Faculty of Engineering and Technology

Assessment of the Higher Education Sector Needs in Palestine

(In the context of the National Spatial Plan 2025)

(تقييم حاجات التعليم العالي الفلسطيني ضمن إطار المخطط الوطني المكاني)

Submitted by:

Jumana Elayyat

(1125131)

Supervised by:

Dr.Shadi Ghadban,

Dr.Ahmad Saleh,

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Committee member: Dr. Naem Abu-Alhummus - member.

Committee member: Dr. Ali Abd Al-Hameed - member.

This Thesis was submitted in partial fulfillment of the requirements for the Master's Degree in Urban Planning and Landscape Architecture from the Faculty of Engineering at Birzeit University, Palestine.

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Defense committee:

Dr.Shadi Ghadban . . ..……

(Chairman)

Dr.Ahmad Saleh ……

(Member)

Dr. Naem Abu Al-hummus …….

(Member)

Dr. Ali Abd Al-Hameed ……..

(Member)

Date of defense:

January 2016

Dedication

To my father who always encouraged me to reach the highest level of success.

To my mother who taught me the meaning of patience.

To my husband (Eng. Amjad Lahlouh) who always supported and helped me.

To my little angels Leen, Yamen,Tala, Jana.

To my country Palestine.

I dedicate this work

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List of Abbreviations

ARIJ	**Applied Research Institute Jerusalem**
EACEA	**Education, Audiovisual and Culture Executive Agency**
GDP	**Gross Domestic Product**
HE	**Higher Education**
HEE	**Higher Education Enrollments**
FTS	**Full Time Students**
HEIs	**Higher Education Institutions**
MEHE	**Ministry of Education and Higher Education**
MoP	**Ministry of Planning**
NSP	**National Spatial Plan**
PCBS	**Palestinian Central Bureau of Statistics**
PLO	**Palestine Liberation Organization**
UNRWA	**United Nations Relief and Works Agency**
UNSCO	**United Nations Special Coordinator Office**
WB	**West Bank**
WBG	**West Bank and Gaza**

Abstract

The study discusses the capacity needs of the Palestinian Higher Education sector in the year 2025 in the context of the National Spatial Plan. This study aims to explain the capacity needs components that achieve the sustainable development of the higher education sector through proposed a new strategic framework for the spatial distribution of the higher education enrollments among the Palestinian HEIs depending on the availability of space on these institutions. The increasing of population affecting directly the increasing of the enrollments in the Palestinian context and the current Higher education facilities will not accommodate the high demand for the higher education in the upcoming years.

The study tries to solve problems that facing the higher education in Palestine, which is related to the physical learning environment and the spatial distribution, such as, the unbalanced of the distribution of the Palestinian HEIs among the Palestinian governorates, the students overcrowding. It is also handling with the incompatibility between the higher education physical planning and the surrounding urban development through setting a framework for the future planning of the higher education sector.

The research plan based on three main folds of data that are: field work, desktop study and theoretical analysis. The methodology is based on descriptive and analytical approaches, in which qualitative and quantitative approaches are applied. The main result of the research is an estimation of HE enrollments and

the needed spaces for them in the year 2025 in the context of the National Spatial Plan, in addition the allocation of the needed spaces is proposed in this research. The study also tries to propose theoretical framework for the improvement of the HE sector.

In addition, the research recommends that the location of the higher education institutions should be considered in the early planning stage. The future enrollments number and their trends should have special attention when planning for new HEI. It also recommends that the provision of the services and student's hostels are a main concern in the rural campuses.

ملخص البحث

يسعى هذا البحث إلى تقييم القدرة الاستيعابية لمؤسسات التعليم العالي الفلسطيني وذلك لتلبية الطلب المتزايد للسكان على دراسة التعليم العالي حتى عام 2025 وذلك ضمن إطار المخطط الوطني المكاني، كما تهدف الدراسة إلى وضع إستراتيجية تقييميه يتم بناء عليها تحديد الفراغات المكانية التي يحتاجها الطلبة المتوقع التحاقهم بالتعليم العالي، وكما تبحث الدراسة في كيفية توزيع هؤلاء الطلبة على الفراغات الموجودة ضمن المساحات الحالية المخصصة لمؤسسات التعليم العالي ، واقتراح مساحات جديدة في مواقع مناسبة لإقامة مؤسسة تعليم عالي عليها مستقبلا.

كما تهدف الدراسة إلى حل بعض المشكلات المتعلقة بكيفية توزيع مؤسسات التعليم العالي ضمن المحافظات الفلسطينية وتضع أسس معينة لبيئة دراسية مريحة فيما يتعلق بالمساحات التي يجب تخصيصها للطلاب ضمن الحرم الجامعي ، وكما هدفت الدراسة إلى وضع إطار مكاني لتوزيع الجامعات الفلسطينية حيث يحقق التلاؤم بين التطور العمراني لمؤسسات التعليم العالي والبيئة المحيطة فيها النواحي الاجتماعية والاقتصادية والثقافية ، وذلك من خلال اختيار المحافظات الأنسب لإنشاء هذه المؤسسات. ولتحقيق هذه النتائج تم الاعتماد على ثلاثة مصادر لجمع المعلومات وهي: 1- العمل الميداني ، 2- الدراسات المكتبية، 3- التحليل النظري للمراجع والتقارير السابقة.

النتيجة النهائية للبحث هي عبارة عن تقدير لأعداد طلبة الجامعات في فلسطين حتى عام 2025 ومحاولة وضع إطار مكاني لتقييم القدرة الاستيعابية لمؤسسات التعليم العالي الفلسطينية، حيث سيعتمد على توزيع الأعداد المتزايدة للطلبة على الفراغات المكانية الحالية المتوفرة ضمن مؤسسات التعليم العالي الفلسطينية واقتراح مواقع جديدة لأعداد الملتحقين الزائدة عن حاجة مؤسسات التعليم العالي الحالية. كما أنها ستقدم مقترحات نظرية لتحسين جودة التعليم العالي في فلسطين وربطه بالتطور العمراني والاجتماعي والاقتصادي لتحقيق تعليم مستدام يخدم الأجيال القادمة . بالإضافة إلى ذلك فقد دعا البحث إلى أخذ موقع مؤسسة التعليم العالي وعدد الطلبة وتوفير الخدمات بما في ذلك سكنات طلابية عند التخطيط لأي مؤسسة تعليم عالي جديدة، وكما دعا البحث إلى الأخذ بعين الاعتبار حاجات السوق المحلي والخارجي في المراحل الأولية عند التخطيط لانشاء مؤسسة تعليم عالي جديدة.

1 Chapter one - Introduction

1.1 Introduction

The higher education sector contributes significantly to the socio-economic development and it is one of the most important investments on human capital. Therefore, HEIs have played a key role in nations building and continue to underpin a wide range of national institutions through the participation of the academic staff in numerous public bodies (Goddard and Chatterton 2000, p481).

Education is considered as a means of economic and social empowerment for the Palestinians. "Education has served as a means of empowerment within the Palestinian community, and as such has played a significant role within the community since 1948. Population growth and popular commitment to education have consistently kept demand for education high" (Save the Children Alliance 2000, p9). The high demand for higher education reflects the needs for expanding HEIs, but that expansion should be managed and controlled in order to achieve sustainable urban development. The space norms or standards are one of the HEIs physical planning controllers and they are considered one of the quality assurance indicators. These norms differ from one country to another due to specific planning considerations, but all of these norms are developed to ensure a comfortable working and studying environment for the HEI community and they are used to assess the rational future space needs. Moreover, norms are considered a controlling factor for the determination of students' densities of the HEIs campuses (SMG 2006).

