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# On the Road to Sustainability: Implementation of the 2030 Agenda Sustainable Development Goals (SDG) in Poland

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**Abstract:** The purpose of the study is to determine the implementation status of the 2030 Agenda sustainable development goals (SDG) in Poland. The current situation in the country is characterized in the introduction, with particular emphasis on the socio-economic situation, economic growth, sustainable development, crucial strategic documents, development policies, non-governmental organizations and good governance. The next part of the article presents the selected for analyses indicators, which monitor the implementation of SDG at the national level (National SDG indicators). The study covers the period 2010–2016. In terms of the research methodology, the dynamic analysis methods were used, i.e., individual dynamics indexes (fixed-base and chain type). The average rate of particular phenomena changes over time was also determined. The data for calculations were retrieved from Statistics Poland resources. The article provides recommendations regarding the effective implementation of SDG in Poland in the years to come. The research results showed that the implementation status of SDG is satisfactory. In the case of 57 indicators out of the 73 analysed, the direction of expected changes was positive; thus the country remains on the right path towards sustainable development. Among the diagnosed problems the following can be listed: obesity, civilization diseases, lower income, government expenditure and R&D outlays in agriculture, fewer adults participating in education, gender pay gap, lower revenues from selling innovative products, unfavourable ratio of disposable income in rural areas against the city, unsatisfactory quality of the law-making, relatively low percentage of energy from renewable sources in transport and land requiring reclamation.

**Keywords:** sustainable development; 2030 Agenda; United Nations; Poland; Sustainable Development Goals (SDG), good governance; Strategy for Responsible Development; dynamics indicators; time series analysis; socio-economic development

## 1. Introduction

The origin of the presented study results from a significant need to analyse the implementation status of SDG in Poland. The awareness of the country situation regarding the implementation processes of the sustainable development concept makes it is easier to plan future activities, identify areas requiring special intervention, control progress and check whether we find ourselves on the right path. Despite the unquestionable economic success observed in the recent years and the ongoing economic growth since 1992, Poland still has to invest efforts in catching up with the civilization distance to the most developed countries in the world. At this point it should be noted that only few countries worldwide have recorded such long-lasting economic growth (measured by GDP). During this time, a significant developmental distance was covered, for example, in 1991 GDP per capita

in Poland, against Western Europe, was as low as 31%, whereas in 2018 it will most likely go up to 67%. In addition, Poland was as the only country on the continent that avoided recession and maintained the ability to develop during the 2009–2010 crisis and in the subsequent period of economic downturn observed in Europe and globally [1]. Also, in relation to the Human Development Index (HDI), Poland has achieved a visible improvement of its position. In general terms, HDI is a synthetic measure describing the level of socio-economic development of individual countries. In 1990, the index value for Poland was 0.712, whereas in 2017 it amounted to 0.865, which was 33rd worldwide. In the discussed period, the index value increased by 21.5% [2].

Among other symbolic events, it should be mentioned that Poland was the first country from the former Soviet bloc that was included in the so-called "developed markets". In September 2018, FTSE Russell the global index agency re-classified Poland from the group of "emerging markets" to "developed markets". As a result, the country joined the world's leading economies [3]. Currently, it is the eighth largest economy in the European Union and the largest one among the Central and Eastern Europe countries. The status of the developed market should change the way investors perceive Poland [4,5]. In the long term it also means more interest in Polish stock exchange and an increased investment potential for foreign entities.

Despite the aforementioned positive processes, Poland still has much to catch up in terms of individual areas responsible for socio-economic development, not necessarily expressed in numerical values only. Equally important is the level of life quality, subjectively experienced by the residents of the country [6–9]. It can be said that the implementation of sustainable development goals is a natural process for Poland and the subsequent stage in building a better place to live for future generations. In addition, this approach allows focusing actions in a coordinated manner, based on the set principles, guidelines and indicators [10,11]. It is easier to determine the scale of developmental progress having defined the signposts (SDG) and paths to follow (assumptions of the 2030 Agenda).

For the purposes of this study, sustainable development is defined as the process of transformations, which ensures meeting the needs of the present generation without reducing the development opportunities of future generations, e.g., owing to integrated activities in the field of economic, social and environmental development [12–16]. The above mentioned definition assumes that both economic and civilization development of the present generation should not be carried out at the expense of depleting the non-renewable resources and damaging the environment, but having in mind the benefit of future generations who will also have their rights to develop [17,18]. At this point, the importance of intergenerational justice should be emphasized and approached as the need for preserving the nature capital for future generations through economical management of natural resources, only a partial use of its potential, maintaining a dynamic environmental balance and the recirculation of resources. Therefore, sustainable development stands not only for fairness in meeting the current needs, but for a deeper concept' of intergenerational justice. The problems of today should be solved in a manner that ensures sustainable material and social and environmental foundations for further development. Intergenerational justice has to take into account the possible inevitability of the present generation giving up, meeting its needs more extensively so as not to limit the chances available for the next generation [19–21]. Such an understanding of sustainable development has been adopted based on the report of the World Commission on Environment and Development entitled Our Common Future [22]. Further development of this idea was continued on the Earth Summit 1992, and as a result, the Action Programme—Agenda 21 was developed [23]. Another milestone in the activities for sustainable development took the form of the United Nations Millennium Declaration, which defined the Millennium Development Goals [24,25]. The implementation of these goals was to allow effective coping with the challenges of the 21st century in the perspective till 2015. The provisions of the 1992 Summit were renewed in Johannesburg in 2002 and then at the Rio de Janeiro summit in 2012, referred to as Rio+20 [26]. At this summit, the Future We Want declaration was adopted, in which the participants expressed their willingness to promote the idea of a sustainable future not only in economic, but also in social and environmental terms. In 2015, the Millennium Development Goals

were replaced by the Sustainable Development Goals (SDG) presented in the *Transforming our World*: *The 2030 Agenda for Sustainable Development* [27]. The 2030 Agenda for Sustainable Development is a development plan for the world, assuming the elimination of poverty, a decent life for all people and ensuring peace by 2030. Sustainable development, or rather striving for its fullest achievement, remains, beyond any doubt, one of the most important challenges faced by the modern world.

It is worth adding at this point that, in recent years, the identification of sustainable development predominantly with environmental and ecological aspects has been one of the biggest simplifications and mental shortcuts, not reflecting the reality, whereas it is the social area [28], taking into account the level of ecological education [29–33] and the above-mentioned development which seems to be crucial for achieving satisfactory results in the future, as it radiates and affects all the other dimensions of sustainable development. Hence, sustainable development does not stand for environmental protection in traditional terms. It primarily means development, however, conditioned by ecological space, and through the assumed synergy of economic, environmental and social aspects, also safe and beneficial for a human being, for the environment and the economy. Nevertheless, the environmental aspect is of fundamental importance for the quality of our lives as well as the lives of future generations [34,35].

It should be noted that in Poland the policy of sustainable development is carried out based on strategic documents. The Strategy for Responsible Development [36] adopted by the Government of the Republic of Poland on 14 February 2017 is the primary, horizontal strategy, presenting Poland's response to the 2030 Agenda. The development model for Poland included in the strategy is essentially consistent with the vision of the world, as defined in the Agenda by the UN. Following the adoption of the Strategy for Responsible Development, in 2018 at the Ministry level, the detailed and most important of Poland's priorities were defined in the context of achieving the 2030 Agenda goals.

