

 TECHNICAL UNIVERSITY - SOFIA  
 FACULTY OF MANAGEMENT



SCIENTIFIC AND TECHNICAL UNION  
OF MECHANICAL ENGINEERING

NATIONAL SCIENTIFIC AND TECHNICAL SOCIETY  
“MANAGEMENT AND ENGINEERING”

# CONFERENCE PROCEEDINGS Volume II

XV INTERNATIONAL  
SCIENTIFIC CONFERENCE  
“MANAGEMENT AND ENGINEERING ‘17”

DAYS OF SCIENCE  
TU-SOFIA

JUNE 25-28, 2017  
Sozopol



# SCIENTIFIC PROCEEDINGS

*SCIENTIFIC-TECHNICAL UNION OF MECHANICAL ENGINEERING*

*Year XXV 4/219*

*June, 2017*

# XV

## International Scientific Conference

### MANAGEMENT AND ENGINEERING '17

ISSN 1310-3946

ISSN 1314-6327

DAYS OF SCIENCE AT TU-SOFIA, 2017

JUNE 25-28, 2017  
Sozopol, Bulgaria

# CONNECTING INNOVATIVE MILIEU, ECOSYSTEM & REGIONAL DEVELOPMENT: AN ANALYSIS OF CONCEPTS

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**Abstract.** This paper presents the nexus between innovative milieu, ecosystem and regional development while citing some relevant cases in various parts of the globe. The concepts of innovative milieu, ecosystem and regional development are broken down and discussed in detail. The paper finds out two major aspects: how innovation milieu transforms regions and discusses the local ecosystems on regional development. The authors carry out literature analysis. Induction, conceptualization and generalization are the main techniques used for present research.

**Keywords:** innovative milieu, ecosystem, entrepreneurship, regional development, skilled labour, social cohesion.

## 1. Introduction

Regional disparities have been experienced in many areas across the globe. Regions have merged and formed unions that experience new entrants an aspect that influences their ranks in the regional classification. Sectors that received poor new entrants have their income per capita significantly affected due to the change in attribution level criterion [1]. It's noted that, despite the existence of regional policies, the gap that exists between the regions grow larger an aspect that is attributed to economic activities that are comprised of spatial inequalities and disparities.

Regional science plays a critical role in social, cultural and economic dynamic spaces that present the concept of the milieu. The scientists have termed it as 'milieu effect' a factor that is termed as one of the contemporary issues of regional socioeconomic dynamics. Earlier on, several approaches were used in explaining the dynamism of some local spaces an aspect that doesn't count in the modern era due to the development of new strategies [2]. For instance, the western regions implemented regional policies that are by the need and circumstance thus offering a variety of assets. Some of these assets are; transportation infrastructures, fair distribution of natural resources, social, cultural facilities, improved education systems, investments amongst other factors. However, a shortage of diverse strategies to be implemented to promote dynamism is experienced despite placing a variety of strategies in place [2]. This aspect brings forth development in these regions.

Under this scope, "innovative milieu" is an approach that has been coined by scientists to refer to a new modelling field. The approach brings change to the regional

growth as it influences external effects, favorable creation as well as promoting the dynamic, productive system.

Aydalot (1986) [3] hypothesizes that a local environment that presents an ecosystem plays a critical role in innovation incubation thus acting like a prism in which innovation catalysts take part giving the space a clear complexion. Further evaluating the principal components of innovation, the author identifies collective behavior and internal structure of an organization as the key elements [4].

This paper presents the nexus between innovative milieu, ecosystem and regional development while citing some relevant cases in various parts of the globe. Further, the concepts of innovative milieu, ecosystem and regional development are broken down and discussed in detail. The paper finds out two major aspects: how innovation milieu transforms regions and discusses the local ecosystems on regional development.

## **2. Regional Development**

Regional development is a broad concept that defines activities or processes that are meant to address regional problems for the better living of the people. It further addresses development interventions that are used to provide solutions to problems facing the society at regional level. The problems can be categorized in three broad areas; social, economic and governance. All the problems and processes taking place under these three concepts are all determined to a successful sustainable living of the regions [5].