Universities have an important impact on the urban economy and the built environment through their effect on housing, local services and its support of the settlement of new companies (Perry and Wiewel 2005). In 2014, the contribution of the education sector in the Gross Domestic Product (GDP) for Palestine exceeds the contribution of the agriculture sector ((PCBS) 2014).

The recognition of the Palestinian state by the UN in the year 2012 is considered a turning point for the Palestinians. This is reflected in the government's struggles to achieve development for all sectors through setting effective future planning policies. For the purpose of that issue, the Council of Ministers admitted the National Spatial Plan (NSP) which is a comprehensive plan that takes into consideration the spatial dimensions to control the development and the geographic distribution of socio-economic activities. It achieves this by using the available resources efficiently through the interaction between different planning sectors. It will also be used as guidelines for future investment projects in a way that promotes sustainability. The NSP project was planned for the long term period to achieve economic, social, cultural, ecological and political balance for the future generations (MoP 2014).

The existence of the NSP is to formulate the mission and goals of an independent Palestinian state. This plan is also based on the 1967 borders which has become a fragmented territory recently due to the practices of the Israeli occupation.

In addition, this comprehensive plan attempt to enhance the contiguity between the West Bank and Gaza strip including east Jerusalem. Moreover, it also takes

into consideration planning for the total Palestinian population including the returnees (MoP 2014).

The Protection Plan is the first production of the NSP which is a plan that explains the Natural Resources and the Archeological Sites spatial distribution through the West Bank. The current study will focus on the higher education sector as a part of the socio economic development which is considered one of the NSP goals.

1.2 Problem Statement

The persistent increase of the Palestinian population concurrently with the growing demand for higher education study led to a high demand for HEIs buildings and facilities. According to a study executed by Maalem (Universal Group for Engineering and Consultant) in the year 2013, the estimated population number of the West Bank and Gaza (WBG) for the year 2025 is about 7 million including returnees. Where, the HEE constitute 0.049% of the total population number in Palestine. Accordingly, the current HEIs buildings are not sufficient to cope with that demand.

On one hand, the space available per student in all Palestinian universities is lower than standards and there is an imbalance in the distribution of students among the Palestinian Governorates. In addition, the Palestinian HEIs are randomly distributed through the Palestinian governorates **(Fig1-1)** and **(Fig 1-2)** because of the obstacles resulting from the Israeli occupation and the absence of a Palestinian governor body before the transfer of the administration of

education from Israel to the Palestinian after the Oslo Accords of 1990 (EACEA 2012,p3).

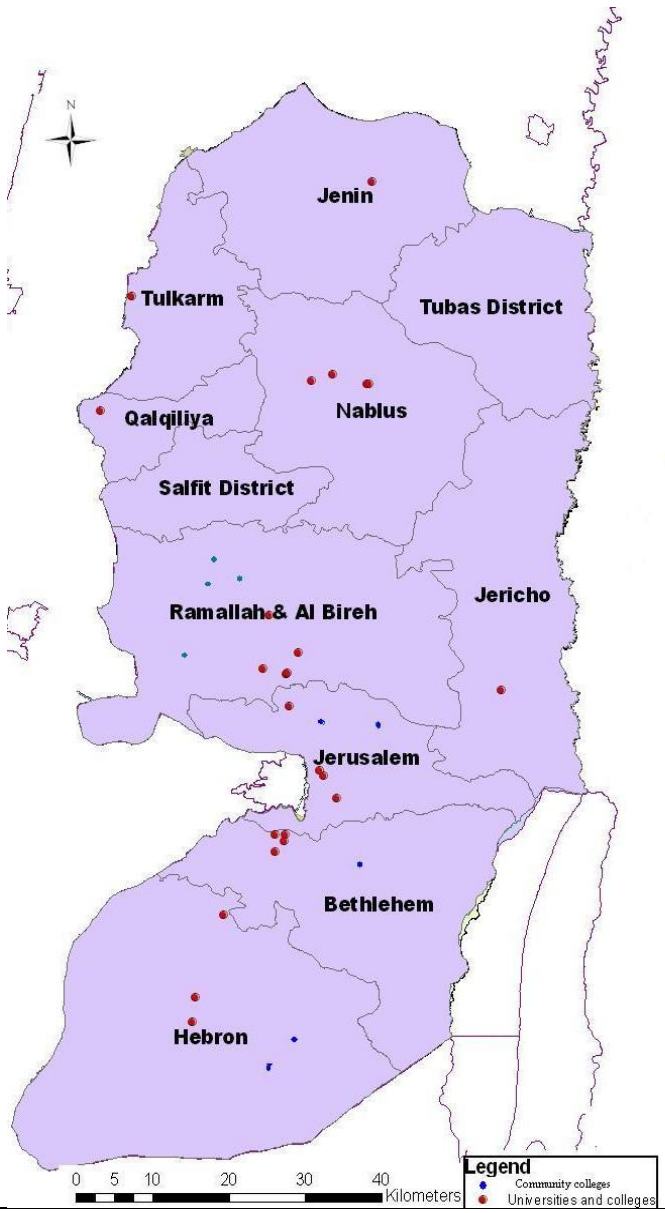


Figure 1-1: The distribution of the HEIs in WB

Source: The author

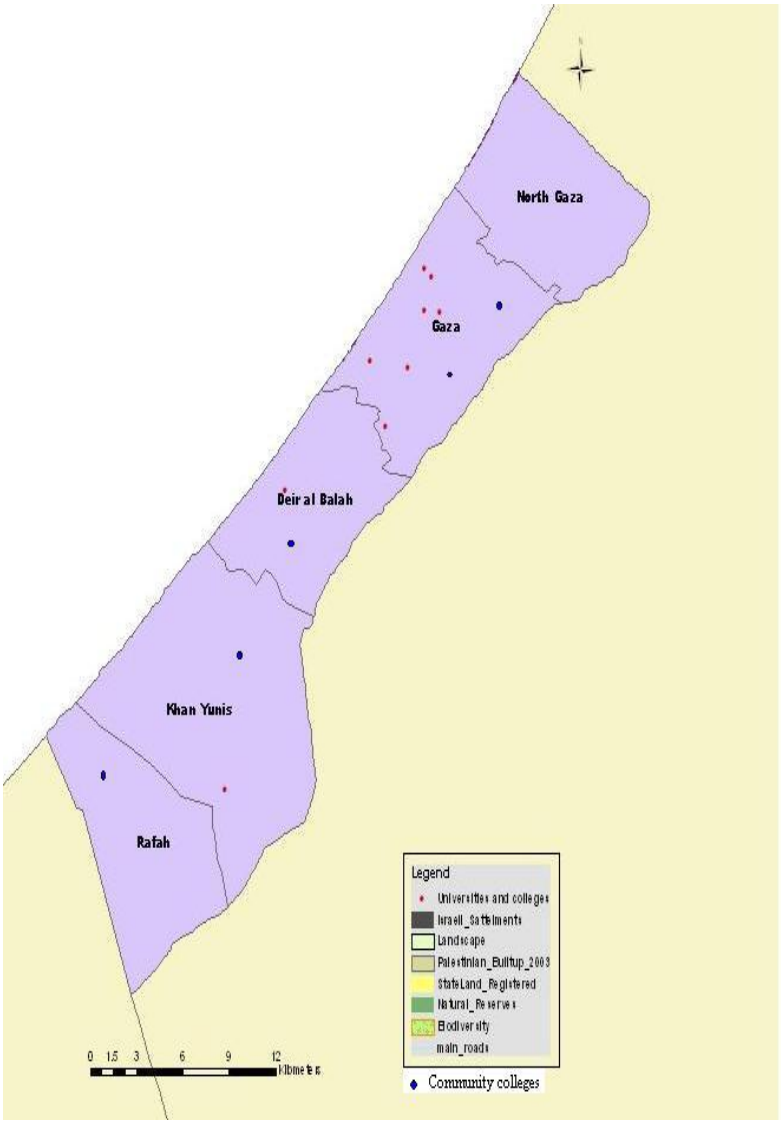


Figure 1-2: The distribution of the HEIs in Gaza Strip

Source: The author

1.3 Research Goals and Outputs:

This research aims to assess the HE sector needs through the analysis of the factors that created those needs. Moreover, it will investigate the proper space per student that will result in comfortable learning and research environment and it will attempt to balance the spatial distribution of HE enrollments among the Palestinian Governorates which will enhance the urban development of the surrounding areas. Lastly, this research provides a general criterion for any future planning for new HEI location.

