organic products. Importantly, these criteria are the basis not only for the evaluation of candidate municipalities, but also for the evaluation of member municipalities every 5 years. Such a cyclical verification of the municipality's condition is a motivation for the consistent implementation of the local sustainable development policy, contributing to the improvement in the quality of life of its inhabitants.

The association is managed by the President, the International Assembly, the International Coordinating Committee, the Board, and the International Scientific Committee. Activities of the association may be supported by the so-called 'Friends of Cittaslow', e.g., associations, chambers of commerce, manufacturing, service, tourism, and agricultural companies [43]. At present, Cittaslow International has 278 members—municipalities, located not only in Europe, but also in North America, South America, Asia, Africa and Australia. Among the 20 national Cittaslow networks in the world, the Italian (87 municipalities), Polish (35), German (23) and Turkish (18) are the largest [14].

Cittaslow members also vary in their socio-economic potential, which is related, for example, to their peripheral location in the region or the proximity of a large urban center [44–47]. One more inherent feature of Cittaslow municipalities should be noted—their development policy is very individualistic, depending on the social and economic potential as well as organizational and financial possibilities. The slow city model is not a universal recipe for development that works well in every municipality—rather, it is adaptive. Each municipality looks for its individual way of being a slow city.

Cittaslow municipalities focus their activities on the protection and improvement of the natural environment in an increasingly conscious and consistent manner. The directions and priorities of the 'European Green Deal' [48] may be a roadmap for the authorities and other local entities for the implementation of such development strategies.

Orienting the development policy of modern municipalities towards green development allows us to believe that, in the near future, green development will be a direction of action of slow municipalities, which will allow us to label them green slow cities [49]. This process is catalyzed by various types of supranational, national, and regional strategies for the development and protection of natural resources. In addition, the evaluation of candidate municipalities for the network or evaluation of its members every 5 years enables the valorization of the pro-environmental component and may indicate future activities, in particular those carried out in cooperation with other entities belonging to the network.

The implementation of such an approach is supported by activities at the regional, national, and international levels, as well as at the local level, by pro-environmental policy of local authorities, aimed at building environmental awareness, by activities of municipality residents in environmental protection, and by pro-environmental activities of local businesses (Figure 1).

