Innovation Systems Management in Metropolitan Regions: The Case study of Yerevan, Armenia

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Thesis to obtain the Master of Science Degree in Urban Planning and Territorial Management

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October 2016
Abstract

Urban planners and economic planners always struggle to define significant approaches to improve the development in a territory that enhances the quality of life. This research project aims to look at local and regional management systems that tend to improve economic growth from the perspective of urban and economic development planners focusing on the innovation systems management. Yerevan the capital and the biggest metropolitan region of Armenia was taken as a case study to develop economic growth guideline which might help decision makers such as urban and economic planners, and legal institution authorities derive smarter innovative management systems to increase opportunities for economic growth and development.

In order to develop a better roadmap for urban and economic development planners on how various planning interventions might promote economic growth and urban development, we tend to address the following main research question:

How an innovation development approach might promote an environment for competitiveness and quality of life of metropolitan regions in developing countries?

This inclusive environment must be stressed both including to an urban planning perspective and to an economic development one. This will address to the main question to achieve better understanding of the context:

1. How efficient is the actual local planning management system of Yerevan: Armenia metropolitan region, and what factors influence the growth of an urban region? 2. What are the new local and regional innovation development systems that are adopted in the other metropolitan region systems in developed countries that could be seen as the benchmark of this subject in the case study? 3. What can urban and economic development planners learn from the observed literature and findings of the success story that can better link urban planning with economic development?

Innovation is a complex process that involves multiple actors. The research project takes a comprehensive approach that looks critically at the different components of the regional innovation system, their mutual relations and the overall economic background, institutional framework and urban development in which innovation activities take place. This distinctive approach provides a solid foundation to identify areas where local and regional innovation system management interventions could be most beneficial by removing bottlenecks and develop existing potential.

Keywords: Innovation system, urban planning, economic development, systematic competitiveness
List of acronyms

ATDA- the Armenian Tourism Development Agency
DKN-Diaspora Knowledge Network
GDP-Gross Domestic Product
ICT- Information and communications technology
IT-Information Technology
LRED-Local and Regional Economic Development
MTA-Ministry of Territorial Administration
NIS-National Innovation System
OECD-Organization for Economic Cooperation and Development
RA-The Republic of Armenia
SPI-Social Progress Index
SMS-State Migration Service
TSE-Target State of the Economy
USSR-Union of Soviet Socialist Republics
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1. Chapter: Introduction
1.1. Topic introduction and Importance: urbanization rhythm

Urbanization is a megatrend which will significantly shape the economic, political and social transformation of societies and their spatial impacts. It is estimated that between 65% and 75% of the world population is projected to be living in cities, with more than 40 million people moving to cities each year. That's around 3.5 billion people now, rising to 6.5 billion by 2050. Future urban growth will thereby almost exclusively take place in developing countries. (Web, 2015) (See Table 1-1).

<table>
<thead>
<tr>
<th>Region</th>
<th>1950</th>
<th>1975</th>
<th>2000</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population (millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>2,519</td>
<td>4,068</td>
<td>6,071</td>
<td>8,130</td>
</tr>
<tr>
<td>More Developed Regions</td>
<td>813</td>
<td>1,047</td>
<td>1,194</td>
<td>1,242</td>
</tr>
<tr>
<td>Less Developed Regions</td>
<td>280</td>
<td>3,021</td>
<td>4,877</td>
<td>6,888</td>
</tr>
<tr>
<td>Rural Population (millions of inhabitants)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>1,786</td>
<td>2,552</td>
<td>3,214</td>
<td>3,185</td>
</tr>
<tr>
<td>More Developed Regions</td>
<td>386</td>
<td>344</td>
<td>311</td>
<td>228</td>
</tr>
<tr>
<td>Less Developed Regions</td>
<td>1,400</td>
<td>2,208</td>
<td>2,902</td>
<td>2,958</td>
</tr>
<tr>
<td>Urban Population (millions of inhabitants)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>733</td>
<td>1,516</td>
<td>2,857</td>
<td>4,945</td>
</tr>
<tr>
<td>More Developed Regions</td>
<td>427</td>
<td>703</td>
<td>882</td>
<td>1,015</td>
</tr>
<tr>
<td>Less Developed Regions</td>
<td>306</td>
<td>813</td>
<td>1,974</td>
<td>3,930</td>
</tr>
<tr>
<td>Percentage of Population Living in Urban Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>29.1</td>
<td>37.3</td>
<td>47.1</td>
<td>60.8</td>
</tr>
<tr>
<td>More Developed Regions</td>
<td>52.5</td>
<td>67.2</td>
<td>73.9</td>
<td>81.7</td>
</tr>
<tr>
<td>Less Developed Regions</td>
<td>17.9</td>
<td>26.9</td>
<td>40.5</td>
<td>57.1</td>
</tr>
<tr>
<td>Distribution of the World’s Urban Population (World)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>More Developed Regions</td>
<td>58.3</td>
<td>46.4</td>
<td>30.9</td>
<td>20.5</td>
</tr>
<tr>
<td>Less Developed Regions</td>
<td>41.7</td>
<td>53.6</td>
<td>69.1</td>
<td>79.5</td>
</tr>
</tbody>
</table>

Source: (Cohen: 2006).

This research project aims to look at local and regional management systems that tend to improve economic growth from the perspective of urban and economic development planners focusing on the innovation systems. Yerevan the capital and the biggest metropolitan region of Armenia was taken as a case study to develop economic growth guideline which might help decision makers to drive smarter innovative management systems to increase opportunities for economic growth and urban development.

Armenia faces with the huge concentration in the metropolitan areas, this problem is not very accurate and it is one of the main preoccupations in the national, regional and local levels. Armenia's population is estimated at 3,018.854 in 2015. The country has a population density of 101 people per square kilometer (263/square mile). Yerevan has a population of approximately ¼ of the country's population. Which means that almost 35% of the population is concentrated in the main city. Armenia is urbanizing at a rate of 0.5% but has seen a population decrease by about 6% over the most recent 4 years. (United Nations, 2015).

In this research, we tend to put together all related entities from government and private sector which can provide a favorable land for the new urban settlement. Fostering innovation systems is essential for regional
development because other strategies and concepts (e.g. Smart Cities, Green Economy, and Urban Nexus Approach) build on innovation to promote a smarter, greener or more inclusive development within urban areas. Managing this rapid growth of megacities and metropolitan regions is becoming crucial. Especially metropolitan regions in less developed countries, like Armenia, is struggling to manage the challenges of this accelerated growth.

1.2. Objectives

In order to develop a better roadmap for urban and economic development planners on how various planning interventions might promote economic growth and urban development, I tend to address the following main research question:

*How an innovation development approach might promote an environment for competitiveness and quality of life of metropolitan regions in developing countries?*

This inclusive environment must be stressed both including to an urban planning perspective and to an economic development ones. This will respond to the main question to achieve better understanding of the context:
1. How efficient is the actual local planning management system of Yerevan: Armenia metropolitan region, and what factors influence the growth of an urban region?
2. What are the new local and regional innovation development systems that are adopted in the other metropolitan region systems in developed countries that could be seen as the benchmark of this subject in the case study?
3. What can urban and economic development planners learn from the observed literature and findings of the success story that can better link urban planning with economic development?

1.3. Methodological approach

With this research work, we aimed at develop a guideline, which can be applied to the metropolitan regions to contribute to the integration of economic development and urban planning. To achieve the goal firstly we have done a basic research for experimental and theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts. With the findings of the last bibliographic references, explore the main issues dealing with the innovation and creativity, metropolitan management system, regional growth, economic development and innovation system management. Secondly, we applied research in order to acquire new knowledge about the most significant success story related to the innovation system in metropolitan region in different countries. Thirdly: we carried out the experimental development for systematic work, drawing on existing knowledge gained from research, formulating the hypothesis, testing this hypothesis, applying deductive and inductive logic.

The research project structured into six chapters. In line with its focus on innovation system promotion in metropolitan regions, the objectives and the methodological approach are identified. Chapter 2 defines the elements of characterization of Yerevan; Armenia in order to provide a wide understanding of the image background of the case study. The political, economic and education contexts of the country are discussed in more detailed way to recognize the bottlenecks and develop existing potential. Chapter 3 highlights the most recent
bibliographic references, the basic principles which have universal relevance in different countries. Key aspects of innovation and creativity, metropolitan regions are clarified and regional innovation systems are described. Chapter 4 considers how the innovation systems were applied in developed country and the success story of the Netherlands are analyzed and discussed in details, Chapter 5 provides a framework and instruments to identify entry points for the promotion of regional innovation systems in metropolitan region of Yerevan, Armenia. The final chapter, Chapter 6, discusses recommendations and considerations for research work.
2. Chapter: Case study elements of characterization

2.1. Country context

This chapter describes the main characteristics of the case study, giving a coherent image and brief historical overview pointing the geographical location, cultural variations, population-distinguishing feature with its migration and emigration flow. We have emphasized on the political, economic and educational contexts of the country in order to understand the assets of the region that can be seen as a benchmark components for developing innovation system, and on the other hand we have identified the gaps that effect on the economic growth, urban processes and competitiveness of the country. While discussing the country context it is essential to look at the territory in light of Caucasus region as the internal and external factors that influence on the social-economic and urban conditions on national, regional and local levels directly connected to the geographical and political relations with the bordering countries. The chapter drawing parallels between Armenia and other countries in the region, highlighting the competitiveness similarities and differences between them from the perspective of economy and education.

2.1.1. Geographical location: Armenia is located in the South Caucasus region of Eurasia and occupies the area in total of 29,800 sq km, out of which land is 28,203 sq km and water area 1,540 sq km. The country borders with Georgia 219 km in the North, Azerbaijan-Nakhijevan 996 km in the East and South-West, Turkey 311 km in the West and Iran 44 km in the South. The land surface is mostly landlocked territory, occupied mountainous and flat terrains, with fast flowing rivers and few forests. The highest point of the land is 4,095 m above sea-level at Mount Aragats, and the lowest one is below 400 m. The climate is highland continental, highland continental, hot summers, cold winters. (“Armenia,” 2016), (“The World Factbook,” n.d.).

2.1.2. History: Armenia dates back to about 4000 BC, due to the bulk of evidence the first civilization plunge down in the Bronze Age and earlier. Between 95 and 66 BC under Tigranes, the Great Armenia achieved at its greatest extent and became the most powerful kingdom of the Roman Republic in the east at that time. (See figure 2-1) Armenian is the only official language, the alphabet was invented in AD 405 by Mesrop Mashtots. According to a 2013 survey, 95% of Armenians stated that they have knowledge of Russian (24% advanced, 59% intermediate), 40% of English (4% advanced, 16% intermediate and 20% beginner). In public secondary schools, Russian and English or another foreign language like French and German are mandatory subjects. Armenia was the first nation that adopts Christianity as a state religion dated to AD 30. The roots of the Armenian Church date back to the 1st century. According to tradition, two of Jesus' twelve apostles named Thaddaeus and Bartholomew established the Armenian Church and preached Christianity in Armenia between AD 40–60. In honor of the apostles, the Armenian Church is called Armenian Apostolic Church.

Figure 2—1|“The Kingdom of Armenia at its greatest extent under Tigranes the Great, who

2.1.3. Population: According to the results of 2011 census de facto the population of the country is 3,018,854. The largest ethnic group is the Armenians (98.1%) the rest of the population are the Kurds (Yezidis) (1.2%), Russians (0.4%) and others (0.3%). The age structure of a population affects a nation's key socio-economic issues. Figure 2-2 illustrates population pyramid the age and sex structure of a country's population. Along the horizontal axis distributed the population, on the left is shown males and females on the right. The shape of the population pyramid progressively changed over time based on fertility, mortality, and international migration trends.

![Population Pyramid of the Republic of Armenia](image)

*Source: the World Factbook*

Normally Armenian family is composed of a man and a woman, with the estimated age of a newlywed couple of 25 for the woman, 28-30 for the man. This age gradually evolves among individuals who majoring in higher education. Traditionally the Armenians like to have children, an average is 2-3 children. Divorce and separation are recently dedicated phenomenon and still taboo. Armenian marriages last very long. According to the World Factbook review, Armenia holds the 111 place on infant mortality rate 13.51 as of 2015. Armenia occupies 121 position with the total population of 74.37 years Life expectancy at birth. ("Armenia," 2016), ("The World Factbook," n.d.)

2.1.4. Immigration and migration rate: Armenian Diaspora

Phenomena: Migration is a megatrend in Armenia. Net migration volume assessment is based on the flows of arrivals and departures from the country. According to the World Bank, Armenian’s migration rate are classified as one of the top highest once in the world. Armenia faced three main waves of the massive population migration within its history, which had the crucial influence on development aspects of the country. The first and the biggest one was a result of the Armenian Genocide of 1915 when the Armenians left their homeland in Western Armenia currently located east part of Turkey. During the last 2 decades, the country experienced an extraordinarily high rate of migration, with the average annual net rate of -3.2% of Armenia’s population. The second migration wave was detected after the earthquake in 1988 and the breakup of the Soviet Union in 1990, approximately 1
million Armenians have joined the diaspora, the main obstacles were economic conditions in Armenia. **The third one was between the period from 1992 to 2001 Armenia was affected by losing 30% of the country's population.** At that time, the country had the lack of independent government experience which gave birth to many political and economic challenges like war, the blockade, the energy crisis. However, the phenomena are continuing to be actual even nowadays. According to the State Migration Service of the Armenian Ministry of Territorial Administration, net arrivals to the country were at a negative level of -31,200 in 2013. The chronology of economic development shows that in the pre-crisis period (until 2008) the growing economy resulted in decreasing emigration rates. The trend changed abruptly after the global financial crisis hit the Armenian economy.

Several studies and conducted surveys indicate that the motives for migration have also changed throughout the course of time. Unemployment is still the dominant factor of emigration, but other reasons such as, geopolitical threats, social justice, negative perception towards economic governance and development uncertainty also play a significant role in the decision to leave the country.

**Armenian diaspora:** The Armenians are 11 million, approximately 3 million are living in Armenia, the other 8 million spread out all over the globe figuring out a large diaspora. The table 2-2 shows the countries where the Armenians made communities. In accordance with the international reports the Armenian diaspora is recognized as one of the most vigorous and organized once. The Armenian diaspora is a crucial power for the Armenians and for the country itself. They providing the country and the nation with the incredible support, investing in educational, historical and cultural programs aimed at preserving the Armenian identity and traditions. The outstanding Armenian labor migrants play the important role in the economic, political and social life of Armenia. Intellectual and financial resources of the diaspora is a powerful tool for the father development of Armenia. (Makaryan and Galstyan, 2013), (“Armenia,” 2016).

**Table 2—1 | Armenian Diaspora by countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Official data</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Russia</td>
<td>1,182,388</td>
<td>14.78%</td>
</tr>
<tr>
<td>2 United states</td>
<td>483,366</td>
<td>6.04%</td>
</tr>
<tr>
<td>3 France</td>
<td>12,355</td>
<td>0.15%</td>
</tr>
<tr>
<td>4 Georgia</td>
<td>248,929</td>
<td>3.11%</td>
</tr>
<tr>
<td>5 Ukraine</td>
<td>99,894</td>
<td>1.25%</td>
</tr>
<tr>
<td>6 Turkey</td>
<td>55,354</td>
<td>0.69%</td>
</tr>
<tr>
<td>7 Canada</td>
<td>50,500</td>
<td>0.63%</td>
</tr>
</tbody>
</table>

2.2. Political context

As reported by the Constitution, Armenia "is a sovereign, democratic, social State governed by rule of law". Between 1922 and 1991 the country was part of the Soviet Union and on 21 September 1991 it admitted its independence from the former Soviet Union. The official name of the country is the Republic of Armenia (RA). Constitution of Armenia was adopted previous 1915, 1978; latest adopted 5 July 1995; amended 2005; by a nationwide elections in 1995, and has since been modified twice in 2005, note - in March 2015, a concept for constitutional reforms approved by the president 2015. Armenia is a republic with a semi-presidential system of government.

2.2.1. Land management and urban planning

According to the Law of the RA "On urban development", main issues of the RA regarding the urban development and measures aimed at the solution thereof are enshrined in planning documents at national, regional and local levels serving as a ground for the spatial development.

<table>
<thead>
<tr>
<th>National level</th>
<th>Regional level</th>
<th>Local level</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Master Resettlement Plan of the Republic of Armenia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Area Arrangement Plan of the Republic of Armenia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Area Planning Designs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Master Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Zoning Plans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The urban system of the RA has been formed under the influence of factors inherent to the command economy and administrative methods of management of the Soviet times, whereas the planning structure reflects the distribution and resettlement of production capacities, which were developing in conformity with the role that was given to RA in the USSR economic system (HABITAT III NATIONAL REPORT, 2014).

2.2.2. Administrative division of Armenia

The governing system of the country underlines into three level of authorities national, regional and local.

**National level**: The Head of State is elected by the citizens of Armenia through direct general elections for five years. The President of the Republic has executive power to appoint the Prime Minister and, upon a recommendation by the Prime Minister, to appoint and dismiss the members of the government. Legislative power is
vested in the unicameral National Assembly (Azgayin Zhoghov, Ազգային Ժողով) consisting of 131 MPs elected for a term of five years.

**Regional level.** Armenia is divided into ten provinces (marzer, with the city of Yerevan (Երևան) having special administrative status as the country's capital. These are not regional self-governments, they are deconcentrated administrative entities. Each province (region) has a deliberative body, the Regional (Marz) Council, know also as Marzpetaran consisting of the Chiefs of Communities and the regional governor. The table 2-2 illustrate the administrative provinces (marzer) of Armenia with the occupied area, population and percent of population below. They are not elected representative bodies and are subordinated to central government and possess only consultative powers. The chief executive of each of the ten marzer is the marzpet, who is appointed by the Government. The legal status of the provinces is governed by the Law on Administrative and Territorial Division of the RA, adopted in 1995. In Yerevan, the chief executive is the mayor, appointed by the president.

**Table 2—2|The administrative provinces (marzer) of Armenia with the occupied area, population and % of population**

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>AREA [KM²]</th>
<th>POPULATION</th>
<th>% OF POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>223</td>
<td>1,060,138</td>
<td>35.12%</td>
</tr>
<tr>
<td>Vayots Dzor</td>
<td>2,308</td>
<td>52,324</td>
<td>1.73%</td>
</tr>
<tr>
<td>Tavush</td>
<td>2,704</td>
<td>128,609</td>
<td>4.26%</td>
</tr>
<tr>
<td>Syunik</td>
<td>4,506</td>
<td>141,771</td>
<td>4.70%</td>
</tr>
<tr>
<td>Shirak</td>
<td>2,680</td>
<td>251,941</td>
<td>8.35%</td>
</tr>
<tr>
<td>Lori</td>
<td>3,799</td>
<td>235,537</td>
<td>7.80%</td>
</tr>
<tr>
<td>Kotayk</td>
<td>2,086</td>
<td>254,397</td>
<td>8.43%</td>
</tr>
<tr>
<td>Gegharkunik</td>
<td>5,349</td>
<td>235,075</td>
<td>7.79%</td>
</tr>
<tr>
<td>Armavir</td>
<td>1,242</td>
<td>265,770</td>
<td>8.80%</td>
</tr>
<tr>
<td>Ararat</td>
<td>2,090</td>
<td>260,367</td>
<td>8.62%</td>
</tr>
<tr>
<td>Aragatsotn</td>
<td>2,756</td>
<td>132,925</td>
<td>4.40%</td>
</tr>
</tbody>
</table>

Source: of Map and data is Wikipedia Armenia

**The framework of regional level administration/ Marzpetaran:** Marzpetaran is actually financed and supervised to implement some of the state programs. As a consequence of the absence of legal and financial grounds of territorial administration initiate a tendency that, Marzpetarans face barriers in developing and implementing region/marz development plans, which greatly increase centralization of government, obstructing the development and strengthening of local self-government in the RA. This situation can be detected as constraints towards innovation system management adaptation and further democratization of government as well as promote inter-community cooperation in the region. This issue will be addressed in the further chapters of the research project.