1.4 Research Questions:

According to the current situation of the HE sector **in the state of Palestine and** regarding the aim of this study, the main question is:

What is the assessment of the HE sector in the year 2025 in the context of the (NSP)?

In order to be able to answer the previous main question, this research will attempt to answer the following sub questions:

- What is the expected projection of the HEE number up to the year 2025?
- What is the proposed total space that will be needed up to the year 2025?
- What is the proposed spatial distribution of the HE enrollments according to the NSP regulations?
- How many new HEIs will be needed up to the year 2025?

- What is the proper location for the proposed HEIs?

1.5 Research Limitations:

To achieve the research objective, all data related to every HEI in Palestine should be collected. However, during the data collection process, many obstacles faced the author such as:

- Difficulties in collecting data about the physical buildings of the HEIs located in the Gaza Strip due to geopolitical conditions. Therefore, the data sources were limited to online ones.

- The geopolitical conditions related to the Oslo Agreement are neglected in this research due to the NSP hypothesis.

2 Chapter two - Theoretical analysis

This chapter focuses on the meaning of the higher education and it explores many HE systems in different countries. In addition to that, it will illustrate the meaning of campus planning and its types and principles. Therefore, it focuses on the spatial planning definition and principles and its role on the sustainable development, however it explains the NSP as an example of spatial planning types which is applied on the Palestinian context.

2.1 The definition of the Higher Education

The HE can be titled as “tertiary education” or post school education, which is divided it into two types: the first (type A) is related to the HE, while the second (type B) is related to the postgraduate studies. The HE qualification degree takes four or five years but in the European system called (Bologna process) it takes minimum three years. The study years of the HE level must have theoretical underpinning, qualify someone to work in a professional field, and learn people in an environment, which also includes advanced research activity (Trung-Nguyens 2011 and Yakkaldevi 2013).

The World Bank definition of tertiary education refers to all post-secondary education including but not limited to universities. Universities are considered as a key part of the tertiary education system, as well as the public and private tertiary institution such as: colleges and technical training institutes (World Bank 2013).

2.1.2 Quality of the HEIs:

The need for trained and qualified employees in the public and private sectors promotes the emergence of various assessment methods to assess the HEIs. Those institutions graduate people who will contribute in the future prosperity. The assessment will be carrying out with two stages in order to graduate high qualified employees; the first stage is dealing with the efficiency of the curriculum, the managerial system, the trends and the goals of the institution and the quality of teachers and students. The second type which related to the physical institution environment and the availability of open spaces for students, it also deals with the suitability of the physical space for the study environment (World Bank 2010). The quality of the HE output is difficult to measure in the quantitative method, but it can be measured by its relative to the society knowledge profiles demand, the efficiency of the graduated students on the labor market, it depends also on the impact of those graduates on the economy and public sector and their way of thinking in working life (WorldBank 2013)

The factors that affect quality of the HE

"The traditional concept of quality is associated with the notion of providing a product or service that is distinctive and special, and which confers status on the owner or user" (Green 1994p13), On the other hand the means of quality in higher education depends on two factors they are the output and the input, the potential of the input and output is influenced by the working environment which can be defined by the surrounding buildings, scientific and teaching equipment, the technology levels, the curriculum content and the teaching way (World Bank

2010). The output is related to the effect of the HE in developing the society, while the input is involving with the students and teachers.

Many factors affected the student's enrollment in the higher education; one of these factors is related to their engagement of a certain research field or study but sometimes their choice also affected by their family willingness or background, moreover the student's interest can be considered another factor that can affect their choice. The contribution potential of teachers in the quality of higher education teaching process is influenced by their life experience, their personal motivation to do jobs well, the suitability of the programs and the teaching staff environment (World Bank 2010)

The most appropriate concept of quality in higher education according to Green (1994), Nata (2005) and Guenin (1988) is the attribution of quality to a reference or standards where the standards here " is a basis for measurement or a 'yardstick'a neutral term to describe a required characteristic of a product or service" (Green 1994p13). The contribution of the quality for a reference is articulated by Nata (2005) and Guenin (1988) as a performance indicator such as; student/ teacher ratio that related to the number of students per teacher. On the other hand, Murdoch (2005) explained that the performance indicator provides more information about the quality of the higher education institutions and it affected directly on the quality of learning; so small ratios of students/teacher lead to better learning outcomes; because more interactive between students and teachers can be achieved in small groups.

2.1.3 The HE Policy

Policies are tools that used to achieve the expected desired goals and to deal with the different problems or matters that affect the higher education process cycle (Trowler 2002). Governments established suitable polices for higher education in order to achieve their desired goals. Bobtana (1998) explains that the growth of Korean economy led to increasing the job's numbers that depend directly on the university graduates, reports indicate that 350,000 jobs created, while the overall number of graduate's students from colleges and universities were 200,000. On the other hand Korea has 131 universities with a number of students of 113, 2000, so colleges established to meet the human resources need for industries and to supply the middle level technicians, so the Korean policy of higher education depends on the economic development. The transformations of the labor force composition, during the last 30 years from 1960 with transition from agricultural sector to service sector, this transition reflected on the universities and colleges polices. As a result, the higher education system expanded to provide opportunities, for secondary school leavers and higher education graduates, the Philippines has noticeable outflow of trained human resources, it has two work forces out flow, first the permanent migration and the second is the temporary immigration (Bobtana 1998).

The trend of the Arab world higher education depends on establishing a knowledge economy and increasing global economic competitiveness (Buckner 2011). According to the previous literature, three models of reforms appears in the Middle East higher education system, namely neoliberal, internationalization

and quality assurance, also the HEIs systems divided in to two types in the Arab world's they are, public based system that found nearly in all Arab countries and the private system which appears in Palestine and Lebanon.

New trends and policies arise in the present era; these founded in the European Union higher education policy that represented as Bologna process, which emphasize on the achievement of a sustainable higher education, the goals for this new policy emphasis on the increasing access from different socio-economic groups to higher education institutions, increasing researches which enhance sustainability, achievement of the labor market and society needs, and increasing the financial resources for higher education (EACEA 2012)

The exploring of the Palestinian higher education law which is established in the year 1998 it aims to achieve a set of goals; the first goal is the provision of the higher education for the Palestinian, the encouragement of the research and technology, the provision of the qualified worker for the Palestinian labor market, the achievement of sustainable education (PLO 1998)

2.1.4 The HE Systems:

The social stratification of the society reflects the needs for diversification of higher education systems, according to Morphew (2002) the diversity of the higher education systems is important to meet the needs of students, regions and the changing of population trends. It also illustrated by (Shavit, Arum and Gamoran 2007) that the diversity of the higher education systems served the social stratification of the scholars; so the higher education systems should

provide more opportunities for people from different social strata. The World Bank (1997) mentioned that the diversity of the higher education systems provides the needs for high professionals occupations needs, technician's needs and it gives the students more choices regarding quality and cost.