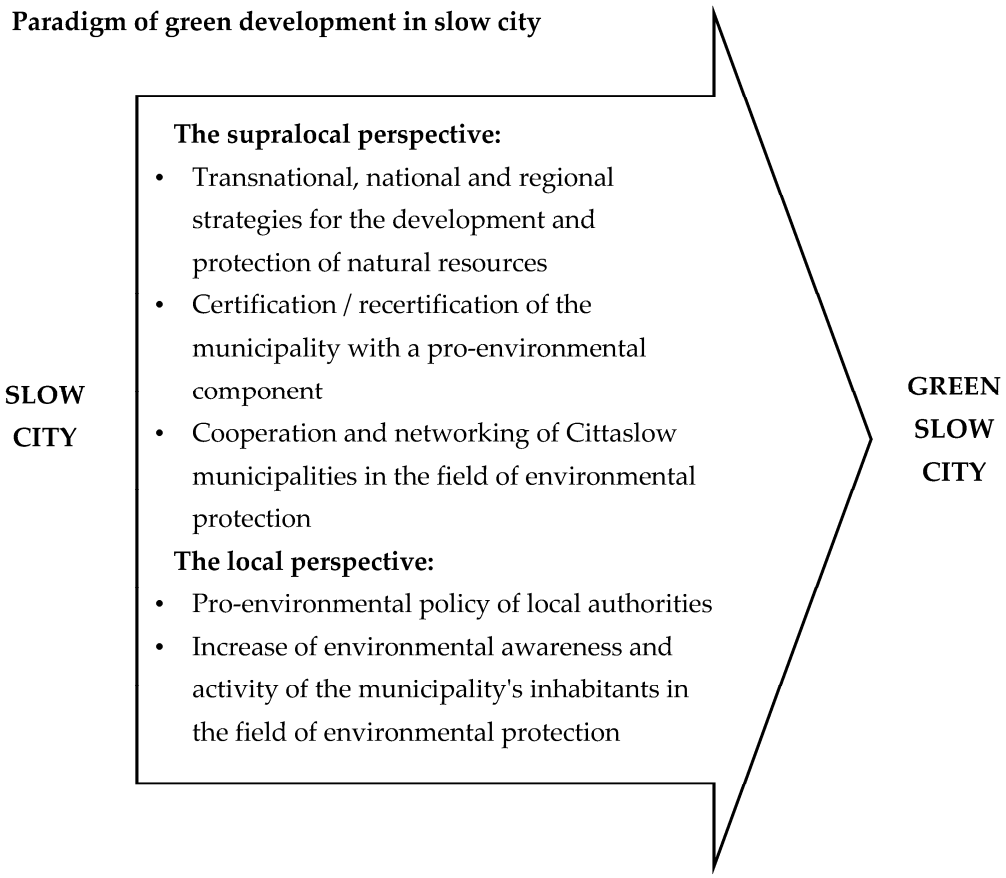

Figure 1. Evolution of the slow city into the green slow city. Source: own elaboration.

Modern municipalities look for a model that will allow them to stimulate their sustainable development, improve the quality of life of their inhabitants, increase the level of competitiveness or improve the so-called urban resilience [50]. Various views are used in the process of municipality management, from simple to more complex ones, including the so-called hybrid approach [44,51]. Considering the environmental perspective, municipalities of the future are green, sustainable, and compact. From the social perspective, they are open, restorative, inclusive and participatory. Last but least, from the economic perspective they are productive, entrepreneurial, innovative, intelligent, competitive, well-managed, effective, and resilient [52–59]. Among many concepts and models of development used in urban and more recently in rural development policies, the importance of the slow city model is growing [11,34,60–63]. This is confirmed by the constantly increasing number of municipalities belonging to the Cittaslow International Network.

The Polish Cittaslow Network was established in 2007. Polish municipalities in the Cittaslow network are highly diversified in terms of their location and size. The vast majority (26 municipalities) are located in Warmińsko-Mazurskie Voivodship, 2 municipalities in Opolskie Voivodship, and 1 municipality in each in the voivodships: Lubelskie, Łódzkie, Mazowieckie, Pomorskie, Śląskie, Wielkopolskie and Zachodniopomorskie. In 2020, the number of inhabitants of the municipalities belonging to the Polish network was from approximately between 3900 and 27,000. A total of 2 municipalities had a population of less than 5000; 8 had between 5000 and 10,000 residents; 7 had between 10,000 and

15,000 residents; 9 had between 15,000 and 20,000 residents; 8 had between 20,000 and 25,000 residents; 1 had over 25,000 residents [64].

The literature review provides theoretical assumptions about the importance of renewable energy in different models of the municipalities. Moreover, special attention is paid to the smart city concept [65,66].

3. Materials and Methods

To answer the research questions RQ1 to RQ5 (Table 1), we carried out qualitative and quantitative data analysis, based on data from four sources: (i) a qualitative analysis of development strategies of Polish Cittaslow municipalities, (ii) a survey of Polish Cittaslow municipalities, (iii) Local Data Bank of Statistics Poland [64] and (iv) data describing the Quality of Life Synthetic Index [46] (Table 1). The analyses were carried out for all 35 municipalities that are members of the Polish Cittaslow Network.

Table 1. Research questions and data categories, sources, and statistical methods.

Research Questions	Data Categories and Sources	Methods
1. Is the deployment of renewable energy included as a goal in the Cittaslow municipalities' strategies?	Qualitative data from the development strategies of municipalities	Qualitative data analysis
2. Do the local governments of Cittaslow municipalities in Poland support the deployment of renewable energy?	Qualitative data from the survey	Qualitative data analysis Shapiro-Wilk test non-parametric Kruskal-Wallis test Spearman's rank test
3. Is there any relation between the goals included in the development strategies and the practical deployment of various types of renewable energy in Cittaslow municipalities?	Qualitative data from the development strategies of municipalities and from the survey	descriptive statistics (N, %) Spearman's rank test
4. Is there any relation between the deployment of renewable energy in Cittaslow municipalities and their social and economic profiles?	Qualitative data from the survey and from Local Data bank, Statistics Poland	descriptive statistics
5. Is there any relation between the deployment of renewable energy in Cittaslow municipalities and the living standards determined by the Quality of Life Synthetic Index?	Qualitative data from the survey and the Quality of Life Synthetic Index	descriptive statistics Spearman's rank test