The territorial policy of state government is implemented by region’s governor, who ensures the realization of state territorial policy in the region. The framework of the state programs they are implemented involves the following spheres:

<table>
<thead>
<tr>
<th>The State Programs Spheres</th>
<th>Legal Basis of Regional Development Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Finances,</td>
<td>- Regional Development Concept</td>
</tr>
</tbody>
</table>

- Urban Development,
- Housing and Communal Unity,
- Transport and Road Construction
- Agriculture and Land Use
- Education
- Social Insurance
- Healthcare
- Culture and Sport
- Nature and Environmental Protection
- Trade, Public Food and Service
- Concept on Regional Development Plans preparation and methodology
- Regional Development Plans for all 10 Regions /4 year/
- Municipal Development 4 year Plans (co-financed from state budget)
- The Community consolidation concept

Local/municipal level: Local self-government is the Constitutionally guaranteed right and capacity of local self-government bodies acting at their own responsibility and as provided by the legislation, to manage the community’s property and financial resources, and to resolve the problems of community importance with a view to improving the wellbeing of the population. Local government units exist only at the municipal (community) level in Armenia. From an administrative point of view, each province is divided into communities (Haraynks). Almost all settlements are self-governing (few communities consist of more than one settlement). There are 915 such local authorities, of which 866 are rural and 49 are urban communities. The average population per community is 2,350 disregarding Yerevan, by far the biggest city in the country (if Yerevan is taken into account, the average is 3,600).

Almost half of the local communities (48.2%) have less than 1,000 inhabitants. Only 8.5% of communities have a population in excess of 5,000. It can, therefore, be said that Armenia has a fragmented, small-municipality system of local government. The Law on Local self-governments determines the basic organizational structure of the communities. The municipal representative body is the “Council of Aldermen”, which is elected directly for a four-year mandate. This representative body has 5 to 21 members depending on the size of the local electors. The only exception is the Yerevan City Council consisting of 65 members. ("Armenia - UNDAF 2016-2020 - ENG.pdf," n.d.), ("Legislation: National Assembly of RA," n.d.), (MERMAGEN and United Kingdom (L, ILDG), 2014)

The framework of the state programs the local self-government duties involves following spheres:

- Infrastructure development and maintenance
- Road network
- Land use regulation
- Pre-school education and culture
- Green-planting and well-planning,
- Maintenance of cemeteries
- Solid waste management
- Maintenance of residential houses and non-residential areas
- Water supply and removal, irrigation
The size correlation of the administrative level authorities and the population distributing in local level communities is not balanced and in many urban and rural areas it is mostly overlapped. Moreover, according to the USAID reports the professionalism, competence, and management skills and capacity of municipal servants in local self-government system are still insufficient to meet the needs of effective municipal governance. There is a shortage of professionals with relevant professional education, qualification, experience, and skills. 1,064 or about 15.2 %t of the 6,958 municipal service positions have become vacant, due to the incompatibility of the labor force with the criteria set forth in their job descriptions. This issue puts a constraint on the background of the development and strengthening of the innovation systems management in the regions.

State organization in urban planning and economic development see Annex B

2.2.4. Territorial Administration Reforms

In 2013, the Ministry of Territorial Administration initiated changes and amendments in the law on local self-governments aimed to increase the transparency and publicity of local self-government bodies’ activities. The initial situation of the communities was with few population, limited financial resources, and weak capacity. After the implementation of the reforms, the expected impact should be the natural development of local self-government, effective and targeted usage of budget, and community institutional consolidation. The vision of the reform is “developed and competitive community” and the government saw as a solution of this through community consolidation and formation of intercommunity units. Community enlargement process was implemented through pilot projects in three regions/marzes in Syunik, Tavush, and Vayots Dzor with the cooperation of local and international (GIZ) expert group. Consolidation (amalgamation, merger) of communities as administrative authorities included one administrative and territorial unit (multiset element community), joint local government authorities (Community Mayor, Community Council), integrated staff, integrated property and consolidated budget. The methodology of the reform was chosen community consolidation models. The scope of local self-governments functions (decentralization level) depends on skills and capacities of the communities. Consolidation “Cluster” and “Regional” models were chosen for the implementation of the reform. “Cluster”-increasing the number and extending the geography of services delivered; carrying out all (basic) mandatory functions currently stipulated by the law. “Regional”-embracing “cluster” consolidation in full, including one or several clusters; enabling to delegate new functions to communities and implement decentralization on a larger scale. Selection of consolidation programs based on the single brand (Tatev), around the urban community (Dilijan, Jermuk, Meghri), common business interest (Zaritap, Gorayk), on geography and relief characteristics as well as with the inclusion of as many provinces as possible with the consent of the Governors.

However the reform program met oppositionists among the economic experts of the country. Some challenges and risks should be addressed before implementing the reform program like distanced authority and limited accessibility, difficulties as regards the designation of the community center, dominant position of the central settlement and lack of attention to the small settlements, based approach of the community mayors to the consolidation process, necessity to build confidence, trust, and favorable opinion among community residents.
2.3. Economic context

According to the government resolutions in 2006 Ministry of Economy was recognized as authorized body responsible for development and implementation of innovation policy in Armenia, in cooperation and coordination with other concerned ministries and organizations.

Armenia is a lower middle-income country, achieving this status in the mid-2000s through a favorable macroeconomic environment and economic reforms. After the collapse of the Soviet Union, early in the 1990 Armenia suffered from an economic, experiencing possibly by the largest GDP decline reported in the region (-40% in 1992). The prove of this was the dividend for the implementation of the reform and liberalization policies, that gave results to control over inflation and fiscal outcomes. Between 2001 and 2008, efficient fiscal management helped to restrain the fiscal deficit to 2.5% of GDP. Public debt shrank from 46% of GDP in 2001 to 16% in 2008, while the debt nearly doubled reaching US$1.9 billion by 2008. The table 2-4 shows the main economic indicators.

Table 2—4 Armenia - Main Economic Indicators

<table>
<thead>
<tr>
<th>GDP (nominal)</th>
<th>USD 9.371 billion (2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth</td>
<td>2.1% (2010), 5.3% (2011)</td>
</tr>
<tr>
<td>GDP structure (2010)</td>
<td>Agriculture: 18.9% (22%) (USD 2.1 billion)</td>
</tr>
<tr>
<td></td>
<td>Industry: 48.4%</td>
</tr>
<tr>
<td></td>
<td>Services: 32.7%</td>
</tr>
<tr>
<td>Labour force</td>
<td>2.252 million</td>
</tr>
<tr>
<td>Labour force by sector</td>
<td>Agriculture: 46.2%</td>
</tr>
<tr>
<td></td>
<td>Industry: 15.6%</td>
</tr>
<tr>
<td></td>
<td>Services: 38.2%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>6.4% (2011), 7.0% (2010)</td>
</tr>
<tr>
<td>Poverty rate</td>
<td>26.4% (2006)</td>
</tr>
<tr>
<td></td>
<td>35% (2011)</td>
</tr>
<tr>
<td>Agro-products</td>
<td>Fruit (especially grapes), vegetables, tobacco, livestock production</td>
</tr>
<tr>
<td>Agriculture sector</td>
<td>16.1% (2011)</td>
</tr>
<tr>
<td>growth</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>Diamonds, metal-cutting machines, press machines, electric motors, tires, cement, fabrics, hosiery, shoes, silk, cloth, chemicals, instruments, microelectronics, precious jewelry, computer software, food, brandy, wine, canned food</td>
</tr>
<tr>
<td>Industrial sector growth</td>
<td>8% (2010)</td>
</tr>
<tr>
<td>Inflation (annual average)</td>
<td>4.1% (2011)</td>
</tr>
<tr>
<td>Average</td>
<td>8.2% (2010)</td>
</tr>
<tr>
<td>Nominal Wage (AMD)</td>
<td>Monthly 102652</td>
</tr>
</tbody>
</table>

Source: Costs and Benefits of Labour: Yerevan, 2012

According to the World Bank reports the sustained economic growth was esteemed in the decade preceding the crisis, creating a proper land for Armenia to move into the category of middle-income countries. Economic growth led to higher real wages and stabilized the level of employment. Combined with growing
private remittances, these factors resulted in a significant lowering of the poverty rate. Drawing parallels with the good performance of GDP during the long stretch of sustained growth, can be highlighted structural problems in Armenia, particularly in regard to the structure of the economy and employment possibilities, leading, among other things, to high migration rate. (The World Bank, 2011)

2.3.1. Labour Market Trends and Characteristics

An assessment was prepared, based upon the UNFPA according which Armenia is an aging nation: the country’s demography is changing in its age structure. In the long term context, the working-age population (aged 15-64) has tendency to decrease to 57% in 2100 from the current level of 68-69%. This is a crucial demographic shift with influential implications for the labor force. The share of the working-age population is assumed at 65.3% in 2020. The rapid aging of Armenia’s population is mainly driven by the migration of its middle-aged segment. Along with other aging nations, Armenia records a consistent trend of a decreasing net reproduction rate and increasing life expectancy (The World Bank, 2011).

2.3.2. Indicators of labor market activity

According to National Statistical Service of Armenia (NSS) measurement the country’s total labor resources is 2.25 million out of 3.26 million de jure population of Armenia. The Graph 2-3 illustrates the economically active population estimating around 60% or 1.19 million of the total population.

Graph 2—1/Labour Market Composition (x 1,000)

Legend: □ Total population, □Labour resources, Economically non-active population ■ Economically active population (Labour force), □Employed, □Unemployed


The gender and age distribution of economic activity of Armenia’s labor force are presented in table 2-3 below. The highest rates of economic activity and employment of both men and women are observed in the age groups of 35–44 and 45–54. However, (registered) unemployment seems to be a much bigger problem for
women than men (in all age groups the unemployment rate of women is 1.4–1.9 times higher). The unemployment rate is especially high among young women. More than 60% of women aged 16–24 fail to find a job in Armenia and in the two following cohorts (25-44) the unemployment rate still around 40%. (Makaryan and Galtyan, 2013).

Table 2—Economic activity by sex and age (as a percentage of cohort)

<table>
<thead>
<tr>
<th>Age</th>
<th>Economically active</th>
<th>Employed</th>
<th>Unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>16–24</td>
<td>36.1</td>
<td>27.8</td>
<td>31.6</td>
</tr>
<tr>
<td>25–34</td>
<td>87.1</td>
<td>53.6</td>
<td>69.2</td>
</tr>
<tr>
<td>35–44</td>
<td>91.5</td>
<td>68.5</td>
<td>78.8</td>
</tr>
<tr>
<td>45–54</td>
<td>90.1</td>
<td>67.4</td>
<td>77.2</td>
</tr>
<tr>
<td>55–64</td>
<td>76.8</td>
<td>55.4</td>
<td>64.9</td>
</tr>
<tr>
<td>65–70</td>
<td>27.1</td>
<td>10.3</td>
<td>17.6</td>
</tr>
<tr>
<td>Total</td>
<td>72.2</td>
<td>51.0</td>
<td>60.5</td>
</tr>
</tbody>
</table>


6% of natural or structural unemployment is a feasible target for Armenia.

2.3.3. Unemployment rate

Based on the household survey data, the actual unemployment rate is estimated at around 17% in Armenia. This indicator, together with net migration potential, is the principal factor for simulation in the TSE model. The target unemployment rate is assumed at 6% of the labor force, which is considered unavoidable for any economy and corresponds to the level of structural unemployment in an economy.

Registered productivity growth in Armenia has no straightforward explanations.

2.3.4. Labor productivity

It is internationally accepted that sustainable economic growth can be founded on technological development and continuous increase in the knowledge base. Research has to be linked with effective technological development and innovation measures. Armenia has shown strong growth rates in productivity since 1993 (See Graph 2-2). The vertical scale of the Graph 2-2 shows Labor Productivity per year. In the 2000-2006 period only, the average productivity level in the economy increased by 15% annually. Such aggressive performance can be explained by three main factors:
- Real growth in productivity due to the steady upgrade of technologies, management style, and skills.
- The booming construction sector recorded a significant marginal increase in the level of output but did not contribute to proportionate growth in employment. This resulted in growing productivity in the sector, which also increased the country’s average level of productivity.
- The contraction of the non-formal portion of the economy. The informal economy in Armenia mostly refers to unrecorded activities and lowered recorded sales levels. Hiding the number of contracted employees is a less widespread practice in Armenia (many companies register their employees but do not officially record full salaries). (Manuk Hergnyan et al., 2014).

Graph 2—2) Labor Productivity Dynamics in Armenia, in Billions (AMD), constant prices

A benchmark analysis was applied to determine the potential level of labor productivity growth in Armenia. The pool of benchmark countries was determined based on prosperity levels comparable to Armenia. The target of strong growth in productivity is the convergence and shrinking gap of Armenia’s productivity from selected countries. The forecasted dynamics of labor productivity in Armenia is presented below as a benchmark to forecasted productivity levels in Russia and the United States (US) (see graph 2-3). The US is viewed as a global benchmark, whereas the convergence with Russia is essential for Armenia as its main export market where Armenian producers compete.

Graph 2—3) Current Stance and Forecasts of Productivity in Armenia, Russia, and the US

The summarized trends of increasing productivity and employment are the result of structural changes. Creating the jobs in new areas lunch accumulation of productivity. The structural conversion reflect the migration of labor skills from low-skill to highly productive higher-skilled sectors, and from rural to urban-based industries.
The change from agriculture to low-skill manufacturing and services at the initial stage of productivity growth is typical for Armenian economy.

2.4. Education context

Armenia has more than 1500-year-old history of education of literacy. Since the very beginning, the education has been the basis of the nation’s political and cultural survival and the incentive for national progress. Within the framework of Scientific Institutions Armenia records tremendous achievements in engineering and machine-tool industries, chemical and light industries, electronics and radio electronics, biotechnology, astrophysics, and power engineering and nuclear energy.

Education system in Armenia is currently facing the pressure of reforms as well as crucial opportunities for development. In 2009–10 the duration of secondary(*) education was extended to the 11 year from the previous the 10 year, and in 2010–11 to 12 year. In spite of this fact, the economic activity of young people aged 20–24 remains very low, and the unemployment rate for this age group has increased from 36.2% to 37.5% and for the 20–29-year-olds from 35.9% in 2009 to 36.1% in 2010.

Armenia joined the Bologna Process in 2005 in Bergen. Since then, the main focus of the Government of Armenia, the Ministry of Education and Science, and the Higher Education Institutions are introduction of a two-cycle degree system, a credit transfer and accumulation system, and a Diploma Supplement system, strengthening of Doctoral Programmes as a bridge between higher education and research area, and creation of a recognition body and national quality assurance agency. The competencies of the Government of the RA include:

- ensuring the implementation of state educational policy;
- establishing national educational standards and procedures for their formation;
- establishing the list of specialties;
- establishing public order for general secondary and higher vocational education;
- approving model statutes of public schools;
- establishing the form of documents confirming the completion of education;
- exercising other statutory powers

In provinces/marzpetarans the governmental level administration of education is implemented by representatives of education departments. The assignment of authorities of local education departments is agreed with the Ministry of Education. Within the framework of their responsibilities are included:

- ensure the enforcement of state education policy in Marz or community;
- keep register for the pre-school and the school age children and ensure their enrollment in the education institutions;
- Implement educational programs in accordance with state educational standards; and
- are responsible for the construction of educational institutions’ buildings and facilities, their utilization, and maintenance (Marz education departments).(Education and Culture GD, 2014)

(*) After the 9 year of obligatory school.
Although the main objectives of the law did not mention innovation as a priority in education sector, the basic principles of state policy refer to supporting entrepreneurs, innovation promotion activities, and the protection of intellectual property rights. This can be seen as a constraints which should be turn into opportunity to promote innovation system strengthening in metropolitan region and in country as well.

**2.4.1. Structure of current education system**

Due to the Constitution of the RA, the primary and basic secondary education is compulsory and free of charge. According to the Law on Education Armenia's public educational system is based on the following schooling programmes

- **general education:**
  - pre-primary (age 2 to 5);
  - primary (grades 1 to 4, age 6 to 9);
  - basic secondary (grades 5 to 9, age 10 to 14); and,
  - senior secondary (grades 10 to 12, age 15 to 17);
  - special general education;

- **extracurricular education;**

- **vocational education** (1-3 years of study at as preliminary and middle/secondary levels professional education);

- **higher professional education;**
  - bachelor level (4-year undergraduate degree);
  - certified specialist;
  - magistracy (2-year Master's degree);

- **post-graduate vocational/professional education:**
  - aspirantura (candidate of science);
  - doctorantura (doctor of science): and,

- **Supplementary education** (Education and Culture GD, 2014).

For a graphic presentation please see Annex A

**2.4.2. Pre-higher education**

**Preschool education:** The main goal of preschool education is to establish the basis for the child's physical, moral and mental development; development of communication skills in mother language and develop basic behavioral skills. The state establishes the following types of preschool institutions: day care (for children from 2 to 3); kindergartens (for children from 3 to 5); or the combination of the above two.

Preschool education is exercised by the local self-government entities.

**1 level is the elementary school (Primary school):** the basic objective of this level is to provide pupils with literacy. The length of the program is 4 years, age of entry is 6 and exit age is 9.
**2 level is the basic school (basic secondary school)** As defined by the Armenia legislation, the aim of general education is to create favorable conditions for the manifestation of the citizens' intellectual, spiritual and physical abilities, their education and development (Art. 18 of the Law on Education). The length of the program is 5 years, age of entry is 10 and exit age is 14. Students hold 9 grade, obtain the certificate of 9-year education and they are allowed to enhance their education both in the high school and in specialized secondary and technical secondary educational institutions.

**3 level is the High school (senior school)** the length of the program is 3 years, age of entry is 16 and exit age is 18. The objective of the high school is to provide complete secondary education, which is realized in the following forms:

- General education study;
- Colleges (deepened study of some subjects);

Students who graduate from the high school are awarded the certificate of complete secondary education, which is called Attestat/Certificate and can continue their study in the higher educational institutions ("EDUCATION SYSTEM IN ARMENIA," n.d.).

**2.4.3. University level studies**

The goal of higher professional education is to provide high-quality professional education and re-qualification based on secondary general and intermediate professional education in regards to educational development needs. Institutions of higher education comprise universities and institutes. University level education includes Bachelor's Degree, Master's Degree, and Postgraduate Education.

**1 stage of university level is Bachelor's Degree, Specialist Diploma:** The Bachelor's Degree is granted to those having completed secondary education and four years' higher education. The Specialist Diploma is conferred on those having completed secondary education and followed five years of higher education.

**2 stage of university level is Master's Degree:** The Master's Degree is awarded to the students who hold a Bachelor's Degree or a Specialist's Diploma and have completed two further years of higher education.

**3 stage of the university level third stage is Postgraduate Education:** A Researcher's Degree or Doctor's Degree (Ph.D.) is granted to the students who conducted a Master's Degree or a Specialist's Diploma upon completion and attestation of three years' postgraduate studies. A Clinical Ordinate and Pharmaceutics Degree are granted to those having studied Medicine and completed at least one year's postgraduate study. ("EDUCATION SYSTEM IN ARMENIA," n.d.)

The international reports state that 21.3% of the population had completed a higher and post-graduate education, while almost the same percentage (21.8%) had a vocational (secondary specialized (professional)) education. The number of students are enrolled in universities overcome 100,000. The majority of graduates and job seekers are economists, but despite their large number, there are not enough competitive candidates in the market. Table 2-4 illustrate distribution of the population according to the different grades of education ("Education in Armenia Country Profile," n.d.).
Traditionally Armenian science was oriented towards natural science, primarily physics and chemistry. This continues, although the share of funding going to natural and technological sciences declined from 89% to 82% over 2003-2011, largely accounted for by a corresponding increase in funding to the humanities from 4% to 21% (Figure 2-4). This fact can be a proper land for the strengthening of innovation system in the country, as internationally known that innovation promotion in 21st century based on the natural science, namely on the information technologies development.

**Figure 2—4** | Funding structure by scientific discipline, 2003-2011 (percent)

Source National Statistical Office of Armenia

Source 1: UNESCO EFA Global Monitoring Report 2008; Innocent Research Centre

<table>
<thead>
<tr>
<th>Table 2—3</th>
<th>Quick Facts about Education in Armenia and the Caucasus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source 1: UNESCO EFA Global Monitoring Report 2008; Innocent Research Centre</td>
<td></td>
</tr>
<tr>
<td>Traditionally Armenian science was oriented towards natural science, primarily physics and chemistry. This continues, although the share of funding going to natural and technological sciences declined from 89% to 82% over 2003-2011, largely accounted for by a corresponding increase in funding to the humanities from 4% to 21% (Figure 2-4). This fact can be a proper land for the strengthening of innovation system in the country, as internationally known that innovation promotion in 21st century based on the natural science, namely on the information technologies development.</td>
<td></td>
</tr>
<tr>
<td><strong>Source National Statistical Office of Armenia</strong></td>
<td></td>
</tr>
</tbody>
</table>
Compared to other CIS countries, Armenia has performed relatively well in terms of research output as measured by the number of international publications, which increased by 70% between 1991-95 and 2007-11. This compares to increases of 28% in Azerbaijan and 2% in Russia, and declines of 1% and 13% in Ukraine and Belarus, respectively. However, the science systems of CIS countries have remained relatively static, with only limited international integration (Europa, 2014)

2.4.2. Mismatch of the labor force and job market

Despite the positive correlation between the employment rate and the level of education, there is a mismatch between the supply and demand of the labour force. The graduates fail to find a proper job in their specialization. As the professional qualifications of graduates do not match with the requirements of the internal and external labour market. This topic was discussed in the economic context as well, and it is actual in education sphere as well. The education system doesn't respond the labour market demands regionally or globally, meaning that both regional and global labour market opportunities will not be fully tapped by Armenians.