It illustrated by the World Bank (2008) that five issues affect the diversity of the higher education systems they are:

- The National policy, which is related to the governmental policies that encouraged or not the differentiations of the systems.
- The market force that related to the needs for the country market.
- The institutional reforms and how the higher education institutions are expanded and changed among the year of development, such as if there is colleges transformed to universities or if there is polytechnics transformed to universities and so on.
- Industry that will encouraged the needs for more highly skilled graduated students in a specific fields.
- Finally the regional initiative that related to the spatial economic development for the region and what is the spatial distribution of the economic activities.

According to the previous, the national policy and the state vision, social demands and the market force demand are the main factors that affected the diversity of a specific higher education system. By exploring many systems from the international countries and from our region it clear that all the systems are

similar regarding the types of the higher education institutions but they differ where they emphasize whether in the technical field or academic.

The British system:

Littlefield (2008) explains that according to the British practice there are three categories of higher education institutions,

1- The university where studying is a full time courses which named as university, university college, polytechnic, technical university, specialist academy

2- The college of further education where teaching is a full time and part time courses to diploma level technical college, technical high school, vocational training college.. etc

3- College of education which takes place of full time courses to get bachelor degree in education which take place in different forms of teacher training collage.

4- Open University where courses are take place by correspondence and no student's accommodation needed.

The Japanese system:

According to Fujimura (1997) and Japanese Ministry of education (2012) the Japanese higher education institutions system contains 780 universities, 387 junior colleges, 57 technical colleges, and open university, it also contains wide range of vocational training schools, the higher education institutions may be national public which, established and operated by the national government and local public that managed by the municipalities and private universities. The distribution of the students in the Japanese higher education institutions is concentrated mainly in the private institutions (**Table 2-1)**

Table 2-1: The distribution of Japanese HEE

Higher education institution type	**Number of enrolled students**
National	628,148
Private	2,421,462
Public	150,589
Total	3,200,199

Source: Japanese Ministry of Education (2012)

The Jordanian system:

A study done by The Education, Audiovisual and Culture Executive Agency EACEA (2012) about the higher education system in Jordan explains that it contains of 28 universities, 16 of them are private, 10 is public and 2 are regional universities, it also contains three university colleges and 50 community colleges

that followed universities. The distribution of students in the Jordanian higher education is concentrated mainly in the Public universities (**Table 2-2)**

Table 2-2: The distribution of HEE in the Jordanian HEIs	
Higher education institution type	**Number of enrolled students**
Public	162,000
Private	68,000
Total	230,000
Source: (EACEA 2012)	

The Syrian system:

The higher education system in Syria contains 6 public universities, 15 private universities, open university and 6 higher education institutes, there are four types of the territory education in Syria: Universities that offer 4year bachelor degree, master degrees and doctoral, higher institutes offers bachelors or masters degree, intermediate institutes that offers 2 years of study relevant to the universities' programs, the public universities are strongly funded support by the government (EACEA 2010)

The United states system:

According to Eckel and King (2004) the higher education system in USA showed that the higher education institutions contains of four categories:

1- Community colleges it is about 110 public two years colleges that award associate degrees vocational field and prepare students to transfer to four year colleges that managed and funded by government on the state or local levels.

2- Public four-year colleges and universities of a number of 630 that prepare under graduate students in professional fields that managed and funded by government on the state or local levels.

3- Private- non- for profit institutions that concentrate of one single field such as nursing.

4- Private- for- profit institutions that offers vocational certificate rather than degrees.

The distribution of students among higher education institutions in USA is concentrated in the public institutions (**Table 2-3)**

Table 2-3: The distribution of HEE in the USA HEIs

Higher education institution type	**Number of enrolled students**
Public	12,370,079
Private	3,964,055
Total	16,334,134
Source: (Eckel and King 2004)	

The Turkish system:

The higher education system in turkey contains 163 higher education institutions which consists of universities, Vocational Schools, higher technology and other

institutions that contains military and police academics, the universities is two types public and non-profit (Turkish council of higher education 2010)(**Table2-4)**

Table 2-4: The HEIs in Turkey	
Type of the HEI	**Number**
Public Universities	95
Non-profit Foundation Universities	51
Foundation Post-secondary Vocational School	9
High Technology Institutes	2
Other Higher Education Institutions	6
Source: (The Council of Higher Education 2010)	

Austria system

The Austrian higher education system consists of three types; universities which can be funded by public or private sectors, university colleges of teacher education, university of applied science, the number of students according to the year 2009/2010 is about 320,000enrollments (**Table 2-5)**

Table 2-5: The higher education system in Austria			
Type of the higher education institution	**Number**	**enrollments**	**brief description**
Universities	22	274,000	They operated and maintained by public sector or private sector
Universities of applied science	21	36,000	The main funding by state and some of them funded by the catholic church, it is managed by the private sector
University colleges	9	15,783	They can be public or private
Source: (Lanzendorf 2006) and (Usher 2014).			

The Austrian higher education new policy emphasized on sharing the private sector in financing the higher education institutions and build combination to grow up the higher education sector by the sharing of the private business and industry, in the past the higher education sector funded mainly by the state but now the private sector sharing is increase (Usher 2014).

The higher education policy is emphasized on the global sharing of the higher education by applying the bologna process.

Singapore:

The higher education system in Singapore consists of five types of the higher education institutions they are:

1- Junior colleges/ Centralized Institute: there are 12 junior colleges with 30,000 students and they enter the university education at the year 20-23 years old and they started the post-secondary education at the age 17 years old. The junior colleges take certificate take one to two years while the centralized institute takes 3 years, by the junior college certificate the students can enter the university education (Ministry of Education- Singapore 2015).

2- Polytechnics: there are five polytechnics with about 70,000 students, it is for students who follow applied and practice oriented training and it takes three years (Ministry of Education- Singapore 2015).

3- The Institute of Technical Education: there are three institutes with about 28,000 students; it takes one to three year (Ministry of Education- Singapore 2015).

4- Arts Institutions: there are two art specialized school with about 4000 students (Ministry of Education- Singapore 2015).

5- Universities: the students can enter universities at the age 20 years old and it takes three to four years, there are four universities in different fields with around 50,000 students, the universities are specialized in economic and technology (Ministry of Education- Singapore 2015).

The ministry of education in Singapore supports the education and linked it with the economic development in the country in order to provide the technician and the educated propel for the future porosity, so they enter the academic and technical institutes before they started their university education (Spar 2009).

Israel:

There are 66 higher education institutions which consist of; 7 research universities, the open university of Israel, 37 academic colleges and 21 academic colleges of education, the institutions are publically funded except the academic colleges which can be publically and non-publically funded (**Fig 2-1)**. Moreover, the number of students in the Israeli higher education institutions is about 308,335 students and they enter the higher education in the age 21 years old because they spend three years in military service (**Fig 2-2)** (Klein-Avishai 2014)

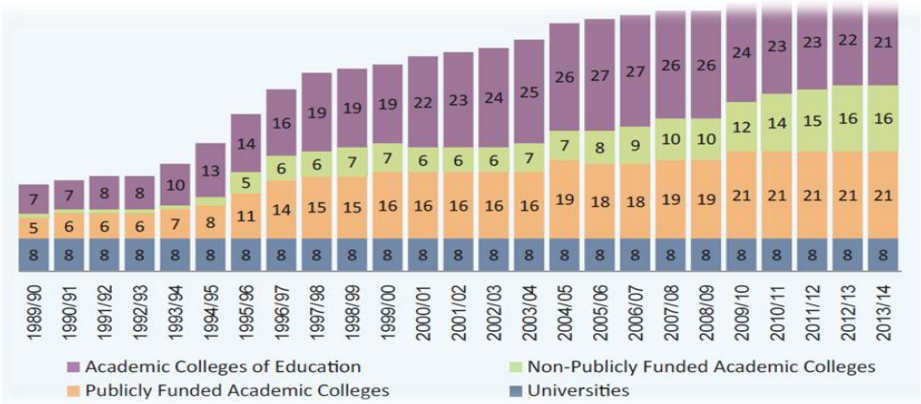


Figure 2-1: The HEIs types in Israel

Source: (Klein-Avishai 2014)