The local development strategies of all Polish Cittaslow municipalities were the source of qualitative data used for the study. The strategies were retrieved from the websites of municipalities from 1 September 2021 to 30 September 2021. They were analyzed using the standard qualitative analysis tools [67–69] in order to answer the main and the additional research questions: (i) Is the deployment of renewable energy included as a goal in the Cittaslow municipalities' strategies? (ii) What type of renewable energy (solar, wind, hydro, geothermal, biomass, etc.) is defined in the Cittaslow municipality strategies? (iii) Is there any correlation between the renewable energy development goals included in the strategies and the practical deployment of various types of renewable energy?

The survey was conducted by the authors in August 2021 in all 35 Cittaslow municipalities that are members of the Polish Cittaslow Network, based on the list of Cittaslow members published by the Cittaslow International Network [14]. It needs to be stressed that despite the linguistic implications of 'slow city' or 'cittaslow' terms, the Polish network includes municipalities that are classified by the DEGURBA classification [70] into 3 categories: 1—cities or densely populated areas, 2—towns and suburbs or medium-density areas, 3—rural areas or sparsely populated areas.

The survey questionnaire included questions about the deployed types of renewable energy and activities aimed at environmental protection. It was sent by e-mail to the decision-makers and people managing the implementation of the 'European green deal' strategy in all of the Cittaslow municipalities. The response rate reached 100%. To answer RQ4, Cittaslow municipalities were divided into 3 categories based on their population, data retrieved from the Local Data Bank of Statistics Poland [64]. The following symbols were used: A—municipalities inhabited by from 20,000 to 26,800 residents, B—10,000–20,000 residents, C—from 3887 to 10,000 residents.

The most numerous group (16) were municipalities with between 10,000 and 20,000 inhabitants: Biskupiec, Sierpc, Nowy Dwór Gdański, Braniewo, Murowana Goślina, Węgorzewo, Dobre Miasto, Lidzbark, Sianów, Olsztynek, Orneta, Nowe Miasto Lubawskie, Barczewo, Lidzbark Warmiński, Rzgów and Lubawa. The second largest group included municipalities below 10,000 residents: Kalety, Jeziorany, Reszel, Bisztynek, Wydminy, Sępopol, Ryn, Pasym, Rejowiec Fabryczny and Górowo Iławeckie. The least numerous groups are municipalities with more than 20,000 inhabitants. Nine units were qualified to this group: Prudnik, Morąg, Bartoszyce, Szczytno, Głubczyce, Olecko, Działdowo, Nidzica and Gołdap.

We also used data sets describing such socio-economic characteristics of the surveyed municipalities [64] as:

- total budget revenues in PLN per capita (average for 2014–2020);
- budget revenues from personal tax in PLN per capita (average for 2014–2020);
- income budgets from corporate tax in PLN per capita (average for 2014–2020);
- percentage of people in pre-working age;
- percentage of people of working age;
- indicator of economic entities per 10,000 population (average for 2014–2020);
- number of social welfare beneficiaries per 10,000 inhabitants (average for 2014–2020);
- percentage of inhabitants using the sewage system in 2019;
- percentage of inhabitants using water supply systems in 2019;
- the percentage of inhabitants using the gas network in 2019;
- the number of unemployed (average for 2014–2020).

The Quality of Life Synthetic Index (QLSI) in municipalities was another source [46] of qualitative data used in the study. The QLSI consisted of 48 detailed indicators concerning the most important areas i.e., demographic development, socio-economic development and prosperity, heritage, culture and recreation, social cohesion, and the natural environment. Within the area of environment, 10 partial indicators were used, and this component was assigned the highest weight among all of the areas. Contrary to other quality of life rankings, approximately 30% relate to the natural environment, including the use of renewable energy sources [46]. The great importance of the environmental component justified the use of this synthetic indicator to analyze the quality of life in municipalities belonging to the Cittaslow network.

