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## THE POLICY OF SMART AND SUSTAINABLE DEVELOPMENT

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### POLITYKA INTELIGENTNEGO I TRWAŁEGO ROZWOJU

SUMMARY: Streszczenie: W otaczającym nas świecie w ostatnich latach daje się zaobserwować pojawienie wielu kategorii opatrzonej przymiotnikiem inteligentny /a. Dotyczy to również polityki rozwoju. W artykule tradycyjna wiedza na temat inteligencji zostanie skonfrontowana z kategorią rozwoju. Podjęta zostanie również próba uzasadnienia, że rozwój nie może być inteligentny. Z całą pewnością powinien być natomiast zrównoważony, trwały i integrujący wszystkie grupy społeczne.

Słowa kluczowe: polityka rozwoju, rozwój trwały i zrównoważony

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## Introduction

The starting point for the discussion on the challenges of modern growth is Europe 2020, *the Strategy for smart, sustainable and inclusive growth* adopted in 2010<sup>1</sup>, which sets out EU goals and priorities for 2010–2020. The use of word *smart* in the title is quite risky and shows some lack of reflection on the actions taken to date. Nevertheless, the question is whether growth can be smart at all. To answer this question references have been made to publications on psychology which formed the background for studies on intelligence. A critical analysis of the legislators' approach was carried out with a focus on their exaggerated expectations towards the implementation of Europe 2020, which is in fact another strategy aimed at creating a modern and competitive economy for the European Union, ensuring at the same time social cohesion.

## Intelligence as a subject of interest of psychology and engineering

Edward Nęcka, in his book *Inteligencja. Geneza. Struktura. Funkcje*<sup>2</sup>, presents selected definitions of intelligence, e.g. 'a general mental adaptability to new problems and conditions of life' (W. Stern, 1921), 'a kind of mental energy that enters into performance on all kinds of mental tasks' (Ch. Spearman, 1927), or the 'ability to handle complex and new tasks'<sup>3</sup>. In other words, as proposed by Prof. Jan Strelau, intelligence is a theoretical construct referring to the relatively constant internal conditions of a human being, determining the effectiveness of the actions that require cognitive processes. These conditions are formed as a result of interaction between genotype, environment and man's own activity<sup>4</sup>. Although many authors research intelligence and write about it, they often avoid defining it directly. Intelligence is comprehended as:

- the ability of learning from personal experience;
- the ability to adapt to one's environment;

<sup>1</sup> Strategy for smart, sustainable and inclusive growth, Brussels, 3.3.2010, KOM(2010) 2020 final version.

<sup>2</sup> E. Nęcka, *Inteligencja. Geneza. Struktura. Funkcje*, Gdańsk 2003.

<sup>3</sup> Ibidem, pp. 17–24.

<sup>4</sup> J. Strelau, *Inteligencja człowieka*, Warszawa 1997, p. 19.

- metacognitive ability – understanding one’s own cognitive processes and the ability to control them.

‘From a biological point of view, intelligence ‘is happening’ in the brain and is determined by the brain’<sup>5</sup>. In such a sense it is an attribute of living organisms which are characterized by a non-zero encephalization quotient. Nevertheless, for a long time people have been trying to design machines which are able to compete with humans in the performance of various tasks. Despite advances in this area, so far none of these machines has been able to pass the Turing test, which is a test of a machine’s ability to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human. Studies on artificial intelligence have been carried out for several decades. An important criterion for the evaluation of artificial intelligence is its ability to take actions that make sense in a specific environment, and then to control them. A system can be called intelligent when it is the initiator, and not only the executor of commands according to the algorithm predefined by a human designer. Since the 1980s high hopes have been put in the construction of so-called artificial neuron networks, which, as rightly observed by E. Nęcka, should be better termed as neuron-like networks. Information in this type of network is processed on a mass scale and in a dispersed manner which always requires appropriate software. The essence of network modelling is that the designer does not program any algorithm for the execution of tasks to be performed by the network according to a predetermined pattern<sup>6</sup>. Currently, artificial neuron networks are used, for example, in software for character recognition, at airports for checking luggage, for speech synthesis and recognition, for approximation, forecasting, prediction of output data based on the input data without the need to explicitly define the relationship between the two datasets, object classification and identification, or the analysis of relationships between data<sup>7</sup>. One of the most desirable and compelling features of artificial neuron networks is their ability to learn<sup>8</sup>.