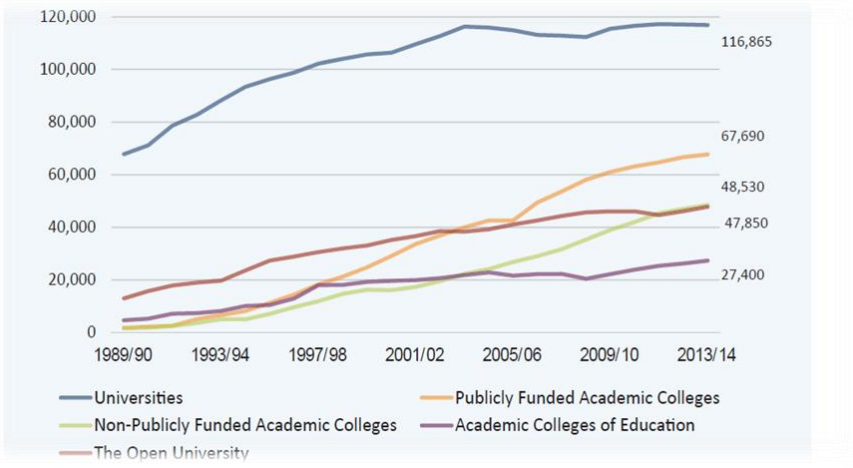


Figure 2-2: The distribution of students in the Israeli HEIs

Source: (Klein-Avishai 2014)

2.2 Campus Planning

The campus planning is a process needed in order to design the physical facilities depends on the higher education institution (college or university) program, objectives and policies. Three aspects affect the overall planning for growth in student's enrollments: 1) the academic planning or program that will guide the undertaking, 2) the physical plan itself, 3) and the financial requirements. The physical plans should handle with the facilities needs for specific purposes and the environments that affect the campus buildings sites; it should reflect the institutions point of view for land use development and the widest range opinions about how the institutions will grow (Halstead 1974) and (Bechtel 1968)

2.2.1Types of campus planning:

According to Dober (1996), there are three types of campus physical building planning regarding time period of the plans:

1- The long range planning: It allows some decisions for the future generations; also it provides sufficient information to evaluate the change and growth that should be planned earlier. In most institutions the long range planning means, facilities planning for ten to twenty five enrollment projections. Demographic techniques that depend on the real births numbers in a state provide a reliable forecasting data for seventeen years enrollment projections. The positive advantage s of the long range planning is its ability to provide a continuous assessment for collage needs, budget requirements and the short-term decisions, while the negative aspects related to being a restrain for short development on the

non-building zones and it prevents any future development in the reserved land location that allocated for the future development for the academic program.

2- **The middle range planning:** It helps in determining the priorities of facilities for which the need is known, but the cost and the type of programs has not been known yet. It has a time period of ten years.

3- **Short-range planning:** It related to the planning period needed for building a facility or improving the land, it is a time needed to prepare and justify a building program, prepare designs and complete specific construction project.

Another classification for planning campuses related to the needs for building to accommodate the enrollments rates explained by Halstead (1974):

1- Planning for enrollments when the higher education institutions need to exceed its service capacity because it isn't enough for the increasing number of enrollments, this can be achieved by increasing laboratories, class rooms, parking lots, offices, etc.,

2- Planning for increasing the capacity of the higher education institution by increasing the studying hours, courses number.

3- Planning for new buildings or new centers, this can be decided when the number of students related to specific academic program isn't achieved, this can be happen, 1) if a considerable number of students live in areas far away from college or university; 2) if per student costs can be substantially reduced; 3) if enrollment potential exceeds the optimum maximum capacities of existing

institutions. According to Littlefield (2008), the physical expansion can be occurred through three ways:

1- Extension to the institutions building externally

2- Displacement for the existing departments

3- Fragmentation through series of separated buildings.

The shape of the development can be shaped through three types:

1- The linear shape like Surrey university (**Fig 2-3)**

2- The radial shape like Essex University (**Fig 2-4)**

3- And the molecular shape such as Yourk University (**Fig 2-5)**

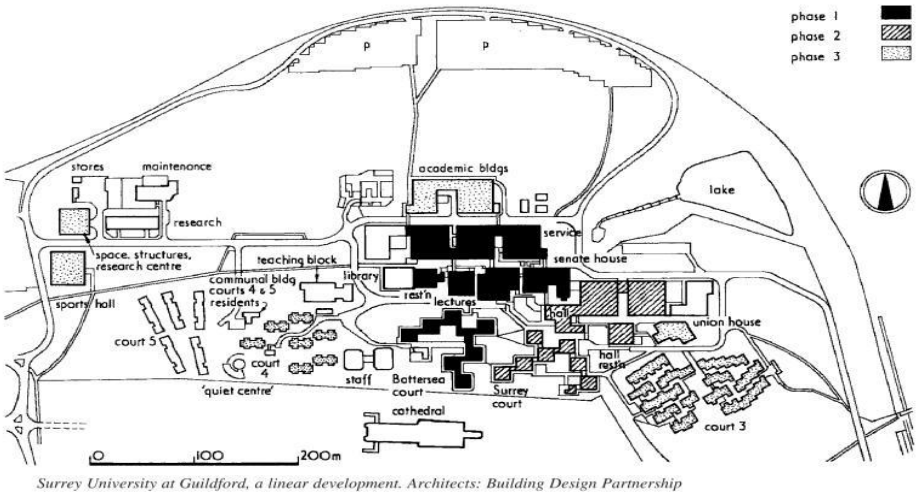


Figure 2-3: Surry University The linear development shape

Source: Littlefield (2008)

The previous shape shows that the first stage of development started at the black area then it followed by the dashed area in linear building expansion shape, this type of expansion due to the site and location prosperities of the institution that allowed this type of development shape.