On the other hand according to the indicator from the Global Competitiveness Report the proxy for (mis-)matches in supply and demand for R&D and innovation (Tables 2-5 and 2-6). The quality of the Armenian educational system is, however, a key strength. In Armenia, the business sector requires further development and an adequately restructured R&D sector. This is reflected by particular weakness in company spending on R&D among the demand side factors, as well as weaknesses in staff training and buyer sophistication.

We tend to analyze the country in a regional context in terms to better understand the case study weakness and recognize the opportunities and potential strengths for the innovation systems development and adaptation. Demand in Armenia, Azerbaijan, and Georgia is on average higher than supply and hence, these economies are experiencing “supply deficit” in terms of R&D, and their enterprises would benefit from enhanced R&D and innovation support. Russia and Ukraine seem to have R&D on offer that is more aligned to the immediate needs of their business sectors. On the R&D supply side, the capacity to retain talent is a challenge for all countries.

Table 2—4| Supply side factors of R&D

<table>
<thead>
<tr>
<th></th>
<th>Quality of maths and science education</th>
<th>Quality of educational system</th>
<th>Availability of scientists and engineers</th>
<th>Availability of research and training services</th>
<th>Quality of scientific research institutions</th>
<th>Capacity to retain talent</th>
<th>Average supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>4.2</td>
<td>3.7</td>
<td>4.0</td>
<td>3.5</td>
<td>3.1</td>
<td>2.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>3.3</td>
<td>3.1</td>
<td>4.4</td>
<td>4.2</td>
<td>3.6</td>
<td>3.5</td>
<td>3.7</td>
</tr>
<tr>
<td>Georgia</td>
<td>3.4</td>
<td>3.2</td>
<td>3.2</td>
<td>3.3</td>
<td>2.8</td>
<td>3.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Russia</td>
<td>4.3</td>
<td>3.5</td>
<td>3.8</td>
<td>4.1</td>
<td>3.7</td>
<td>2.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Ukraine</td>
<td>4.8</td>
<td>3.6</td>
<td>4.5</td>
<td>3.9</td>
<td>3.6</td>
<td>2.0</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Armenian higher education is in need of modernization, so as to become a driver of growth. Some large foreign investors in ICT are cooperating with universities to overcome skills deficiencies, and should be taken as examples of good practice to be shared. Cooperation with research institutes should be expanded, including joint MSc and PhD degrees.

2.5. National Innovation System regulation in Armenia

The government approved the concept on innovation activity in the RA aims to formulate general approaches and principles of the state policy which are directed at the consistent creation and development of NIS together with its basic elements and infrastructure, capable of ensuring sustainable development of the country and increasing its competitiveness as well as creating a favorable innovation environment for international economic cooperation. On 14 April 2011 the law on the National Academy of Sciences of Armenia (NAS RA, n.d.) was adopted by the parliament, which assigned a status of highest self-governing state organization with special status to the Academy empowered to coordinate and carry out basic and applied research directed to the creation of a knowledge-based economy, and social and cultural development of the country. This Law gave more power to the Academy and its research institutes in carrying out business activities towards the commercialization of R&D outcomes and the creation of spin-offs. The Ministry of Education and Science (MES) is the state body authorized to develop and coordinate S&T policy-making and the Ministry of Trade and Economic Development is responsible for the development and implementation of innovation policy, in cooperation and coordination with other concerned ministries and organizations. The committee is also responsible for the development and implementation of research programmes in the country through three main financing mechanisms: thematic (project-based) financing, basic financing and special purpose projects (NAS RA, n.d.).

Table 2—5 | Demand side factors of R&D

<table>
<thead>
<tr>
<th>Country</th>
<th>Degree of customer orientation</th>
<th>Firm-level technology absorption</th>
<th>Extent of staff training</th>
<th>Buyer sophistication</th>
<th>FDI and technology transfer</th>
<th>Company spending on R&amp;D</th>
<th>Average demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>4.6</td>
<td>4.4</td>
<td>3.6</td>
<td>3.5</td>
<td>4.9</td>
<td>2.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>4.7</td>
<td>4.9</td>
<td>3.9</td>
<td>4.1</td>
<td>4.7</td>
<td>3.3</td>
<td>4.3</td>
</tr>
<tr>
<td>Georgia</td>
<td>3.8</td>
<td>4.1</td>
<td>3.6</td>
<td>3.2</td>
<td>4.1</td>
<td>2.5</td>
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<tr>
<td>Russia</td>
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<tr>
<td>Ukraine</td>
<td>4.5</td>
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<td>3.7</td>
</tr>
</tbody>
</table>

3 Chapter: State of the Art

In fact, innovation has now become a hot topic for discussion in international associations, EU as well as private and public sectors all over the world. Within the scope of this chapter I am seeking to (i) understand the context of innovation and creativity, (ii) Identify different types of innovation and creativity highlight those once that are related to the spatial planning and benchmarking of the M metropolitan regions (iii) Focus on the innovation system instruments via adjusting the strengths and assets of the metropolitan regions to overcome the gaps and weaknesses, analysis them from the perspective of three main aspects economic background, institutional framework, and urban development.

3.1. Innovation and creativity context

“We can’t solve problems by using the same kind of thinking we used when we created them.”

Albert Einstein

Today’s world is characterized by rapid and nonlinear change (Technology and reserved, n.d.). Globalization of commercial networks and infrastructures is turning emerging economies. People everywhere are given permission, and their needs are changing rapidly as they live longer in the developed world and live better in the developing world. Such changes affect new industries and old, high-tech and low-tech, manufacturing and services. As a result, rapidly changing strategies become more and more crucial for the executives; the underlying assumptions are no longer valid, and rivals have steadily copied away any competitive advantage. When change is nonlinear it is subject to unanticipated, sudden accelerations. It’s difficult to adapt to such change without a fundamental change in strategy. Here innovation take the responsibility of catalyst in the rapidly changing environment.

In this section of the research work the context of the innovation and creativity are observed. The questions like “what is an innovation?” and “what is a creativity?” are responded via referencing to the latest bibliographic articles and to the outstanding authors.

What is an innovation? Having background also of humanitarian sciences firstly I check the definition of innovation in the dictionaries. According to Merriam-Webster the definition of innovation is:

“Innovation is a new idea, more effective device or process” (“Definition of INNOVATION,” n.d.)

According to Maranville innovation can be referred to better solutions that meet new requirements and unarticulated needs, as well as existing market needs. This is illustrated through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments, and society. Frankelius defined innovation as something original and more effective and, as a consequence, new, that "breaks into" the market or society. (Frankelius, 2009), (Maranville, 1992)

Melissa Shilling from New York University defines innovation in a very clear way that will help better understand what innovation is. According to her innovation is the act of introducing a new device, method or material for application to commercial or practical objectives. (Schilling, 2012)

While analyzing this definition first of all it became obvious that innovation is the activity of bringing something new into the world. This is an important element and can be illustrated in three forms. Firstly, it can be the device. For example, a new smartphone or a new motorbike, like tangible products. Secondly, innovation
can concern a new method, for example, a new way of assembling cars or a new way of growing crops and such innovation can concern a new business process. A new method can also concern a new way of making money, which is often referred to as a new business model. These three examples of new methods concern a change in how something is being done. Thirdly, innovation can also concern a new material, for example, a new type of glue, metal or plastic. In this definition, the important element is that this new device, method or material should also be applicable to personal or practical objectives. Meaning, an innovation needs to be serving either an internal need of an institution or it should be sold in the markets. Summarizing the definition of innovation concept can be concluded that it should be useful and bring benefits to humanity.

What is creativity? Creativity is a summarized function of knowledge, curiosity, imagination, and evaluation. The higher is knowledge base and level of curiosity comparably the more ideas and combinations you can achieve. In fact, the correlates to creating new and innovative products and services become more realistic if we understand three important levels of creativity, which are discovery, invention, and creation.

Discovery: The lower level of creativity is discovery. Just as the name implies, it’s when you become aware of or stumble upon something—discover it.

Invention: A higher level of creativity is invention. Invention is higher than discovery, it’s something that is going to happen. If you don’t invent it, someone else will.

Creation: Creation is the highest level of creativity. There are things that only a specific organization can create! The key is tapping into what those things are.

Everyone is a creative creature in their nature, however let’s go deeper and understand what make people creative. Here I would like to make quick journey over the history and look at the creative geniuses like Leonardo Da Vinci, the well-known artist and scientist from the 15th century. He made beautiful paintings, but also nice blueprints for various kinds of innovations such as airplanes, way before they were ever built. He is seen as the greatest minds that ever lived. Another one is Salvador Dali, the well-known artist who not only painted beautiful surrealistic paintings but was also known throughout the world as a sculpture and jewelry maker. Now what do these people have in common? What makes these creative geniuses so creative? Some people argue that the creative geniuses are slightly mad, that it's the madness that's necessary to make them creative. I don't think so. Let's look at what makes people creative. Already in the 80's, Harvard scientist Teresa Amabile created a model that specifies the factors that are important for people to become creative. She specified three factors (See Figure 5).
The first one is expertise, technical, procedural and intellectual knowledge about the domain that one is working in. The second is motivation, the willingness to conduct a task that one is doing. And finally, the third factor is creative thinking skills, how effectively and imaginatively people can approach problems. Now let's look a bit more at these three elements.

**Expertise.** There is a confusion that when people used to work in the same field for long period they lose the ability to think out of boxes and be creative. Maybe there is a kind of true in this hypothesis, but in all honesty, what is much more of a problem is not having enough knowledge. Why lack of knowledge is a problem? For instance, if you do not have enough knowledge about a certain area, you don't know what has been done before, so you might be working on something that's not novel. Also with too little expertise, you have no knowledge of where the boundaries in this area are. So you might be working on something spectacular and you wouldn't even recognize it, and quit with it because you lack to see the value of your idea. You're working on a type of solution that simply doesn't work and you may not know what's useful and come up with ideas that are simply irrelevant. The situation is very similar in working on the research dissertation, unless we have enough knowledge and expertise to speak for these four elements, it is very hard to be creative.

**Motivation.** It's common to distinguish two kinds of motivation. **Extrinsic motivation** is about doing a certain task simply because you love doing it without getting anything out of it, other than joy and satisfaction. The other one is intrinsic motivation that expects really some benefits. **Intrinsic motivation** makes you have more willingness to work hard and continuously think about the problem, and all of these issues make intrinsic motivation such a critical element of creativity. So if you want to be creative, it certainly helps when you are intrinsically motivated.

**Creative thinking skills.** It's all about how flexibly and imaginatively you can approach problems. This is not so easy because many people go through their lives like robots, as though things are already scripted for them, and this makes sense since it is very efficient. Being creative might be very difficult if you act like a robot. If you use automatic scripts and schemas that are in your head, you stop thinking too soon before you get the optimal solution. Drawing parallel with the creative thinking and being creative, it's better to think like a child, to think
like someone who hasn't learned all these assumptions, who hasn't learned all these automatic scripts and schemas, a person who sees a box and thinks this is not just a box. It's a castle. It's a boat. That way of thinking, outside the boundaries and borders, is really what's necessary to create and be creative. (Runco and Pritzker, 1999)

Getting to summarize what makes people creative! Is it madness? Maybe for some, but it’s not mandatory to be mad to be capable to create. Three elements that are important to take into account. Having enough knowledge, being intrinsically motivated and creative thinking skills, these three elements are all crucial to be creative.

There are various tools to enhance creativity with the aim to provide a very structured procedure to tackle problems and aim to look at new opportunities. In this section I tend to discuss the left-right brain alternation. This tool is about the idea that different parts brain have different functions. The right side of the brain is very good at artistic, creative and emotional tasks. The left part of the brain is really good at math, analytics, analogical thinking. It is important to keep alternating between the left and right part of the brain, and this is supposed to have three effects. First of all, it overcomes the bias of the dominant brain half. People who have a dominant left brain are very analytic. And for others the right half is dominant are generally very emotional and artistic. When doing tasks we tend to use our dominant brain half, and alternating between brains overcomes this bias. Second combine ideas that on the one hand come from thinking about the emotions of the citizens of the region, and on the other hand come from the analytic part like engineers and planners. In this case both the citizens are oriented and a solid plan of institutional settlements are achieved. And third, when we supposedly create linkages between the two parts of the brain, this creates synergy and makes us more creative. All in all, left-right brain alteration structures allow to think analytically or emotionally, moreover enables to see the bigger picture a little bit better that is fundamental for urban planners.

3.1.1. Types of Innovation

It is important to identify types of innovations as they are realizing in different ways. Henderson and Clark noticed that the Incremental – Radical dichotomy alone was not enough to explain what company would be in a better position to innovate and under what circumstances. They started wondering, for instance, why some incumbents would fail to catch something as straight-forward as some incremental innovations, just like Xerox failed to develop a small plain-paper copier even when it was the leader in xerography technology. The investigation led them to divide the technological knowledge required to develop new products, and consequently to introduce innovations, along two new dimensions: knowledge of the components and knowledge of the linkage between them, called architectural knowledge. (“Henderson – Clark Model,” n.d.), (Lytras et al., 2008).
Hereby are discussed product innovations, service innovations, and process innovations. Moreover, distinction between incremental and radical innovations as well as difference between architectural and modular innovations addressed in this section.

**Product innovation** refers to the innovation of physical tangible products. In contrast to such kind of physical products, services are generally not tangible. Take for example a pizzeria that starts to deliver pizzas at the customer's doorstep. This delivery of the product, so not only the pizzas themselves, but the bringing of pizza to someone's house is a new service for the organization. Product innovations and service innovations have in common that they concern the output of organizations, output in terms of what they deliver to the outside world.

**Process innovations** concern innovation in how an institution manages its activities. It related to changes regarding the product or the service production process. It is mandatory to impact on the final product but produces benefits in the production process, normally increasing the productivity and reducing costs. For example, automobile produced by robots compared to that produced by human workers. Another example of a process innovation is the assembly line of Ford, the US car manufacturer. Ford was the first to introduce the assembly line to put together their cars. Ford built an assembly line, and instead of having a car standing on the same location all the time, the cars moved through the factory, where each additional component was added to the car by people who specialized in that specific task. (Davis, 2012)

**Service innovations** concern a new or significantly improved service concept that is taken into practice. It can be for example a new customer interaction channel, a distribution system or a technological concept or a combination of them. A service innovation always includes replicable elements that can be identified and systematically reproduced in other cases or environments. The replicable element can be the service outcome or the service process. A service innovation is a service product or service process that is based on some technology or systematic method. For instance new distribution methods, novel application of technology in the service
process, new forms of operation with the supply chain or new ways to organize and manage services. (“Service innovation,” 2016)

Above discussed product, service, and processing innovations can be incremental or radical. Incremental innovations are different from solutions that already exist. Radical innovations are new and very different from solutions.

**Incremental innovation** does not related to huge widespread changes. On the contrary, firms that innovate incrementally tend to do so just a little bit at a time. Incremental innovation can be seen as cost-cutting or feature improvements in existing products or services (Leifer, 2000). An example of incremental innovation is Google’s release of Gmail. When Gmail launched it had a limited feature set, however a unique advantage, delivered emails had. Unlike competitors it was clean and easy to use with no distracting flash ads and numerous interface improvements. Over the time Google released more features and made the service faster, better, and easier to use. Later on Gmail was taken out of “beta” and finally listed as being “complete,” though to this day improvements continue to happen. The company has used this exact same policy multiple times with their new products, from their Maps service to the browser Chrome. The reason incremental innovation is so popular is because it has reduced risk in comparison to radical innovation.

**Radical innovation** known also as disruptive is an innovation that has a significant impact on a market and on the economic activity of firms in that market. This concept addresses the impact of innovations as opposed to their novelty. The innovation could, for example, change the structure of the market, create new markets or render existing products obsolete. In other words radical innovations create major disruptive changes, meanwhile incremental innovations continuously advance the process of change (The OECD Innovation Strategy, 2010).

The third and last distinction is the one between modular and architectural innovation. Modular and architectural innovations mostly applicable in the complex technical system Modular innovation concerns changing a component without changing how a system is configured. And architectural innovation refers to a change in the configuration of the entire system and how its components interact.

**Modular innovation** may result in the complete redesign of core components, while leaving linkages between the components unchanged. For example, the first bikes either had no pedals or have pedals attached directly to the axle of the front wheel. Over the evolution of its history that historic bike to a modern one the pedals interact with other parts of the bike in a different manner. Modular innovation refers just to a single part of the bicycle change, but not the way it interacts with the rest of the bike. These kind of changes could be the seat, or the light, or the handlebar and change nothing else about the bike.

**Architectural innovation** will have a great impact upon the linkage of components, but the knowledge of single components will remain the same. An example of architectural innovation is the hard disk evolution. This industry of hard disk went through several waves of miniaturization, the first mainframe computers were packed with 14-inch diameter disks, after some years the industry came out with 8', 5.25', 3.5' and 1.8' disk drives. Each and every time the size of the hard disk diminished the knowledge of the linkages between components was evolving, while the single components were using pretty much the same technology.
3.1.2. How innovation could be applied in the case study

In terms of product innovations the development of new local economic products like e.g. hiking zones, agro-tourism tours or even fruit processing initiatives has contributed to new learnings on market demands. From the perspective of process innovations the alignment of the local stakeholders towards developing a common objective and common implementation procedures results in a new format of organization and process orientation that is very different to former hierarchical structures. Tourism cluster could fulfill service innovation including a well-functioning and service-focused on the Armenian Tourism Development Agency, the Ministry of Trade and Economic Development, and other government bodies that administer national parks, historical sites, and the national ballet and orchestra.

3.1.3. Types of creativity

According to the Mumford creativity is the production of novel and useful ideas. Creativity is also known as ideation. Innovation is the production of actual ideas in the form of products and services also known as implementation. It is crucial to emphasis on ideation, as every product starts with an idea. (Mumford, 2011).

According to Guilford, ideas can be evaluated in terms of fluency, flexibility, and originality. Fluency refers to the volume of ideas. For example, creative team have a lot of ideas, however, it is important to measure the number of ideas generated per person. Suppose we’re measuring the fluency of a five-person group and a three person group. The 5 person group generates 20 ideas in 10 minutes, and the 3 person group generates 18 ideas. If we divide the total number of ideas by the number of people in the group the five-person group would have a score of four per person ideas, and the group of three of six per person.

Flexibility, refers to how many different kinds of ideas a group has. Suppose our task is to generate as many uses for a paper clip as possible. One group ideas were about holding papers of some kind, they would only get one point for flexibility. Suppose another group says, use the clip to make a necklace. Use the clip to pick a lock. Use the clip to create a suture for a wound. That group would have the same fluency score, three ideas, however their flexibility score would be higher the thoughts are about fashion, engineering, and medicine.

Originality means novelty. Technically, a given idea is deemed to be original if less than 5% of the population, or cohort, generates that idea. Ideas that are statistically rare can be more valuable. (Thompson, 2013).

Summarizing all above mentioned can be concluded that flexibility is the key component. Groups that are high in flexibility are also high in fluency and originality. If you think of a large number of categories, you can then unpack those categories and generate a lot of novel ideas.

According to Finke and Smith, creative output can be evaluated in terms of two dimensions, creative versus traditional. And realistic versus idealistic. I call you attention on these four quadrants. Creative realism. High creativity and high realism.
These are novel ideas that can work. Creative idealism. High creativity and low realism. Novel ideas in an impractical context. Conservative realism. Traditional ideas and high realism. Old, tried, and true ideas. Finally, conservative idealism. Traditional ideas and low realism, old ideas put in an impractical context. And creative realism, ideas that are very original and can work. In new urban development, this would mean novel ideas that can work with existing supply chain, urban infrastructures, manufacturing capacities, and so on. In science, it would mean ideas that are novel and explained all previous research. (Smith et al., 2009)

Summing up: First, creativity starts upstream of innovation. Second, teams that generate a lot of ideas are more likely to have an idea that is original or high in creative realism. Finally, encourage people to suggest ideas that are not traditional or conservative, and politically incorrect. In other words, allow the team to generate a high volume of ideas and set aside judgment.