As shown in Table 1, selected methods of descriptive statistics were used for the analysis of quantitative data. The distribution of quantitative variables was tested using the Shapiro-Wilk test. The results indicated that the distribution of most variables is non normal, and therefore the analysis was performed using the non-parametric Kruskal-Wallis test. Spearman's rank correlation was used to study the correlation. The applied non-parametric tests are appropriate to obtain answers to the research questions to which the answers were not normally distributed.

4. Results

4.1. Renewable Energy in the Development Strategies of Cittaslow Municipalities

The attitude of local governments to investments in renewable energy was assessed based on the analysis of the development strategies of Cittaslow municipalities, retrieved from the websites of municipalities in September 2021. The set of qualitative data contained information on all Cittaslow municipalities in Poland.

The findings show that 74.3% of local governments declared in their development strategies the use of renewable energy, and 68.6% identified concrete actions related to the deployment of renewable energy. Specific types of renewable energy are indicated only in the strategies of 28.6% of Cittaslow municipalities. Other strategies provided general information and indicated that renewable sources, also called alternative or green energy sources, should be used.

Among the 26 Cittaslow municipalities that indicated the need to develop defined types of renewable energy, only 10 referred to specific renewable energy sources. Strategies of 8 municipalities (22.9%) indicated the use of solar power, which is the most popular renewable energy source in Poland. Solar renewable energy is used to produce electricity for production and heating purposes, and it is processed using solar collectors and solar panels. Therefore, 22.9% of the strategies declared installation of solar collectors and solar panels.

Biomass and its different types were included in the strategies of 14.3% of Cittaslow municipalities, whose local authorities have stated that biomass energy is an important source of renewable energy. The strategies of 14.3% of Cittaslow municipalities include a declaration of investments related to wind energy. The strategies of 8.6% of Cittaslow municipalities include declarations of investments in geothermal energy.

The strategies stated that investments in renewable energy sources are of less importance due to the low population density, and it is not a priority for the municipality. There are also no proper conditions for the development of renewable energy, and little can be achieved in this regard. The strategies stated that with low environmental pollution, the potential investment costs related to renewable energy sources are disproportionate to benefits that can be obtained.

No strategy included any analysis or description of the conditions for renewable energy investments. Although the analyzed strategies did not indicate the sources and amounts of financing for renewable energy investments, their SWOT (strengths and weaknesses, opportunities, and threats) analyzes contained statements that the possibility of obtaining EU funds is a significant opportunity for the deployment of renewable energy.

4.2. The Implementation of Tasks Related to Renewable Energy Sources in Different Types of Cittaslow Municipalities and Correlation between the Renewable Energy Goals Included in the Strategies and the Practical Deployment of Various Types of Renewable Energy

The second part of the study on the diversification of renewable energy activities in Cittaslow municipalities was based on the analysis of qualitative data obtained in the survey. A total of 66% of the surveyed municipalities implemented activities related to solar renewable energy, and 23% to wind energy. The implementation of tasks related to geothermal energy (only 3 municipalities—8.6%) and hydropower (2 municipalities—5.7%) was rarely mentioned. Only one municipality indicated the implementation of tasks related to renewable energy from biomass. The analysis confirmed a strong variability of the obtained indications (coefficient of variation 88.6867, standard deviation: 0.9375). Respondents indicated the maximum of 3 activities supporting renewable energy deployment (3 municipalities). Additionally, 2 types of energy were indicated by 7 municipalities, one type of renewable energy—by 14, no type of renewable energy was indicated by 11 municipalities (Table 2). The median is at 1, the arithmetic mean is 1.057.

Table 2. Number of types of renewable energy deployed by different types of Cittaslow municipalities.