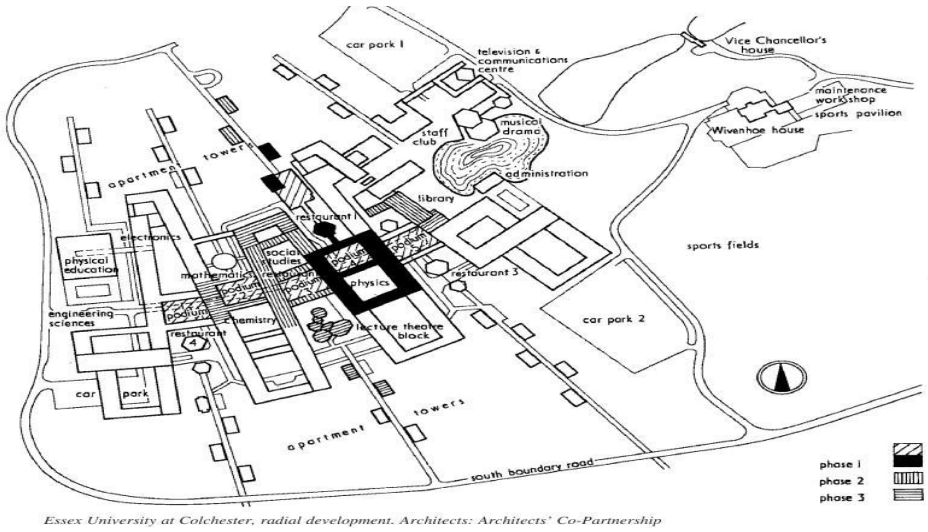
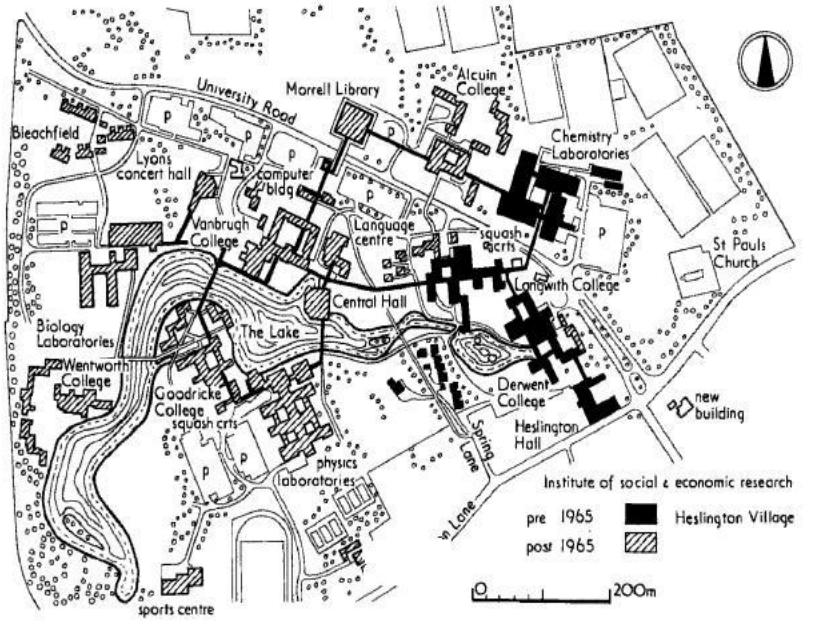


Figure 2-4: Essex University: The Radial development

Source: Littlefield (2008)

The shape above shows that the first stage of development started with the black area that considered center of the campus buildings then it followed by many buildings with radical shape of development.



York University, a molecular type of development plan. Architects: Robert Matthew, Johnson-Marshall and Partners

Figure 2-5: Yourk University: The molecular shape

Source: Littlefield (2008)

The previous shape that called the molecular shape of development it contains compound building that formed the molecular shape, which started with the black area.

2.2.2Campus planning justifications:

There are many justifications for planning new campus in any country such as; the population growth and the enrollments rates, providing on-campus housing, increase the accessibility, the needs for new higher education institution that

compatible with the uncertainty conditions, the urban development character on the surrounding areas of the campus (Halstead 1974), (Bechtel 1968)

The Population growth:

The population growth affected directly the campus population growth that includes, the student enrollment numbers, faculty and academic members, the administration staff and the associated population (Halstead 1974), (Bechtel 1968). The range of students (15000 – 25000) is desirable for establishing new campus (Bechtel 1968).

The prediction of the higher education enrollments depends on many factors that affect the enrollments rates and the campus population such as; according to Chen (2008) and Diane (2000) the demographic change and the economic conditions are the main factors. Bowen and Sosa (2014) explained that the political conditions can be a dependent factor. The number of high school graduates, immigration and out immigration, employment and unemployment rates, the number of population in the cohort (18-24) age and the number of applications for higher education are factors considered as dependent variables for the higher education predicting students enrollments (Clagett 1989), (Barbett1996), (Lins1960), (Heller 1999),(Li 2013). It is also mentioned that the projected enrollments for upcoming years are used to estimate the support funds required for the areas of teaching, facilities, administrative support and it also helps in determination of the magnitude of the labor force (Chen 2008).

Providing on-campus housing:

This factor is important to provide safe place for students and it will increase the accessibility for the students to their campus. Therefore, if the housing in the vicinity is not sufficient or not comfortable the on-campus housing should be provided and it will contribute in the achievement of education opportunity for all (Bechtel 1968).

Increase the accessibility:

The providing for a transportation system such as; transit system or the existence of free way- express way, good circulation movements that serves an area will be an important issue to establish new campus that will provide comfort for campus population(Bechtel 1968).

The compatibility for the uncertainty conditions:

The social change regarding the new social thought such as; changing life style, the trends for studying high academic degrees such as; the doctorate which needs a campus that supports the research or having equipments for a specific technological specialization (Bechtel 1968)

The urban development:

Popescu (2012) added that the universities of whatever size is drawn in the large metropolises, but the large universities may completely dominate on the built environment if the city is smallish; so the effect of the large university on the small communities is more considerable, practically; 15000 students can generate

related community population between 45000-60000 people and the 25000 generates community related population range between 75000-100000 people, On the other hand, the proper management of the surrounding area around the campus contributes in the development of the higher education institution (Bechtel 1968).

Most of the cities is established around universities and those universities considered the center of the cities and involved in the urban development and played a critical role in the urban and regional development of those cities, such as, Bristol (UK), Bologna (Italy), Salamanca (Spain) (Popescu 2012). Take the university of Bristol as an example, In the 1960s the economy of the city of Bristol depends mainly on manufacturing and aerospace industry, on that time the contribution of The University is small, in the year 2009 when the manufacturing has gone except the aerospace industry the university is provided 5500 jobs and 4500 from indirect employments (Thomas 2009).

It appears that the establishing of a higher educational institution can contribute in developing an area.

2.2. 3 Types of campuses regarding the spatial location:

The University, which is considered one of the higher education institutions, refers to the university or collection of university and university buildings that owned by the university, which aimed to achieve an institutional role. Campuses is classified according to their spatial location for three types **(Fig 2-6)**; campus outside the

city **(Fig 2-6 A)**, or campus within the city **(Fig 2-6 B)** and third type that has many buildings distributed in different locations **(Fig 2-6 C)** (Heijer 2011).

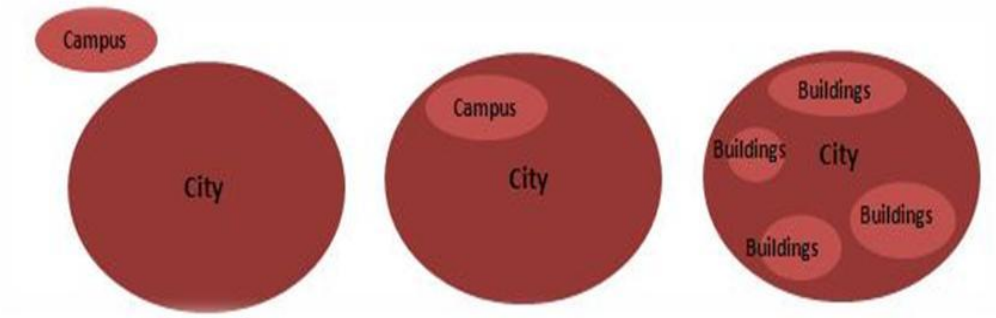


Figure A: The Greenfield, outside the city, **Figure (B)**: Gated within the city, **Figure C**: Integrated with the city
Figure 2-6: The three different spatial locations for campus

Source: Heijer (2011)

In addition, the campus can be classified as urban or suburban according to its location within the urban fabric; "the urban campus located close to a metropolitan central business district or it is nearby one or more of the following, intensive commercial, residential, governmental, office, or cultural uses, moreover the suburban campus location presently characterized by nearby uses, or potential uses, of moderate or low intensity, and by a peripheral location with respect to a metropolitan central business district" (Bechtel 1968, p8).

2.2.4 Site selection indicators for allocating new campus buildings:

It explained in the Carnegie Commission on Higher Education(1971) that the location is one of the major factor in successions of most of the successful colleges, it also suggested that all new campuses should located near the main

line of travel, near population centers and colleges shouldn't be located in an area of increasing population.