Creativity can be discussed from the perspective of person, process, product and press of the environment. This method is known as four Ps (4Ps) of creativity. The 4Ps represent the nature of creative Persons, the Processes they use, the Products or outcome of their efforts, and the Press, or environment that supports or hinders creativity. (Gautam, n.d.). These approaches are widely used in psychological study of creativity. Learning and acknowledging plays a crucial role in the innovation and creativity context, the higher is the level of awareness, comparably the higher is the possibility to be more creative and innovative. However, the 4Ps constructs discussion addressed issues in (i) learning for the future, and learning our limitations, (ii) collaboration and creative eccentricity, (iii) where to stand fast and when all is in flux, and (iv) factors in programs that remain receptive to innovation programs which can catch, rather than miss, the passing waves (Runco and Pritzker, 1999)

Having revised overlook of the innovation and creativity as well as the discussions of the different authors could be state that people are the most vital component in innovation. It's human beings who create, innovate and react on these interactions. Machines and computers are not able to describe opportunities, make research, set up goals, generate and evaluate ideas. People matter most. And getting the right people involved
who are passionate about new ideas, thinking out of the boxes and not wedded to the "way we do things" matters a lot.

3.2. Metropolitan regions

A metropolitan area is often defined as a sub-national geographic space consisting of a densely populated urban core and its less-populated surrounding territories, however in general these different territories have certain linkages with each other. metropolitan regions are also often defined as systems of cities that involve a certain hierarchy in their functions and the number of inhabitants. They can be based on a certain regional identity that shares industry, infrastructure and market connections. The figure 3-3 shows the different territories that can often be found in metropolitan areas (The World Bank, 2009). In general it involves a leading primary city, secondary cities surrounding it, and urban towns which are often more closely related to rural areas and, to a certain extent, play an intermediary role between the rural and urban areas. Primary cities are often defined as leading cities in their country or region, and are disproportionately larger than any others in the urban hierarchy. The secondary cities are defined by (Roberts, 2014) as “secondary hubs, spokes and centers in a complex network of production-distribution supply chain and waste management recovery systems connecting different spatial levels of human settlement at both a national, but increasingly global, system of cities.”. In case of Armenia, as well as in many developing countries, the structure centralized in the primary city, which is the capital of the country. On the other hand it is surrounded by smaller secondary cities that are growing steadily and are merging with the capital. In many developing countries the change of an urban to a rural area can also be very sudden. (Shawn Cunningham and Frank Wältring, 2015).

![Image: Representation of a regional economy](source)

In developing countries the use of the term “metropolitan region” or “area” drawing parallel with the growth of capital cities and the social effects provoked by the migration of inhabitants from rural to city areas. At the same time secondary cities gained increasing consideration in the process of urbanization growth because it is expected that they will experience tremendous growth in the upcoming decades and will become strong urban agglomerations and metropolitan regions or systems of cities. metropolitan regions have not yet become integrated planning units in most developing countries. Thus the performance of a metropolitan area
and secondary cities, and their nexus to the more rural surroundings, is to a large extent defined by the “level, quality and global orientation of the connectivity of its supply chains and logistic systems that support the development of the local regional economy…” (Roberts, 2014). Urbanization growth requires more complex and comprehensive regional intervention approaches and the economic development requirements should be matched in the longer run.

3.3. Innovation system management

In today’s competitive world, the ultimate aim of innovation management is to develop the ability of the territory to deliver new value to the society. For instance, the focus of innovation management is to allow the territory to respond to the external or internal opportunities and use its creative efforts to introduce new ideas, processes or products. Innovation management is about how institutions and their representatives act with innovation systems. For example, innovation system management concerns have to formulate an innovation strategy. On the other hand innovation management also concerns the actual execution of innovation programmes and policies, for instance, development of a new output through making decisions such as which members should be on the executive team? And how to deal with unexpected events and other challenges that surround the innovation system. Innovation systems management approach can support spatial planning to foster a regional dynamic that is reflexive and that lays a foundation for future growth and development. Viewing a region from a metropolitan perspective makes sense if there is sufficient governance capacity and the social or economic interest to to overcome an isolated city approach. Strengthening interrelations and creating synergies between the different territories is thus one of the key reasons why metropolitan regions have become reference points for the design of development and innovation strategies.(Cohen, 2010) (Uzama, 2011).

Verspagen and Ter Weel state that “the central idea in modern innovation systems theory is the notion that what appears as innovation at the aggregate level is in fact the result of an interactive process that involves many actors at the micro level, and that next to market forces many of these interactions are governed by nonmarket institutions”. For these two authors management problems mainly accors due to the inefficiency of the process observed at the macro level, depends on the behavior of individual actors and the institutions that govern their interaction. Institutions in this sense describe both societal norms as well as formal and informal organizations. (Weel et al., 2010). From an innovation systems perspective, the emphasis is less on the internal technology management activities of individual firms at the micro level, and more on the dynamics, process and transformation of knowledge and learning within a complex economic system. Cunningham addresses to the differences of innovation systems management summarizing them as follows: (Cunningham, 2012)

- **National innovation systems** – bring to the forefront the central role of the state as coordinating agent of public resources, often with the emphasis on research and development and innovation commercialisation. Their particular attractiveness to policymakers lies in the explicit recognition of the need for complementary policies – this draws attention to weaknesses in the system while highlighting the national setting of most of the institutions in the system.

- **Sectoral innovation systems** – the emphasis of sectoral innovation systems is on a group of firms that develop and manufacture products for a specific sector and that generate and utilize the technologies of that sector. The boundary of the system is drawn around a technological paradigm that is formed by
a knowledge base, specific technologies and inputs, the different actors and networks that are system-
ically interacting, and the institutions supports a specific industry.

- **Local and regional innovation systems** – the focus is on the configuration of regional networks, 
  organizations and institutions, which are in turn mainly focused on a specific geographic space and the 
  specific knowledge spillovers that occur around certain firms, industries or institutions unique to that 
  space.

*Figure 3—4* [Different innovation system perspectives overplayed]

Within a particular region in a country, all three of these innovation systems perspectives could be 
relevant; yet industries, individuals and whole regions might not even be aware of their existence (*Figure 3-4*). 
Firms within a metropolitan region may not even be aware that their behaviour, networks and innovative activi-
ties are shaped by NISs (e.g. the availability of certain technological capability within a country created by 
comparative advantage), sectoral innovation systems (particular knowledge domains relevant for the industry 
network or value chain the firm is a part of) and a local innovation system perspective (e.g. the firm is surrounded 
by several suppliers, some customers and perhaps some important service providers, which makes it possible 
for the firm to operate in a particular place).

### 3.4. Innovation system management in metropolitan regions

Innovation districts are geographic areas where leading-edge companies, research institutions, start-
ups, and business incubators are located in dense proximity. In this section of the research work I focus on the 
following subsystems that are mostly relevant to the research topic: the political system (government), education 
system, culture-based public, economic system and urban planning. In order to make, the categorization more 
accurate 3 main sub-systems will be discussed deeply: Institutional framework, economic background, and 
urban development. The role of these three subsystems is fascinating in the management and development of 
the innovation systems in metropolitan regions. The role of them is tremendous in the establishment of a re-
Regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters and science and research parks, because they act like constraints to the establishment of innovation policies.

3.4.1. Institutional framework

Managing urban growth has become one of the most key challenges of the 21st Century. The context of urban governance has itself experienced a major transformation over the last decade and a half. As in many other countries, in Armenia the governance has been affected by movements towards democratization and political pluralism, an important decentralization and the rise of civil society. Various legal and institutional reforms in many countries have given shape to institutional reforms at the local and municipal levels. Currently, many small cities suffer from the deficiency of necessary institutional capacity to be able to manage their rapidly growing population. The urban growth results fundamental changes in the nature and tasks of urban management and governance (Cohen, 2006). Roberts states that there is a lack of urban, innovation and network management competencies: Future urbanization movements in developing countries will focus on secondary cities and middle-sized towns (Roberts, 2014). Nevertheless, the most of these cities lack innovation and urban management skills as well as the ability to promote the flow of knowledge between people and different knowledge poles. This requires moderation and facilitation competencies, and at the same time the ability to combine more specific market, industry and knowledge aspects.

There is a dominance of top-down vs. bottom-up policies: A coordinated strategic orientation requires and promotion of regional innovation systems at the policy institutional levels. The reality in developing economies is often rather different: economic development promotion is rather defined by a centralized approach and not from a synergetic approach in which top-down and bottom-up perspectives and knowledge creation enrich each other. A gap of responsibilities in a larger number of ministries at the national level and line ministries in the more decentralized territories makes coordination in general even more difficult.

Industries and their supporting institutions are co-dependent on each other, and they could also easily lock each other into very specific development paths. This perspective can be specified also in case of industry development and regional policy. Policies respond to or accelerate the development of certain industry structures, which in turn accelerate or shape the development of specific policies that benefit the regions. This can be both a good thing and a bad thing when change is needed (Shawn Cunningham and Frank Wältring, 2015).

Government has a key role in facilitating research collaboration between industry and the academic sector. The public administration’s role is to establish policies and legislation to encourage innovation and more favorable legislation, helping develop innovation management techniques (IMT) and supporting SMEs in their innovation activities. From the perspective of the public administration three classes of interventions are more common to create a supportive land for the enterprises: externalities, redistribution, and credit constraints. First, entrepreneurship or industrial policy helps internalize externalities, (Chatterji et al., 2013) If they will benefit from taxes paid by a successful firm in the future, then they will be more motivated to aid the firm up-front with public subsidy: tax breaks to million-dollar can compensate for the future taxes that the local government will extract from them.

According to Rauch in case the human capital externalities and industrial policy builds human capital, then this may have beneficial results throughout the region (Rauch, 1991). The redistributive policies are tools...
for fighting against centralized poverty by encouraging nearby business development. The aim of this policy is best seen in the “Empowerment Zones” program and the Appalachian Regional Commission in the United States, the “Enterprise Zones” program in the United Kingdom, and the numerous European policies meant to bolster declining regions. (Busso et al., 2013). A final, popular justification for policies that particularly benefit smaller firms is that there exist credit constraints that somehow create difficulties to fund worthy start-ups (Audretsch et al., 2011) or that certain entrepreneurs are discriminated in these credit markets where government aid can solve this problem (Chatterji et al., n.d.). While it is assuredly true that not every profitable project is funded, it is hard to see exactly how the government has any comparative advantage as a venture capitalist (Lerner, 2002). Nonetheless, the public administration has provided either loan guarantees or direct lending to various entrepreneurs. However this tactic cannot last forever and a long-term sustainable strategy should be developed to provide the settlements with the necessary equivalent conditions and productive environment.

The role of the institutional sector is important in promotion of the lines of NIS. These lines of enquiry should not be seen as being static or as a prediction of what is needed, but should rather be interpreted as providing different perspectives (research angles) on the interaction between different actors within a system. These lines of enquiry are presented in four themes these are based on the Four Pillars of Innovation Systems model developed by Meyer-Stamer and Hildebrand (1994). These four lines of inquiry are shown in figure 3-5. There are two further lines of enquiry that require emphasis in a developing country:

1. Investigation not only on the interaction and dynamics between individual elements in the system, but in the whole system.

2. Exploring poorly articulated needs or unmet demands that are not visibly pursued by the innovation system.
3.4.2. Economic background

From the perspectives of economic and business, innovation can be considered as a catalyst to growth. Innovation lies at the heart of economic development and creativity lies at the heart of innovation. At present it is acknowledged that technological innovation through research and development is a leader and one of the driving forces of the knowledge society. Economic innovation is still associated with high tech, patent production and budgets spent on R&D. Surely innovation can be technology-driven, but it can also be carried out between knowledge and technicians, or between socio-cultural trends and economic development. A neglected factor in attempts to strengthen the (inter)national economic and knowledge position of countries is creativity.
It is not a secret that geographical proximity increases the production of the company, among other reasons because it generates a culture of common values between entrepreneurs, local politicians, and citizens. Their creation supposes one of the greatest efforts to promote themselves internationally and attract investment, as their success may suppose a leap in global competitiveness for the whole urban region. Geographically concentrated industry activity creates pools of skilled labor and specialized suppliers, and increases opportunities for knowledge spillovers. The strategic value of these agglomeration economies may vary by firm, depending upon the relative value of each economy, and upon firm and agglomeration economy traits. (Alcacer and Chung, 2014)

There are various approaches discussed regard to innovation system management in a geographically concentrated regions, however hereby I call your attention on the Porter’s diamond model, as it generates numerous components that are more relevant to the research topic. Porter observes, as a rule competitive advantage of nations is the outcome of 4 interlinked advanced factors and activities in and between companies in these clusters. (Porter, 1998a). These can be influenced in a pro-active technique by government (Etzkowitz and Leydesdorff, 2000a) see figure 3-6.

Figure 3—6|Porter’s Diamond model of clustering

Porter’s Diamond Model

Traditionally economic theory mentions the following factors for comparative advantage for regions or countries (Porter, 1998a):
1. Land
2. Location
3. Natural resources (minerals, energy)
4. Labor, and
5. Local population size.

Porter says that sustained industrial growth has hardly ever been built on above mentioned basic inherited factors. Abundance of such factors may actually undermine competitive advantage! He introduces a
concept called "clusters" or groups of interconnected firms, suppliers, related industries, and institutions that arise in certain locations (Porter, 1998b).

These clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field. They grow on locations where enough resources and competencies a mass and reach a critical threshold, giving it a key position in a given economic branch of activity. Porter says clusters can influence competition in three ways:

- They can increase the productivity of the companies in the cluster.
- They can drive innovation in the field.
- They can stimulate new businesses in the field.

Some well-known examples of Clusters are USA/Silicon Valley (computers), Netherlands/Rotterdam (logistics)/Amsterdam (innovation), India/Bangalore (software outsourcing), USA/Hollywood (movies), France/Paris (fashion).

On the other hand many economic clusters are failing globally. The primary reason for the failure and ultimate collapse of clusters is underestimating stakeholder engagement strategies and alignment as being insignificant not only to the initial and sustainable success of clusters. Hence it is highly imperative that a Quadruple Helix Model is initiated, comprising all tiers of 1. National government, 2. Organized business, 3. Institutions of higher learning and 4. Civil society organizations (Etzkowitz and Leydesdorff, 2000b).

The Quintuple Helix Model revenges all the Helixes observed before and propose a holistic concept where knowledge is the essential force and driver for progress and innovation spirit. The figure 3-7 visualizes the goal of the Helix-Conception is accomplished through the resource of knowledge which produces additional value for society in order to lead in the field of sustainable development (Carayannis et al., 2012). The specialty of the Quintuple Helix Model can thus be described in the following way:

"The Quintuple Helix Model is interdisciplinary and transdisciplinary at the same time: the complexity of the five-helix structure implies that a full analytical understanding of all helices requires the continuous involvement of the whole disciplinary spectrum, ranging from the natural sciences (because of the natural environment) to the social sciences and humanities (because of society, democracy and the economy)" (Carayannis and Campbell, 2010).
The most significant constituent element of the Quintuple Helix are the active ‘human agents’ and the resource of ‘knowledge’, which, through a circulation (i.e., circulation of knowledge) between social (societal) subsystems, changes to innovation and know-how in a society and for the economy (Barth, 2011). The Quintuple Helix, illustrates the collective interaction and exchange of knowledge in a state (nation-state) by means of the following five subsystems (i.e., helices): (1) education system, (2) economic system, (3) natural environment, (4) media-based and culture-based public (also civil society), (5) and the political system (Carayannis and Campbell, 2010).

The figure 3-7 the Quintuple Helix Model as a promoter to sustainable development of society (Carayannis and Campbell, 2010). In this Cumulative Model of Quintuple Helix, the asset of knowledge moves through a circulation of knowledge from subsystem-to-subsystem (Barth, 2011). This circulation of knowledge from subsystem-to-subsystem implies that knowledge has qualities of an input and output of and for subsystems within a state (nation-state) or also between states. If an input of knowledge is contributed into one of the five subsystems, then a knowledge creation takes place. This knowledge creation aligns with an exchange of basic

knowledge and produces new inventions or knowledge as output. The output of knowledge creation of subsystems has therefore two paths: (1) firstly leads to an output for the production of innovations for more sustainability in a state (nation-state); (2) secondly leads to an output on new know-how back into the circulation of knowledge.

Summing up can be observed that the input and output of knowledge, on the one hand, serves as an input or resource for advanced societies and economies, that increasingly depend on knowledge. On the other hand, production of knowledge (knowledge creation) also generates knowledge as an output, which then is being recycled as a knowledge input. Meanwhile, for the successful implementation of an innovative district and favorable environment of the innovative industry, the presence of the stakeholders are crucial. The triangle behind the development of a cluster phenomenon relies partnerships between higher education (college & universities), industry and government.

### 3.4.3. Urban planning

According to Peter Hall, urban land-use planning need to become more proactively linked with economic development policy, strongly emphasizing the three-way interaction between: people, places, and industries, in order to achieve the best overall results (Hall, 1999). He acknowledges that the great cities of the past were overcrowded, dangerous, unhealthy, and chaotic. Nevertheless, he argues that great cities are central to civilization because their very size and complexity make them natural sites for “the innovative milieu.” The culture of the city centralization have been and will continue to be actual issue for the urban developers. Urban growth is always welcome. However this phenomena have to be managed in a way that cities serve to everyone. Hall observes that the significant cities of the past have been successful either as cultural incubators (Athens, Florence) or as technological innovators (Manchester, Detroit, Silicon Valley). But civilization has now embarked on a “marriage of art and technology,” a synthesis of these two forms of innovation to create a new culture. The reason of the Technopolies is the exploitation of the synergies generated by the physical proximity of high-technology companies, and the contact of these (mainly orientated towards the world of knowledge) with top-level university and research centers. As Carayannis and Campbell, Porter and Barth as well we many other authors Hall either believes that in the genesis of a Technopolis three partners must exist: The entrepreneurs, the government (which normally acts as promoter), and the academic world (the function of which is the training of the highly qualified professionals that these companies require). (Castells and Hall, 1993).
We are dealing with the urban planning and in this context it is mandatory to think strategically and to see the “big image”. The long-term survival of a planning programme or policy depends on strategic innovation.

Decision makers cannot allow New-Co’s youthful quest for an entirely new future to cast CoreCo as an aging dinosaur. NewCo’s future is uncertain, and CoreCo is the foundation. CoreCo must always revised through continuous process improvements, process revolutions, and new product and service launches. (Govindarajan and Trimble, 2013)

According to Govindarajan the four types of innovation require different managerial approaches, as they differ along three important dimensions: the expense of a single experiment, the time frame over which results become apparent, and the ambiguity of results. For example, a single process improvement is required low investments, and its effects are quickly obvious and measurable against past operational performance. Process revolutions cost more and take longer. Major product or service innovations generally requires more capital and the results may remain uncertain for several quarters. Strategic innovations mostly require the greatest investments over the longest time periods, and results can anticipate for years. These differences in expense, time frame, and uncertainty influence on such decisions as who should lead and participate in an innovation initiative, how much resources should be allocated, how progress should be assessed, and so on. (Govindarajan and Trimble, 2013).

The holistic approach that integrates the above mentioned tactics are proposed by Alfonso Vergara. Fundación Metrópoli is an international center of innovation in cities and regions that observes a design methodology of Intelligent Territories, offering a model for understanding and designing innovative places. Alfonso Vergara the president of the Fundación Metrópoli in his book “Intelligent Territories” states that innovative behavior is a philosophy “new scale of thinking for the 21st-century city”. The methodology possesses great capacity to discover a consistent and shared vision for the future, face globalization challenges respecting for local identities. (VEGARA and RIVAS, 2004). Vergara explored in the cases of the Bilbao Next project in the European context, and the Malacca Straits Diagonal in the Asian context, both of them present urban innovations in public space, infrastructure, and urban design concentrating on the pedestrian scale. Within these contexts, discovers the emerging mega-economy of urban solutions, design at the intersection of the physical and virtual.
spaces, and the concept of territorial components of superiority. Vergara states intelligent territories or “Smart Places” are the innovative city regions around the world that are efficaciously facing the challenges and risks of globalization. Smart places are capable to achieve and sustain a balance among the concerns of economic competition, social development and cohesion, and cultural and environmental sustainability. He develop the methodology that emphasizing on the following strategic components:

1) **Intelligent Territories**: the capacity of the city to define an intelligent future, to articulate a leadership of the target territory.