Categories of Municipalities by Population	Number of Renewable Energy Types							
	Three		Two		One		None	
	N	%	N	%	N	%	N	%
A	2	66.7	3	42.9	3	21.4	1	9.1
B	1	33.3	3	42.9	5	35.7	7	63.6
C	0	0	1	14.2	6	42.9	3	27.3
All	3	100	7	100	14	100	11	100

Source: own elaboration.

The results indicate that the surveyed local governments took activities aimed at supporting the deployment of different types of renewable energy (Table 3). Activities supporting deployment of energy from biomass was declared in only one of them—the one with the largest population. Solar energy activities were carried out in 7 Cittaslow municipalities with over 20,000 residents, 7 Cittaslow municipalities with less than 10,000 residents and 9 Cittaslow municipalities with a population between 10,000 and 20,000 residents. The largest share of municipalities supporting wind energy deployment has more than 20,000 residents (5 answers). Water energy activities were carried out in 2 Cittaslow municipalities whit a population between 10,000 and 20,000 residents. Geothermal energy was supported in 2 Cittaslow municipalities over 20,000 residents and in one Cittaslow municipality whit a population of 10,000–20,000 residents.

Table 3. Types of supported renewable energy by categories of Cittaslow municipalities.

Categories of Municipalities by Population	Biomass Energy		Solar Energy		Wind Energy		Water Energy		Geothermal Energy	
	N	%	N	%	N	%	N	%	N	%
A	1	100	7	30.4	5	62.5	0	0	2	66.7
B	0	0	9	39.2	2	25.0	2	100	1	33.3
C	0	0	7	30.4	1	12.5	0	0	0	0
All	1	100	23	100	8	100	2	100	0	100

Source: own elaboration.

In order to determine the relationship between categories of Cittaslow municipalities and the types of deployed renewable energy (Table 4), we applied Kruskal-Wallis test. The results confirm that the category of municipality has a significant impact on the deployment of solar energy ($p < 0.05$). There was no significant influence of the type of territorial unit on the implementation of tasks related to other types of renewable energy.

Table 4. Kruskal-Wallis tests for the type of renewable energy in Cittaslow network vs. categories of municipalities by population.

Kruskal-Wallis Test	*H*(2)	*p*
Solar energy	<0.05	<0.05
Wind energy	4.216	>0.04
Water energy	0.302	>0.59
Biomass	0.493	>0.49
Geothermal energy	1.770	>0.19

Source: own elaboration.

Spearman's rank test showed a significant correlation between the type of municipalities and the implementation of tasks related to wind energy (rho = 0.393, $p < 0.05$). There is no significant correlation with other types of renewable energy.

The research results show differences between the declarations in strategies and the practical actions (Table 5). The largest number of declarations related to renewable energy

deployment can be found in the strategies in municipalities of 10,000–20,000 residents (53.8%), while most activities are carried out in municipalities with more than 20,000 residents (40.6%). There is a slight advantage of declarations in strategies (23.1%) over the implementation of tasks related to renewable energy (21.6%) in municipalities with a population below 10,000 residents.

Table 5. Renewable energy declared in the strategies versus practical activities in particular types of Cittaslow municipalities.

Categories of Municipalities by Population	Renewable Energy Declared in Strategies		Deployed Renewable Energy	
	N	%	N	%
A	6	23.1	15	40.6
B	14	53.8	14	37.8
C	6	23.1	8	21.6
All	26	100	37	100

Source: own elaboration.

The Spearman's rank test did not show any significant correlation between the declarations in Cittaslow municipality strategies and the implementation of tasks related to renewable energy sources (rho = -0.239; $p < 0.05$). There is no significant correlation between the declarations in the strategy and the number of inhabitants in municipalities (rho = 0.278; $p < 0.05$). There is also no significant correlation between the type of Cittaslow municipalities (rho = 0.024; $p < 0.05$) and population.

4.3. Differentiation in the Implementation of Tasks Related to Renewable Energy Sources in Cittaslow Municipalities Depending on Their Socio-Economic Profile

The results of the research indicate that there were 24 Cittaslow municipalities which took at least one type of activities related to the development of renewable energy. They are classified in this study as 'the active'. Moreover, 11 municipalities did not indicate any type of renewable energy. Therefore, they were classified as 'passive'. In total, the passive municipalities had over 142,000 residents, while the active ones more than 367,000 residents. We carried out a comparative analysis of selected socio-economic characteristics of these two groups, based on descriptive statistics (Table 6).