Various regions utilize diverse mechanisms that enable them to create sustainable systems. This aspect leads to the development of regional policies in a bid to control some of these aspects as well to pave way to some key development activities. Regional development puts into consideration other determinants that play a crucial role in its existence [6].

Development maybe considered as achieving a highly sustainable economic niche as well as preserving the social aspects through the right governance [7]. However, the ecosystem is the backbone of the regional development in that all the development activities must consider the impact on the ecosystems and whether some development processes adversely affect it. Therefore, in a bid to evaluate the regional development in detail, the paper evaluates some of the key drivers to regional development and how its linked to innovative milieu as well as the existing ecosystems [8].

### **2.1. Drivers for Creating Excellent Regional Innovation Development Policy**

In many discussions, scientists have come into a consensus when it comes to identification of key drivers of regional innovation development where the focus is diverted to growth and prosperity of advanced economies [9]. Advanced economic growth is directly linked to regional development and takes in a couple of factors that lay a platform for the growth. The developments are regulated under certain regional policies that play a role in regulating aspects like trade or governance aspects [5].

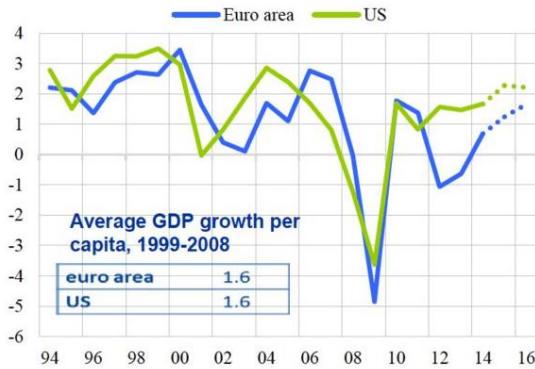
There are broad categories of factors contributing to regional development. The factors can either determine output level over a specific period like investments under physical capital, technology or human skills factored in. The other category is the exogenous viewed because of a process in which research and development as well as human capital translates to a higher productivity [10].

Developments would always require investments of capital, technology and human labor to be achieved. These three factors are known to influence the efficiency in which successful entrepreneurship and resource allocation are achieved [11]. Another important aspect that is not considered as a factor is the rules, policies as well as the legislations that regulate the operations of the players that purchase inputs, process goods and services to ensure there is a stable, fair and competitive transparent framework. These policies apply differently in regions even though some can cut across like border trade customs [12].

It's also noticed that growth and prosperity is highly influence by entrepreneurship and social cohesion. Regional development is stimulated by risk-taking entrepreneurship that contributes to the renewal of the economy of the regions in consideration [13]. On the other hand, social cohesion which is itself influenced by the status of the of the economy, fosters growth whereby it results to a high-quality life and retention over a prolonged period as well as attracting new market entrants and human capital.

Another key driver that is known to be a key driver to innovation and entrepreneurship is social capital also factored in as an aspect of social cohesion [14].

In Figure 1 below, a comparison of GDP per capita growth between EU ns US is shown [15]. This indicator of regional development that is obtained from the GDP growth.



**Figure 1.** GDP per capita growth comparison

Source: <https://www.weforum.org/agenda/2015/10/is-europe-outperforming-the-us/>

According to analysts, a standard list of drivers is formulated even though it's not fixed but always subject to variations. They include; macroeconomic conditions, regulatory frameworks to ensure there is a lively competition and efficient markets, adequate infrastructures; dynamic innovation process; skilled human labor; entrepreneurial spirit; and a high social cohesion [16]. These drivers interlink with each other. Moreover, regulatory frameworks, fiscal and monetary policies will vary from state to state as well as from region to region. For instance, within the European context the responsibilities are shared with the supranational authorities that control the competition and monetary policies [17]. In this paper, four key drivers will be discussed namely; innovation, skills, entrepreneurship and social cohesion.