To briefly summarize the studies on intelligence, both characteristic for living organisms and artificial ones, it can be concluded that the differentiating factors will always be the ability to learn, take reasonable actions under given circumstances, and adapt to a changing environment. All these processes always need the ‘brain’, either live or artificial. But the artificial brain, so far, remains a product of human ingenuity and the ability to go beyond the limits of human knowledge.

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<sup>5</sup> E. Nęcka, op. cit., p. 64.

<sup>6</sup> Ibidem, pp. 221–244.

<sup>7</sup> R. Tadeusiewicz, *Sieci neuronowe*, Warszawa 1993, pp. 13–14.

<sup>8</sup> E. Nęcka, op. cit., p. 237.

## Studies on socio-economic growth

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Growth is a term which is as equally difficult to define as intelligence. In general, it refers to the process of changes which affect whole systems or their elements. Growth is a category that refers to nature, society and the economy. According to the widespread expectation, change should be positive and mark the transition from less desirable to more desirable states. However, in the real world growth is not stable and does not show a rising trend, but fluctuates and is characterised by stages of decline, increase and stagnation. Changes can only be qualitative or qualitative and quantitative. In social sciences considerable interest in the field of studies on growth has been observed aimed at identifying causal factors and building action plans to improve socio-economic transformations. Consequently, a large number of publications on economics and sociology dealing with this topic are now available. In this paper only a few books or reports will be mentioned that are, in my opinion, representative of the increasingly popular approaches to the need to change the perception and measurement of growth. The first one is the Report of the Commission for the Measurement of Economic Performance and Social Progress, which was published under the meaningful title *Measurement error – Why GDP is not enough*. The Commission, chaired by J.E. Stiglitz, A. Sen, and J.-P. Fitoussi, tried to explain why the traditional measurement of economic change using GDP does not reflect what should be captured when measuring growth, but also suggested modifications in national accounts, especially if we want to overcome the problem of measuring the sustainability of growth<sup>9</sup>. Firstly, it concerns the System of Environmental-Economic Accounting (SEEA), which is an extended version of the System for National Accounts (SNA). The SEEA produces internationally comparable statistics on the environment and its relationship with the economy. One objective of the UN Committee of Experts on Environmental – Economic Accounting (UNCEEAA) established in 2005 is to elevate the SEEA to an international statistical standard and advance its implementation in countries. Secondly, the solution to this problem is seen in indices focused on measuring over-consumption, under-investment and excessive use of resources, such as Adjusted Net Savings (ANS), Ecological Footprint, and Carbon Footprint. The advantage of ANS is that estimates of resource depletion are based on the calculation of resource rents. Rents are derived by taking the difference between world prices and the average unit extraction or harvest cost (including a 'normal' return on capital) and finally global pollution damages

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<sup>9</sup> J. E. Stiglitz, A. Sen, J.-P. Fitoussi, *Błąd pomiaru. Dlaczego PKB nie wystarcza*, Report of the Commission for the Measurement of Economic Performance and Social Progress, Warszawa 2013.

from carbon dioxide emissions are deducted. The disadvantage of ANS, as with other indices, is the arbitrary choice of what is accounted and the prices used, especially when the market is imperfect or does not exist at all. A major shortcoming of ASN estimates is that the adjustment is only limited to carbon dioxide emissions, and that the calculations do not include other important sources of environmental degradation, such as unsustainable fisheries, soil degradation, biodiversity loss and underground water depletion. But there is also a problem with pricing natural resources, environmental damage and externalities. Fluctuations in the prices of many raw materials are sometimes politically motivated. Scarcities of resources are not fully reflected in prices, so the importing country usually pays less for its imports than would be required, and this does not promote the sustainable use of resources. Low prices can, paradoxically, encourage exporting countries to increase the extraction of resources. For developed countries changes in the ASN over time are almost entirely caused by changes in savings, while changes in natural capital are relatively unimportant. For underdeveloped countries, because of the negligible savings, the lower the value of human and material capital, the greater the weight of changes in natural capital.

