

**ANNA BUSŁOWSKA**

## **TRIPLE HELIX MODEL – POSSIBILITIES OF SUSTAINABLE DEVELOPMENT**

**Summary:** Modern economic thought provides various theories on the best models of socio – economic development. On the one hand, it raises the need to build innovative, competitive economies, on the other enhances great importance of sustainable development, which refers to meet all human needs through regular contact and relationship to the natural environment. Considering the above, the purpose of this article is to answer the question of whether and how the concept of Triple Helix is combined with the concept of sustainable development. Can the development of cooperation within the above mentioned model foster sustainable development processes?

Answers to the above question can be found in the analysis of the characteristics and goals of sustainable development model and the Triple Helix. It can be assessed, that these two concepts could complement each other and promote mutual development.

**Key words:** Triple Helix, sustainable development, innovation.

### **1. INTRODUCTION**

The concept of sustainable development has become the main paradigm of development. Creating a fully balanced model of life, i.e. improving the quality of life all over the world without a wasteful overexploitation of natural resources, has been the subject of deliberation of political, scientific and ecological environments. What is being highlighted most of all is the need to integrate activities in the three main areas: economic growth and equitable distribution of benefits, protection of natural and environmental resources in order to preserve our environmental heritage and natural resources for future generations and social development. On the other hand, the creation of knowledge-based, innovative and competitive economies is indicated as a main path of development. One of the most interesting and least examined approaches to innovation is the Triple Helix model (‘golden triangle’ of cooperation between business, science and administration). This model assumes

that in the knowledge-based societies not only industry and administration but also universities play a crucial role in the development of innovation. Moreover, the cooperation between the three main institutional spheres creates the unique innovation policy and each institution, apart from fulfilling its traditional function, to a certain extent, takes over the role of the two others. Taking everything mentioned above into consideration, the aim of the article is to answer the question if and how the ideas of the Triple Helix concept incorporate into the idea of regional sustainable development. Can the development of cooperation within the above mentioned model foster sustainable development processes?

## 2. TRIPLE HELIX – TOWARDS INNOVATIVE ECONOMIES

The Triple Helix is an approach to innovation, which assumes intrasectoral cooperation between the three spheres: public administration (government), scientific units (research institutes, higher education) and business (companies, industry). Due to this kind of collaboration, the Triple Helix model enables synergy that fosters the development of innovation and the creation of the knowledge-based economy<sup>1</sup>.

Main articles devoted to the theoretical principles of the Triple Helix were published in the last decade of the XX century. It should be highlighted, however, that work on the development and diffusion of innovation and the creation of the knowledge-based economies began as early as in the first half of the XX century and its main theoreticians were J.A. Schumpeter (author of the concept of innovation), C.U. Lowe, J. Sabato and M. Mackenzie. Theoretical foundations of the Triple Helix model were laid by H. Etkowitz and L. Leydesdorff. Their research fostered dissemination of the concept that stresses the growing role of universities in mutual relationships of the three spheres: science, business and public administration<sup>2</sup>.

On the basis of the research conducted by L. Leydesdorff and H. Etkowitz, two approaches to the Triple Helix concept can be distinguished: institutional and evolutionary. The first one includes three configurations of the system science – business – administration: statist, laissez-faire, balanced<sup>3</sup>. The statist configuration points that the administration (government) plays the lead role in building relationships between the spheres. The source of dominance is the ability to issue rules and regulations. This kind of configuration predominates, among others, in

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<sup>1</sup> A. Świadek, *Regionalne Systemy Innowacji w Polsce*, Wydawnictwo Difin, Warszawa 2011, s. 29.

<sup>2</sup> L. Leydesdorff, H. Etkowitz, *Emergence of a Triple Helix of university–industry–government relations*, “Science and Public Policy” 1996, vol. 23, p. 279–286; H. Etkowitz, L. Leydesdorff, *Universities in the Global Economy A Triple Helix of University–Industry–Government Relations*, Cassell Academic, London 1997, p. 14–31.

<sup>3</sup> H. Etkowitz, L. Leydesdorff, *The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations*, “Research Policy” 2000, vol. 29, p. 109–123; L. Leydesdorff, H. Etkowitz, *The Triple Helix as a model for innovation studies*, “Science and Public Policy” 1998, vol. 25 (3), p. 195–203.