The municipalities that declared the implementation of tasks related to renewable energy sources were characterized by a higher average value of the following indicators: budget revenues from personal tax in PLN per capita, budget revenues from corporate tax in PLN per capita, the ratio of economic entities per 10,000 residents, percentage of residents using sewage systems and from the water supply.

The age structure of the residents was similar in both groups. This applies to the share of people in pre-working age and the share of people in productive age. The average, minimum and maximum value of these indicators in municipalities belonging to both groups were at a comparable level.

A higher level of the number of social welfare beneficiaries per 10,000 residents and a lower ratio of economic entities per 10,000 residents in the group of the municipalities with low activity in the implementation of tasks related to renewable energy sources, may suggest that these municipalities are often have a lower level of economic potential than the active ones. This is also confirmed by the fact that the average size of the municipalities in the first group is 12,988 residents, and in the second 15,309 residents. The group of active local governments also includes the largest commune from the entire surveyed population.

Table 6. Descriptive statistics for selected socio-economic indicators of Cittaslow municipalities passive and active in supporting renewable energy deployment.

	Type of Municipalities	Mean	Median	Max	Min	Range	Std. Dev	Var
Total budget revenues in PLN per capita, average for 2014–2020	passive active	4186.9 4086.3	4066.1 4022.7	5399.6 5388.5	3722.1 3546.5	1677.5 1842.1	498.3 440.4	248,286.9 193,934.1
Income of budgets from personal tax in PLN per capita, average for 2014–2020	passive active	614.1 622.4	598.0 597.5	911.7 1384.3	335.7 316.6	575.9 1067.7	173.5 214.9	30,114.1 46,177.1
Income of budgets from corporate tax in PLN per capita, average for 2014–2020	passive active	21.4 22.5	21.6 13.9	58.7 100.2	0.3 1.3	58.5 98.9	16.8 24.5	280.8 600.8
Percentage of people of pre-working age	passive active	18.1 17.5	18.4 17.2	22.0 20.0	15.9 15.3	6.1 4.7	1.7 1.3	2.9 1.7
Percentage of people of working age	passive active	60.7 60.7	61.3 60.7	63.0 63.3	58.1 58.5	4.9 4.8	1.7 1.6	2.9 2.4
Index of economic entities per 10,000, average for 2014–2020	passive active	1102.6 1114.3	1255.6 1327.7	1643.3 1785.3	54.5 96.4	1588.8 1688.9	548.9 539.4	301,265.9 290,906.8
Number of social welfare beneficiaries per 10,000, average for 2014–2020	passive active	1029.1 973.2	947.0 909.3	1847.0 1730.2	290.0 313.0	1557.0 1417.2	439.6 330.3	193,245.2 109,124.2
Percentage of residents using the sewage system, 2019	passive active	93.2 95.4	93.8 96.8	100.0 100.0	79.6 78.9	20.4 21.1	6.3 4.9	40.0 24.4
Percentage of residents using the water supply system, 2019	passive active	73.2 73.6	75.2 76.2	96.7 99.6	38.3 38.2	58.4 61.4	17.9 16.5	320.4 272.0
Percentage of residents using the gas network, 2019	passive active	38.1 37.1	52.5 41.2	89.2 88.7	0.0 0.0	89.2 88.7	31.3 30.5	976.5 930.8
Number of unemployed people, average for 2014–2020	passive active	596.2 764.7	519.4 796.3	1068.6 1406.4	174.4 202.3	894.1 1204.1	326.8 375.5	106,773.4 141,005.4

Source: own elaboration based on [64].

4.4. The Quality of Life Synthetic Index of Cittaslow Municipalities and Its Correlation with the Local Governments' Activities Supporting the Deployment of Renewable Energy

The Quality of Life Synthetic Index used to analyze the standard of living in Cittaslow municipalities ranged for the Cittaslow municipalities from 44.02 to 59.06. Its average level was 49.28, while the median was slightly lower at 48.43.