2) **Urban component of excellence**: Identify the urban component of excellence, having these components give a great opportunity to discover the interaction between different components of excellence. These components could be a university, historical center, waterfront, commercial site, or an ecological corridor.

3) **Clusters of excellence** urban people: this point of intersection is the key success of the interaction among these components of excellence, the ability to establish a strong network between them.

4) **Strategic projects**: the projects to have capacity to be relevant, to have capacity to create competitive advantage for the city. These projects are not projects to solve the deficit. Every mayors of the cities are aware about the deficit of the city, but few of them conscious about the strategic options. Strategic projects are based on strengths, are inspire in the specific component of the excellence of the city. We can create value based on our own identity and our own strength.

5) **The city as ecosystem of innovation**: here is important to understand how the city is organized, identify the dominant stakeholders, the sector that brings more value to the city. It is crucial to recognize the social architectural ecosystem, the economic strengths and clusters, the institutions, as well as environmental ecosystem and urban infrastructure which inspire the physical form and scale of the city.

The above mentioned components are the key aspects of the sustainability, sustainability that based on the intelligent capital of the city. In future through technology we can move from traditional urbanism to digital urbanism that can accelerate the understanding, can improve the governance, the functioning of the transportation and organization, can improve ecosystem. Urban Intelligence and digital technology will allow cities to avoid isolation and will create opportunities for them to belong diagonals and diamonds. This means that the development will not carry out only in the physical level but also virtual (online, knowledge-based) level.

In summary, this chapter provided insight into basic aspects of the innovation and creativity, knowledge-based society and economic development of metropolitan regions as well as the role of innovation systems in this respect. One the one hand, it emphasized the importance of considering metropolitan regions as agglomerations of inhabitants, industries and territories. On the other hand, it stressed the importance of taking a regional system perspective to promote more holistic as opposed to isolated and only business-focused innovation promotion approaches. It’s worthy to acknowledge the lessons from the past to develop desired future. The cities can be competitive, however they should be designed in a way to serve to human beings and urban planning can make this interaction of creating intelligent cities for people.

Lundequist and Power (2002) have classified 4 types of cluster building processes: “(a) industry-led initiatives to build competitiveness and competence within an existing base; (b) top-down public policy exercises in brand-building; (c) visionary projects to produce an industry cluster from ‘thin air’; (d) small-scale, geographically dispersed, natural resource based, temporal clusters that link, or dip, into global rather than national and regional
systems and sources of innovation, competitive advantage and strategic assets.”. Hence, these four considerations on clusters are mainly pondering on the ways clusters were initially created.

Vergara pointed on the first one industry-led initiatives to build competitiveness and competence within an existing base, emphasizing on the components of excellent of the region; and father on he looks at the territory as a potential element of diagonals and diamonds. Geographically dispersed, temporal clusters that link into global systems and sources of innovation, competitive advantage and strategic assets.
4 Chapter: Success story

In this chapter of the research project we observe the success story of the Netherlands that increase its economic competitiveness and the life quality of people focusing on the innovation systems. Although it is significant, there are essential differences not only between less and more developed countries, but even within regions of countries and agglomeration areas such as metropolitan regions as it was described in the chapter 3. The characteristics of less developed metropolitan regions and their demands on regional innovation systems are rarely mentioned in the general literature on innovation systems and regional economic development. Thus innovation and innovation systems are important for societal development in every region in the world. Within the scope of this section of the research work we firstly understand systematic competitiveness of targeted country and the metropolitan regions in order to evaluate their potential to create innovative economy growth and urban development. Secondly we find out the competitive advantages and excellence components of these region to observe the driving forces on each level (micro, meso, macro meta (see figure 15)). Thirdly we figure out the main components for the creation of the favorable environment for business innovation and links within urban settlements in the regional level. Finally, we show how the results are converted into regional strategies for fostering innovative economy and urbanism and how they can be applied in the case study. The decision factor in choosing the Netherlands as success story was based on the fact that The European Commission has chosen Amsterdam as the European Capital of Innovation 2016 (iCapital).

4.1. Economic Systemic Competitiveness

The metropolitan regions are complex and dynamic systems and it is essential to own a heuristic model that combines crucial insights from economics, urbanism, and other disciplines in order to better understand the driving forces of economy and urban development. Hereby we tend to focus on the systematic competitiveness analytical concept developed by a group of researchers (Klaus Esser, Wolfgang Hillebrand, Dirk Messner, Jörg Meyer-Stamer) at German Development Institute since the early 1990s. It is a heuristic framework pulling together contributions from economics and other social sciences based on the experience. This concept highlight competitiveness and the driving forces of the territory that convert the comparative advantages into competitive advantages based on their excellence components, with the great involvement of the stakeholders. System means a pattern of actors, institutions, organizations and policies which are interlinked through complex feedback mechanisms and which, taken together, create a coherent entity. (See figure 4-1) The concept of Systemic Competitiveness introduces four analytical levels (Esser et al., 2013), (Esser, 1996).

- the micro level where companies compete in competitive markets, but where also networks and alliances of companies emerge to sustain their competitive efforts,
- the mesolevel of selective interventions to support companies’ efforts to shape a competitive advantage,
- the macro level of generic institutions, economic policies and framework conditions,
- the meta level of basic orientations in a given society as well as other soft variables.
In the scope of this research project, based on the local and regional level in order to have a complete image of the region, it is crucial to observe the territory as a “system” where all the levels are mutually connected and depending from each other. The Four Pillars of Innovation Systems model developed by Meyer-Stamer and Hildebrand (1994) address to the system competitiveness levels.

4.1.1. Spatial Systemic levels:

Within the framework of spatial planning while we are drawing parallel between spatial and economic system levels we face some terminological confusion in regards to four system levels. In this case it is important to understand the main relations between spatial and economic planning.

<table>
<thead>
<tr>
<th>Spatial development terminology</th>
<th>Systemic Competitiveness terminology</th>
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<tr>
<td>• Meta = global</td>
<td>➔ Meta / Macro / Meso / Micro have no spatial connotation</td>
</tr>
<tr>
<td>• Macro = national</td>
<td>➔ Macro = generic framework conditions that apply to all sectors / industries alike</td>
</tr>
<tr>
<td>• Meso = somewhere in between, often used in places without an intuitive understanding of “municipal/local” and “regional”</td>
<td>➔ Meso = targeted interventions, specialised organisations Policies, factors and elements between Macroeconomics and Microeconomics</td>
</tr>
<tr>
<td>• Micro = municipal/local</td>
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Spatial planning Instruments in Portugal are undergoing into 4 levels:

**National:** Defines the territorial management strategy to all country and National Programme for Spatial Planning Policy. The strategic national spatial planning options and the spatial structuring model, taking into account the urban system, infrastructures and collective facilities of national interest, as well as areas of national interest in terms of national defence and public security, agriculture, forestry, the environment, heritage and the economy, exploitation of geological resources and use of renewable energy sources, as well as directives and guidelines to regional level. At national level spatial instruments are also focused in environmental issues and national protected areas, such as:

- Sectorial programmes and special programmes
- Protected areas programmes
- Public water bodies management programmes
- Coastal zones
- Estuaries programmes

**Regional:** Defines the territorial management strategy to each region, according to national development policies. Directives and guidelines to municipal (and inter-municipal) levels Regional programmes: The strategic spatial organisation decisions at the regional level and the respective spatial structuring model, taking into account the urban system, infrastructures and collective facilities of regional interest, as well as areas of regional interest in terms of agriculture, forestry, the environment, ecology, the economy, integrating the national infrastructure networks, mobility networks and regional collective-use facilities;

**Inter-municipal/Local:** defines Inter-municipal programmes – Inter-municipal territorial plans. Ensures coordination between the regional programmes and between municipal and inter-municipal spatial plans

- Inter-municipal master plan
- Inter-municipal Urban Zoning Plan
- Inter-municipal Detailed Plan

**Municipal/Local:** Defines, according to regional directives and its own development strategy, land-use regulations, the municipal spatial planning model, decisions on location and management of collective facilities and the relationships of interdependence with neighboring municipalities.

- Municipal Master Plan
- Urban Zoning Plan
- Detailed Plan

The coherent correlation of economic and spatial system levels provide us with a image of the territory as a complex system where each level is an essential co-connected element working on level scope and influencing on system space.

In order to meet our third sub-objective, that is, to create favorable environment for the innovation system development, we concentrate on how the region is regulated on each level and identify the responsible
authorities for the interventions and assets. To this purpose we use enable, pull and push strategy in order to provide evolutionary landscape. Within the scope of each success story one type of intervention will be discussed to have a vivid picture what needs to be considered given their discussions and how they can be applied to the case study.

With the **Enable, Push and Pull** components we mean;

**Enable:** Innovative technology database, supporting labels, creating risk awareness, technology demonstration, capacity building, promoting lifestyles, and environmental information campaigns

**Pull:** Feed-in tariffs, taxes/Subsidies, carbon-trading

**Push:** Environment regulations, policies, standards, incentive programs for innovative tech diffusion

### 4.2. Innovative environment in Dutch metropolitan regions. What makes them internationally attractive?

In this part of the research we call your attention on the Netherlands; the Europe’s creative epicenter and an excellent place to establish innovation systems. We observe that the Netherlands is a success example for its entrepreneurial spirit and out-of-the-box thinking. The NIS emphasized on the technological development of pioneering organizations. During the recent decade these reports have discussed the basic elements of a NIS ((Bartholomew, 1997),(Sigurdson and Cheng, 2001),(Lundvall, 2010)). (Bartholomew, 1997) states the four basic elements of a NIS are the government, research institutions, educational institutions and industry. Research institutions and industrial firms are the centers of the system. Government and educational institutions are satellites that strengthen their function. Referring to the 3.4.3. Urban planning section it is actual to mention again the approach of Peter Hall, who emphasize the three-way interaction between: people, places and industries. In his “Cities in Civilizations” book he promises a golden age to the cities that innovate in the three interdepending levels: culture, economy, and urban organizations. The competitive regions are the ones that are innovative in all levels and survive in the global competition (Hall, 1999). “Creative city” concept was handed in several cities of UK as a cultural strategy to transform traditional industrial parts of the city into integrated fashion areas. One of the successful examples of the “Creative City” cultural strategy is the landmark of Bilbao Guggenheim Museum that transform an industrial city into the post-modern “city brand”. In the Netherlands this concept was firstly introduced by Zef Hemel and the Dutch Ministry for Housing and Spatial Planning in 2002 in the Delta Metropolis. In the 21st competitive century the true value is generated by those individuals who invent and create new products, who apply knowledge for making assets that are smart or ‘cool’. These creative workers are called ‘the creative class’. The **figure 4-2** illustrates the results of the 2004 mapping on the distribution of the creative class and the creative industries over cities in different regions in the Netherlands, and their influence on regional and national economic production. (Modder and Saris, 2005)
The figure shows the Amsterdam region as creative core and gravitational center of high concentration of creative industries. (Cooke et al., 2008). The European Commission has chosen the European Capital of Innovation (iCapital) award 2016 to Amsterdam. Being selected as a most innovative city Amsterdam awarded the prize of €950,000, which will be used to scale up and expand the city's efforts on innovation. The innovator city has received the award in recognition of its approach to innovation related to four basic areas of urban life: governance, economics, social inclusion and quality of life. (Navigation path, 2016) Hereby we will concentrate on the Amsterdam metropolitan region to go deep and understand the fundamental components of the creative industries and innovative system success on each systematic levels (meta, macro, meso, micro).

4.2.1. Meta level competitiveness assets

The geographical advantage of the country is its location in the North Europe: the Dutch urban regions generate a creative network city, which is part of a new configuration on the international level with the Belgian diamond region of Brussels-Antwerp-Gent and the Rhein-Ruhr region, and urban regions between them. This North-Western European territory contains about 30 million people and is one of the 10 super-regions of the world in terms of its successful complementary poles of competence. The dynamic competitive advantages of the Netherlands is its innovative culture and high quality of life that attracts creative minds, this key elements make the region one of the world’s most multicultural hubs for creative talent. Schools like Design Academy Eindhoven, Amsterdam Fashion Institute and Arnhem Academy of Art & Design are the results of an open and experimental environment in the creative economy.
The Dutch push factors like policies and regulations established friendly environment for the innovation system development. We observe in the OECD studies that the Dutch National Urban Agenda (NUA) embraces broad strategic objectives aimed at strengthen economic growth, innovation and quality of life in Dutch cities. For this purpose the NUA made an essential shift from past urban policy in the Netherlands. This process carried out with the collaboration of the Ministry of Interior and Kingdom Relations, the Ministry of Economic Affairs, the Ministry of Infrastructure and the Environment and with the integration of more than 500 stakeholders from different spheres. The Dutch NUA revolves around four guiding principles (OECD, 2016):

1. **Strengthening the urban network.** The government focuses on the primary and secondary urban regions equally and delegate their resources according to specific region. The NUA goes beyond and embraces broader objectives like quality of life and innovation (including the concept of circular economy, smart mobility, social and managerial innovation, etc)

2. **Fostering adaptability and resilience.** NUA aimed at supporting cities quickly develop solutions in response to new economic and social challenges and market them internationally.

3. **Enabling customization and experimentation.** The government own a no one-size-fits-all approach and will give chance some cities to deviate from existing regulatory schemes to better address social issues.

4. **Multi-level, public-private co-operation on shared ambitions.** The government acknowledges the importance of co-operation workable solutions with various levels of government, businesses and other social stakeholders, rather than a unilateral supply-demand relationship between cities and the government.

A huge number of cities, other institutions and stakeholders have joined to the government's initiative. Significant examples of proposed initiatives include solutions for smart cities the Huge Security Delta hub in Europe, accessible cities-Groningen and Zwolle, inclusive cities-Eindhoven, healthy cities-Utrecht.

4.2.2. **Macro and meso level pulling, pushing and enabling components:**

The flexible and open environment contributed to the smooth transition from the industrial economy into the innovation system driven one. This shift has tremendous impact on the lifestyle, the use of land, the buildings and neighborhoods. The Dutch creative city regions are organized by two poles: the α-pole around the old gravitation center Amsterdam and the β-pole around the high-tech industry in the south (Modder and Saris, 2005). The Philips region stretches from Amsterdam to Aachen (Germany) and Leuven (Belgium, IMEC). In Amsterdam we find headquarters and marketers, in Nijmegen the supply and development of semiconductors, Eindhoven is the techno pole with R&D, application, embedded systems and design. Crossing the borders we find the research centers of Philips in Leuven and Aachen. The Philips region is connected by three highways: the A2, A50 and the A12.

Just curious is the Meta level competitiveness enough in a globalized economic and innovation-led system clusters and does it remove the obstacle of the vertical organization of public policy?

**Economic pulling factors** such as economic and finance system is an example where the innovation-led system clusters were stimulated top-down. In the late of 1990 when the governing authorities own a strategy to make an economic “boom” of its inner city based on the innovation system management, lots of economist were luck of trust to this initiative and during the first decade they even left the region. The official policy was aimed at “re-industrialization” and at services. However, after 20 years the inner city of Amsterdam presents a density of
housing and workplaces not seen since 1950s. Currently according to the statistics more than 13% of the total national employment work in the creative economy. (Modder and Saris, 2005).

The Netherlands Foreign Investment Agency (NFIA) as a supporting institution stands ready to help companies (big and small) at every stage of establishing or expanding operations. NFIA offered free confidential services include:

- Organizing fact-finding missions
- Arranging meetings with relevant partners
- Providing personalized guidance and counsel on tax, government and permit procedures
- Exploring location options and business solutions (Milieu, 2013)

Richard Florida highlighted the creativity chain in Dutch cities illustrated in the figure 4-3. In this model he pointed the inspiration as such initial step to set up willingness for the interaction between professionals from different branches which in its turn promises propelling growth: product development and application. This model will be discussed in the local level directly linking with the firms and institutions ("ISOCARP Congress Reports Archives," n.d.).

**The spatial planning pushing factors** such as policies and regulations are successful on many fronts: The metropolitan area of Amsterdam is established in two governance arrangements; a smaller scale consists of 16 municipalities and a larger scale partnership of 36 municipalities and 2 provinces which is called Metropoolregio Amsterdam or MRA. To address the national meta-objective of the country, which is to create interactive nexuses between the primary largest metropolitan regions and secondary once, the Transport Authority Amsterdam region set out a program to covers around 1.3 million people across 16 municipality including Amsterdam. The MRA operates in three main policy fields: transport, economic development, and spatial planning. Each of these policies have its own platform:

1. Platform for the Accessibility of the Amsterdam Metropolitan Area (PBM): it meets 6 times an year and coordinates all activities related to traffic and transport projects.
2. Platform for the Regional Economic Structure (PRES)
3. Platform for Planning (PRO): it meets 4 times an year focusing on the issues of sustainability, metropolitan landscape and urbanization. (OECD, 2016)
MRA keeps control of spatial development and implements a leasehold system (i.e. the city land is not sold, but leased to the private sector), which results in the Amsterdam government owning about 80% of the city land. (About 20% of the city land was sold in the early 20th century.) The Amsterdam government states that the implementation of the leasehold system can effectively prevent land speculation and generate revenues for financing infrastructure projects (Legislative Council Secretariat, 2007).

Amsterdam is one of the world’s well-urbanized metropolises that offers variety and order. The pattern is quite strict, most of the houses have the same height and width, the color ranges is restricted, at the same time each unit is completely individual in an organized complexity. This complexity makes the city attractive and unique. The government, institutions and commercial organizations cooperatively develop a structured approach towards sustainable house building ((Bartholomew, 1997),(Sigurdson and Cheng, 2001),(Lundvall, 2010)). They aimed to develop and build housing estates that stimulate both the physical and psychological health of its inhabitants. These housing estates contribute to the preservation and development of the natural environment.

**One of the enabling drivers** of Amsterdam’s success as a knowledge city is the constant inflow of new ideas and talent into the city. (Urban Innovation Network and Elsevier, 2015). Drawing parallel between research strengths with larger economic development goals become a hot topic. Amsterdam is one of the examples around the world at both the national and regional levels that have focused on research as inform and catalyze for economic growth.

On macro level Amsterdam contributes strongly to the greater Randstad’s research output in research areas such as medicine (excluded from graph below) and biochemistry, genetics, and molecular biology, on the other hand the Randstad complements Amsterdam in several areas in which the city has shortage such as engineering and earth and planetary science. (See Graph 4–1)
4.2.3. Micro-local level: Zooming out Amsterdam metropolis

In this micro level it’s worthy to zoom in the metropolitan region and understand how the meta, macro and meso systematic level interventions impact on the micro/local level organizations, institutions, businesses and citizens. To observe the nexus between the spatial conditions and business environment we used the model below developed by the Jaap Modder and Jeroen Saris in their report on “Creative spaces in the Netherlands”. It distinguishes between four types of 'business environments' for the disruption of innovation. See figure 4-4

On the vertical axis we distinguish between internal and external. This distinction relates to the degrees to which the sector needs a supportive urban environment. On the horizontal axis we distinguish experimental versus commercial. Thus four kinds of innovative environments occur.

Figure 4—4 | Innovative business Environments |

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<th>Creative workshops</th>
<th>Transactional environments</th>
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<tr>
<td>• open and divers</td>
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<td>• affordable</td>
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<td>• space</td>
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<td>• complementary</td>
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<tr>
<td>• external interaction</td>
<td>• new or old center</td>
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<th>Experiment</th>
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<td>Incubators/ breeding places</td>
<td>Places of production</td>
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<td>• internal interaction</td>
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<td>• diversity</td>
<td>• industrial sites</td>
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<td>• starters habitat</td>
<td>• brainparks</td>
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<td>• trial and error</td>
<td>• monofunctional</td>
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Source: (de Stad bv)

Zooming the Amsterdam metropolitan region we focus on the creativity chain suggested by Richard Florida and discussed above. The fundamental principle of the model was "Inspiration>interaction>transaction". In the macro level it’s essential to create an "Inspiration" environment for the entrepreneurs. Firstly, established the experimental incubators, which are small core enterprises (1 to 3 persons) that need urban environments with a great deal of variety. Secondly “interaction”, entrepreneurs in creative workshops need complementary companies and look for affordable urban spaces that offer diversity, space and openness. Thirdly, in the transactional environment the core creative entrepreneurs and the distributional, organizationally oriented companies interact and meet their clients. The average size of the companies is a bit bigger. The market-oriented production companies do have more employees and are strictly focused on production costs. This typology of innovative companies in the life cycle of their development makes it possible to distinguish different urban 'milieus' that are more or less equipped to offer the right conditions to the entrepreneurs. In Amsterdam a vivid example is Stedelijk Museum in het Post CS-gebouw.
While Amsterdam is an important global and national highly favored place to settle for the commercial services and the growing entertainment industry, there is a shortage of film industries and production because it is too expensive for productive and distributive companies. The diagnosis shows Amsterdam Region needs more breeding grounds and more production or supplier areas. These specific kinds of space are available in the former shipyards and industrial sites north of the North Sea Canal connecting Amsterdam Harbour to the North Sea. The demand for space can be solved when you take a larger region into consideration: in Zaanstad (north of Amsterdam) and Almere a lot of space is available. (Modder and Saris, 2005).