The main goal of the strategy is to create conditions for the growth of Polish residents' income, along with increasing cohesion in the social, economic, environmental and territorial dimension. The detailed objectives include: sustainable economic growth based, to a greater extent, on knowledge, data and organizational excellence (areas: reindustrialisation, development of innovative companies, small and medium enterprises, capital for development, foreign expansion); socially sensitive and balanced territorial development (areas: social cohesion, balanced territorial development); and an effective state and institutions for growth and social and economic inclusion (areas: law for the citizens and the economy, pro-development institutions and strategic development management, e-state, public finance, effective use of the EU funds). It is easily noticeable that the adopted main goal and the specific objectives for Poland, for the coming years, are directly correlated with the concept of sustainable development. It should be noted that the environmental aspect permeates and co-creates the listed goals on the basis of synergy.

The sustainable development goals (SDG) are crucial for the research results presented in this study [37–41]. The names of the listed goals have been quoted in their full form (see Table 1). The carried out analyses basically cover the years 2010–2016, i.e., have a retrospective nature, in the sense that they cover the period before the official adoption of the latest sustainable development goals (SDG). This, however, is not an obstacle for conducting the research properly, interpreting the results and providing further recommendations on this basis.

There are, obviously, more approaches to the problem of monitoring the processes for the sustainable development concept implementation [42–44]. For example, the division of thematic areas performed in previous years and the resulting indicators inspired by the European Union's view of sustainable development [45]. Among the aforementioned thematic areas (SDI scheme), the following are included: socioeconomic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance. On the basis of the EU scheme, providing the substantive framework, the research on the indicator-based measurement of the sustainable development level in various parts of the world, e.g., in Russia, Poland, Asian or African countries was

carried out. In each of the mentioned cases, the studies covered a relatively long period of time, up to a dozen or so years [46,47]. The described EU approach has not been used in this study as it concerns the implementation of SDG, i.e., a more recent approach and subject to the current evaluation.

At this point, good governance [48,49] should be mentioned, which can be perceived from the perspective of its base, the key determinant affecting the effective implementation of development goals, including those directly related to sustainable development. In Poland and also in other countries, the very concept of good governance is related to institutionalized values such as democracy, respect for human rights, accountability, transparency and greater efficiency and effectiveness of the public sector [50]. In other words, there is no effective implementation of the sustainable development concept without good governance at the national, regional and local level [51,52].

In terms of good governance, as the component of sustainable development concept, a special place is occupied by non-governmental organizations, which can provide important support for public authorities. The optimal solution is the cooperation between social leaders [53], community representatives of a given area and the business and public administration sector leaders, thus co-creating the network of effective space management [54]. The activities performed by the organizations themselves are perceived as an important phenomenon, manifested in creating development perspectives for the poorer part of society and the participation in current social and economic policy development [55]. In other words, non-governmental organizations, in addition to business and public administration sectors, constitute inseparable components and remain the creators of social and economic development [56]. Moreover, through their activity they support obtaining social consensus for the most important development projects. They can also play the role of a natural incubator for ecological [57], creative and innovative solutions, the source of tolerance and empathy, as well as the forge of human talents taking advantage of endogenous developmental potentials ingrained in the community [58].

Referring, at this point, to the so-called third sector (non-governmental organizations) is deliberate, particularly in relation to Poland, where social activity and endogenous initiatives after several decades of the socialist system, formally ended in 1989 and did not reach the levels observed in Western European countries. The simplest measurements of this activity include electoral turnout, or just the number and activities of foundations and associations. However, one should bear in mind that the observed situation may also result from social mentality, the cultural code in this part of Europe, significantly different from e.g., in Anglo-Saxon culture.

The main purpose of this study is to determine the implementation status of sustainable development goals (SDG) in Poland, based on the indicators monitoring this development at the national level (National SDG indicators) [59]. The study covers the period 2010–2016. The indicators used in the analysis constitute an extensive list retrieved from the official national public statistics. The research methodology used to assess the SDG implementation included the dynamic analysis methods, i.e., individual dynamics indexes (fixed-base and chain type). The average rate of change regarding particular phenomena over time was also determined. The data for calculations originate from the sources of Statistics Poland [59]. Recommendations for an effective implementation of SDG in Poland, in the years to come, can also be distinguished among other research purposes of the article.

## 2. Research Method

As mentioned earlier, the concept of sustainable development is implemented in Poland based on strategic documents, among which the most important one is the Strategy for Responsible Development [36]. In addition, the shard responsibility model for the implementation of sustainable development goals is applied, as recommended in the 2030 Agenda. At the political level, both programmes and actions are developed and designated to ensure progress in achieving the set objectives. Public statistics are responsible for their monitoring [60,61]. The compliance of the Strategy for Responsible Development with the 2030 Agenda is noticeable at the level of goals, areas and priority actions, as well as the indicators monitoring progress in their implementation. The Ministry of

Investment and Economic Development is the coordinator of the Strategy for Responsible Development implementation. The Ministry of Entrepreneurship and Technology coordinates the implementation of the UN Agenda at the government level in Poland, also ensuring the consistency of goals with the national development policy.

The Agenda highlights the importance of an efficient monitoring and reporting system in achieving the set goals. In Poland, the activities in this respect are coordinated by the Central Statistical Office (Statistics Poland). It is responsible, e.g., for reporting indicators, providing reliable and credible data, both in the national and global dimension. The reporting platform [59], provided by Statistics Poland, monitors the goals of sustainable development and transfers data for the global needs.

Generally, the overall SDG monitoring covers four sets of indicators: the set of global sustainability indicators (adopted by the UN) providing values for Poland; the set of national sustainability indicators (used in this study); and two sets of indicators for the monitoring of sustainable development at lower territorial levels (regional and local). This time the set of indicators presented in the national module (National SDG indicators) was selected for the research, as it best corresponds to the actual Polish nationwide conditions.

As it has already been mentioned, in Poland, the Strategy for Responsible Development is the response to the 2030 Agenda. The country development model included in the strategy is consistent with the vision of the world specified in the UN Agenda. In Poland, the set of national indicators, defined by the Statistics Poland, is used for the purposes of reporting. These indicators differ from the global approach (Global SDG Indicators) due to the specificity of the country and the adopted internal regulations [59]. In the aforementioned national module, the indicators are assigned to 17 goals corresponding to the SDG defined in the 2030 Agenda (Table 1).

**Table 1.** The sustainable development goals and the corresponding indicators monitoring sustainable development at the national level (national SDG indicators).

| Goal | National SDG indicators |
| --- | --- |
| 1. No poverty (End poverty in all its forms everywhere) | 1.1 At-risk-of-relative poverty rate<br>1.2 Real adjusted gross disposable income of households per capita at PPP (UE28 = 100)<br>1.3 Number of dwellings per 1000 population<br>1.4 Overcrowding rate |
| 2. Zero hunger (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) | 2.1 Prevalence of obesity among adults<br>2.2 Agricultural land area in farms exceeding 30 ha as % of agricultural land area in farms in total<br>2.3 Average monthly income per capita from private farm in agriculture in relation to income per capita from self-employment<br>2.4 Agricultural Orientation Index for government expenditures (AOI)<br>2.5 Share of certified agricultural land area of organic farms in total agricultural land area of farms<br>2.6 Expenditure on R&D in agriculture in relation to GDP |
| 3. Good health and well-being (Ensure healthy lives and promote well-being for all at all ages) | 3.1 Healthy Life Years—males<br>3.2 Healthy Life Years—females<br>3.3 Active Ageing Index (AAI)<br>3.4 Deaths due to diseases of the circulatory system per 100 thous. population<br>3.5 Deaths due to diabetes mellitus per 100 thous. population<br>3.6 Deaths due to malignant neoplasms per 100 thous. population<br>3.7 Deaths due to chronic respiratory disease per 100 thous. population<br>3.8 Number of physicians per 10 thous. population<br>3.9 Number of nurses and midwives per 10 thous. population |