The second book, from which much can be concluded on development through the analysis of the distribution of income and assets in the long-term, is *Capital in the Twenty-First Century* by T. Piketty<sup>10</sup>. In the overall conclusion of his monumental work the author says that 'a market economy based on private property, if left to itself, contains powerful forces of convergence, associated in particular with the diffusion of knowledge and skills; but it also contains powerful forces of divergence, which are potentially threatening to democratic societies and to the values of social justice on which they are based'. For Piketty 'the principal destabilizing force has to do with the fact that the private rate of return on capital,  $r$ , can be significantly higher for long periods of time than the rate of growth of income and output,  $g$ '.<sup>11</sup> This implies that 'the entrepreneur inevitably tends to become a rentier, more and more dominant over those who own nothing but their labour'.

Countries being on very different levels of development operate in parallel in the global market. In 2015 the Nobel Prize in Economic Sciences was granted to Angus Deaton, a Scottish-American economist for his analysis of consumption, poverty and welfare. Deaton's most important books are *The Great Escape: Health, Wealth, and the Origins of Inequality* (2013), *The Analysis of Household Surveys: A Microeconomic Approach to Development*

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<sup>10</sup> T. Piketty, *Kapitał w XXI wieku*, Warszawa 2015.

<sup>11</sup> *Ibidem*, p. 723.

Policy (1997), and Understanding Consumption. Clarendon Lectures in Economics (1992).<sup>12</sup>

*The Killing Fields of Inequality* by Göran Therborn is another interesting book in the context of deliberations on growth<sup>13</sup>. The problem of inequality only apparently affects underdeveloped countries. In Western Europe, significant differences in life expectancy between people representing different groups of income can also be observed. While the 1980s and 1990s were generally a period when longevity increased, the beginning of the 21<sup>st</sup> century has brought in many countries an increase in the mortality rate of people from the poorest quintile. In countries undergoing political transformations an increase in mortality rates was already seen in the 1990s. Generally, higher rates of premature deaths are found among unemployed and excluded people<sup>14</sup>. Therborn distinguishes three kinds of inequality:

- vital – associated with population ecology, system of status and medical knowledge;
- existential – associated with family system and gender status, ethnic-racial relations and social hierarchy;
- resource – associated with economic and political systems, environmental conditions and achievements<sup>15</sup>.

Inequality can be produced in four basic ways: distantiation, exclusion, institutions of hierarchy, and exploitation. It affects the health and life expectancy of individuals, their autonomy, recognition and respect, economic resources and other aspects of life<sup>16</sup>. Therborn emphasizes that the life chances of people are formed in early childhood, and their influence is often stronger than the impact of income and assets.<sup>17</sup>

It seems that the indicated social and economic problems, amplified by occasional shocks and crises, are the most serious challenge to the politicians responsible for shaping development strategies. On top of that, there is an escalating global ecological crisis, which worsens the conditions of life on

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<sup>12</sup> A. Deaton, *The Great Escape: Health, Wealth, and the Origins of Inequality*, Princeton 2013; A. Deaton, *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Baltimore 1997; A. Deaton, *Understanding Consumption*, Clarendon Lectures in Economics, Oxford 1992.

<sup>13</sup> Book in Polish translation: G. Therborn, *Nierówność, która zabija. Jak globalny wzrost nierówności niszczy życie milionów i jak z tym walczyć?*, Warszawa 2015.

<sup>14</sup> Ibidem, pp. 12–13.

<sup>15</sup> Ibidem, p. 60.

<sup>16</sup> Ibidem, pp. 73–74.

<sup>17</sup> Inequalities of life between different social groups have been well documented in Britain. It has been demonstrated that today in London men living in the richest neighbourhoods have a life expectancy 17 years longer than men from the poorest district. This difference is the same as between the UK and Burma. G. Therborn, op. cit., p. 96.