The site evaluation criteria that contain the following indicators for choosing the best location for establishing new campus will be projected on the Palestinian situation.

1- Site appeal

The campus should be located in an area which has beautiful location in order to attract student because some of the campus recreation facilities can be used, the existing of the campus site in beautiful location will add a value for its physical building, in the urban campus may benefit from the man made cityscape (Bechtel 1968)

2- Land use

"The land use can encourage or restrain the development process, the land ownership togother with laws and legislation that define the possibility of land development is so important. Moreover the land topography which is related to the land physical shape and the properties and boundaries may add or deduct the value for the land" (Saleh 1998, p9).

in the case of campus planning a general slope of small rise and fall is desirable for the aesthetic considerations and drainage (Bechtel 1968)

According to Bechtel(1968) that the zoning, regional and state master plan, the highway, mass transit, recreation and parks, water resources, pollution control can affect the potential of the campus location.

3- Community development and control

The surrounding community development can affect the campus location and it can add a value for a specific site, so the public attitude regarding the development of a community can affect the type of the development for an area. So the ordinance and public control for the surrounding area around the campus is an important issue (Bechtel 1968)

4- Public support

"The public supports manifested in numerous ways: overt expressions of enthusiasm by local governments, chambers of commerce, civic groups, and individuals; assistance in the form of plan and ordinance amendments and agreement for provision of initial services, such as roads, utilities, fire protection, or annexation; and offers of land at reduced or no cost these attitudes can influence critically the initial location decision and the continuing success of the new campus" (Bechtel 1968, p10)

5- Circulation

Bechtel (1968) also mentioned that the university must locate on an express way or free way and the availability of the arterial road is essential for the campus services, it also explained that each site should evaluated separately in terms of its circulation requirements, considering the availability of on-campus housing, staff, enrollments, and the relationship with the metropolitan areas such as; the recreation and cultural facilities, the provision of commuter parking and the commuting distance should be acceptable for campus population trips and the using of bus or transit system.

The spatial site location for college is influenced by two variables, the relative attraction of the opportunity and the distance separation between the land use and the service (Rushton 1971). The relative attraction for collages to attract enrollments depends mainly on the attendance rate of the high school graduates magnitude and the geographic location of the collage, it also depends on the population concentration among the campus location. On the other hand Schofer (1975) explained that the relative location is a critical factor in success or failure of a college and he confirmed that the arising student's number can be balanced according to the economic, political and academic considerations

6- Demography:

The previous source explained that the potential of the sites should be compared by its proportional location to the region's population centers and it is clear that 15000 to 25000 students plus the university community population can influence the long- rang population projections.

7- The impact of the university on the community:

According to Perry, Wiewel (2005) and (Popescu 2012) the university is considered the center of culture, contributes in important ways to the economic health and physical environment development, it is an important element in the urban economy and the built environment. Universities and their local surrounding affected each others in different ways such as, political, cultural and economic; this relation is affected by the size of the university and the surrounding community

The economic impact can appears through the effect of students and teachers on the housing market, local services, their income will be spent in some ways un baying their needs, it is an important factor in labor market, companies may settle near universities, it graduates qualified manpower that they affect their communities, . from the political side the university is considered an important land users, it may play an important role in local politics where physical planning issue are concerned, historically it have played a critical role in generations of new political ideologies and movements. Culturally it affected its surrounding communities by the effect of universities facilities such as, theaters, mass communication and galleries, the human capital investment, participations in a local network for regional development, collaborations with local businesses though the Research and Enterprise Directorate, technological innovation processes and the participation of academic staff as trustees in local charities (Wusten 1998) and (Popescu 2012)

8- Community facilities and utilities:

The provision of facilities such as; shopping areas, schools, hospitals, recreation areas, churches, cultural and governmental centers, is an influence factors that add value for the site (Saleh 1998), the existing of water and sanitary unit, telephone and gas can add credit for the proposed site.

9- Environmental considerations:

The potential site should be free of the harmful hazards such as, smog, noise, traffic congestion, heavy industrial issue, airways, blighted surroundings and airports (Bechtel 1968).

To reduce the possibility of sites or to reduce the proposed sites the following development standards or norms should be applied, these can be related to the university population, basic area requirements and other site area allowance (Bechtel 1968) (**Appendix 6)**.

2.2.5The allocated space per student in campus buildings:

In any town development, there are different town functions that required space such as work, recreation, and residential, the space that these functions are required depends on the number of population, immigration and emigration (Ruiter 1998). Nishide (2008) explains that spaces between people is necessary to prevent intrusion, humans needs space around their bodies. It is important to design space regarding to the invisible measure of human body, the invisible dimensions related to the extended of persons along our senses of sight, smell and hearing, the previous named as personal space that defined by (Sommer 1969) as the surrounding area around human body within which the intrusion between bodies does not happen. Beyroughy (2009) mentioned that the total area of usage space can be divided into two areas: the first area is the space management for the near-term usage of the existing resources and the second is the planning for the long-term decision that relates to the provision of space resources. The previous

literature showed that as an example of space management is the handling of the assignment of people or activity that suitable for an existing room, while space planning is related to the decision for which room ought to be built or re-allocated to different tasks. It also mentioned that the long range space planning nature suggests that the decision should be made before the exact details of current timetable, student's numbers, etc, become available, so in order to cope with this uncertainty conditions regarding lake of information about the future forecasting, tried and tested standards will be applied, this coincide to relying upon "space norms"

A study done by Space Standards Management Group (SMG 2006) defined the space norms as the allowance of non-residential space intended for each student; it can be set to control the non-teaching facilities, such as offices, various facilities for students. Norms might be physical objective provides a base for space planning which used to calculate the overall demand for offices and then design it to satisfy the needs (Beyroughy 2009). (SMG) 2006 explained that space norms can be used to assess space needs, manage spaces between users and departments and to plan new future spaces it showed that there are various standards and norms are found for controlling the quality of space and the density of students in universities and university colleges, some of these examples found on the Toronto University it has a 690 students\hectare. Another example from our region is the Egyptian standards that allocated an area of $10m^2$ per student from the site area of the campus for building and a percentage of 15% from the site area of the campus for landscape ((NAQAAE) 2010). The Jordanian's

standards allocated a total area for landscape and building from university campus equal to 30m^2 ((HEAC) 2010). The Saudi Arabia standards for the private universities are 40m2 for each student ((MOHE 2013). The University of Texas in the United States of America provides an area of 28m2 for each student (University of Texas 2014). The area for each student is around 23m^2 in Hebrew university in Israel (Perry and Wiewel 2005). The area per student is equal to 55m^2 of National University of Singapore (NUS 2012). The Palestinian standards allocated 16m^2 for each student from the university and university colleges sites ((AQAC) 2012).

2.3 The Spatial Planning:

Spatial planning revolves around: "the problem of coordination or integration of the spatial dimension of the sectoral policies through a territorially-based strategy" (UNITED NATIONS 2008, p1), in proportion to the previous definition it appears that spatial planning is more than land use regulations, it revolves around creation a kind of harmony between social, economic and environmental sectors in a framework of compatibility with the goals of the decision makers in a region.

Various definitions of spatial planning subsist, and these definitions changed over times, as an example the European commission (1997) underline spatial planning as a public sector activity, so it is a process used mostly by the public sector to allocate future activities in the space (Dane 2007)

Spatial planning should deals with the objectives and interests of the human beings and it should manage the conflicts between the different lines of planning development process such as the conflict between the economic development and the serving of the natural heritage. In practice it should be accepted that these conflicts neither be removed in order to achieve an optimal solutions (Faludi 2001).