**Table 1.** *Cont.*

| Goal | National SDG indicators |
| --- | --- |
| 4. Quality education (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) | 4.1 Adults participating in education or training (aged 25—64)<br>4.2 Unemployment rate of basic vocational school leavers (LFS)<br>4.3 Results of PISA tests—percentage of top-performing students in reading literacy<br>4.4 Results of PISA tests— percentage of top-performing students in mathematics<br>4.5 Results of PISA tests—percentage of the lowest-performing students in reading literacy<br>4.6 Results of PISA tests—percentage of the lowest-performing students in mathematics<br>4.7 Results of PISA tests—proportion of students achieving at least a minimum proficiency level in reading<br>4.8 Results of PISA tests—percentage of students achieving at least a minimum proficiency level in mathematics<br>4.9 Percentage of children aged 3–5 covered by pre-primary education |
| 5. Gender equality (Achieve gender equality and empower all women and girls) | 5.1 Employment rate of women with the youngest child up to 5 years old (LFS)<br>5.2 Percentage of women in managerial positions (IV quarter)<br>5.3 Gender pay gap<br>5.4 Activity rate—females<br>5.5 Activity rate—males |
| 6. Clear water and sanitation (Ensure availability and sustainable management of water and sanitation for all) | 6.1 Percentage of population connected to wastewater treatment plants<br>6.2 Percentage of population connected to water supply system<br>6.3 Exploitable underground water resources per 100 thous. inhabitants |
| 7. Affordable and clean energy (Ensure access to affordable, reliable, sustainable and modern energy for all) | 7.1 SAIDI (System Average Interruption Duration Index)<br>7.2 Renewable energy share in the gross final energy consumption<br>7.3 ODEX (Aggregated energy efficiency index, 2000 = 100) |
| 8. Decent work and economic growth (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) | 8.1 Employment rate of persons aged 15 years and over (by LFS)<br>8.2 Employment rate of women with the youngest child up to 5 years old (LFS)<br>8.3 Share of exports of high technology products in total exports<br>8.4 Percentage of employees hired on the basis of employment contract<br>8.5 Ease of Doing Business Index (ranking positions in Doing Business)<br>8.6 Percentage of children aged 1–3 covered by different kinds of institutional care |
| 9. Industry, Innovation and Infrastructure (Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation) | 9.1 Expenditure on R&D in relation to GDP<br>9.2 Business enterprise expenditure on R&D in relation to GDP<br>9.3 Share of net revenues from sales of new or significantly improved products in total turnover in industrial enterprises<br>9.4 Index of multimodal accessibility of transport<br>9.5 Percentage of households with broadband Internet access at home |

**Table 1.** *Cont.*

| Goal | National SDG indicators |
| --- | --- |
| 10. Reduce inequalities (Reduce inequality within and among countries) | 10.1 Differentiation of gross value added per person employed in total at voivodships level (NTS 2)<br>10.2 Differentiation of GDP per capita at subregions' level (NTS 3)<br>10.3 Average annual net disposable income per capita in a household in rural areas in relation to urban areas<br>10.4 Income quintile inequality ratio |
| 11. Sustainable cities and communities (Make cities and human settlements inclusive, safe, resilient and sustainable) | 11.1 Air quality indicator (46 zones of the country where air quality assessment is made)<br>11.2 Share of buses powered by alternative fuels in the total number of buses serving urban transport<br>11.3 Mixed municipal waste collected per capita in urban areas<br>11.4 Average useful floor area of dwelling per capita in urban areas |
| 12. Responsible consumption and production (Ensure sustainable consumption and production patterns) | 12.1 Resource productivity<br>12.2 Domestic material consumption (DMC) per capita<br>12.3 Level of recycling and preparation for re-use of selected waste fractions: paper, metals, plastic and glass<br>12.4 Energy intensity of the economy |
| 13. Climate action (Take urgent action to combat climate change and its impacts) | 13.1 Greenhouse gas emissions (1990 = 100)<br>13.2 Share of renewable energy in transport |
| 14. Life below water (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) | 14.1 Cargo traffic at seaports<br>14.2 Percentage of average paid employment in maritime economy |
| 15. Life on land (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) | 15.1 Percentage of NATURA 2000 sites covered by management plans<br>15.2 Forest cover<br>15.3 FBI—Farmland Bird Index (2000 = 100)<br>15.4 Share of devastated and degraded land requiring reclamation in total area |
| 16. Peace, justice and strong institutions (Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels) | 16.1 Regulatory quality<br>16.2 Time required to enforce a contract<br>16.3 Government effectiveness index<br>16.4 Percentage of individuals using the Internet for contacts with public authorities or public services for submitting completed forms |
| 17. Partnerships for the goals (Strengthen the means of implementation and revitalise the global partnership for sustainable development) | 17.1 Net official development assistance as a proportion of gross national income |

Source: National SDG indicators. Statistics Poland [59].

The methods of dynamic analysis [62–67] were used to assess the implementation of sustainable development patterns in Poland. For each of the sustainable development indicators, individual dynamics indexes were calculated. Dynamics indexes represent measures determining the ratio of the phenomenon size in two different periods. Dynamics indexes may refer to homogeneous phenomena, described by a single time series. Such indexes are referred to as individual dynamics indexes. Having assumed the basic period $t^* = 1$ and the analysed period $t = n$, the fixed-base individual indexes are expressed by the following formula:

$$i_{n/1} = \frac{y_n}{y_1} \times 100\% \quad (1)$$

where $y_n$ is the phenomenon level in a given period (moment) and $y_1$ is the phenomenon level in a comparative period.

The chain index is expressed by the below formula:

$$i_{\frac{n}{n}-1} = \frac{y_n}{y_{n-1}} \times 100\% \quad (2)$$

where $y_n$ is the phenomenon level in a given period (moment) and $y_{n-1}$ is the phenomenon level in the previous period.

Both the fixed-base and chain indexes allow for assessing changes in the studied phenomenon between the selected periods (moments). The index value ranging from 0% to 100% indicates the phenomenon decline. The value higher than 100% means an increase in the phenomenon level within the analysed period, and the value equal 100% indicates an unchanged level of the studied phenomenon.

An equally important aspect is the assessment of changes in a given phenomenon throughout the entire period covered by the study. For this purpose, an average rate of the phenomenon change over time can be used. It is determined by applying the geometric mean of chain indexes using the following formula:

$$\overline{i_G} = \sqrt[n-1]{\prod i_{n/1}} \quad (3)$$

The medium-term rate of change in the analysed periods is calculated as the difference:

$$\overline{T_n} = i_G \times 100 - 100 \quad (4)$$

As a result of using these indicators it will be possible to show how their value changed from year to year and also against the first research period, which will allow showing whether the changes in a given indicator are beneficial from the perspective of the sustainable development concept implementation. Determining the medium-term rate of change will show the average annual level of change.

## 3. Results and Discussion

The table below presents comprehensive research results obtained using the dynamic analysis methods, individual dynamics indexes (fixed-base and chain type) and determining the average rate of change for individual phenomena over time (Table 2). Based on the research results it is possible to formulate analytical conclusions and recommendations for the future, as presented later in the study.