The group of 16 municipalities with 10,000 to 20,000 residents had the highest average quality of life index. This group of municipalities included those with the lowest (Węgorzewo) and the highest quality of life index (Murowana Goślina).

The group of 9 Cittaslow municipalities with more than 20,000 residents had a lower average value of the analyzed Quality of Life Synthetic Index. The lowest average value index was characteristic for the group of the 10 smallest Cittaslow municipalities i.e., with less than 10,000 residents. The maximum value of the indicator in this group was relatively the lowest It was in this group that the maximum value of the Index was the lowest—55.53 (Table 7).

Table 7. The value of the Quality of Life Synthetic Index for different categories of Cittaslow municipalities.

Categorization of Municipalities by Population	Max	Min	Average	Range	Var
A	57.14	45.91	49.52	11.23	18.5
B	59.06	44.02	50.14	15.04	15.2
C	55.53	44.26	47.69	11.27	10.8
All	59.06	44.02	49.28	15.04	15.0

Source: own elaboration.

Considering the distribution of responses on the number of supported renewable energy types in different categories of Cittaslow municipalities (Table 2), it can be concluded that in the Cittaslow municipalities which implemented 3 types of activity, the average Quality of Life Synthetic Index was the lowest at 47.72. It was slightly higher in the group of municipalities that declared 1 type of activity at 48.44. In 11 Cittaslow municipalities that did not declare any tasks related to renewable energy sources, the Index was 49.84. The highest Quality of Life Index (50.78) was in municipalities that implemented 2 types of activities.

The Spearman's rank test showed a significant correlation between the Quality of Life Synthetic Index in Cittaslow municipalities and their activities related to the development of wind energy (rho = 0.393, $p < 0.05$). There is no significant correlation with the other types of renewable energy deployed in Cittaslow municipalities.

5. Discussion

The literature indicates the importance of local governments' activities in the deployment of renewable energy [71] as well as the impact of pro-environmental solutions on the development of areas and the improvement of the quality of life of residents [72,73].

Our findings show that although most of the development strategies of Polish Cittaslow municipalities include a declaration of renewable energy deployment, far fewer of them put this goal as a priority and there is no information on how the efforts to achieve sustainable development will be implemented. As priority actions, the commune authorities indicate socio-economic development related to construction or modernization of roads, sewage systems, construction of water pipes, household sewage treatment plants, or the construction of waste incineration plants. This may result from the expectations of the inhabitants of municipalities, as well as the knowledge of local conditions for investing in renewable energy. This hierarchy is also produced by the limitations of local budgets, which do not allow local authorities to extend their investments beyond mandatory tasks [74]. Such barriers to the development of renewable energy are also observed in other countries [75–77]. The biggest problem for the Cittaslow municipalities is the lack of funds for investments related to renewable energy. This is why local authorities point at EU funds as a key factor supporting municipal budgets and allowing them to invest

also in renewable energy. This is in line with many studies which show that the success in introducing renewable energy largely depends on public funding [78].

In 74.3% of Cittaslow municipalities, local governments declared that they implement activities related to the deployment of renewable energy as one of the goals of the development strategy. In most strategies, the entries were laconic. The strategies contained general information on the type of renewable energy sources. Similarly, as shown in the studies of other authors [74], none of the strategies included an analysis of the conditions for the deployment of renewable energy and the sources of financing such investments. This proves that although the strategies may be an important instrument to support the development of renewable energy at the local and regional levels in other countries [79–82], they have been not used in this way by Polish Cittaslow local governments yet. In addition, the opinions of the inhabitants of Cittaslow municipalities indicate the lack of significant effects that are assumed in the documents and strategies [83].

Results of the surveys indicate that regardless of the size and type of municipality, renewable energy is an unused resource in both urban and rural areas, which is also confirmed by other studies [84–86]. It is probably influenced by the specificity of the examined municipalities and their socio-economic characteristics. The policy of municipalities aiming at the development of renewable energy is different. There are also different geographic, climatic, and social conditions, which can significantly affect the deployment of renewable energy.