### 2.1.1. Innovation

Innovation is a broad concept that materializes in a modern day technological advancement. Under modern growth theory, innovation is an endogenous aspect where firms are required to constantly innovate to meet the growing needs of human as well as to achieve a continuing market advantage. This is achieved through creation of new products as well as creating new efficient processes. Research and development is a major ingredient to innovation as it contributes to the overall knowledge. In most regions, the government supports the research and development in a bid to keep up with the technological advancement with constant innovation [18].

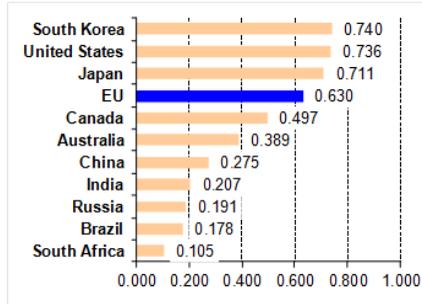
Innovation takes various forms of ranging from new product design as well as production processes rather than inventions. Innovation has three distinct stages that are because of a process. These phases are: knowledge generation, knowledge sharing and distribution and application of the knowledge in product development by users a process that transforms to new business and economic development [19]. The

innovation phases are determined by numerous factors like the research capacities of regional institutions, research and development activities of the institutions and firms and the degree of human capital invested [20]. Knowledge distribution and application largely relies on the worlds education standards, research, and business activities.

The most crucial tools that foster innovation as per the past records of innovation activities are based under microeconomic levels [21]. The stability of microeconomic conditions as well as the effective human skills responsible for development is determined by the roles that the national climate for innovation plays. According to Morgan and Sol (2004) [22], the local level firms learn from other firms whereby they tend to use external economies as benchmarks resulting to risk internalization that is bound to product development even though at times may end up forging the supply chain links [23]. Regions and localities have the innovation determined by building of a knowledge base through the encouragement of research activities as well as attracting enterprises that utilize advanced technology and talented researchers while facilitating co-operation between the parties [24].

Economic development of a region incorporates various stakeholders who need to work together to achieve the objectives set regionally. The network circles of the players should exist in a coherent manner to allow east development [25]. At times, poor coordination may lead to under achievement of economic aspects as in most cases, governments may consider pursuing development goals independently that may not be fully consistent with the other region members [26]. Effective innovation systems offer a great deal of effort to ensure crosscutting co-ordination between the key players.

Under the aspect of innovation, regional development would largely depend on the aspects that are meant to improve businesses within the regions. The aspects work along under government policies that are laid down upon certain agreements signed by the member countries. Governance is a key factor that would largely determine how innovation is carried out as it needs both financial and institutional support [27]. Government funded projects would highly require innovativeness as they are meant to meet the rising needs of the society as well as solving societal problems [28]. Government sponsored projects as well as ones done by the private sector all have an economic value attached to them that contributes positively towards regional development. Figure 2 below shows a comparison of innovation performance of EU against the other global competitors. The innovation performance can as well translate to the development of the regions.



**Figure 2.** EU Innovation performance compared to main global competitors  
*Source:* [http://europa.eu/rapid/press-release\\_MEMO-14-140\\_en.htm](http://europa.eu/rapid/press-release_MEMO-14-140_en.htm) [29]

For instance, an agreed regional; agreement to install a nuclear plant to solve energy crisis problems within a region would highly require resources especially research, human skills, and capital. Nuclear projects have a lot of controversies due to their impact on the environment [30]. The materials used in nuclear plants are radioactive and have adverse radioactivity that affects human and plant life.

A country within a region would need to consult with other countries to establish how the project will affect them [31]. A lot of innovation is required in setting up this project and constant research is a key ingredient to its success.

Another case of innovation is the advancement of the computing world that has led to the growth of many business sectors due to improved efficiencies in the processes and production procedures.