**Table 2.** Collective list of the research results regarding the implementation status of sustainable development goals (SDG) in Poland using individual dynamic indexes.

| Indicator | Chain Index (%) | | | | | | | Fixed-Base Index *i* = 2010 (%) | | | | | | | Med-Term Rate of Change (%) | Direction of Changes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | | |
| | - | 97.1 | 96.4 | 99.4 | 100.0 | 95.7 | 89.7 | 100.0 | 97.1 | 93.7 | 93.1 | 93.1 | 89.1 | 79.9 | −3.7 | p |
| **1.1** (total. aged 0–17. 65 and older) | - | 97.5 | 95.2 | 99.1 | 100.0 | 94.5 | 79.6 | 100.0 | 97.5 | 92.8 | 92.0 | 92.0 | 86.9 | 69.2 | −6.0 | p |
| | - | 93.3 | 95.5 | 92.5 | 107.1 | 100.0 | 97.2 | 100.0 | 93.3 | 89.2 | 82.5 | 88.3 | 88.3 | 85.8 | −2.5 | p |
| **1.2** | - | 103.0 | 103.9 | 100.6 | 100.7 | 101.2 | 101.9 | 100.0 | 103.0 | 107.0 | 107.6 | 108.4 | 109.7 | 111.8 | 1.9 | p |
| **1.3** | - | 100.9 | 101.0 | 101.1 | 101.0 | 101.1 | 101.1 | 100.0 | 100.9 | 101.9 | 102.9 | 103.9 | 105.1 | 106.2 | 1 | p |
| **1.4** | - | 99.4 | 98.1 | 96.8 | 98.7 | 98.2 | 93.8 | 100.0 | 99.4 | 97.5 | 94.3 | 93.1 | 91.4 | 85.7 | −2.5 | p |
| **2.1** | - | 101.8 | 102.2 | 102.6 | 102.1 | 102.0 | 102.4 | 100.0 | 101.8 | 104.0 | 106.7 | 108.9 | 111.1 | 113.8 | 2.2 | n |
| **2.2** | - | 97.4 | 105.3 | 102.5 | 100.0 | 100.0 | 102.4 | 100.0 | 97.4 | 102.6 | 105.1 | 105.1 | 105.1 | 107.7 | 1.2 | p |
| **2.3** | - | 88.7 | 119.1 | 105.1 | 76.2 | 94.4 | 105.4 | 100.0 | 88.7 | 105.6 | 111.1 | 84.6 | 79.8 | 84.2 | −2.8 | n |
| **2.4** | - | 83.6 | 96.7 | 78.0 | 80.4 | 108.1 | 105.0 | 100.0 | 83.6 | 80.8 | 63.0 | 50.7 | 54.8 | 57.5 | −8.8 | n |
| **2.5** | - | 119.8 | 123.0 | 110.5 | 113.4 | 90.3 | 85.8 | 100.0 | 119.8 | 147.3 | 162.8 | 184.5 | 166.7 | 143.0 | 6.1 | p |
| **2.6** | - | 83.3 | 80.0 | 100.0 | 150.0 | 83.3 | 80.0 | 100.0 | 83.3 | 66.7 | 66.7 | 100.0 | 83.3 | 66.7 | −6.5 | n |
| **3.1** | - | 101.0 | 100.0 | 100.2 | 101.0 | 100.5 | 102.0 | 100.0 | 101.0 | 101.0 | 101.2 | 102.2 | 102.7 | 104.8 | 0.8 | p |
| **3.2** | - | 101.6 | 99.2 | 99.8 | 100.0 | 100.8 | 102.2 | 100.0 | 101.6 | 100.8 | 100.6 | 100.6 | 101.4 | 103.7 | 0.6 | p |
| **3.3** | - | - | - | - | - | - | - | 100.0 | - | 100.4 | - | 104.1 | - | - | - | |
| **3.4** | - | 97.6 | 104.5 | 100.0 | 95.7 | 106.3 | 93.2 | 100.0 | 97.6 | 102.0 | 102.0 | 97.6 | 103.8 | 96.7 | −0.5 | p |
| **3.5** | - | 104.1 | 105.1 | 104.3 | 91.2 | 122.2 | 100.5 | 100.0 | 104.1 | 109.5 | 114.2 | 104.1 | 127.2 | 127.8 | 4.2 | n |
| **3.6** | - | 99.5 | 102.8 | 99.4 | 101.6 | 105.4 | 99.4 | 100.0 | 99.5 | 102.3 | 101.7 | 103.3 | 108.8 | 108.2 | 1.3 | n |
| **3.7** | - | 101.2 | 91.4 | 104.7 | 85.7 | 117.6 | 100.0 | 100.0 | 101.2 | 92.5 | 96.8 | 83.0 | 97.6 | 97.6 | −0.4 | p |
| **3.8** | - | 101.5 | 105.7 | 100.0 | 103.2 | 100.9 | 103.9 | 100.0 | 101.5 | 107.3 | 107.3 | 110.7 | 111.7 | 116.0 | 2.5 | p |
| **3.9** | - | 100.9 | 112.9 | 94.8 | 99.3 | 99.3 | 99.5 | 100.0 | 100.9 | 114.0 | 108.0 | 107.3 | 106.5 | 106.0 | 1.0 | p |
| **4.1** | - | 84.6 | 102.3 | 95.6 | 93.0 | 87.5 | 105.7 | 100.0 | 84.6 | 86.5 | 82.7 | 76.9 | 67.3 | 71.2 | −5.5 | n |
| **4.2** | - | 112.5 | 102.5 | 103.8 | 89.8 | 87.1 | 103.6 | 100.0 | 112.5 | 115.2 | 119.7 | 107.5 | 93.6 | 97.0 | −0.5 | p |
| **4.3** | - | - | - | - | - | - | - | 100.0 | - | 138.9 | - | - | 113.9 | - | - | |
| **4.4** | - | - | - | - | - | - | - | 100.0 | - | 160.6 | - | - | 117.3 | - | - | |
| **4.5** | - | - | - | - | - | - | - | 100.0 | - | 70.7 | - | - | 96.0 | - | - | |
| **4.6** | - | - | - | - | - | - | - | 100.0 | - | 70.2 | - | - | 83.9 | - | - | |
| **4.7** | - | - | - | - | - | - | - | 100.0 | - | 105.2 | - | - | 100.7 | - | - | |
| **4.8** | - | - | - | - | - | - | - | 100.0 | - | 107.7 | - | - | 104.2 | - | - | |
| **4.9** | - | 110.5 | 100.7 | 106.31 | 107.2 | 106.1 | 96.3 | 100.0 | 110.5 | 111.3 | 118.4 | 126.8 | 134.5 | 129.6 | 13.8 | p |
| **5.1** | - | 98.6 | 101.0 | 101.4 | 104.6 | 103.7 | 98.3 | 100.0 | 98.6 | 99.7 | 101.0 | 105.6 | 109.6 | 107.7 | 1.2 | p |
| **5.2** | - | 107.3 | 96.7 | 96.9 | 103.8 | 107.8 | 100.2 | 100.0 | 107.3 | 103.8 | 100.5 | 104.3 | 112.5 | 112.8 | 2.0 | p |
| **5.3** | - | 122.2 | 116.4 | 110.9 | 108.5 | 96.1 | 97.3 | 100.0 | 122.2 | 142.2 | 157.8 | 171.1 | 164.4 | 160.0 | 8.1 | n |
| **5.4** | - | 100.4 | 100.6 | 100.2 | 100.6 | 99.8 | 99.8 | 100.0 | 100.4 | 101.1 | 101.3 | 101.9 | 101.7 | 101.5 | 0.2 | p |
| **5.5** | - | 100.5 | 100.5 | 100.2 | 100.5 | 99.8 | 100.3 | 100.0 | 100.5 | 100.9 | 101.1 | 101.6 | 101.4 | 101.7 | 0.3 | p |
| **6.1** | - | 101.5 | 104.4 | 102.5 | 101.7 | 101.7 | 101.1 | 100.0 | 101.5 | 106.0 | 108.7 | 110.5 | 112.4 | 113.6 | 2.2 | p |
| **6.2** | - | 100.2 | 100.3 | 100.1 | 104.1 | 100.2 | 100.1 | 100.0 | 100.2 | 100.6 | 100.7 | 104.8 | 105.0 | 105.1 | 0.8 | p |
| **6.3** | - | 100.4 | 100.9 | 100.7 | 100.4 | 100.7 | 101.1 | 100.0 | 100.4 | 101.3 | 102.0 | 102.5 | 103.1 | 104.3 | 0.7 | p |
| **7.1** | - | 97.8 | 82.2 | 100.1 | 75.3 | 127.3 | - | 100.0 | 97.8 | 80.4 | 80.4 | 60.5 | 77.1 | - | -4.2 | p |
| **7.2** | - | 110.8 | 105.8 | 104.6 | 100.9 | 103.5 | 95.0 | 100.0 | 110.8 | 117.2 | 122.6 | 123.7 | 128.0 | 121.5 | 4.0 | p |
| **7.3** | - | 98.0 | 97.4 | 96.4 | 98.4 | 98.5 | - | 100.0 | 98.0 | 95.5 | 92.0 | 90.5 | 89.2 | - | −1.9 | p |