Russia, China, Eastern Europe and Latin America. The laissez-faire configuration assumes a limited state intervention in the economy, which is typical for the USA and the Asian Tigers. Companies are a driving force of the economy and the two other spheres act as ancillary support structures for the activities of entrepreneurs in the field of innovation. The balanced configuration presents a balanced state of dependence between the spheres. This form is typical for the Knowledge Society and it has the most positive impact on creating more favourable environment for innovation.

The evolutionary perspective assumes that the spheres of business and administration are the co-evolving sub-sets of social systems. The innovation potential is a result of a significant role of universities in two- and multi-sided relationships. The key aspect is the transition of many elements from universities to business and administration in order to generate new institutional and social formats in the field of production, transfer of knowledge etc.

In Polish literature, the concept of the Triple Helix is relatively little widespread. It is the general approach that prevails, which treats the described issue as an element of national or regional innovation systems<sup>4</sup>. In spite of the growing participation of private capital in research and development activities, the involvement of public institutions still decides on the development of a particular area. It should be highlighted that the role of administration is not only limited to mediation between science and business, but it should also include shaping innovation policy and providing tools and mechanisms to support innovation. Therefore, the role of administration sphere in the Triple Helix model is active and has a direct impact on innovation activities<sup>5</sup>. The collaboration is not the same in all cases. It has been noticed that in different regions, the Triple Helix has a different structure and development path. It is caused by the dominance of various actors in a particular area, relationships and connections do not have linear character in this case<sup>6</sup>.

### 3. The concept of sustainable development

Understanding sustainable development is characterized by interdisciplinary approach<sup>7</sup>. The theory in this aspect is not focused exclusively on the issues connected with the natural environment. Due to this, it is more proper to see sustainable development in more broader context – as a development which is durable, socially fair, compatible with ethical norms and economic calculations

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<sup>4</sup> T. Truskołaski, *Kształtowanie warunków współpracy w oparciu o model triple helix na przykładzie metropolii białostockiej*, „Ekonomia i Prawo” 2013, tom XII, nr 1, s. 21–34.

<sup>5</sup> Tamże.

<sup>6</sup> M. Ranga, H. H. Etzkowitz, *Triple Helix Systems: An Analytical Framework for Innovation Policy and Practice in the Knowledge Society*, “Industry and Higher Education” 2013, vol. 27 (4), Special Issue, p. 237–257.

<sup>7</sup> D. Kielczewski (red.), *Od koncepcji ekorozwoju do ekonomii zrównoważonego rozwoju*, Wydawnictwo Wyższej Szkoły Ekonomicznej w Białymstoku, Białystok 2009, s. 18; B. M. Dobrzańska, *Planowanie strategiczne zrównoważonego rozwoju obszarów przyrodniczo cennych*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok 2007, p. 24–35.

and realized with due regard to the laws of nature. General ideas regarding this concept can be divided into the following groups: as socio-philosophical ideas, as a theory of economic development and as a direction of research. The first category includes definitions that stress harmonization of relationships between the natural environment and civilizational human activity in every dimension, e.g. education, technology, economy, social diversity, cultural activity sphere, politics, patterns and norms of behavior, products of mass culture. The second way to approach sustainable development is determined by philosophy and is related to economic interpretation. The durability of sustainable development is most often associated with the durability of the natural environment capital, but this durability can also be understood in a broader sense – as a development understood quantitatively and qualitatively – the prosperity<sup>8</sup>. According to the theory, sustainable development is linked not only with the growth of per capita income, but also with the improvement of other elements of social prosperity. It involves structural changes in the economy and the whole society. Thus, sustainable development is examined in the following dimensions: ecological (ecodevelopment), economic, social, psychological, demographical, spatial<sup>9</sup>.

The third way of understanding sustainable development is by looking at it as on a direction of scientific research. The theory of sustainable development evolves simultaneously with practice. It is perceived as the necessity to examine the problems connected with long-term economic development carefully and to undertake extensive research in the field of environmental and natural resource economics. There are many arguments in favour of conducting more in-depth research in the field of macrosystem functioning: economy – society – the natural environment. Firstly, neoclassical economics did not provide solutions for the destruction of ecosystems, which leads to the global ecological disaster. Secondly, it is a problem of managing the knowledge capital, which is very often analyzed as an independent source of wealth, apart from the three traditional ones (earth, work and capital)<sup>10</sup>.