### 2.1.2. Skilled labour

Human skills are key elements of regional economic development whereby there is pooling of skilled labor an aspect that gives entrepreneurship, business development and investments an opportunity. The diverse human skills are considered as ingredients of innovation. Further, skill development provides opportunities that are critical to the social inclusion [30].

In every sector, skilled labor is required to enable the production processes and the service industries thrive thus boosting the economic development. In the industrial process, whereby we have several sectors like manufacturing requires trained personal to undertake all the manufacturing activities taking place [32].

Human skills are important aspects since they lead to labor market policy development. The government seeks to establish employability of the labor force using various tools like; job placement, counselling and vocational training. These aspects enable one to acquire and polish the skills related to his area of work and career. The main goals of labor market policy are to guarantee the markets efficiency as well as

increasing their productivity. According to Martin & Grubb (2001) [33], labour market programmes are considered effective when local characteristics of the target groups are put into account to match with the local market needs.

Regionally, labor markets are matched by the employers who seek to recruit potential candidates to undertake various position towards the contribution of productivity of the labor markets. Professionals are the people who take large share of the labor markets and contribute to a considerable extent to the growth of the economic development [34]. Member countries in the unions like EU have their citizens works across borders within the region in a bid to bridge the gaps in expertise.

Trade unions, local authorities as well as trade organizations are responsible in offering labor market services. These services include; vocational training, placement and reintegration services. Existing infrastructure is considered when delivering employment services as well as public transport and municipal services. Employments and training programmes are critical aspects for labor market efficiency to meet business needs for the changing skills [35].

To increase policy effectiveness, the market policy maker's co-ordinate the local business growth benefits to ensure that it benefits the socially excluded group. The disadvantaged group can be offered work and training opportunities by employers to fit the labor market demands [36].

For a business to access its labor market programmes, a skill upgrade of low-qualified employees is deemed necessary. Researchers note that there is a closer integration that awards reciprocal advantage [37]. Economic development is achieved by development actors, where the key to attraction, retention and nurturing up of skilled labor is very crucial for business development.

Economic prosperity is a key to regional development and offers advantages of closer integration where employers place their labor demands to the supply side. This offers an opportunity for the socially excluded as they stand to benefit from dynamic economy. Regionally, the weak economies get aid from the fact that they belong to an umbrella that shields them from being exposed to extremities. For instance, economic equality is somehow promoted in European Union [38]. European Union forms one of the largest single markets around the globe with more than 500 million consumers.

They have trading policies that govern their member states and flexible customs within member countries. Those aspects create conducive labor markets for the members and they don't face challenges during importation and exportation. This aspect leads to regional development by creating stable economies for the member countries.

### **2.1.3. Entrepreneurship**

Economic growth is highly dependent on entrepreneurship, which is vital for economic development. In most countries, the national governments promote entrepreneurship at national level where it provides a stable macroeconomic framework as well as a good business climate. Governments lay a good platform for its citizens to start businesses like reviewing their fiscal and monetary policies [39].

They make more funds available for borrowing as well as giving out loans to its citizens to enable them to invest. Also in government institutions, entrepreneurship courses and training takes place for both the working and the unemployed. This aspect is to ensure that there is uniformity in the business services offered [40].

Entrepreneurship leads to direct pooling of profits that in turn are used to do major development projects through payment of taxes. Entrepreneurship is influenced by both local and international environments. The nature of the local entrepreneurship will vary across the local areas while being directly influenced by; wealth, education, and occupation. In regions where firms are highly concentrated, the regions can be known to have reached the threshold of entrepreneurial activities [41]. The regions are responsible to the rise of economies in those regions as well as being able to attain competitive advantages over the others.

The local needs of a region are influenced by a couple of factors that enable the policies to consider several location-specific factors. Business incubators and networks are some of the of the location-specific factors tailored to meet the local needs. The regional governments have the mandate to oversee the prevailing conditions that mostly affect the firms within the region as well as controlling the investments and upgrading the business environments [7]. Multinationals also play a part in investing in foreign countries where they must abide with the set regulatory frameworks within certain regions. Different member countries in a region or union have different policies even though they discuss and agree on which terms are to apply internationally or within a specified region.