**Table 2.** *Cont.*

| Indicator | Chain Index (%) | | | | | | | Fixed-Base Index *i* = 2010 (%) | | | | | | | Med-Term Rate of Change (%) | Direction of Changes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | | |
| | - | 100.4 | 100.0 | 100.0 | 102.0 | 101.4 | 101.7 | 100.0 | 100.4 | 100.4 | 100.4 | 102.4 | 103.8 | 105.6 | 0.9 | p |
| **8.1** (total. men women) | - | 100.9 | 99.8 | 100.0 | 101.7 | 101.0 | 101.8 | 100.0 | 100.9 | 100.7 | 100.7 | 102.4 | 103.5 | 105.4 | 0.9 | p |
| | - | 100.0 | 100.2 | 99.8 | 102.3 | 102.1 | 101.3 | 100.0 | 100.0 | 100.2 | 100.0 | 102.3 | 104.4 | 105.8 | 1.0 | p |
| **8.2** | - | 98.6 | 101.0 | 101.4 | 104.6 | 103.7 | 98.3 | 100.0 | 98.6 | 99.7 | 101.0 | 105.6 | 109.6 | 107.7 | 1.2 | p |
| **8.3** | - | 85.0 | 117.6 | 111.7 | 117.9 | 107.6 | 100.0 | 100.0 | 85.0 | 100.0 | 111.7 | 131.7 | 141.7 | 141.7 | 6.0 | p |
| **8.4** | - | 99.5 | 99.5 | 100.0 | 100.3 | 100.0 | 100.5 | 100.0 | 99.5 | 98.9 | 98.9 | 99.2 | 99.2 | 99.7 | 0.0 | n |
| **8.5** | - | - | - | 81.8 | 71.1 | 78.1 | 96.0 | - | - | 100.0b | 81.8 | 58.2 | 45.5 | 43.6 | -18.7 | p |
| **8.6** | - | - | 136.4 | 138.3 | 126.5 | 118.1 | 112.1 | - | 100.0a | 136.4 | 188.6 | 238.6 | 281.8 | 315.9 | 24.0 | p |
| **9.1** | - | 104.2 | 117.3 | 98.9 | 108.0 | 106.4 | 97.0 | 100.0 | 104.2 | 122.2 | 120.8 | 130.6 | 138.9 | 134.7 | 5.1 | p |
| **9.2** | - | 115.8 | 150.0 | 115.2 | 115.8 | 106.8 | 134.0 | 100.0 | 115.8 | 173.7 | 200.0 | 231.6 | 247.4 | 331.6 | 22.1 | p |
| **9.3** | - | 78.8 | 103.4 | 94.6 | 101.1 | 108.0 | 85.3 | 100.0 | 78.8 | 81.4 | 77.0 | 77.9 | 84.1 | 71.7 | -5.4 | n |
| **9.4** | - | - | - | - | 102.7 | 103.8 | - | 100.0 | - | - | 109.4 | 112.3 | 116.6 | - | 1.1 | p |
| **9.5** | - | 107.6 | 109.7 | 102.7 | 103.3 | 99.9 | 106.6 | 100.0 | 107.6 | 118.0 | 121.1 | 125.2 | 125.0 | 133.3 | 4.6 | p |
| **10.1** | - | 102.0 | 99.3 | 96.7 | 100.7 | 98.6 | - | 100.0 | 102.0 | 101.3 | 98.0 | 98.7 | 97.3 | - | −0.4 | p |
| **10.2** | - | 99.1 | 100.6 | 100.0 | 99.4 | 100.6 | - | 100.0 | 99.1 | 99.7 | 99.7 | 99.1 | 99.7 | - | 0.0 | p |
| **10.3** | - | 101.5 | 99.6 | 102.7 | 98.6 | 102.2 | - | 100.0 | 101.5 | 101.1 | 103.8 | 102.3 | 104.5 | - | 0.7 | n |
| **10.4** | - | 100.0 | 98.0 | 100.0 | 100.0 | 100.0 | 98.0 | 100.0 | 100.0 | 98.0 | 98.0 | 98.0 | 98.0 | 96.0 | −0.7 | p |
| **11.1** | - | 100.0 | 92.9 | 94.8 | 113.6 | 95.3 | - | 100.0 | 100.0 | 92.9 | 88.1 | 100.0 | 95.3 | - | −1.0 | p |
| **11.2** | - | 121.7 | 96.4 | 114.8 | 93.5 | 124.1 | 105.6 | 100.0 | 121.7 | 117.4 | 134.8 | 126.1 | 156.5 | 165.2 | 8.7 | p |
| **11.3** | - | 95.4 | 96.4 | 93.6 | 97.6 | 99.6 | 104.0 | 100.0 | 95.4 | 92.0 | 86.1 | 84.0 | 83.7 | 87.0 | −2.3 | p |
| **11.4** | - | 101.2 | 101.6 | 101.2 | 101.6 | 101.1 | 101.5 | 100.0 | 101.2 | 102.8 | 104.0 | 105.7 | 106.9 | 108.5 | 1.4 | p |
| **12.1** | - | 85.7 | 116.7 | 107.1 | 103.3 | 104.8 | 98.5 | 100.0 | 85.7 | 100.0 | 107.1 | 110.7 | 116.1 | 114.3 | 2.3 | p |
| **12.2** | - | 123.7 | 87.2 | 94.5 | 99.7 | 98.3 | 104.5 | 100.0 | 123.7 | 107.8 | 101.9 | 101.6 | 99.9 | 104.4 | 0.7 | n |
| **12.3** | - | - | - | 133.3 | 87.5 | 123.8 | 107.7 | - | - | 100.0b | 133.3 | 116.7 | 144.4 | 155.6 | 11.7 | p |
| **12.4** | - | 95.3 | 95.3 | 99.0 | 93.2 | 97.4 | 101.8 | 100.0 | 95.3 | 90.8 | 89.9 | 83.8 | 81.7 | 83.1 | −3.0 | p |
| **13.1** | - | 99.9 | 98.2 | 99.1 | 96.9 | 100.8 | - | 100.0 | 99.9 | 98.1 | 97.2 | 94.2 | 94.9 | - | −1.0 | p |
| **13.2** | - | 103.0 | 95.6 | 101.5 | 93.9 | 90.3 | 69.6 | 100.0 | 103.0 | 98.5 | 100.0 | 93.9 | 84.8 | 59.1 | −8.4 | n |
| **14.1** | - | 97.0 | 101.9 | 109.4 | 106.8 | 101.2 | 104.9 | 100.0 | 97.0 | 98.8 | 108.1 | 115.5 | 116.8 | 122.5 | 3.4 | p |
| **14.2** | - | 100.0 | 100.0 | 116.7 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 116.7 | 116.7 | 116.7 | 116.7 | 2.6 | p |
| **15.1** | - | - | - | - | 964.7 | 117.2 | 113.1 | - | - | - | 100.0c | 964.7 | 1131.0 | 1278.6 | 133.8 | p |
| **15.2** | - | 100.0 | 100.3 | 100.3 | 100.0 | 100.3 | 100.0 | 100.0 | 100.0 | 100.3 | 100.7 | 100.7 | 101.0 | 101.0 | 0.2 | p |
| **15.3** | - | 98.6 | 96.9 | 100.5 | 98.3 | 102.8 | 101.1 | 100.0 | 98.6 | 95.6 | 96.0 | 94.5 | 97.1 | 98.1 | -0.3 | n |
| **15.4** | - | 104.6 | 100.5 | 96.1 | 101.5 | 101.0 | 102.0 | 100.0 | 104.6 | 105.1 | 101.0 | 102.6 | 103.6 | 105.6 | 0.9 | n |
| **16.1** | - | 94.9 | 103.2 | 109.4 | 100.0 | 95.2 | 95.0 | 100.0 | 94.9 | 98.0 | 107.1 | 107.1 | 102.0 | 96.9 | −0.5 | n |
| **16.2** | - | 100.0 | 82.5 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 82.5 | 82.5 | 82.5 | 82.5 | 82.5 | −2.7 | p |
| **16.3** | - | 96.9 | 109.7 | 105.9 | 115.3 | 96.4 | 86.3 | 100.0 | 96.9 | 106.3 | 112.5 | 129.7 | 125.0 | 107.8 | 1.3 | p |
| **16.4** | - | 89.8 | 120.5 | 107.5 | 129.8 | 106.1 | 119.7 | 100.0 | 89.8 | 108.2 | 116.3 | 151.0 | 160.2 | 191.8 | 11.5 | p |
| **17.1** (total) | - | 100.0 | 112.5 | 111.1 | 90.0 | 111.1 | 150.0 | 100.0 | 100.0 | 112.5 | 125.0 | 112.5 | 125.0 | 187.5 | 11.0 | p |
| **17.1** (for least developed countries) | - | 119.0 | 100.0 | 368.0 | 83.7 | 124.7 | 165.6 | 100.0 | 119.0 | 119.0 | 438.1 | 366.7 | 457.1 | 757.1 | 40.1 | p |