Education as a strength for the economy: In order to identify the research areas in which Amsterdam has a comparative advantage in comparison with other European cities, we focus on four main dimensions of research performance – relative volume, usage, impact and excellence. Amsterdam has key strengths in medicine. Among the eleven cities under comparison, Amsterdam ranked first and second respectively in terms of relative volume and impact of medical research (See figure 4-5). The city’s research community has produced over 3,600 publications over the past 10 years in oncology, and Amsterdam’s relative research impact in clinical neurology is more than twice the world average. Among the eleven European comparator cities, it is second only to Manchester in terms of relative world download share.

Amsterdam’s universities should continue to grow strong connections, especially with pharmaceutical companies. Amsterdam’s researchers are globally connected and 60% of all Amsterdam researchers begin or

![Radar chart of relative academic patent citation share for Amsterdam by subject area, from 2004 to 2013 per year.](image)

Source: Publication data from Scopus® and Patent Data from Lexis-Nexis®
primarily establish their scientific careers outside of Amsterdam. A similarly high percentage of Stockholm researchers also have non-local roots. During the last decade Amsterdam researchers co-authored more than 100 publications with researchers from 66 different countries (Urban Innovation Network and Elsevier, 2015).

**Collaborating with Industry:** From 2004 to 2013, about 5.3% of Amsterdam’s publications were co-authored with at least one corporate researcher, putting it in the seventh position among the eleven European cities. Copenhagen and Stockholm have the highest levels of academic-corporate collaboration over the entire period, at 10.3% and 8.5% respectively. In recent years, however, the relative share of academic-corporate collaborations for those cities has declined. Although Amsterdam produces highly impactful research, there is clearly an opportunity to strengthen the connections between its universities and companies.

### 4.3. Lessons learned

The Amsterdam’s case helps us to understand the importance of the systematic competitiveness and collaboration between the levels. Firstly we observe that the key factors conducive to the success of the creative economies in the Netherlands is the context of the social-economic and cultural environment in meta and macro levels. The open-minded and new experiments encouraging attitude create a fundamental basis for the innovation system grow in the metropolitan region. The geographic location in the North-Western Europe and the new configuration on the transnational level together with the Belgian city region of Brussels-Antwerp-Gent and the Rhein-Ruhr region, and urban regions between them makes Amsterdam one of the 10 super-regions of the world. Its success in global competition depends on its ability to develop a pattern of complementary poles of competence.

Secondly, the institutional framework of Amsterdam metropolitan region is very organized, the platform is working in a collaborative way. They give power to the different entities and institutions to come up with the new and innovative ideas, to be more efficient and more flexible, to organizing meetings between the creative and other economic sectors to stimulate creative collaboration. The tools they used the creativity chain, the interactive approach and the model for environmental analysis resulted the bottom-up way of strategy building closer to the stakeholders.

Thirdly, the government and the government policies that put together different ministries for the specific tasks towards to the common goal. They emphasize all their efforts on bringing talents in their region to create a worldwide competitive innovation incubator, where the human capital is the key element.

When we try to import this kind of experience to the other metropolitan region we should take into account these kind of aspects, as on the other metropolitan region this meta, macro and meso level environment is different, therefore in the micro level results will not be the same.
5. Chapter: How might Yerevan become an innovative metropolitan region

In this part of the research we give a brief description of Yerevan metropolitan region zooming out the economic situation and urban planning processes. Referring to the discussions in the observed bibliographic literature and findings from the success stories we elaborate on how might Yerevan become a more innovative city.

5.1. The synopsis of Yerevan metropolitan region

Yerevan was founded in 782 BC along the Hrazdan River. Since 1918 it has been the capital and the administrative, cultural, and industrial center of the country. The first modern Master Plan was created by architect M. Mehrabyan 1906-1911. (“Yerevan,” 2016). The figure 5-1 shows the evolution of the Master Plan of Yerevan from 1920-2004. (Mamyan and Urban Heritage, 2014). The second Master plan and the main one was designed by Aleksandr Tamanayan in 1925 for 150'000 inhabitants He developed the plan of the socialistic city using the principle and forms of “city-garden” as a best example and option of new urban center at that time. Currently, rapidly growing Yerevan changes its urban structure by using few ideas of A. Tamanyan's Master Plan and putting those ideas under the Local Developments. (Mamyan and Urban Heritage, 2014)
Since the beginning basic problems of the Master Plan was the detailed plan of the center. The main stress of the plan was concentration on the historical, cultural and commercial trends. The gaps of the plan were the planned neighborhoods for various uses which weren’t realized. The absence of these zones create high level of agglomeration in the city center. Examples of this neighborhoods include the Noragyugh area, which was planned to serve as a business-administrative center which would compensate a part of the load of the central part. New construction proposals also included the North Avenue and the Main Avenue, Amiryan Street, Kond, 30th quarter, building of a big sports and resort center at the Republic Stadium area and other areas. At the starting phase when there were no corresponding legal bases the construction was realized chaotically without saving the resources and taking into consideration the complex plans of the developments and ecological problems.

In the scope of urban planning the following gaps were identified mainly in the central part:

- Violations of the Detailed Plan of the center of Yerevan
- Violations of building principles and urban planning requirements
- Presence of incomplete buildings
- Unjustified building of green areas
- Rapid growth of illegal construction
- Decrease of capital functions
- Distortion of the historical architecture of the center
- Changes in the inhabitation of the center
- Neglect of the disabled problem

The situation changed in the recent years when various experienced methods of city reconstruction and modernization practice of the international agencies were implemented in the country. Investments are being promoted and the demand of land areas has immensely grown. These projects have always been considered as important state projects and have included complex problems concerning economic development and rehabilitation. The solving of the problems has also been unique for each situation, be it political, economic, urban planning, ecological, demographic and other aspects.

The latest and current master plan of Yerevan’s of 2005-2020 has been approved during the period of time when the trade relations and the upcoming development trends were made much clearer. The modern normative and legal base of urban planning and land usage was mainly developed. (See figure 5-2)
Yerevan’s developing master plan of 2005-2020 crucially differs from previous urban planning projects by its documentation, problems and methods. These documentation is not accessible to public.

According to the requirements of Article 14.3 of the Law of the RA "On urban development", Master Plan of the Community (Settlement) is elaborated for all lands included within the administrative borders of the community.
The Master Plan, being an urban development project (spatial planning) document of a strategic nature, defines:

a. primary directions of spatial development of communities;
b. provisions of use of lands being objects of urban development activities, mandatory requirements and limitations;
c. primary (up to 5 years), medium-term (5-10 years) and perspective (10-15 years) stages for development of lands;
d. designated use of land parcels included within administrative borders of communities and/or the alteration thereof by fulfilling legislative requirements of the legislation. (*HABITAT III NATIONAL REPORT, 2014*)

According to the active state policy, this master plan is considered to be a master plan of the transition period. The main objective of the master plan is the creation of urban planning basis in accordance with the socio-economic background for the following strategic problems to be solved phase by phase:

- rehabilitation of the city substructures, stabilization of situation with the least insurance level
- reconstruction and modernization of systems and their reduction
- transition to a stable development

Summing up above discussed aspects can be concluded that Yerevan city was designed to be a capital and cultural, commercial and economic center of the country. At the same time it is a residential area and home for more than 1.5 million people. In order to manage this dynamic and meet with the challenges of the rapidly growing city we should develop a holistic innovation system approach to create an environment where people would live, create and work, the economy would growth and the historic city would maintain its uniqueness and identity.

**5.1.1. Institutional framework in Yerevan metropolitan region**

Yerevan city was established as a province/marz/municipality after the enactment of the RA Law on Self-Government in the City of Yerevan at the end of 2008. The sub-national government in Yerevan City consists of the Council of Aldermen and the Mayor of Yerevan; first established after the elections of the Council of Aldermen in 2009. The City is divided into 12 administrative districts which are dedicated units of the Municipality (See table 5-1).
The position of the head of an administrative district is a discretionary position, and the head is appointed to and dismissed from office by the Mayor. The municipality enjoys such powers in nearly all sectors (urban development, nature protection, road construction, transport, education, social security, culture, and health). Despite this power, in regards to law, the municipality doesn’t take any responsibility of promoting innovation systems in the metropolitan region. The Law requires the expenditure of each administrative district to be shown separately in the budget of Yerevan City. (Sustainable Urbanism, 2007)

The territorial institutions of Yerevan and their role and competences see Annex C

5.2. Revealing development bottlenecks

Referring to the chapter 2 where have been already discussed the social-economic, education and political context of the country, here we are zooming out the main constraints of the metropolitan region, taking into account the levels of systematic competitiveness. We tend to reveal development bottlenecks in each level in order to recognize the gaps and understand what kind of diagnosis and strategy we need in order to overcome them. Taking into account that the research dealing with the regional/macro, meso level, we highlight the gaps that influence on innovation system management.

Meta level:

- Mass emigration: From the late 1980s to the new millennium, the country lost 30% of its inhabitants due to emigration
• Absence of the national development strategic vision.
• Restrictions due to regional integration EU, Russia, US,
• Geographical location: Being surrounded by the muslin countries with whom still exist political unsolved issues the country faces with various social-cultural, political and economic barriers.
• Post-soviet conservative thinking: Lack of self-confidence or soviet stereotypes, expectation for the support of parents, acquaintance-relatives are the main constraint and bottlenecks for the promotion of entrepreneur spirit and innovative thinking. The society and the governing authorities are lack of trust to the new experiments and prefer to stay far from risks, they are more concentrated to maintain what they have and assimilate into the majority.

Macro level:
• Lack of the supporting competition policies like, fiscal, innovation and trade
• Tax insufficient incentives and policies for small and medium businesses,
• Lack of capacity in governmental support organizations
• Accountability of politicians, hierarchic isolated system, corruption
• Weak NIS: NIS are not supported by adequate financial commitments or tailor-made key actions.
• Weak urban-rural connection and collaboration: there are no transportation node for the soft access between urban and rural settlements.

Meso level:
• Unfriendly and unfavorable environment for the small and middle businesses
• Lack of taxation incentives for the business and real estate
• Isolated industrial structure
• Centralized infrastructure system
• Weak import-export policies
• High rate of unemployment and poverty A number of factors is largely preconditioned on high level of poverty among the youth:
  - Lack of jobs, including high-paid jobs; Unconscious selection of the profession; Lack of information (where to find correct information); Lack of motivation; Lack of key skills to be competitive in the labour market (command of foreign languages, pro-activeness, communication, entrepreneurship, etc.); Mismatch between self-evaluation and reality: Lack of pro-activeness and innovative thinking (for instance for launching entrepreneurial activity).
(HABITAT III NATIONAL REPORT, 2014)

Micro level:
• Weak communication between industry and universities
• Weak communication between enterprises and support institutions
• Mismatch between education supply and job market demand correlation
• Lack of innovation support institutions
• 90% of people work in production and not in R&D
• Lack of skills among workforce
• Housing problems of young people, especially urban dwellers
• Oligarchy market structure

Summarizing: R&D infrastructure is under-developed, and universities lack in financing. Public and private R&D expenditures are extremely low, and there are no tax incentives and public support measures for innovative and collaborative activities. Armenia lacks developed clusters and networks, and what is worse there is no perception of their importance. There is no cooperation between technology and R&D institutions and other sectors of the economy and society, and academia-business-public sector cooperation is extremely weak. Financial market is under-developed, and companies and entrepreneurs have extremely limited access to venture capital. This factors left external migration moods among urban dwellers studying at professional education institutions of Yerevan. 53.4% of 268 students from among higher education institutions of the capital has expressed wish to achieve their future plans abroad (55.5% of students residing in Yerevan, 54% of those came from other cities of the RA and studying in Yerevan).

5.3. The excellence components of the region

Armenia is challenged to develop its “competitive advantages”, meaning the creation of economic value based on existing natural, knowledge and institutional resources. But to develop a competitive advantage into a sustainable competitive advantage is even harder to do, because this means that the region must possess value creating things or capabilities that cannot be duplicated or imitated by other regions (Competitive Defendability). In this case Armenia should define its excellence components, the prolonged benefit of formulating and implementing some unique value-creating superior skills and superior resources (financial, physical, legal, human, organizational, informational and relational) that have being implemented and succeeded during centuries. As was already mentioned above in the research the problems could not be solved on the same level of thinking when they were created. In order to overcome these problems we change our attitude to them through changing short run disadvantages into long-run advantages.

Strong diaspora: ready business investment and marketing collaboration in the diaspora contribute many Armenian businesses and even industries.

Geographic location: In the short run the country’s location, with difficult border crossings on all sides, and limited and relatively high-cost air connections to Europe are not assets. However, in the long run we tend to see it as an advantage Armenia’s location in the center of the Southern Caucuses potentially makes it ideal as a regional hub in visiting surrounding countries. The people also have a reputation of being friendly and hospitable.

Depth knowledge guides: wildlife, attraction development, destination management, and guiding skills for adventure travel and outdoor sports (Nathan Associates Inc. and Austin Associates Inc, 2004).

Carried out assessments of selected sectors of the economy through a review of existing documents and bibliographic literature, extensive interviews and discussions with public and private sector representatives we identify the below-listed industries as a potential excellence components for the region. Referring back to
the chapter 3 we highlight the Armenian industry clusters via competitiveness diamonds model developed by Michal Porter (Nathan Associates Inc. and Austin Associates Inc, 2004).

Annex D illustrate the competitiveness diamonds of the chosen industries.

5.3.1. Information Technology

Traditionally Armenians used to be good at IT and social sciences. Armenia now exports IT products and services to more than 20 countries including the US, Europe, and Russia. The best prospects for growth in the IT industry would appear to be customized software, followed by software support and implementation. Basic higher education in IT sector is considered to be good, but advanced training at the university level has not been able to keep up with technological advances. The mismatch of the IT education system and the industry demand is obvious. There is a fair degree of brain drain occurring in the IT sector. As technicians reach their potential and gain international professional certification, they often immigrate to other countries paying higher wages.

Having ongoing support from the government, investments from abroad, international and national demand, the skilled and potential labor can be seen as incentives for IT industry clustering. IT sector can organize to collaborate with universities to close the gap between what an institution of higher learning offering and what is needed by industry, simultaneously strengthen private training centers.

Improve the quality of innovation services provided and become specialized, with the more significant service component. Attract greater levels of foreign joint venture outsourcing, of increasing complexity and value added. Attend trade shows to acquire greater knowledge of market trends and opportunities. Take advantage of the Enterprise Incubator Foundation’s new offices in the US, Canada, and Germany. Increase direct service interaction with customers. Place the industry increasingly on the “cutting edge” of technological innovation through joint ventures, between and among firms and universities and technical institutes. This will require the significant upgrading of training and research capabilities and of market knowledge.

5.3.2. Tourism

Unique history, culture, religion, archeology and being the first Christian nation are the main attractions of the country. The Armenian diaspora forms the most significant group of tourist arrivals. 21% of all tourist arrivals come from the United States, 12% from Russia, 9% from France, and the remainder from other EU and CIS countries (Nathan Associates Inc. and Austin Associates Inc, 2004).

Armenia’s location in the center of the Southern Caucuses makes it ideal regional hub for Trans-Caucasus types of tours. This proposal will be succeed if the difficult border crossing issues will be resolved and strong partnerships will be forged with ground operators in neighboring countries. Three countries, Georgia, Armenia, and Turkey could create an attractive Trans-Caucasus tour cluster.

There is a high priority to format an innovative tourism cluster that addresses their common interests for more coordinated planning between tour operators and their related firms: hotels, guest houses, restaurants and their suppliers, marketing and promotion companies etc., associations, agencies, attractions, airlines, hand-
icraft providers, and educators. Differentiate Armenia as a unique travel destination, with targeted quality improvement over time to appeal to target-visitor priorities. Expand beyond the diaspora market. Explore the possibility of regional tourism. Understand and respond to the needs of specific market segments. Obtain information about current visitor characteristics, feedback, expenditure patterns. Understand decision-making of potential visitors. Specialize in and perfect specialized tours for niche market travelers, e.g. historical, religious, birds, butterflies, and buildings, to name a few. Increase the number of maintained attractions and services. Organize and publicize special events.

5.3.3. Gems and Jewelry

The Yerevan Jewelry Plant was one of the most significant jewelry factories in the Soviet Union. Diamond cutters and jewelry makers in many respects operate in two different spheres, receive their raw materials from different sources, use different technologies, and sell to different markets. The cut diamond market for Armenia is bound by tradition and trust, much of it going to Armenian diaspora wholesalers in Los Angeles, Antwerp, Israel or Moscow. High-end jewelry producers have their buyers in Europe and in the US.

In terms of product and process innovation it is important to increase differentiation and image in the marketplace and trade through innovative actions to increase quality, a perception of low risk (e.g. GemPrint) and investments in skills, certifications and technology. Set Armenian cut diamonds recognition and branding initiatives that highlight the quality of the diamonds and the cutting. Develop market awareness of the Armenian product. Continue to emphasize industry and trade fairs as a means to learn about trends, designs, industry linkages and networking. In terms of service innovation it will be productive to emphasize on the online marketing aimed at recognition among non-diaspora market.

5.3.4. Agricultural Processing

Agro-processing is the third largest contributor to GDP behind agriculture itself and construction. Agricultural products include grain crops, vegetables, and fruits which are mainly exported in processed form; vegetables are most often canned, while the fruits are processed into jellies, jams, compotes, leathers, and fruit fillers, which make up the majority of the produce packed in cans and jars. The majority of the rural population are working in agricultural sector. The food processing sector has diversity of sub-industries including meat and milk processing, honey, however it would be inappropriate to present all of them in Competitiveness Diamond. We have therefore selected three sub-industries for additional focus, presenting them in a manner that contributes to the recognition of the excellence component of Armenia's food processing industries. The sub-sectors presented include food processing in general (with the example of SIS Natural discussed), the Yerevan Brandy Company, and the wine industry. In the past ten years, the number of vineyards, wine and brandy factors have started to increase together with the export.

Product and process innovation will promote the cluster development. Use innovative quality packaging, labeling, etc. to present quality image and brand with internationally recognized certifications. Establish an Ar-
Menian standard of quality. Participate in trade fairs to learn more about international markets, distribution networks, and product development opportunities. Learn about non-diaspora channels and segments, to expand sales to international markets. Invent, test and develop new recipes to cater to customer tastes.

5.3.5. Textile and clothing

The industry is composed of at least four textile and clothing sub-sectors: 'cut and sew' clothing, knitwear, carpets, and shoes. According to Armenia competitiveness assessment report in 2002 the industry was still one of the more labor-intensive sectors in the economy. 90% of the employees are women. Some elements of the apparel sub-sector would like to target the high-end, high-quality segment of the market since the industry cannot compete with countries like China and Turkey on cost alone. From this light apparel industry should emphasize on the carpet and shoes sub-sectors as the Armenian carpet industry has long history and famous for its unique design. The Armenian leather shoes are known for their high quality and comfort. The industry is not very competitive and could not survive with the rivals from both low-cost labor countries like China or Bangladesh not with the high quality-high cost producers as Italy or France.

Summing up: Business-government dialogue is weak and not focused on the strategic issues relating to building competitiveness. Dialogue and decisions are not based on sound industry understanding of excellence components. There is nobody that properly brings together government, business and other interests to focus all stakeholders on the competitiveness issues and excellence components. It will be significant to have an agency in each industry which will be the representative and will keep the linkage between public and private as well as customer and producer. The role of the agencies in the competitive cluster will be to support businesses in the industry, rather than direct them. All organizations need to agree with and contribute to a competitiveness vision. A quality rating system, or a system of standards or certifications should also be further developed and refined by the cluster.