Earth, and in many places has reached a catastrophic scale (for example, the great cities of Asia, Latin America, Africa, and mining and industrial areas in developing countries). But given the scale of social challenges the ecological problems seem to lose importance. Only the richest countries can afford to push forward ambitious environmental programmes, seeing them as an opportunity to create new jobs and improve the living conditions of people. In many regions of the world growing awareness of the dangers of environmental degradation is not accompanied by adequate corrective and preventive measures. After a period of global involvement in ecological activities in the 1990s (the Earth Summit in Rio de Janeiro in 1992 and its main products: the Rio Declaration, Agenda 21, UN Framework Convention on Climate Change, the Convention on Biodiversity), again there was more consent for the further devastation of nature for the sake of overcoming poverty and hunger, sometimes accompanied with often meaningless debates about the need to live in a clean environment. The impact of the Rio+20 Summit on public opinion and politics was weaker, and the proclaimed need for the development of green economy did not gain universal approval, especially in economic practice. In this area, the world is deeply divided both in terms of defining needs and financial and technical capabilities to satisfy them. In many developing countries, especially China, India, but also in other countries of South America, Asia and Africa, a rapid expansion in the size of the middle class is observed, with all its expectations as to living standards and demand for the consumption of goods and services. From the point of view of the capacity of the Earth as a planet to provide the necessary resources to meet this new surge of needs, this means overconsumption, leading directly to growing social stratification, dissatisfaction and ecological disaster.

The social and environmental conditions, both at the global and national scale, strongly determine the conditions for the implementation of planned and unplanned growth, regardless of the views of politicians and their constituents.

### Europe 2020 Strategy

Given the EU's expectations for smart growth, it is worth taking a look at the Community's strategic development plans, bearing in mind its social achievements, the aging of societies, and international relations. Adopted by the European Commission in 2010, the *Strategy for smart, sustainable and inclusive growth*, commonly known under the short name *Europe 2020*, sets out three mutually reinforcing priorities:

- smart growth: developing an economy based on knowledge and innovation;

- sustainable growth: promoting a more resource efficient, greener and more competitive economy;
- inclusive growth: fostering a high-employment economy delivering social and territorial cohesion<sup>18</sup>.

The chosen priorities for growth are, in general, to enable the focusing of attention and funds on the implementation of measures that should foster social cohesion and to improve the competitive position of the Community in the international arena. As was rightly pointed out in the strategy, Europe's average growth rate has been lower than that of our main economic partners, largely due to a productivity gap that has widened over the last decade.

Much of this is due to differences in business structures combined with lower levels of investment in R&D and innovation, insufficient use of information and communications technologies, reluctance in some parts of our societies to embrace innovation, and a less dynamic business environment, particularly that of small and medium-sized enterprises. Monitoring the implementation of the strategy will be facilitated by specific headline targets for which measurable evaluation indicators were assigned:

- 75% of the population aged 20–64 should be employed;
- 3% of the EU's GDP should be invested in R&D;
- the '20/20/20' climate/energy targets should be met (including an increase to 30% of emissions reduction if the conditions are right);
- the share of early school leavers should be under 10%, and at least 40% of the younger generation should have a tertiary degree;
- 20 million fewer people should be at risk of poverty.

The Commission also put forward seven relevant priority themes:

1. Innovation Union.
2. Youth on the move.
3. A digital agenda for Europe.
4. Resource efficient Europe.
5. An industrial policy for the era of globalisation.
6. An agenda for new skills and jobs.
7. European platform against poverty.

These priority themes address issues of high social and economic importance, and reflect the correct diagnosis of the needs and conditions to meet them, including in the global context. In principle, Europe 2020 is meant to help Member States develop their strategies to return to sustainable growth and public finances.

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<sup>18</sup> *Strategy for smart, sustainable and inclusive growth ....*



## 'Smart growth' in practice – the example of Poland

Considering the goals for the current financial perspective of 2014–2020, a preliminary assessment of selected activities can be done with reference to 'smart specialisation areas' and eco-innovations in Poland.