Entrepreneurship also allows money to flow from one country to the other and in cases where the countries are in a union, the trade becomes even easier as customs might be waived or at minimal rates. That way, there is more business-taking place and more money is being generated. This contributes to economic growth of a nation an aspect that contributes to regional development. For instance, since the entry of Latvia to the EU, the country has had significant growth and it even contributed to the expansion of EU markets [13]. Their GDP had an inclining effect after recession period. This was an indicator that becoming a member of EU contributed for their economic growth and regional development at large.

#### **2.1.4. Social Cohesion**

For every growth driver, there is a social dimension and can be either grouped into social cohesion, social inclusion or social capital. Social cohesion majorly focuses on the quality of life that contributes to a good business environment thus attracting more capital investments and talents. Social cohesion broadly describes the aspect of social inclusion and capital within a region [19]. Under social inclusion, the weak economies within regions are integrated into the labor market and helped to carry on with its developments for a prosperous society. On the other hand, networks and shared values best describe the social capital that is crucial aspect in business growth.

Social cohesion is highly depended on the governance aspects. Social inclusion works around a couple of policies and regulatory framework. In addition to that, social

capital is also depended on such aspects and some of these areas include; security, health, employment, education, environment, infrastructure among others [16]. To achieve regional development, governments for the respective member countries and the local partners must intervene as well as co-operate in formulating joint solutions. Some issues that countries within certain regions face are complicated and maybe linked to urban centres like poor housing leads to the aspect of social exclusion.

Social capital is best described by shared norms and values that lead to amalgamating of communities, sectors and enterprises as well as individuals to their mutual benefits. Further research reveals that leadership and participation of employers and employees are stimulated by the mechanisms that are in place for constructing social capital [21]. Encouraging industrial associations is one of the mechanisms that have been put in place to impact change. This may not be easy since large firms usually dominate the associations that may not be organized at a community level. Social capital is also used in giving support to the economic development but it's not straightforward since a problem arises from the development of strong social networks that excessively rely on the local contacts [9].

### **3. Innovative Milieu**

As per Maillat (1992) [42], the innovative milieu brings forth social, cultural, economic and political factors together that occur in a geographical setting. An innovative ecosystem involves utilization of knowledge and competence to attain some degree of conceptualization that aims at improving an existing state or entirely providing a solution to an existing problem.

The innovation ecosystem is directly linked to innovation hub that is used to refer to a global network connection that aids in creating value in the world economy [43]. This concept is related to the models of regional innovation where the logic behind its construction is the same.

Further, an innovation ecosystem would comprise of dynamic processes that are aimed at producing solutions to different challenges. The world is experiencing numerous problems ranging from incurable diseases to harsh climatic conditions. Innovation ecosystems, therefore, provides a promising platform to find amicable solutions to these problems. These problems are not experienced in all the regions in the world as each region experiences a different problem. However, the global warming effect is experienced worldwide [44].

Innovation milieu can as well refer to global networks and technological platforms that trace its roots in industry and business sectors. The culture of innovation began during the industrial era a time when cities and metropolitans were being built. For instance, the rise of United Kingdom would represent as a real picture of innovation milieu [44]. In the current times, the concept has gone to other levels with the Silicon Valley being one of the most recent concepts of innovation ecosystems. Silicon Valley brings forth an important aspect of advancing global economy and network. This brings regional development in the regions where the hubs are being set.

Another aspect that influences innovative milieus is meso-economy an element that is used to explain the internal components of the system. Meso-analysis helps in explaining the micro and macro analysis of the economic aspect of a region [45]. The economic dimension of a country is very critical as it describes the financial position of a country. The region is considered economically stable if their socioeconomic factors are stable. Regions with poor governance have weak economies as well as the ones that don't embrace innovation [20].