Some key recommendations include:

- Competitiveness innovation strategy should be adapted and inform, prioritize all aspects of the national dialogue on the economy and cluster-based approaches should guide associations and increase their service impact and relevance.
- Private sector needs to build capacities to develop its opinion, obtain sound data and information, and conduct good analysis. Real data – in the form of models, cases, best practices, benchmarking - is needed to guide dialogue.
- In respects government need to improve the business environment and to assist certain industries. These efforts need to continue, but need to become informed by prioritized requirements for international competitiveness.
- Armenia needs a credible, capable independent or public-private body, trusted, to focus on competitiveness. A Competitiveness Council format should be considered. Certainly, the core functions of a Competitiveness Council (e.g. providing policy advice and advice on policy implementation; sound competitiveness and policy analysis; monitoring the country’s competitiveness performance; benchmarking against best practices worldwide; and providing data and information to all constituents) are needed in Armenia.
- Mapping the leading innovative institutions, enterprises and individuals and create friendly environment for them to come up with innovative experiments.
Educational institutions need massive injections of resources and relevancy, and need to be brought into a deep and productive partnership (or customer service) relationship with business. Curriculum and research need to be informed by competitive business priorities.

5.4. How are innovation and competitiveness interconnected

The main components of the institutional environment have positive and significant impact on economic growth in the long-term. The success of the European countries is directly linked to the successful implementation of government policies in the areas of taxation, education and infrastructure. Meanwhile, competitive advantages are not only based on the availability of natural resources, but they are conditioned with the skilled workforce, social cohesion, favorable investment climate and the government’s ability to respond quickly and effectively to the changes of economic conditions.

5.4.1. Innovation-oriented Portugal’s Clusters approach to local economic development

Despite the success experience of the Netherlands in case of Portugal we see the success of cluster oriented economy growth. Porter developed a vision for a more competitive Portugal via provided guidance on how business leaders and public and private institutions should act and interact with each other. Despite at that time IT industry was a hot topic anyway he suggested to concentrate more the traditional and long-term advantages and create clusters in Portugal based on their competitive advantages. Since then some of the clusters are still successfully operating in national and international market and responsible for a large portion of the Portuguese exports. In his report Porter addressed macroeconomic weaknesses of the country. Project “building the competitive advantages of Portugal” was structured in two stages: Stage 1 (six months) was entitled competitiveness audit and Stage 2 (eight months) focused on initiatives for action. The Porter Project encouraged a new paradigm for change and 11 initiatives for action (six clusters and five public policies). Michael Porter assumed a limited number of initiatives for action, which were subdivided into 6 clusters and 5 public policies. The clusters included were: wine, tourism, automobile, footwear, textiles and wood products, whereas the public policies regarded topics such as: management capabilities, science and technology, education, financing and forest management. One impotent note touches the approach of cluster used in Portugal’s case; is that they didn’t take into account a specific location of the cluster, instead considers a cluster as the whole industry located in the country (See figure 5-3). (Gonçalves et al., 2015).
The analysis of the potential of traditional industries clusters presented by Porter stated that the introduction of new technologies and innovation systematic approach in the traditional sectors was a basis for future competitive advantage, contributing to its survival and its transformation. This allowed: firstly, evident improvements in traditional sectors such as footwear, textiles, clothing and apparel (design, small series and quick response to market demands); secondly, improvements in wines, with obvious increase in quality and, where a dynamic approach was followed, incorporating the changes resulting from the emergence of new markets in addition to those identified in the Porter Report; and finally highly visible improvements in furniture quality and design.

5.4.2. How Success story finding can be applied in case study?

We acknowledged the numerous different explanations of regional growth that can be found within the fields of local and regional economics, urban planning or systematic competitiveness. However, it is significant to highlight that no any nation or region are similar. Each of them is unique and has its own strengths and weaknesses. It is like an iceberg, when we try to implant the success experience or system of the success stories in the case study we should not only look at the visible part of the iceberg as vision, strategies, goals etc. but we should observe deep and understand the main differences regard to culture, habits and attitudes, afterwards, filter what can be accepted as an success example to fulfill in Armenia or what should be avoided to implement.
Despite the social-economic, cultural, geographical as well as mentality differences of Amsterdam there are several preconditions like Meta and macro level environment preparation and meso and micro level collaboration towards the common strategic vision to gather talents over the world and create innovation incubator based on human capital can be seen as key preconditions for the strategic development of innovation system management in Armenia. In case of Portugal the concentration on the existing competitive advantages to formulate clusters and increase economic competitiveness also can be seen as positive precondition for Armenia.

5.4.3. How observed knowledge can be the subject of the case study?

In order to develop competitive advantages in Armenia and become a more knowledge-intensive and competitive in economy, the country should go beyond the improvement of macroeconomic indicators and institution-building efforts. It will need to increase value-added production and innovative capacities, and to improve the efficiency of government, institutions and businesses, management and technology skills. More decentralized institutional run, more collaboration between urban and economic planning authorities, economic data analysis and demand-driven business initiatives matching the supply of services to the demand in the market will be required. In order to achieve LRED RA and Yerevan metropolitan region will have to shift from traditional approach to LRED into innovation system ones (See figure 5-4)

**Figure 5—4| Promotion of an innovation system approach of LRED**

- Less selection of motivated target group, less bottom-up
- Agriculture focus
- Provision of generic finance for farmers etc.
- Set up of generic institutions like farmer centres
- No selection of motivated target group
- Livelihood approach

- Promotion of LRED initiatives with motivated businesses and stakeholders
- Focus on rural and industrial development
- Linkage approach: Making use of what support is present
- Strong bottom-up approach
- Market and competitiveness-driven approach

- Promotion innovative businesses in traditional and new sectors
- Promotion of urban and rural innovation-networks with specialists and local businesses and institutions
- Linking bottom-up and intelligent incentive-driven top-down approaches
- Set-up of more specialised innovation institutions based on concrete demand and potential (start with explorative small experiments)

Based on the profound experience with innovative local and regional bottom-up economic development experiences, it is now required in Armenia to not only overcome traditional approaches but also to move one step further to promote the identification of innovative businesses and the set-up of a local innovation system that is based on the promotion of innovative products, processes and business models of enterprises.
5.5. A methodology to prepare an action-oriented diagnosis of the metropolitan region

Based on lessons learned from the success story and observed literature as well as on the tested hypothesis we are suggesting the following statement for the Yerevan metropolitan region to overcome the currents constraints and achieve to the desired outcome.

5.5.1. Integrated bottom-up and top-down management approach

Establish bottom-up and top-down policy making and governing approach, a multi-level intervention approach linking network interventions at the business (or micro), institutional level (meso) and the policy level (macro). It's crucial to put stress on the local people as they possess knowledge that was generated during centuries via experience transmitted from generation to generation like knowledge transition pipelines. They know the region the best with their gaps and assets and play key role in activities occurring there. On the other hand professionals who are working on the top level of the institutions possess academic knowledge and skills to solve the existing problems. In regards to this it is crucial that top-down and bottom-up management system carry out emphasizing on the strong dialogue and collaboration between local people and institutional authorities. For the long term development it’s significant to link the economic framework with the urban planning. Since the region will recognize its excellence components and will set up interconnected top-down and bottom-up dialogues and economic and urbanism nexus they will be more capable to establish common strategic vision and attract more investments and implement strategically relevant decisions and project (See figure 5-5). Otherwise, donor organizations and investors are operating in the region dictating and adapting their own vision instead of recognizing and going forward to the competitive advantages toward adding a value on the existing assets.

Figure 5—5 | innovation system management approach

Top-down policy incentives and strategies

Local bottom-up promotion
5.5.2. Knowledge-based economic development

It is a generally accepted fact that at the current stage of development of the society research, development and innovation (RDI) and a high concentration of educated people can become determining factors for sustainable economic development, increasing the country's competitiveness in international market and key to solving many social problems. In addition, the high-level human capital needs to be complemented by other factors like a broadly talented workforce and a base of economic activities, which are equally important for regional growth in a tolerant, open-minded, and diverse climate. The addition of tolerance to well-known parameters of economic growth is the creative people that is focused on aspects that have to do with the inclusion and well-being of people. In sum, this approach focuses on three related elements: a good people climate attracts and retains creative and talented people, who, in turn, fertilize the ground for a competitive business climate, and, finally, a good and competitive business climate brings about economic growth. Figure 5-6 presents the argument in schematic form. The tolerance parameter covers a broad range of elements that influence the milieu and atmosphere of a metropolitan region.

In the case of Yerevan tolerance has to do with low entry barriers, for instance, openness toward newcomers and open-mindedness toward different cultures and different norms that can help region compete for talent keeping in mind that open-mindedness makes it easier for newcomers and that people who differ from the norms can be creative and innovative. Businesses with knowledge-intensive approach move to the region with a high concentration of talents and creative workers. As it was already discussed in Amsterdam case, these creative people known as the creative class will impact on the minds of politicians and urban plan-
The linkage between business policies with educational and cultural policies will build a powerful coalition among three major levels local, regional, and national. A creative class climate can be seen as an additional ingredient to a business climate, in that the presence of human capital and talent is key factor for attracting and developing new high-technology and creative industries, urbanization economies, and consequently fostering the economic growth of Yerevan metropolitan region.

As it was mentioned before in this research Armenia suffered from brain drain and this phenomenon is still continuing to happen nowadays in the country. A significant change may occur in Armenia if the representatives of creative class over the globe both Armenians and foreigners will create newly skills, taste for innovation and networks. There are three specific advantages firstly, the use of volunteer return of expatriate professionals can free up substantial resources for other development needs; secondly, the transfer of knowledge occurs faster because less adjustment time is needed, and thirdly expatriates ‘connections and interest in the homeland foster the creation of networks and follow-up mechanisms. By retaining contacts at home and being familiar with the cultures of origin, members of the diaspora most effectively bridge the gap between the developing and the developed worlds (Lowell and Gerova, 2004).

The ICT-based ‘social-informatics’ approach has been promoted to convert brain drain into brain gain. Perhaps the most well-known are the International Migration program of UNESCO, who has as a high priority the strengthening of capacity, sustainability and effectiveness of diaspora networks to promote brain gain through the use of ICT. With the use of information and communication technologies (ICT), this trend can be reversed to brain gain - considering the expatriate skilled population as a potential asset. With the facilitation of information exchange, technology transfer and business expansion migration we can bring new development dynamism and link the country of origin to the global economic system. The crucial strategies for achieving this are to (1) use of ICT to contribute to the promotion of brain gain, (2) promote mechanisms and effective tools to improve cooperation links and knowledge sharing, (3) strengthen diaspora networks, and (4) improve access to ICT for diaspora populations. UNESCO’s Diaspora Knowledge Network (DKN) project was initiated in 2005 to address these goals and to develop both quantitative and qualitative measures of social solidarity. (Grossman, 2010)

5.5.3. The innovation iterative process for local economic development

We figure out a concept that should prepare favorable land and friendly environment for the innovation system management in Yerevan. In order to grow businesses in metropolitan region, a supportive environment is required, which runs beyond macroeconomic stability or management and entrepreneurship capacities at the business level. Most competitive regions and locations followed interventions at different levels and thus created synergies.

The urban and economic planners together with institutional authorities will have to create space where public and private sector representatives will think together, come up with innovative ideas and experiment them, solve basic problems. The figure 5-8 show the innovative iterative process to input short-term quick wins to gain trust,
skills and experience, which in its turn will outcome deeper appraisals, medium to long time sustainable initiatives and strategy development for the region.

Figure 5—7 | The innovation iterative process approach

The approach interprets innovation system management as a process governed by motivated stakeholders or innovators. It emerges from an iterative process of implementing concrete initiatives together with the public and private stakeholders like urban and economic planner, chamber commerce, NGOs, local businesses and the respective learning processes.

Generally, universities and research centers are the centers for exploratory and exploitative research-based innovation. According to Cooper among universities with research activities, a distinction may be made between so-called think-tank universities and do-tank universities (Cooper, 2009). For think-tank universities, their criterion is academic excellence. They serve the advancement of science and, in doing so. Public funding is crucial to this type of university. The role of do-tank universities is different. The main research target of this type of universities is to serve appropriately the emerging need of industry. Their research activities are applied and/or practice-based. Cooper stated that do-tank universities are not leaders but followers of industrial development. This statement is true in advanced countries, where domestic industry has a key role in creating demand and providing private funding for do-tank universities, which tend to follow industrial development. (Inzelt, 2015), (Cooper, 2009). Yerevan metropolitan region is reach in think-tank universities, but to overcome the mismatch between industry and education sector they will have to emphasize on the do-tank universities in order to keep the contact between mentioned two sectors.

I-hubs can be seen as connect and foster impact projects between social entrepreneurs/innovators in Armenia and their counterparts within the Armenian Diaspora and abroad, as well as between do-tank universities and industry. Strong leadership is a key element for the success of an iHub. It should be based on public-private partnerships and comprises innovative urban policies and redevelopment strategies and flexible, non-continuous development phasing. Good physical and virtual connectivity will be essential for social, institutional
and territorial interaction within the region, fostering its integration into the city and the overall city-region. Interaction among the different environments – clustering, talent, built, cultural and natural – stimulates the dynamics of the zone. Besides the presence of knowledge and creative class, the environment tends to be diverse, multicultural and vibrant, with the presence of foreign talents. A mixed-use environment combining residential, working, learning, shopping and entertainment functions is one of the main characteristics of these hubs, fostering the emergence of a good place to live, work, learn and play. The function of this hubs will be the promotion of business networks for exporting processed products. Linking producers to supermarkets in Yerevan metropolitan region and improving their information and training services. The design of a pedestrian zone by the municipality for SMEs and least but not last the promotion of identified start-up opportunities with local training institutions, etc.

5.5.4. Promotion to the competitiveness and life quality

Base on the analysis of the systematic competitiveness of the two success stories we come to the conclusion that most competitive regions and locations followed interventions at different levels. Yerevan metropolitan region should go beyond macroeconomic stability or innovation system management and entrepreneurship capacities at the business and urban environment in order to increase its competitiveness in a systematic direction and created synergies.

1. At the local, regional or national policy level (macro level), including e.g. Eliminating bureaucratic obstacles for firms or promotion policies

2. At the business (micro) level promoting entrepreneurship, start-ups and increasing competitiveness and innovation capacities in existing firms. Based on lessons learned the support of individual businesses in an isolated way does not have a high impact. Whereas, supporting them in a systemic way within clusters or in networks with service providers may increase its impact

3. At the institutional (meso) level quality infrastructure for business associations, economic development agencies or departments, institutes or support institutions like training or technology institutes,

Steps to Improve Competitiveness

- Shifting from Production-focused to Market-focused Strategies
- Appeal to a non-diaspora, Global Market
- More Sophisticated Company Strategies and Capabilities
- Industry Leadership and Cooperation
- Effective Public-private Dialogue
- Investment in Knowledge and Skills

Simon Kuznets in his report called "National Income,1929-1932" (Kuznets, 1934) presented that the economic competitiveness of a country is measured by the Gross Domestic Product, (GDP). GDP has defined and shaped our lives for the last 80 years. It is crucial to understand how GDP came to dominate our lives and we should note Kuznets’ report was delivered at a moment of crisis. At that time the U.S. economy was
plumming into the Great Depression and policymakers were struggling to respond. But in 21st century we need other measurement of the welfare of the nation. The Social Progress Index SPI is a measure of the well-being of a society. According to the Social Progress Index the measure of what can be defined as a good society based around three dimensions. The first one is, does everyone have the basic needs for survival: food, water, shelter, safety? Secondly, does everyone have access to the building blocks to improve their lives: education, information, health and sustainable environment? And third one, does every individual have access to a chance to pursue their goals and dreams and ambitions free from obstacles? Do they have rights, freedom of choice and freedom from discrimination and access to the world's most advanced knowledge? We don't measure how much a country spends on healthcare, we measure the length and quality of people's lives. We don't measure whether governments pass laws against discrimination, we measure whether people experience discrimination. (Green, n.d.) Analysis shows that the countries that have high GDP are most of times low in SPI. But this doesn’t mean that GDP is not important. We have to remember that GDP is a measurement tool invented in the 20th century to address the challenges of the 20th century. In the 21st century, we face new challenges: ageing, obesity, climate change, and so on. To face those challenges, we need new tools of measurement, new ways of valuing progress. Innovation and systematic way of thinking and acting will be a tool to achieve that index. People need to create, to innovate and experiment in order to feel themselves important and to have a sense of belonging at the region where they live, work and play.
6. Chapter: Conclusion

From the analysis of the related bibliography and success stories of the Netherlands and Portugal we identified some preconditions and key factors that are crucial for the development of a strategy in order to achieve the desired outcome of the implementation of an innovation system management in Yerevan. Nevertheless, to achieve these outcomes we need to fulfil some hypothesis in meta and macro levels, that are also interrelated with regional and local ones.

The most significant aspects that I conclude is that the existing constraints in macro and meso levels should be overcome to create friendly environment for the enterprises and encourage the new innovative experiments in meso and micro level. The current centralized and isolated institutional framework must be resolved to allow that an innovation system management could be fulfilled in Yerevan metropolitan region. The current constraints are more in the political domain than technical or economic ones.

The other aspect that is important is that municipalities and regional authorities has a crucial role in creating quality of environment and urban life, openness and accessible infrastructures. They can manage this conditions to create good environment to attract more talents and investments. In regional level there are potential assets that can be developed. The investment in the education and capacity building of the local people today will potentiate economic growth in the region, via attracting more talents and investments.

Finally we can already identify few sectors that can be seen as excellent assets of the region, and which can be clustered. If the skilled labor and new job opportunities will concentrate in one cluster based on the excellent component of the region they could positively impact on the competitiveness and life quality of the people. The following points will potentiate the establishment of an innovation system environment;

- Subsidiarity: empowering the local people to address the challenges via capacity building and integration of new talents
- Establish top-down and bottom-up innovation system management mechanisms
- Sustainable objectives: have long-term strategic projects to have capacity to be structural relevant, to have capacity to create competitive advantage for the region. Strategic projects should be based on strengths.
- Trust and collaboration: the institutions exist and the policies are well written but they are isolated and are not working collaboratively towards a common goal
- Form follows function using what Yerevan has: pointed out what are the cultural assets that can be seen as clustering benchmark
- PPP-participation: Local people are the only unit that makes the system work.
- Make market work: create equal opportunities for all the innovative enterprises and focus on the demand and existing assets
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ANNEXES

Annex A: Armenian's education system
Annex B: State organization in urban planning and economic development

<table>
<thead>
<tr>
<th>Institution</th>
<th>Institutional Role</th>
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<tbody>
<tr>
<td>President</td>
<td>The RA President is the head of the state, who watches over upholding of the RA Constitution, and ensures the regular functioning of the legislative, executive and judicial powers.</td>
</tr>
<tr>
<td>Judiciary</td>
<td>In the RA, justice is exercised only by courts in conformity with the Constitution and laws. Courts of first instance of general jurisdiction, courts of appeal and the Court of Cassation, as well as, in cases provided by law, specialized courts operate in the Republic of Armenia. The highest judicial instance, in matters other than constitutional justice, is the Court of Cassation, which is called with ensuring the uniform application of law. The powers of the Court of Cassation are set out in the Constitution and the law.</td>
</tr>
<tr>
<td>National Assembly</td>
<td>The legislative power is exercised by the RA National Assembly. Among other powers of the National Assembly specified by the Constitution, the latter approves the state budget, oversees the state budget execution, as well as the use of loans and credits received from foreign states and international organizations, if the opinion of the Control Chamber is available, considers and approves the annual budget execution report, and upon the recommendation of the RA Government defines the administrative division of Armenia (including RA administrative units, i.e. the list of marzes and communities, settlements included in each of them, territories and boundaries of RA Communities).</td>
</tr>
<tr>
<td>Executive</td>
<td>The Government makes and carries out the RA domestic policy, while the foreign policy is made and implemented in conjunction with the RA President. The Government, in the manner prescribed by the RA Constitution, submits its Program to the RA National Assembly for approval, submits the State budget proposal for approval, secures the state budget execution, submits a report on execution to the National Assembly, manages the state property, carries out uniform state financial, economic, credit and tax policies, carries out the state policy in science, education, culture, health, social security and nature protection, ensures that the public order is upheld, implements other operations and exercises other powers defined by the Constitution and the laws.</td>
</tr>
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| Ministry of Finance (MOF) | RA MOF is a republican body of executive power, which makes and implements the RA Government policies in the areas of raising revenue for the state and public financial management. It plays a key role in Public Financial Management (PFM) for the Yerevan Community. Below are indicated those functions of RA MOF that have a direct bearing on the Yerevan community’s PFM system.  
• To decide on and set key macroeconomic targets, to conduct macroeconomic planning, macroeconomic reviews and analyzes; to develop and implement the fiscal policy in coordination with the RA monetary policy;  
• To develop medium-term and strategic policies for tax and other revenue; to develop tax and customs administration methodology;  
• To organize activities in the budget process for the forthcoming year, including to prepare and issue methodological instructions and guidelines to local governments for making estimates necessary for community budget formulation, bids for budget funding, forms of estimates and submission procedures for operating costs of budgetary institutions; to regulate the relationships between the RA state and community budgets;  
• To organizing cash management and expenditure funding, to organize execution of community budgets; to provide methodological guidance for normative regulation of relationships with execution of community budgets;  
• To arrange the entry and spending of cash managed by the community through the treasury single account of the competent authority; to exercise ex-ante control over payments made by community institutions during the execution of community budgets;  
• To record planned summary community budget indicators and outturn for a given year;  
• To develop the internal audit methodology, to ensure that a system of training and continuing professional development is in place in the area of internal audit;  
• To coordinate drafting activities of procurement related legal acts and to accept or submit them for approval, methodological guidance for the procurement process and to provide methodological support to clients in organizing the procurement;  
• To ensure that there is a system of professional training of coordinators of procurement of clients, continuing development and qualification evaluation in place; to issue the list of qualified procurement professionals (persons);  
• To organize the issuance the official procurement bulletin; |
### Ministry of Territorial Administration (MTA)

MTA plays a key role in local development, municipal service and state oversight over community operations. Below are indicated those functions of RA MTA that have a direct bearing on the PFM system of Yerevan Community.