Source: Authors' compilation: National SDG indicators. Statistics Poland [59]; a—base year 2011, b—base year 2012, c—base year 2013; p—positive direction of changes (green colour), n—negative direction of changes (red colour), the particular groups of indicators, corresponding to SDG, were additionally highlighted in the shades of grey; for 3.3 and 4.3 to 4.8 indicators, due to data gaps, only the fixed-base index was partly calculated; therefore the directions of changes were determined for 73 out of the total of 80 indicators.

Evidently positive changes can be observed in the range of indicator values monitoring the goal of no poverty. The directions of changes in the values of all indicators in this area were positive. In terms of zero hunger, the values of indicators varied regarding their impact on sustainable development. Positive changes are observed in the percentage of people aged 18 and over suffering from obesity. The increased share of agricultural land area in farms exceeding 30 ha in the total agricultural land area in fames was recorded. Unfavourable changes are observed regarding the average monthly income per capita from private farms in agriculture in relation to income per capita from self-employment. In turn, positive changes can be observed in relation to the share of the certified agricultural land area of organic farms in the total agricultural land area of farms. In each of the analysed years, the Agricultural Orientation Index for government expenditures (AOI) was below 1. This signifies a decline in the orientation of expenditure on agriculture at the central government level against the total central government expenditure, i.e., total expenditure of the central subsector and the insurance sub-sector expenditure (according to the Classification of the Functions of the Government—COFOG). R&D expenditure in agriculture in relation to GDP in the analysed period presented an unchanged level ranging from 0.04% to 0.06% in each of the studied years.

The occurring changes cannot be unequivocally assessed in the area of good health and life quality. The value of the Active Aging Index (AAI) can take point values on the scale from 0 to 100; the higher the point value, the greater the contribution of older people to society and the better conditions for active aging. In the case of Poland, the change in the indicator value remains favourable. Longer average life expectancy in the health of both women and men should be assessed positively. Death rate due to cardiovascular diseases per 100,000 population went down in the analysed period. However, the number of deaths caused by diabetes per 100,000 population went up. The same situation referred to the number of deaths from malignant tumours per 100,000 population. In turn, the number of deaths resulting from chronic respiratory diseases per 100,000 population declined. The increase was recorded in the number of doctors per 10,000 population as well as the number of nurses and midwives per 10,000 population.

The changes occurring in the field of good quality of education can be assessed positively. Negative changes are observed in relation to one indicator only, i.e., the percentage of adults participating in education or training (aged 25–64). The changes in the next area, i.e., gender equality can also be assessed positively. The problem is, however, an increasing gender pay gap (wage gap). The area where the changes can unequivocally be assessed as positive is clean water and sanitary conditions. The values of all indicators in this area show changes heading in the desired direction.

The next area subject to analysis was clean and affordable energy. The increased share of energy from renewable sources in final gross energy consumption was recorded. The SAIDI (System Average Interruption Duration Index) expressed in minutes per customer per year is the sum of products of a long and a very long interruption duration in electricity supply and the number of customers exposed to such interruption effects in a year divided by the total number of customers. The SAIDI indicator informs about the total duration of interruptions in electricity supply (in minutes) to be expected, on average, by a consumer in a year. In the years 2010–2015, the value of this indicator went down. The ODEX indicator (Aggregate Energy Efficiency Index, 2000 = 100) shows aggregated changes in unit energy consumption, observed at a given time at specific levels of end use, calculated as the quotient of actual energy consumption in a given year and theoretical energy consumption, not taking into account the effect of unit consumption (i.e., assuming the current energy consumption of the manufacturing processes of given products). The ODEX indicator does not show the current level of energy intensity, but the progress against the base year. The lower the indicator, the higher the improvement in energy efficiency. In the case of Poland, the indicator value declined in the period 2010–2015.

Positive changes took place in the area of economic growth and decent work. The total employment rate of people aged 15 and over (according to BAEL) increased for both women and men. According to BAEL, positive changes are also observed in the employment rate of women with the youngest child up to 5 years old. Its value went up in the analysed period. The share of exports of

high technology products in total exports also increased. The percentage of people employed based on employment contracts went slightly down. Poland improved its position in the Doing Business ranking. A significant increase can be observed regarding the percentage of children aged 1–3 covered by various forms of institutional care.

The next studied area was industry, innovation and infrastructure. In this area, positive changes are observed regarding the vast majority of indicators. R&D expenditure in relation to GDP in 2016 against 2010 went up. The expenditure of the enterprise sector on R&D in relation to GDP also recorded an increase. The Public Transport Accessibility Index (PTAI) was defined for the years 2013–2015, and in this period its value increased. An increase was also recorded in the percentage of households with broadband Internet access at home in the years 2010–2016. The only indicator recording unfavourable changes was the share of net revenues from sales of new or significantly improved products in net revenues from total sales in industrial enterprises. The value of this indicator in the analysed years showed a decline.