The implementation of 'smart growth' in Poland is the responsibility of the Ministry of Development, which oversees the expenditure of funds under the Smart Growth Operational Programme (SGOP)<sup>19</sup>. The total allocation for the programme from EU funds is EUR 8,613,929,014. The minimum contribution from the national budget estimated based on Article 120 of the general regulation at the programming stage was EUR 1,575,940. The implementation of the SGOP is financed from public and private funds: EUR 6,116,056,353 under thematic objective 1 – *Strengthening research, technology development and innovation*, and EUR 2,200,878,402 for thematic objective 3 – *Enhancing the competitiveness of small and medium-sized enterprises*. The priority goal of the SGOP is to improve the innovativeness of the Polish economy. This goal will be achieved primarily by increasing the expenditure of enterprises on R&D, strengthening the links between business and science, and better commercialization of R&D results. 'In the framework of the implementation of this strategy it will also be possible to finance experimental actions under the SGOP that are in line with the entrepreneurial discovery mechanism. To implement experimental actions ensuring the selection of the projects which potentially contribute to the identification and development of new smart specializations (under the framework of the monitoring of National Smart Specialization), no more than 2% of resources from the European Regional Development Fund for thematic objective 1 will be allocated'<sup>20</sup>.

## National Smart Specialisation and eco-innovations in Poland

The strategy for smart specialization is defined in separate documents at national and regional levels. For Poland it is an annex to the Enterprise Devel-

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<sup>19</sup> Detailed description of priority axes for the Smart Growth Operational Programme/ Szczegółowy opis osi priorytetowych Programu Operacyjnego Inteligentny Rozwój 2014 – 2020, Ministry of Development, Warszawa, 4 April 2014, pp. 3–8, [www.poir.gov.pl](http://www.poir.gov.pl) [05/07/2016].

<sup>20</sup> *Ibidem*, p. 4.

opment Programme – National Smart Specialisation (NSS)<sup>21</sup>. National smart specializations are grouped into the following thematic areas<sup>22</sup>:

1. Healthy society.
2. Agri-food, forestry-timber and environmental bioeconomy.
3. Sustainable energy.
4. Natural resources and waste management.
5. Innovative technologies and industrial processes (in the horizontal approach).

The choice of specializations is relevant from the point of view of economic needs and compliance with the guidelines of the European Commission. It is still too early to evaluate the effects of the measures, since the allocation of funds has only just begun. Characteristically, this strategy is focused on technological aspects. The strongest emphasis in the NSS is put on supporting the development of innovative technical solutions that do not necessarily have to produce effects that are universal, large-scale, or promote social cohesion. Because of their price, these solutions may be available in the future to small groups of domestic and foreign beneficiaries and create a few jobs for highly educated specialists.

Poland has very limited experience in the area of the innovative economy, so it is hard to expect any breakthrough caused by NSS. Eco-innovations, for example, seem to be particularly desirable because of their potentially strong positive impact on the natural environment and quality of life of people, as well as the competitiveness of the economy. Eco-innovation means any new or significantly improved product (commodity or service), process, organizational change or marketing solution that reduces the consumption of natural resources (materials, energy, water and land) and/or reduces the emission of harmful substances throughout their life cycle. Such innovations can be developed practically in all smart specialization areas and under several priority themes: Innovative Union; Resource efficient Europe; An industrial policy for the era of globalization; and An agenda for new skills and jobs.

Eco-innovations can be either 'pushed' by supply, or 'pulled' by demand. Both of these aspects are affected by legislation which defines technical norms and environmental standards, but also the institutional and financial conditions (for example, operational programmes of the EU, together with

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<sup>21</sup> Krajowa Inteligentna Specjalizacja, Ministerstwo Gospodarki/National Smart Specialization, Ministry of the Economy, Warszawa 2015, [www.mg.gov.pl](http://www.mg.gov.pl) [05/07/2016]; Wytuczne w zakresie kontroli w ramach obowiązków Instytucji Pośredniczących i Instytucji Wdrażających dla Programu Operacyjnego Inteligentny Rozwój 2014–2020/Guidelines on audits in the context of the responsibilities of Intermediate Bodies and Implementing Authorities for Smart Growth Operational Programme 2014–2020, Ministry of Development, Warszawa, 27 June 2016, [www.mr.gov.pl](http://www.mr.gov.pl) [05/07/2016].