Source literature is rich in attempts to define and understand sustainable development. Probably the most popular definition is the one suggested in the Brundtland Commission Report in 1987 (it defines sustainable development as a way of satisfying needs by contemporary generations, so that future generations could fulfill their needs in an unlimited manner)<sup>11</sup>. Contemporary source literature perceives sustainable development mainly as: ‘socio-economic devel-

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<sup>8</sup> D. Kielczewski, *Konsumpcja a perspektywy zrównoważonego rozwoju*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok 2008, p. 16; B. Poskrobko, *Teoretyczne aspekty ekorozwoju*, „Ekonomia i Środowisko” 1997, nr 1, p. 10–11; P. Jeżewski (red.), *Ochrona środowiska i ekorozwój*, SGH, Warszawa 2000, p. 39–40.

<sup>9</sup> D. Kielczewski, *Konsumpcja a perspektywy zrównoważonego rozwoju*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok 2008, p. 30–31.

<sup>10</sup> B. Poskrobko (red.), *Ekonomia zrównoważonego rozwoju, Materiały do studiowania*, Wyższa Szkoła Ekonomiczna w Białymstoku, Białystok 2010, p. 133–134.

<sup>11</sup> Tamże, s. 11–20.

opment in which, in order to provide equal access to the environment for particular societies and their citizens of contemporary and future generations, the process of integrating political, economic and social activities takes place with due respect to the balance in the natural environment and the durability of the basic processes in nature<sup>12</sup>.

Sustainable development is assumed to be the one where the synergy of economic, environmental and social aspects is safe and beneficial for the human being, environment and economy. In this sense, sustainable development does not act as a 'brake' on progress, but is its 'initiator' and 'stimulator'.

#### **4. INNOVATION AS AN OBJECTIVE OF SUSTAINABLE DEVELOPMENT**

As it was stated in the previous chapter, sustainable development should not be associated only with protection of the natural environment. On the other hand, however, the foundations of sustainable development are strongly connected with ecological problems and this aspect is crucial in the general concept of sustainable development. The second side of the subject is related to the Triple Helix model, which comes down to activation and creation of innovativeness through collaboration of the subjects belonging to the spheres of science, business and administration. When relating to the aspects of development and bearing in mind the aforementioned issues, it is advisable to take into account the document *Europe 2020. A strategy for smart, sustainable and inclusive growth*<sup>13</sup>. The development objectives included in it relate not only to smart development (economy based on knowledge and innovation) but also to sustainable development, i.e. supporting the economy that uses resources more effectively, is more environmentally friendly and more competitive. The above mentioned regulations point at the mutual character of the phenomena mentioned in the article. Sustainable development means building competitive economies and it relates to innovation activities. Such an activity can be the collaboration within the Triple Helix model. It can therefore be estimated that these concepts complement one another in order to obtain more effective development of the particular EU regions.

It should be noted, however, that the idea of sustainable development, which is probably too much abused in politics and the media, is essential in contemporary social and economic reality. Expansive, very often wasteful economic policy, impending global problems (demographic, epidemics, wars) cause that the natural environment is treated as a certain tool and not a fully integrated system. For the above reasons, the concepts of innovation, including those realized within the Triple

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<sup>12</sup> B. M. Dobrzańska, *Planowanie strategiczne zrównoważonego rozwoju obszarów przyrodniczo cennych*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok 2007, s. 31–32.

<sup>13</sup> *Europa 2020, Strategia na rzecz inteligentnego i zrównoważonego rozwoju sprzyjającego włączeniu społecznemu*, Komisja Europejska, Bruksela 2010, p. 13–17.

Helix model, should support and strengthen the integrity of the socio-economic system with the ecosystem of a particular region, country, continent. The objectives of sustainable development should be set and fulfilled in various aspects of socio-economic life, especially within<sup>14</sup>.

- Social objectives: satisfying basic human needs, improving the quality of life by providing decent living conditions, maintaining cultural variety,
- Economic objectives: providing proper number of goods and services, combating unemployment,
- Ecological objectives: long-term maintenance of stability of ecological processes, protection of species diversity, high quality of the natural environment.