Small changes are observed in inequality reduction. The indicators monitoring this area were practically unchanged in the analysed period. The changes of all indicators referring to the goal of sustainable cities and communities are positive. Responsible consumption and production was the next analysed area. The level of recycling and preparation for reusing selected municipal waste fractions, i.e., paper, metals, plastics and glass also increased. Domestic Material Consumption (DMC) per capita and resource productivity went up.

The activities undertaken in the field of climate cannot be assessed unequivocally. It is confirmed by value changes of two indicators monitoring this area. The percentage of energy generated from renewable sources in transport declined in the analysed period. In turn, the dynamics of greenhouse gas emissions (1990 = 100) were reduced. Another analysed area was life below water. The cargo turnover at seaports and the percentage of average employment in the maritime economy increased. In the area of life on land, the values of four indicators were analysed. The percentage of Natura 2000 sites covered by management plans was higher. Poland is a country characterised by an extensive forest cover. In the analysed period, the value of Farmland Bird Index FBI (2000 = 100) went down. The share of devastated and degraded land requiring reclamation presented an insignificant level in the total area and slightly increased.

Peace, justice and strong institutions represent yet another area under analysis. The first of the studied indicators was the quality of the enacted law. It is used to assess the government's ability to develop and implement correct policies and regulations allowing for the promotion of private sector development. It assumes values in the range from −2.5 to +2.5, with higher values indicating a higher level of good governance. In the analysed period, the values for Poland ranged between 0.93 and 1.05. Positive changes are observed regarding the average time needed to recover contractual receivables in courts. In 2010 it was 830 days, whereas starting from 2013 it was 685 days. Another analysed indicator was the government effectiveness index. This indicator assesses the quality of public services, the quality of bureaucracy, the competence of public officials, the independence of state administration (civil service) against political pressure and the social credibility of the authorities in terms of the conducted policy. The indicator takes values between −2.5 and 2.5. In the analysed period, its value ranged from 0.62 in 2011 to 0.83 in 2014. An increased percentage of people using the Internet in contacts with public administration to submit completed applications was recorded. The last studied area was partnerships for goals. Within this area, net official development assistance as the proportion of gross national income in total and for the least developed countries is monitored. Its value increased in the analysed period. The support for the least developed countries also went up.

## 4. Conclusions

To summarize and make general conclusions, it can be stated that in terms of achieving the 2030 Agenda goals in Poland the situation is following the right path. In the case of 57 indicators out of the 73 in total, the direction of the expected changes was positive. In other words, Poland finds itself

on the way towards sustainable development, allowing for the elimination of poverty, ensuring a higher quality of life for all residents and peace and care for the natural environment, thus meeting the provisions of the 2030 Agenda.

Obviously not all indicators presented the desired direction for change. Unfavorable tendencies could be primarily observed in the case of: the percentage of adults suffering from obesity, income per capita in individual agricultural holdings, the reduction in the level of central government funds allocated to the sector of agriculture, R&D expenditure in agriculture in relation to GDP, deaths caused by diabetes and malignant tumors, adults participating in education or training, gender pay gap, the share of net revenues from selling new or significantly improved products in net revenues on total sales, the relationship of average annual disposable income of households in rural areas against the city, domestic material consumption, the percentage of energy from renewable sources in transport, the abundance of common birds in agricultural landscape, land requiring reclamation and also the quality of law-making.

At this point, it should be added that Poland is a relatively strongly decentralized country, i.e., local governments have numerous duties in terms of stimulating socio-economic development but, at the same time, they also have the tools and public funds at their disposal to support such development, including its sustainable aspect [68,69]. Therefore, it should be approached having in mind that local government units in Poland (at voivodship, poviats and, in particular, municipal level) represent an important link on the way towards implementing the concept of sustainable development.

## 5. Recommendations for Poland

The below table presents recommendations regarding the effective implementation of SDG in Poland in the years to come (Table 3). The recommendations were developed based on the research results, with particular emphasis on the diagnosed areas and problematic phenomena. Similarly to the research part, the national module monitoring sustainable development (National SDG indicators) was taken into account. The discussed characteristics should be approached as an auxiliary material and an added value for the creators of the sustainable development process in both the national and regional dimensions, i.e., for the representatives of government administration, local government, business sector, non-governmental organizations and the world of science.

**Table 3.** Recommendations regarding effective implementation of sustainable development goals (SDG) in Poland.

| Sustainable Development Goals (SDG) | Recommendations for the Coming Years with the 2030 Perspective |
|---|---|
| Goal 1. No poverty | It is necessary to continue efforts aimed at reducing the existing level of poverty, mainly through the publicly funded assistance programs addressed to the poorest. Regarding housing and overpopulation, low interest rates and hence high availability of mortgage loans seem a current remedy for these problems. State intervention is not necessary. In this situation, market mechanisms remain a sufficient factor. Demographic problems as well as the declining population number in the country affecting the overcrowding rate are also of high significance. |
| Goal 2. Zero hunger | In this area, the key issue is fighting obesity. Prevention, promoting healthy lifestyle, investing in sports and recreational infrastructure, funding trainers' work with the youth, etc. can be considered the most effective. The education sector should be taken advantage of, i.e., educating about the benefits of healthy nutrition, physical activity and regeneration. Among other issues, it is important to consistently subsidize the agricultural sector, with particular emphasis on organic farming, making this economy branch a viable and competitive sector. It is also recommended to increase expenditure on research and development in agriculture and to promote ecological agri-tourism farms. |

**Table 3.** *Cont.*

| Sustainable Development Goals (SDG) | Recommendations for the Coming Years with the 2030 Perspective |
| --- | --- |
| Goal 3. Good health and well-being | In the context of extending the life expectancy of the society in full health, two issues remain crucial: the level of medical care, with particular emphasis on check-ups and prevention, and promoting a healthy lifestyle. Efforts and financial resources should be focused on prevention, education regarding cardiovascular diseases, diabetes and cancer. The country population is aging; therefore, it is necessary to activate older people, but also take advantage of their knowledge and life experience. Non-governmental organizations will be helpful in this respect. |
| Goal 4. Quality education | Nowadays, good quality education is based on diagnosing and adopting educational curricula to the labour market requirements, which also counteracts unemployment. Schools, the graduates of which achieve professional success, are better perceived by the society and have a larger number of people willing to learn there. People participating in education and training must approach it as an actual added value, by investing their time and money they expect a high-quality product. It can be assumed that more children will be covered by pre-school education if kindergartens receive higher funding from public resources. |
| Goal 5. Gender equality | Women bringing up small children should be provided with a range of legal and institutional facilities allowing their return to the labour market. In addition to safeguarding their employment stability in the Labour Code, the solutions such as teleworking or carrying out professional tasks partially at home may turn out helpful. An employer, if possible, should allow such solutions. In Polish law, there are no provisions discriminating women in any form (differences in wages, promotion procedures, recruitment, etc.). An example of promoting gender equality can be given by managers of public institutions. It should be noted here that the political equality of men and women and equal access to public functions by persons of different gender has become one of the most important problems of modern politics in the last 30 years. In addition to the general regulations on the protection of human rights provided by the international law, the introduction of strict gender equality solutions has been initiated. |
| Goal 6. Clear water and sanitation | The percentage of population using sewage treatment plants and water supply systems is largely correlated with the rate of technical infrastructure development. In turn, the infrastructure (both technical and social) is co-financed, in most cases, from public means, including the European Union funds. If we assume fast development of infrastructure, we should acquire and use public resources more effectively. In the context of groundwater exploitation, consistent care of hydrogeological balance is necessary as it fits directly into the environmental area of sustainable development. |
| Goal 7. Affordable and clean energy | The continuity of electrical energy supply depends on the condition of technical infrastructure. This infrastructure requires permanent funding, modernization, renovation and maintenance. One of the solutions in this respect is including such costs in the budgets of responsible entities. The share of energy from renewable sources in the total energy consumption is relatively low. In this situation, co-financing ecological solutions from public funds, ecological education of the society and legal regulations facilitating and promoting renewable energy sources are highly recommended. |
| Goal 8. Decent work and economic growth | Effective promotion of employment enhancing economic growth should be based on facilitating the establishment and running of own businesses in terms of financial (subsidies), educational (training, consulting) and institutional (help provided by public administration) support. The export of high technology products should be enhanced in many ways, as they create a strong national brand. In addition to financial support (public grants for the best), exporters should be offered both substantive and promotional assistance, e.g., as part of government campaigns addressed to the potential foreign partners. The ease of doing business depends on the quality of public administration, effective prevention of bureaucracy and full transparency of procedures. Meeting this recommendation can result in an image-related advantage, manifested in the perception of Poland as an appropriate place for higher value and quality investments. |
| Goal 9. Industry, Innovation and Infrastructure | In the coming years, higher expenditure on R&D in relation to GDP is expected. For this reason, market innovators should be supported by offering them larger access to cheaper loans, projects supporting innovative economy, co-financed from public funds and using tax incentives (reliefs). The focus of the carried out activities should be shifted towards the enterprise sector, from which originates the majority of expenditure on R&D in Poland. Such strategy should contribute to higher value of revenues from selling innovative products. The increase in the value of an inter-sector transport accessibility indicator depends on the previously described development of technical infrastructure. A similar relationship is observed in the percentage of households with broadband Internet access. |