<sup>22</sup> [www.ncbr.gov.pl](http://www.ncbr.gov.pl) [05/07/2016].

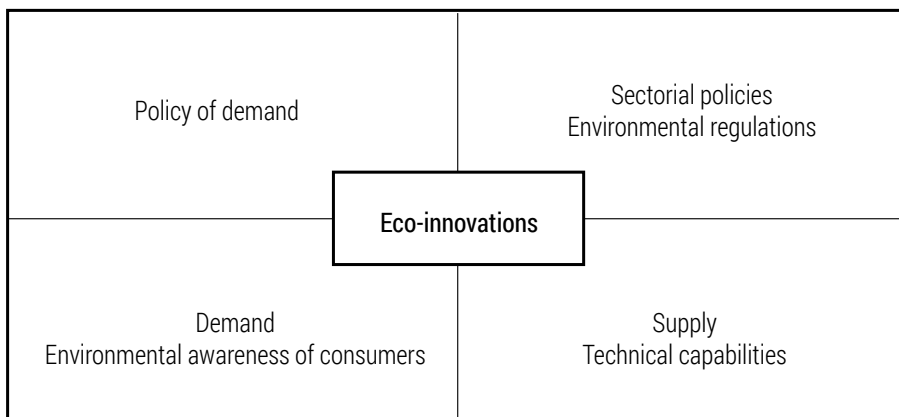


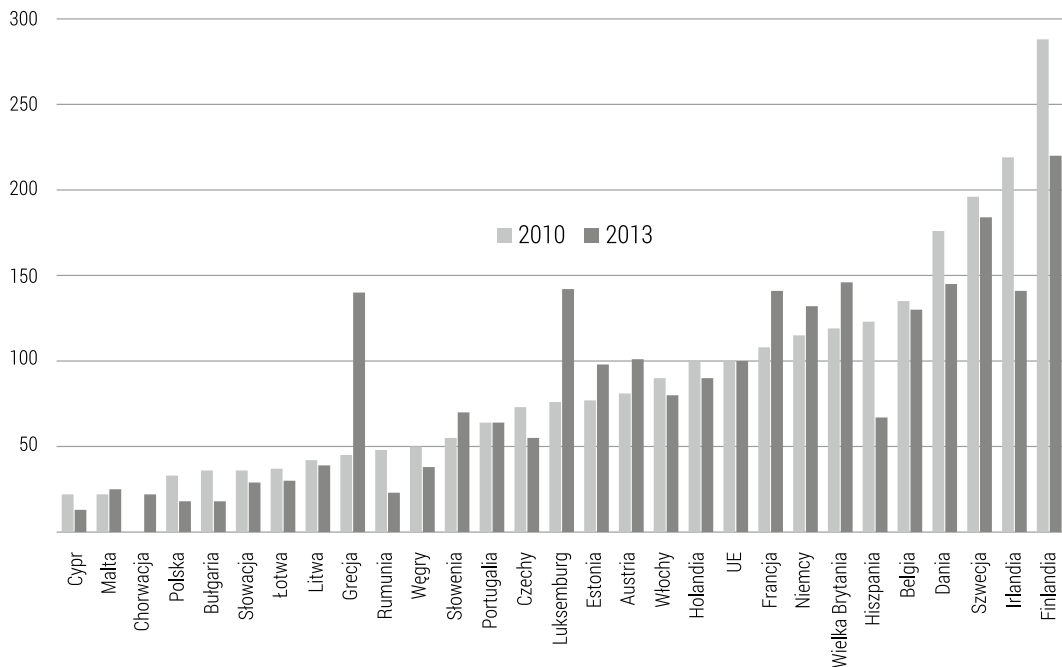
Figure 1. Determinants of eco-innovations

their earmarked funds, ecological product fees and educational activities). This system is presented in Figure 1. In Poland, due to the still relatively low level of environmental awareness of consumers and their limited purchasing power, the scenario in which innovations are pulled by market demand is unlikely. Better chances for innovation are seen in the activity of enterprises and R&D centres which consider the exportation of the results of their work on R&D+I an attractive prospect.