The vast majority of Cittaslow municipalities are located in Warmińsko-Mazurskie Voivodeship, in the east of Poland. Due to its peripheral location and low level of economic development, the region is one of the poorest regions in the country. Moreover, in a large part of Warmińsko-Mazurskie Voivodeship there are areas of natural value, therefore it is not possible to build, for example, wind farms. Due to the low population level, the demand for renewable energy may be lower than in other regions of the country or Europe. Moreover, high unemployment means that the inhabitants of the region do not have the possibility of financing investments related to renewable energy sources. It is also worth emphasizing that the geographic conditions and climate in the region with the highest share of Cittaslow municipalities are not conducive to the implementation of tasks related to solar or geothermal energy. It is one of the coldest areas in Poland.

Cittaslow municipalities vary in their levels of socio-economic development and quality of life. However, they have natural environment resources of above-average value. This may be an important element in the transition of slow municipalities towards green slow municipalities, i.e., a model in which technological solutions and renewable energy sources are used to protect the natural environment. The importance of this resource in the development of slow municipalities can be discussed, for example, in relation to the tourist offer, building sustainable transport infrastructure or improving the quality of life [87–89]. It is worth noting that the diversification of the used energy sources is an element of building energy security [90]. Increasing the implementation of tasks related to renewable energy deployment by Cittaslow municipalities can mean lower energy purchase costs. Activity in promoting and using renewable energy sources can contribute to achieving positive social, environmental, and economic effects.

The study may have a limitation. Although it was carried out based on data for all Cittaslow municipalities in Poland, the conditions for the deployment of renewable energy by local governments in other countries may significantly vary. Thus, the findings and conclusions of this research should not be attributed to all National Cittaslow Networks, until a comparative study with other national Cittaslow Networks confirms or rejects this limitation.

6. Conclusions and Recommendations

The slow city concept highlights the appreciation of the quality and creativity in unhurried and reflective activity of people in all areas of their lives, circular economy, social justice, local culture and heritage, sustainability and cooperation. Cittaslow municipalities

implement this concept in different social, economic, and administrative conditions of 30 countries forming the international network. The network identifies itself as a cluster of resilient microeconomies that extend the commitment to sustainable development through actions for integration and shared responsibility. It stresses the need to focus actions on the protection and improvement of the natural environment in an increasingly conscious and consistent manner.

Most Polish Cittaslow municipalities declare the implementation of renewable energy as one of the goals in their local development strategies. However, the support of the deployment of renewable energy is not a priority, as being located mostly in one of the poorest regions of Poland and the European Union, they face a lot of challenging and pressing social and economic problems typical of peripheral areas. Solving many of these problems is an obligatory task for the local authorities in Poland, while the implementation of renewable energy is not obligatory. Thus, in the context of a cumulation of development issues and serious deficits of funds, they choose the activities, which are obligatory. Many of these are a part of the slow city concept at the same time, e.g., waste selection, large-size waste selection, wastewater treatment, forest planting and protection of green areas, replacement of furnaces for heating buildings and asbestos removal from roofs. They add up to the increase in the standard of living of residents and help to implement the green city model.

On the other hand, despite serious bottlenecks, more than a half of Polish Cittaslow municipalities take actions supporting the deployment of renewable energy. They stress that it is possible only when public—mostly the European Union funding, is available for this goal.

Based on the findings and discussion, Cittaslow municipalities are recommended to direct more attention and efforts to increase the promotion of renewable energy, as well as seek public aid to co-finance future renewable energy projects.

Considering the model of the analyzed municipalities, the strategies should contain detailed information on activities related to the pursuit of the best possible living conditions. Such conditions also include the use of renewable energy sources.

The principles of cooperation in the field of renewable energy sources should be evidence-based and promote practices that are the best in a given social, economic and environmental context. Therefore, further research on the attitudes and behavior of local authorities in municipalities belonging to the Cittaslow network should be carried out. Future research will form the basis for multi-level decisions regarding the implementation of activities supporting the deployment of renewable energy to the greatest possible extent.

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