Regions have experienced challenges in leadership that don't build favorable conditions for innovation. Long-term structural changes are required to embrace change for a positive impact in the modern society. The modern society faces many challenges that hinder systematic innovations like energy crisis, weak healthcare systems, waste systems among others [20]. The systematic view is required in a bid to change a city into an innovation ecosystem. These factors are key determinants of regional development.

Transitions in sociotechnical systems are directly related to ecosystem innovations that may take decades to be seen. For instance, the transformation of a rural area into an industrial hub would take decades. The transition doesn't rely on technology only but also other factors like societal and cultural changes.

Modern day systematic innovation strategies are an essential part of national development strategy even though some lack practical guidelines [43]. Evaluating the general scenario of the innovation ecosystem, it's found that technological possibilities, politics, market trends, consumer behavior, and competitor behavior affect innovation for regional growth as well as the cultural context of beliefs and values.

Adoption of technologies can also be used as strategy to explore systematic change and innovation as it pertains the use of renewable energy sources and healthcare reforms using information technology concepts. Technology is applicable in diverse areas to spearhead the regional development, and it's important for the users to consider the maturity, costs, as well as legislations that may govern a technology [43]. Also, the general values of the society may influence practical frameworks like the climate change awareness and escalating energy demands. Geels (2010) [46] reveals that for a region to address the challenges, it may need some extra dynamics that are related to the society and consumer behavior.

#### **4. Ecosystems**

Ecosystems under the concept of regional development focuses on the environmental effects as they are the backbone of all the developments. Ecosystems refers to the environmental resources that humans use and possess an intrinsic value with long term sustainability. The world is facing many problems with the very rising population yet the resources are scarce. Ecosystems come in handy when one is defining regional development. The factors are as well linked to innovation milieu. For the fact that human beings are busy trying to meet their daily needs, they end up exploiting the environmental resources at a high rate an aspect that brings forth profound consequences to the environment. There are four major resources in an

environment. They can either be continuous or extrinsic or renewable and non-renewable.

Renewable resources describe the natural resources capable of regenerating into further products or the same products within a given period. They renew themselves and become available for use again even after their first use.

E.g., clean water and clean air. Non-renewable resources describe the resources that their availability is limited and they can be depleted upon usage over time. Such resources are minerals, and ground water. Continuous resources - these are resources whose availability are always and cannot be affected by gross mismanagement. E.g., solar energy, and wind energy. Extrinsic resources - refers to resources that are capable of being degraded and their availability can be continuous is well managed, for example, human skill.

#### **4.1. Ecosystems and Sustainable Development**

Environment (ecosystems) and sustainable development have a very close nexus whereby the later depends on the former. In the international report by World Commission on Environment (WCED), its identified that the main goal of development is to meet the material needs of human kind. It's also added that over exploitation of environmental resources may lead to crisis of destabilization of ecosystems thus compelling human societies that cannot meet the essentials of future needs.

However, a lot of activities have taken place on earth such that the resources are altered or depleted. For instance, settled agriculture as well as diverted water course and emission of noxious gases that lead to global warming has adverse effects on the ecosystems. Under this concept regions have been called to buy the concept of sustainable development as it acts as an overriding objective with a test of national policy as well as for international cooperation.

Researchers further add that human beings should be cautious with the activities they undertake in the ecosystems to prevent aspects of over exploitation and pollution. Sustainable development consists of several types of dimensions; social, economic, and environmental dimensions. Under the ecosystems and sustainable development in regions, the researcher will focus on the environmental aspect that has various dimensions. Environmental dimensions represent the ecosystems whereby it covers aspects like reduced waste, gas emissions, reduced impact on human health, renewable materials use and elimination of toxic substances.

#### **4.2. Environmental Interdependence**

Environmental quality should be maintained through a sustainable use of resources. Human activities are geared towards development of economies for the nations. Social human needs also have a direct impact on the environment. Problems associated with the environment are all the same from region to region unlike social and economic factors. Many human activities like industrial and agriculture largely depend on the environmental resources like soil, air, water among others. Carrying out these activities have brought forth some serious environmental issues like global

warming due to toxic emissions to the atmosphere. However, some issues may be categorized as local since they apply to a specific region or nation while global warming is a global issue.