The above mentioned objectives of sustainable development seem easier to achieve when the cooperation within the Triple Helix model is being ensured. Various subjects occurring in the Triple Helix model aim at meeting the above stated development objectives to a varying degree, e.g. business sphere is mainly focused on economic objectives (maximization of profit). In view of the above, it is the administration that plays a special role in the realization of the Triple Helix model and acts as a potential animator of collaboration, which safeguards the fulfillment not only of economic objectives, but also social and ecological ones. Universities and other educational institutions, when acting in collaboration with administration and business, have positive impact on creating proper innovation environment. Transferring various elements from universities (e.g. commercialization, social distribution) to either business and administration is very important.

Summing up the aforementioned considerations, the Triple Helix concept is crucial for achieving more effective sustainable development of a region. It provides better, more synergistic effects. On the other hand, however, it should be noted that in Poland ‘the golden triangle’ of collaboration still gained very little popularity. There are not many areas where this collaboration is being encouraged. One of a few examples of it, can be the creation of the Białystok Science and Technology Park. It was the initiative of the local government of the City of Białystok and is now managed by the City as a budget unit. It is a place where the collaboration between Białystok universities and local companies is being promoted. This collaboration aims at increasing innovation and creativity of the companies situated in Podlaskie Voivodeship. This typically economic aspect occurs in the majority of such initiatives. There is little or no promotion of collaboration in the field of other objectives of sustainable development, i.e. social and ecological. In case of science and technology parks, it can be the promotion of proecological and proinnovative attitudes or the creation of local innovative culture. It very often happens that the parks function only as an office space where innovation is only a purely theoretical concept.

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<sup>14</sup> B. Poskrobko (red.), *Sterowanie ekorozwojem*, Tom I, Wydawnictwo Politechniki Białostockiej, Białystok 1998, p. 161–162.

## 5. CONCLUSION

It can be stated that the assumptions and characteristics of the Triple Helix are consistent with the objectives of sustainable development. Firstly, the main objective of sustainable development is assumed to be greater fulfillment of all human needs (physical and mental) by a proper contact and attitude to the natural environment. Moreover, among the specific objectives there are: increasing real income per capita, providing equal access to natural resources, providing justice and security, increasing the level of education, maintaining biodiversity, ensuring sustainable use of land and ecosystems etc.<sup>15</sup>. The development of innovation within the Triple Helix model may enhance the fulfillment of the above objectives. It can therefore be assumed that the two concepts may complement each other. It is important to develop economically rational solutions, which will limit resource consumption, prevent environmental pollution and save natural ecosystems. When implementing them, it is important to have a creative and innovative look at the widely understood problems of the contemporary world. The collaboration within the Triple Helix model can prove to be very useful.

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<sup>15</sup> P. Jeżewski (red.), *Ochrona środowiska i ekorozwój*, SGH, Warszawa 2000, p. 173–174.

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## **MODEL TRIPLE HELIX – MOŻLIWOŚCI ROZWOJU ZRÓWNOWAŻONEGO**

**Streszczenie:** Współczesna myśl ekonomiczna dostarcza wielu teorii dotyczących najlepszych modeli rozwoju społeczno-gospodarczego. W szczególności z jednej strony podnosi się konieczność budowy gospodarek innowacyjnych, konkurencyjnych, z drugiej dużą wagę przywiązuje się do aspektów zrównoważonego rozwoju, który dotyczy zaspokojenia wszystkich potrzeb człowieka poprzez prawidłowy kontakt i stosunek do środowiska przyrodniczego. Mając na uwadze powyższe, celem artykułu jest znalezienie odpowiedzi na pytanie, czy i jak założenia koncepcji Triple Helix wpisują się w ideę zrównoważonego rozwój regionalnego, czy rozwój współpracy w ramach powyższego modelu może dynamizować procesy zrównoważonego rozwoju?

Odpowiedzi na wyżej postawione pytania, można znaleźć w analizie cech i celów modelu zrównoważonego rozwoju i Triple Helix. Analiza pokazuje, że te dwie koncepcje mogą się wzajemnie uzupełniać i sprzyjać wzajemnemu rozwojowi.

**Słowa kluczowe:** Triple Helix, zrównoważony rozwój, innowacyjność.

*Dr Anna Busłowska  
Uniwersytet w Białymstoku  
annabuslowska@yahoo.com*