Expenditure on eco-innovation is one of the main elements determining the level of their development in the country. Capital expenditures were expressed as eco-innovation inputs. The index for this area is calculated based on three indicators: government investments in environmental and energy R&D, green early stage investments and total R&D personnel<sup>23</sup>. As shown in Figure 2, the value of investments in eco-innovations has recently decreased in many EU Member States, including Poland.

For many years Poland has been in the group of countries that have scored lowest on the eco-innovation input index. This persistent situation is reflected in long-term underinvestment in Polish science. It may turn out at the end of the current financing period that, as was the case of the previous EU development strategy, the grand declarations are rarely reflected in practical achievements, and the Community is pushed to the sidelines because of R+D+I. The situation of Poland in this respect has not changed for years. The apparently large budget earmarked for the development of 'smart specializations' (over EUR 8 billion) is no longer impressive if we realize that the annual R&D budgets for the leading pharmaceutical companies are higher than the amount allocated for this purpose in Poland for 2014–2020. The disper-

<sup>23</sup> [www.eco-innovation.eu](http://www.eco-innovation.eu) [25/06/2016].



**Figure 2.** The index of eco-innovation inputs for 2010 and 2013 in EU Member States

Source: author's own analysis based on [www.database.eco-innovation.eu](http://www.database.eco-innovation.eu) [25/06/2016].

sal of these funds between small and medium-sized enterprises, although desperately in need of money, reduces the possibility of financing large research projects, and also creates a limitation for basic studies that are pushing the boundaries of human knowledge but do not necessarily end with commercial success.

## Conclusions

Naming the development *smart* and creating a special *Europe 2020* strategy for it is like enchanting reality to make it more kind to EU Member States and the whole European Community. Declining growth, serious demographic problems associated with the aging population, and financial crises and perturbations associated with the massive influx of immigrants make up the overall picture of the current European Union. The original English term *smart growth* has been translated into Polish using a catch-all phrase *inteligentny wzrost* [lit. intelligent growth], to encompass development based on

knowledge and innovation<sup>24</sup>. But long-term studies have shown that intelligence – either natural or artificial – requires the use of a brain. Development does not have and cannot have a brain. The *intelligence* of development has been and will be determined by the brains of those who plan and implement development. But there is still much room for improvement in this area, and this does not concern just terminology. The call for ‘smart solutions’ has already been answered by market players who have launched smart/intelligent houses<sup>25</sup>, paints<sup>26</sup>, and even plasticine<sup>27</sup> (*sic!*). The bar was therefore set at a high level: it is now difficult to imagine the next generation of these products, since the existing ones already bestow attributes previously reserved for the creations of beings capable ‘of reasoning, planning, problem solving, abstract thinking, understanding complex issues, fast learning and learning from personal experience’<sup>28</sup>. And this is how knowledge-based (hopefully) growth has become a victim of newspeak, the language used by Polish administration and politics.

The need for development, however, is too serious a matter for flippant criticism of the Europe 2020 strategy only because of its title. After all, it accurately identifies the current situation and presents well-defined goals and priorities. Considering, however, ‘smart’ specializations, it seems that too much emphasis is put on technical solutions, while the overarching priority is still to return countries to sustainable growth fostering social cohesion. Technical solutions cannot eliminate the dangers looming from increasing social inequalities. Modern technologies are often reserved for selected groups, both in the labour market and areas in which these technologies are implemented. To ensure sustainable growth in the sense of development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs requires an adequate response to these needs and a consideration of factors determining their satisfaction, not only through the promotion of technical development, but most of all through easier access to the benefits offered by new technologies.

## Literature

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<sup>24</sup> [www.mg.gov.pl](http://www.mg.gov.pl) [05/07/2016], p. 2.

<sup>25</sup> [www.somfy.pl](http://www.somfy.pl) [15/06/2016].

<sup>26</sup> [www.urzadzamy.pl](http://www.urzadzamy.pl) [15/06/2016].

<sup>27</sup> [www.bestprezenty.pl](http://www.bestprezenty.pl) [15/06/2016].

<sup>28</sup> L. Gottfredson, “Wall Street Journal” 1997, p. 13, quoted after: E. Nęcka, op. cit., p. 24.

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