Further, wastes that have been disposed to the water sources have serious effect on flora and fauna. The wastes have chemicals that are not friendly to the water animals and water plants. We also note that emissions to the ozone layer leads to its depletion an aspect that has contributed ill health on both animals and plants. The continued dependence on all the countries across the globe notes that cooperation and coordination are deemed necessary to curb the issue of environment since they are linked to economic aspects like poverty.

Therefore, ecosystems need to be guarded as far as human developments take place. This is to ensure there is habitable environments for the future generations. Pollution control and environmental summits needs to be followed to the later to ensure every member nation is responsible for any emission. Economic growth largely on the ecosystems whereby, a more advanced nation will excessive use of resources an indicator that there is a high degree of environmental pollution. For instance, China, where it's a leading country in manufacturing processes across the globe faces a serious aspect of pollution. The pollution leads to other health hazards like respiratory diseases and cancer.

## **5. Nexus between ecosystems, innovative milieu and regional development**

The three terminologies are closely linked to each other in several dimensions. Under the previous discussion, the researcher found out that regional development is highly influenced by innovation, entrepreneurship, social cohesion and skilled labor. Unions are formed to assist the member countries in achieving their development goals. The members are able to access cheap goods within the region without paying customs as well as trading within the other member countries.

Regional development is achieved when various aspects have been put in place. For instance, innovation is a critical aspect that influences the production of new products as well as new processes that lead to advanced values of products. When innovation contributes to development of a new product, it's quite sure that the product will have an economic value and can be sold.

New products that are developed because of innovation milieu lead to increased business an aspect that translates to more money earned by a country or the owner. When the country is in business its making money that money can be channeled to meet development goals as well as economic development.

Innovation also leads to production of sophisticated products that are used to solve problems for the human kind. For instance, a nuclear plant comes because of innovation and constant research & development. A nuclear plant though very expensive and hazardous to the human health, it's very efficient. Nuclear plant generates a lot of power that leads to reduced rates meaning people can invest more thus channeling the output towards regional development.

Also, ecosystem is another aspect that has a link to the regional development. Resources are scarce to meet the daily rising needs of the human kind. However, the consequences of using some resources leads to serious environmental issues that cause more damage than the developments.

Global warming and toxic gas emissions lead to health problems and the nations need to address the issues of toxic emissions, and on how they can reduce them. Ecosystem innovation works in cases where we have experiences and feedback. To successfully implement a structure, a single innovator wouldn't make it alone rather he would need a team that has a know-how for successful implementation of any technology [47]. Ecosystem users depend on others like resources and expertise for a complete cycle. Moreover, a systematic innovation in an ecosystem would see changes being actualized in phases and different sectors.

## **6. Conclusion**

The paper discussed addressed the link between ecosystems, innovation milieu and the regional development. The drivers that contribute to the regional development were discussed as well and established how they affected regional management. Innovation milieu is an important aspect when it comes to regional development. The concept is spearheaded by the changing technological aspects that allow innovation to take acute phases in a very short period. Innovation is used to find solutions to challenges that regions face as well as the addressing global issues. Energy crisis and changing climatic conditions are some of the factors that influence regional development. Silicon Valley is a modern-day innovation ecosystem that has seen old fashioned cities being transformed to a high-tech economy hub. Regional development is highly influenced by innovation milieu and ecosystem even though other socioeconomic factors play a critical part

## **Acknowledgments**

The paper has been elaborated within the project 5.2.2 “The Development of Innovation and Entrepreneurship in Latvia in Compliance with the Smart Specialization Strategy” of the National Research Programme 5.2 “Economic Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development – A New Approach to the Creation of a Sustainable Learning Community (EKOSOC-LV)”

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