- State policy-making in municipal service;
- Methodological guidance for and oversight of the human resources management of the staff of community heads, in the manner prescribed and in specified cases, carrying out official investigations, maintaining the staff reserve of the municipal service and the ledger of municipal servants, monitoring of the training of municipal servants, appealing to the court against actions and/or inaction that contradict the requirements of RA law,
- Carrying out legal oversight of own and delegated (by the state) powers of the community head;
- Monitoring RA community budget execution;
- Providing official clarifications and advice on own and delegated powers upon the request by local governments;
- Carrying out the powers reserved to RA regional governors by law and other legal acts in Yerevan.

### Communities

A community is the public residing in one or several localities; in addition, the community is a legal entity with ownership and other property rights. Local governance is exercised in RA communities, which is the right and ability of the community to address matters of local concern for the welfare of residents at their own responsibility. There are 915 communities in the RA. The land located within the administrative boundaries of the community other than the land for state needs and lands that belong to natural persons and legal entities is owned by the community. The communities formulate their budget independently, while the sources of community revenue are specified by law. The law specifies such sources of funding for communities, which ensure that their powers are exercised. Communities introduce local taxes and duties within the limits provided for by law. The powers delegated to communities by the state must be funded from the state budget. The local governance right of the community is exercised by local governments, the Council of Aldermen and the Head of Community, who are elected for a four-year term as prescribed by law. The Council of Aldermen of the community manages the community property in the manner provided by law, approves the community budget presented by the Head of the Community, oversees budget execution, introduces local taxes, duties and charges and bounding legal acts within the territory of the community.
Annex C: The territorial institutions of Yerevan and their role and competences

<table>
<thead>
<tr>
<th>Institution</th>
<th>Institutional Role</th>
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| **The Council of Alderman** | Alderman  
The Council of Alderman of the City of Yerevan is the highest body of local government in Yerevan. Among other powers, the following powers are reserved to the Council of Aldermen by law:  
• To elect a mayor and oversee the mayor’s activities;  
• To approve the charter, structure, staff list and pay rates assigned to positions for the municipality, administrative districts and entities in their jurisdiction;  
• To set the rates of local taxes, duties and fees for services delivered by the community;  
• To approve one year, four-year, and longer-term and special plans of development of Yerevan;  
• To take decisions on credits, and loans and attract other borrowings as defined by law;  
• To take decisions on Yerevan budget, its amendments, oversee budget execution and mayor’s annual report;  
• To approving the annual plan for providing the property owned by Yerevan for use and disposing of it. |
| **The Mayor of Yerevan** | The Mayor of Yerevan is the local government body managing the activities of Yerevan Municipality. The law specifies the legal acts adopted by the Mayor and the procedure for adopting them. Among other powers, the Mayor also has powers:  
• To develop and submit to the Council of Aldermen for consideration the documents (including the budget, development plans and budget execution reports) passed within the powers of the Council of Aldermen listed above;  
• To manage Yerevan budget resources and their purposeful use;  
• To oversee the activities of the Chief Financial Officer and the secretary to the staff of the Municipality;  
• To organize collection of property and land taxes, local taxes, duties and fees for services delivered by them, collection of receipts from letting and disposal of property owned by Yerevan and oversight as provided by law and apply sanctions to the people failing to pay them in the manner prescribed by law;  
• To ensure that there is an internal audit system in place at the municipality within the framework of legislation. The Mayor organizes his activities through the Deputy Mayor (deputies), Heads of administrative districts, the Chief Architect of Yerevan, Advisors, Aides to the Mayor, the Press Secretary and the staff of Yerevan Municipality. |
| **Finance Department** | Department  
Supports the Mayor of Yerevan in exercising the powers in the area of finances reserved to the Mayor by law, including: |
| Revenue Recording and Collections Department | Supports the Mayor of Yerevan in fully and effectively exercising the powers in the area of revenue reserved to the Mayor of Yerevan by law, including:  
- Organizes and regulates property and land tax recording and collection, as well as organizes recording and collection of local taxes and duties, fees for services delivered by them, receipts from letting property and land owned by Yerevan;  
- Participates in the process of Yerevan budget revenue, regulates and supervises the recurrent revenue provision in a fiscal year;  
- Submits an annual report to the Council of Alderman and Mayor of Yerevan on budget revenue. |
|---|---|
| Procurement Department | Serves as the structure for organizing and coordinating the process of purchasing goods, works and services under the Yerevan budget and is responsible for:  
- Ex-ante control of the procurement process,  
- Preparing procurement plans and changes thereto and submitting to the Mayor for approval;  
- Reviewing specifications of items submitted during the procurement process and ensuring that they comply with legislative requirements; |
| Internal Audit Department | This department is responsible for carrying out the internal audit in Yerevan Municipality (including administrative districts) and entities within its jurisdiction (SNCOs, CNCOs and Joint-Stock Companies). It operates directly under the Mayor of Yerevan and reports to the latter and to the Internal Audit Committee. It is governed by the RA legislation, its Charter, internal audit standards and rules of conduct in its activities. All functions of the organization related to financial management and control are subject to internal audit. The Head of the internal audit unit and the internal auditors have no right to implement functions or activities in the organization other than those related to the internal audit. Internal auditors in communities and institutions within their jurisdiction, are municipal servants and qualified auditors simultaneously, who are appointed or dismissed from the position, as well as subjected to disciplinary fines by the head of the organization. The internal audit is based on the strategic plans and annual programs for providing assurance and advisory services to the management of the organization. |
| Administrative Districts | With a view to carrying out efficient local governance and territorial administration in Yerevan and making the local government more accessible for the public, the City of Yerevan has been divided into 12 administrative districts (Ajapniak, Avan, Arabkir, Davtashen, Erebouni, Kentron, Malatia-Sebastia, Nor Nork, Nork-Marash, Nubarashen, Shengavit and Kanaker-Zeitun). The staff of administrative districts represents dedicated units of Yerevan Municipality exerting the Municipality’s powers in the territory of administrative districts of the City of Yerevan. |
| External Audit | The RA laws on the Local Government in the City of Yerevan and the Budget System Law establish that the Council of Alderman of Yerevan approves the budget of the city of Yerevan and oversees the Yerevan budget execution. As part of that function, Council of Aldermen of Yerevan is authorized to review any budgetary action, effectiveness and quality of implementation of activities and request reports on executed expenditure. With a view to carrying out effective oversight of Yerevan budget, the Council of Aldermen must engage audit services in the manner prescribed to be paid from the Yerevan budget. Each year the budget execution report for Yerevan is accepted by the Council of Aldermen only if there is an independent audit opinion, with |
| Chamber of Control | The Chamber of Control is an independent body overseeing the use of budget funds and the state and community property. By virtue of law, the RA Chamber of Control has wide powers in terms of the external oversight of community activities. Among other powers reserved to it by law, the latter is also responsible for overseeing community budget outlays, as well as performing compliance and performance audit of functions of bodies securing community budget receipts, overseeing how the community cash management and expenditure funding is organized, and management of community property (including, intellectual property, cultural values), use (disposal, privatization, letting out and providing for free use), development plot of land, trust management and concession. The Chamber of Control operates based on annual plans approved by the decision of the RA National Assembly. After the end of each year, but not later than within 3 months, the Chamber of Control submits an annual report to the RA NA containing progress reports on all programmatic items in the annual plan. The annual activity plan of the Control Chamber is discussed in the National Assembly without taking a decision. The Chamber of Control conducts oversight in form of monitoring, reviews, and analyzes and may carry out the following types of oversight: financial, compliance, performance and environmental. During its activities the Chamber of Control is free to choose the form and type of oversight, except when the law specifies a specific type of audit for the subject of oversight. The RA state and local governments, businesses, officials and citizens have right to appeal the actions of the Chamber of Control administratively and/or in the court. (“Ficheiro,” n.d.) |
Annex D: The competitiveness diamonds of the chosen industries.

Figure 1. Apparel Industry Diamond

**Factor Conditions**

**Basic (medium)**
- High land transport costs

No local production of inputs; landlocked country requires 2 way transport
  - Oversized, outdated plant and equipment
  +/- Some skills and networks remaining from pre-independence
  • Available quota, at least until 2005
  • Some smaller, more efficient plants
  • Available, low-cost labor

**Advanced (low/medium)**
Lack of investment in modern plant and technology
+ Some design and branding capability.

**Firm Strategy, Structure, and Rivalry (low/medium)**
Largely seeks production contracts based on price competition or Diaspora connections
Some use of local quota for foreign producers
+ Smaller producers attempting to design and brand

**Demand Conditions (low/medium)**
- Some domestic demand
+/- Important CIS market, especially Russia; but open competition from other producer countries
Market requires quality, but is very cost conscious
Diaspora provides some contract opportunities

**Organization, Cooperation, and Supporting Organizations (low)**
Few functioning linkages within the industry
Absence of effective service from linkage with skills providers

Role of Government (low)
- ADA is interested in promoting the sector
**Factor Conditions**

**Basic (high)**
- Little land area for expansion of agricultural production
- Reputation for tasteful produce free from the use of chemical fertilizers. Strong reputation within the CIS for good quality.
- Inexpensive farm and factory labor
- Favorable climate for horticultural production and for early-season fruits and vegetables in Southern Armenia.

**Advanced (low/medium)**
- Lacking management or marketing skills
- Products are of low value added
- Lack of high quality local jars and bottles
- High transportation costs, especially through Georgia
- Lack of mechanized farm equipment
- Inefficient use of agricultural land - small plot size
- Lack of a certified laboratory for ISO and HACCP certification
- +/- Increasing, but still rare use of ISO and HACCP certifications
- +/- Good technical skills
- Several firms manage the cold chain effectively

**Demand Conditions (medium)**
- Little demand pull marketing.
- Limited brand recognition.
- Little knowledge of international distribution chains
- +/- Dependence on the Diaspora market and old contacts in the CIS markets.

**Organization, Cooperation, and Supporting Organizations (low/medium)**
- Few effective associations in the sector.
- Little, or no, consolidation of cargo shipments.
- Little contact between industry and the institutions of higher learning to produce graduates that can be of use to the sector.
- No accredited certifying capability (ExLab is qualified, however)
- +/- Linkages starting to form – e.g. collection points, rural to market transporters, processors, makers of packaging material, transporters of processed products, marketers, Individual firms have solid linkages with suppliers and distributors

**Role of Government (high)**
- Government controls or regulations do not seem to be a part of any obvious problem
- +/- Like all exporters, the food-processing sector is exempt from VAT on imported and exported items

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**Figure 2. Food Processing Industry Diamond**

**Firm Strategy, Structure, and Rivalry (low/medium)**
- Export strategy is geared to the Armenian Diaspora market and distribution networks
- Few branding strategies in place, and companies do not make use of appellations of origin to increase brand appeal
- Organic certifications are not actively sought to bolster product claims
- Several companies have sound, relatively sophisticated strategies based on quality

**Demand Conditions (medium)**
- Little demand pull marketing.
- Limited brand recognition.
- Little knowledge of international distribution chains
- +/- Dependence on the Diaspora market and old contacts in the CIS markets.

**CIS market recognizes Armenian produce as being of good quality.

The Diaspora represents an interested specialty markets.

CIS represents a large potential for market."
Figure 3. Jewelry Industry Diamond

Firm Strategy, Structure, and Rivalry (low/medium)
Little image building or differentiation for Armenian producers
Some jewelry producers have developed production relationships and alliances with distinguished wholesalers and retailers.
Trade show attendance has been critical for jewelers for both market contacts and keeping up to date with trends and styles.

Demand Conditions (low/medium)
Few linkages with retail, little knowledge of consumer tastes and trends in design
Significant Diaspora presence in the international industry facilitates interest in Armenian production.
No significant reputation for quality, reputation, or design
There is a large potential market, for contract production of jewelry for large distributors/retailers.

Role of Government (high)
+ The GOA supports the development of the sector.
+ It is currently writing a new gems and jewelry law.
+ The sector has been exempted from all forms of VAT.

Factor Conditions

Basic (medium)
• Few indigenous raw materials, heavy reliance on imported raw materials
Transport costs and issues are not a barrier.
Low-cost labor

Advanced (medium/high)
• Little formal training available to supply the industry
• There is no internationally recognized skills or professional certification capability
• Local design capability is not highly advanced
+/- Strong history of jewelry production, with remaining skills and reputation

Demand Conditions

Organization, Cooperation, and Supporting Organizations (medium/high)
Little collaboration thus far within the jewelry industry, although there are three associations
Little cooperation thus far to establish and promote quality and skills standards
Factor Conditions

Basic (medium)
- Armenia does not have diamonds, must import raw materials
- Transport costs and issues are not a barrier
- Low-cost labor

Advanced (low/medium)
- Little formal training available to supply the industry
- There is no professional certification capability
+ Companies have invested in in-house training and apprenticeships.
+ Armenian has very good, skilled cutters, quality of cutting is high
+ Armenia has a substantial Russian quota for diamonds, has established other sources

Demand Conditions

(low/medium)
- Few direct linkages with retail sales, or with customers
- Little knowledge of value factors for the customers (e.g., security, image)
+/- Strong Diaspora presence in international markets provide interest and basis for investment in Armenian production.

Organization, Cooperation, and Supporting Organizations

(low/medium)
- No useful collaboration with technical or training institutions. Solutions are on an individual company basis
- No industry-wide vision yet established
+ Demonstrated ability to meet, share information, undertake joint initiatives
+ Some linkages between diamond processors and the precision engineering and jewelry industries
+ Some local production of cutting equipment

Role of Government

(medium/high)
+ The GOA supports the development of the sector
+ It is currently writing a new gems and jewelry law
+ The sector has been exempted from all forms of VAT
Figure 5. Information Technology Diamond

Firm Strategy, Structure, and Rivalry (low/medium)
- Little direct contact with customers or markets.
- Little direct service provision to customers.
- Product/service range has been restricted by the communications monopoly
  + Firm strategies are based on quality and low cost.

Factor Conditions

Basic (medium)
+ Relatively low wage rates.
+ Immunity to landlocked situation
+ Relatively few raw material import requirements.
+ Sound basic literacy and skills.

Advanced (low/medium)
- Universities and technical schools are not providing the skills required by business.
- +/- Armentel monopoly is a costly burden, however, this monopoly will soon end.
+ Relatively well trained workforce.
+ Some actions have been taken to improve training.

Demand Conditions (medium/high)
+/- Heavy reliance on Diaspora connections for marketing and customer learning.
+ Recent increased FDI years in the form of vertical integration.
+ Fast growing international demand for IT services.
+ Growing, but small local demand for IT services.
+ Diaspora network remains interested in outsourcing and investment, and is well-connected in international markets

Organization, Cooperation, and Supporting Organizations (low/medium)
- Training providers have insufficient capacity and focus on industry needs.
- Lack of certifying capability in-country.
+ Two active associations already support the sector.
+ Firms have shown that they can cooperate and work together, including subcontracting.

Role of Government (medium/high)
+ Extremely supportive from the highest levels of government.
+ A pioneer itself in the application of computers and the Internet, e.g., e-government, e-visas, etc.
**Figure 6. Tourism Industry Diamond**

**Firm Strategy, Structure, and Rivalry (low/medium)**
- Many players in the market compete by offering low prices, quality suffers from price pressures
- Little forward integration – only a few companies are directly represented in key markets
- Virtually no market targeting outside of the diaspora
+ Some participation at trade shows and efforts to sell Armenia as a destination

**Demand Conditions (low)**
- Little customer learning outside the diaspora market
- Inconsistent contact between Armenian tour operators and potential clients abroad
- Little market research conducted by or available to tour operators
- Armenia is largely unknown as a desirable tourist destination outside of the diaspora
- The numbers of tourists interested in specialized or unique experiences is large and rising

**Factor Conditions**

**Basic (medium/high)**
+ Interesting culture, history, and hospitality traditions
+- Many natural and historical attractions
+- Location: future - a regional hub; present - blockades and regional instability

**Advanced (low/medium)**
+ Partial refurbishment of tourist attractions, road construction
- Few attractions have been developed and maintained
- Students not prepared for careers in tourism; little contact between industry and educational facilities
- Inadequate lodging facilities outside of Yerevan
+- No quality rating system (classification of tour operators, guides, and hotels); new tourism law will partially address this
+- Experienced guides available but more expertise needed for niche markets

**Organization, Cooperation, and Supporting Organizations (low/medium)**
- Discord between ATDA and private sector, unclear roles
- Little collaborative linkage between training providers the industry
+ Some pooling of resources at trade shows and efforts to sell Armenia as a destination

**Role of Government (medium/high)**
+ Openly supportive for many years
+ Removed the sector from paying VAT on imported goods
+ Instituted e-visas for tourists
Figure 7. Yerevan Brandy Company Diamond

Firm Strategy, Structure, and Rivalry (medium/high)
+/- YBC provides skilled labor through on the job training.
+/- Several competitors; some of them low-quality imitations
+ Increasing differentiation, emphasis on premium quality
+ Integrated strategy: sources raw materials, while distributing its own product to wholesalers
+ Maintains strong quality control
+ Beginning to make use of Pernod/Ricard distribution network

Factor Conditions

Basic (medium)
- Increases in production limited by availability of quality grapes
+/- Good supply of raw materials
+ Product recognized for quality and tradition

Advanced (medium/high)
- Unable to use the “cognac” name outside of the CIS

+ Sound, forward thinking, strategic management
+ YBC actively ensures access to grape supplies through contracts and investment in productivity

Demand Conditions (high)
+ 90% brand recognition in Russia (main market)
+ 55% of export market.
+ Armenian and Soviet diasporas recognize and value product
+ Investigating new markets

Organization, Cooperation, and Supporting Organizations (low)
- Little interest in collaboration or associations thus far, despite YBC attempts to interest the industry.
- Little basis for cluster linkage.
**Factor Conditions**

**Basic (high)**
- + Centuries old tradition of winemaking
- + Heirloom grape production provides for specialized niche market
- + Proper climatic conditions in most years

**Advanced (low)**
- - Small land size precludes use of machinery in most cases, some consolidation of land possible.
- - Traditional technologies for grape growing and fermenting result in unpredictable quality
- - Root stock susceptible to phylloxera
- - No domestic production of wine bottles, imported bottles costly

**Demand Conditions**

**Firm Strategy, Structure, and Rivalry (low/medium)**
- - Bulk of production is low quality, low cost wine
- +/- Some investment in developing knowledge, promotion and presentation of finer wines, primarily for knowledgeable domestic and diaspora markets
- + Increased numbers and investment in wineries

**Figure 8. Wine Industry Diamond**

**Demand Conditions (medium)**
- - Strong competition from other international, low quality producers
- + Long-term CIS market for inexpensive wine
- + The Armenian diaspora demand for Armenian wines consumed for holidays and special occasions

**Organization, Cooperation, and Supporting Organizations (low/medium)**
- - Little indication of linkage or interrelationships amongst firms
- - Limited formal, technical training opportunity
- + Existing industry association