**Table 3.** *Cont.*

| Sustainable Development Goals (SDG) | Recommendations for the Coming Years with the 2030 Perspective |
| --- | --- |
| Goal 10. Reduce inequalities | Reducing inequalities in the social, economic and territorial dimension remains one of the most important challenges the country faces in the coming years. The observed economic growth should not result in more extensive social stratification as it would contradict the idea of sustainable development. Among the recommendations aimed at reducing inequalities, the following can be listed: counteracting unemployment, providing the most transparent procedures for professional promotion and social advancement, establishing minimum wage, tax system which takes into account increased burden for top earners (progressive taxation), supporting employee mobility, facilitated access to public services and health care, funding public education, and supporting rural development. |
| Goal 11. Sustainable cities and communities | The condition of air quality is becoming a problem in Poland. The situation deteriorates in some parts of the country because apart from the operating industrial plants or mines, an increased number of cars and higher intensity of coal, wood and other solid fuels burning in furnaces (the so-called low emission) have been recorded. It is also influenced by weather, climate or general conditions of the area (e.g., a city in a valley, windless weather). A relatively low popularity of renewable energy sources is also of significant importance. Recommendations in this respect include replacing old furnaces, using high-calorific coal, ban on burning garbage, connecting homes to the heat distribution network, energy saving (thermal modernization), promoting renewable energy and using public transport (eco-buses). Among other issues in this area, segregation of waste should be promoted by using financial reliefs and environmental education. |
| Goal 12. Responsible consumption and production | Domestic Material Consumption (DMC) related to the productivity of resources and GDP, or rather its potential increase, is, in fact, the price which the country pays for accelerated socio-economic development and catching up with the distance to civilisation. It is a common phenomenon in developing countries and Poland is/has been such a country over the recent years. Additionally, DMC is involved, to a large extent, in the implementation of infrastructural projects from the EU funds. In terms of recycling, two issues should be highlighted, i.e., technical possibilities of its implementation and environmental education at an appropriate level, contributing to its application. Energy intensity of the economy, similarly to material consumption, should gradually decrease along with the country's socio-economic development. |
| Goal 13. Climate action | Recommendations for the reduction of greenhouse gas emissions include, e.g.,: thermo-modernization of residential and public buildings, wider usage of natural gas substituting coal (including industrial plants), modernization of heat distribution networks, improving energy efficiency of lighting as well as consumer electronics and home appliances, the reduction of methane emission, using public transport, improved municipal waste and sewage management (the reduction of waste at source), tree planting, recycling, infrastructure improvement for cyclists and pedestrians, stricter emission standards for combustion engines, and using renewable energy sources. |
| Goal 14. Life below water | In this area, it should be recommend to transfer some volume of loads from road or air transport to the maritime transportation. Such a solution in the current situation of overloaded public roads and the existing transport congestion should have a positive impact on the implementation of the sustainable development concept. This phenomenon is closely related to the percentage of average employment in the maritime economy. Moreover, all possible efforts should be made to ensure that ships and port infrastructure present a good technical condition and do not pollute sea waters. |
| Goal 15. Life on land | The recommended direction for the coming years is to increase the percentage of Natura 2000 areas covered by management plans, i.e., the Plan of Protection Tasks or Protection Plan for more effective nature protection. The widest possible socialization of the process for developing these documents is recommended. Gradual increase of the forest cover indicator in Poland is very important from the perspective of achieving the sustainable development goals. The value of the abundance of common birds in the agricultural landscape is conditioned by the aforementioned development of organic farming and the general care for agricultural areas in the country. In terms of devastated and degraded land requiring reclamation, our recommendation is to provide greater support for this process from public funds and to develop auxiliary plans facilitating reclamation. |

**Table 3.** *Cont.*

| Sustainable Development Goals (SDG) | Recommendations for the Coming Years with the 2030 Perspective |
| --- | --- |
| Goal 16. Peace, justice and strong institutions | Further actions by the government are recommended to regulate the promotion of private sector development and to facilitate the functioning of enterprises. The more so, as this sector will be primarily responsible for Poland's economic growth. In addition, courts should function much faster and more efficiently to recover contractual receivables from the concluded agreements (repayment of debts). Furthermore, consistent improvement of the quality of public services and competences of state officials are essential to counteract bureaucracy. It is also recommended to increase significantly the percentage of people using the Internet in contacts with public administration. E-administration is an important and indispensable element of the country's sustainable development. |
| Goal 17. Partnerships for the goals | It is recommended to increase the amount of the official net development assistance spent (total and for the benefit of the least-developed countries) in relation to Gross National Income. Such actions manifest solidarity in the pursuit of the sustainable development goals and support for the countries which find themselves at the beginning of catching up with the development and civilization distance. |

Source: Authors' compilation based on References [70–87].

## 6. Further Research Directions

The conducted research and its interpretation, as well as the recommendations made on this basis, represent one of the stages in monitoring the implementation of sustainable development goals (SDG) in Poland. Further research directions can include permanent monitoring of the progress made in concept of sustainable development implementation, based on the data provided by Statistics Poland in the global, national, regional and local dimension.

In addition to using public statistics, own research based on survey questionnaires can be carried out. The representatives of the community (including NGOs), public administration, entrepreneurs and scientists can be asked how they assess the process of reaching sustainable development in Poland. Such a study, taking into account endogenous social potentials, will have a significant cognitive value. In addition, more detailed research can cover virtually any of the suggested indicators monitoring the implementation of SDG.

Poland finds itself on the right path towards sustainable development. Future research directions can be based on comparative analyses of Poland's position in terms of the level of SDG implementation in relation to other countries of the region, the continent and the world. Access to reliable statistics may turn out problematic in this respect. At this point, however, it is assumed that each of the countries which adopted the 2030 Agenda will successively monitor progress in achieving their goals. Comparing Poland to other countries will be important in the context of finding its place against the others and supporting the most sensitive areas. The data for the study can be derived from the sources of Statistics Poland (global module).

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