In spatial planning the future remains open because the strategic plan is not more than momentary record of the reached agreement, so the actors of spatial planning prepare a plan to keep the future open but the time has the major concern, it also open frame of reference for negotiations (Faludi 2001).

2.3.1 Spatial planning theories:

Morphet (2010) discussed the spatial planning theories and principles ; in order to study its meaning and how it works, he explained that spatial planning theories have four approaches revolved around "intuitionism" or normative and explained what is the role setting of spatial planning routed in the self-evident ethical attitude by way of equitable attitudes, the first approach depends on the communicative theory corresponds with the previous for the reason that it recognizes the spatial planning role as a comprehensive planning mode, it has been interesting with the redistribution and modern analysis in order to obtain the relative results for those in discrepancy access to power, so the communicative theory has a general approach because it doesn't relate to a particular operational context, so it can be used to analyze the outcomes of spatial planning in the

context according to its principles, while, the second approach of spatial planning theory considered political dimensions as major factor in planning, this approach based on the argument that all planning process depend on power to get its results, this approach discuss the political issues and it is effect on planning process from local power to national power, so this political approach discussed the spatial planning in terms of power, it is a general approach differ from context to another according to the power acting in each context, on the third approach the spatial planning based on the governance decision making, the argument in this approach based on if the administrative system well regulated ,the administrator or manager can take the best decision of individual, as a result this approach argue that the public policy should shaped as individual instead of organizational, so this approach take the holistic form and joined- up approach, in this holistic approach spatial planning can be implemented with its focus on place, so the spatial activities in this approach can be distributed locally in a vertical integration but in the same time with horizontal integration in the holistic approach , finally the fourth approach considered spatial planning as a model of delivery of outcomes and it depends on the expected measurable results of the distribution of activities on a particular place, however this approach depend on the investment on a place to get the most measurable benefit.

2.3.2 Spatial planning principles:

The scope of spatial planning differs from country to another but all countries involved around three fundamental principles. The first is that spatial planning provides long or medium strategy for the different territories, which serve their

objectives and integrated with the different perspectives of sectoral policies. The second is that spatial planning handling with the land use and the physical development of an area, such as, agriculture or transport, the spatial planning third fundamental principle is the planning of different sectoral policies in different scales (Koresawa and Konvtiz 2001).

The previous literature explained that The effectiveness of spatial planning measured by its capacity to set a framework to help territories in coping with the uncertain conditions regarding social, economic and technological changes, including :

- Changing in work nature
- The demographic changes
- The technological innovation
- Changing in values such as, interests of economy instead of protect the environmental resources.

So in the context of spatial planning under uncertainty conditions the spatial planning should take a medium-term perspective, or it should increase the dependant variables.

According to the administrative role, the spatial planning is carried out at different tires of government, namely, national, regional and local levels. National spatial planning guides the spatial development at the national scale, while the regional has a lower scale that related to the region and the local planning carried out at the municipal scale and related to the land use planning. In addition, the national spatial planning considered as a tool that distribute the

economic activity and social welfare between regions that named national-regional planning (Koresawa and Konvtiz 2001).

2.3.3 The Role of the HEIs in the Sustainable Development:

The sustainable development aims to meet the needs for the present generations without compressing the needs for the future generations (Cortese 1992).so the previous literature contains stating of two concepts, the first one is the needs for education from the different social stratification and the second is the concerns with the environmental issues.

The sustainable development should contains four principles; (1) the equity principle which contains, the geographical, social and procedural equity, (2) the normatively principle that related to the social construct basically the capacity of human to making normative decisions, which based on the values we sustain about the developing way, (3) the integration principle in order to achieve the integrity between the social, environmental and economic sectors, (4) the dynamism principle related to the suitability of the development with the uncertainty conditions (Waas and Wright 2011) , (Waas 2012).

According to (UNESCO 2012) the education can contribute in the sustainable development through the helping of people to develop their skills and knowledge that will promote the knowledgeable decisions for them and others. The sustainability in the higher education is one of the important aspects today it can be achieved by the involvement of the higher education institutions in the regional or a global level and it should minimize the negative environmental, economic, social and health effects. The Palestinian higher education can

promotes the sustainable development through the increasing of research that explains our priorities and the Palestinian needs through the social, environmental, economic Velazquez (2006, p. 812) defined the sustainable higher education institution "as a whole or as a part, that addresses, involve and promotes on a regional or a global level, the minimization of negative environmental, economic, social, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles'' it also defined by Cole (2003, p.30) ''the one that acts upon its local and global responsibilities to protect and enhance the health and well-being of humans and ecosystems. It actively engages the knowledge of the university community to address the ecological and social challenges that we face now and in the future''

2.3.4 Spatial Planning in Palestine:

The definition of planning appeared the first time since the occupation of Palestine by Israel in 1948 and after that entrenched in 1967. Historic Palestine delimited by Jordan Valley and Dead Sea from east, Ras Al-naqora in the north, Mediterranean sea and Egypt from west and red sea from south (Sha'at 2011)

Palestine divided into two parts: Gaza strip (360 sq.km) and West Bank (5800 sq.km) which are totally separated. In Gaza there are two main centers, Gaza city in the north and Khan-Younes in the south with approximately 350,000 inhabitants. On the other hand West Bank have four main regions: in the north

Jenin, Tulkarem and Nablus, in the Middle Ramallah and Jerusalem, in south Hebron and Bethlehem , and from east Jordan Valley (Sha'at 2011)

Oslo agreement divided West Bank to three classification: A, B and C, A: with full Palestinian control, B: Combined area between Israeli and Palestinian, C: full Israeli control.

2.3.5 Challenges of planning in Palestine

Most important challenges in planning in Palestine are land and population, land which is West Bank and Gaza but no Man`s Land. The Israeli settlements established on the occupied Palestinian land and 12 million people living outside their occupied land. Other challenge in Palestine is the existing acceleration of implementation of projects with absence of comprehensive national scheme which will be difficult to deal with it later (Sha'at 2011)

In the planning structure must the planning be sustainable whether in infrastructure, education and economic, this could be a challenge to achieve the interests of the next generations with consider the geographical development

Goals and objectives:

The purpose of spatial planning in Palestine to arrange the urban structure whether in West Bank or in Gaza strip, this will be suitable for next generation with consider the population number after a long term, this could conserve all natural recourses and ensure good life with development of environment, the

follow objectives should achieve in Palestine to improve the sustainable living (Ministry of Planning)

- Provide practical tools for different planning approach.
- Prepare planning guide wit full sequence of plans.
- Provide the expected out comes from planning.
- Prepare an outline of how improve the quality of planning and the purpose of planning.
- Spatial planning in Palestine is in the beginning stage, and the first product of spatial planning is the (Protection Plan for Natural Resources and Archeological Sites- Northern Governorate). See appendix

2.3.6 The National Spatial Plan (NSP)

The National Spatial Plan is a comprehensive plan takes into confederation the spatial dimensions to control the development and the geographic distribution of the socio-economic activities, it achieves the best use of the available resources through the interaction between the different planning sectors, it also considered as guidelines for the future investment in order to distribute the future projects in order to achieve the sustainability (MoP 2014).

The Justification:

The land and population are the major indicators that affect any planning process, so the Palestinian population has an increasing trend, the population number around 10 million and half of them are returnees, so to accommodate with this population increase the (NSP) is established. Another cause is the spreading of

sprawl and without concerns with the value of land and the availability of infrastructure. Another reason is the sustainable planning has a major concern.

The goals:

It is intend to provide a management scheme for the future activities in order to protect the available resource for the future generations, and it aims to provide a general policy for the different sectors in the Palestinian state.

3 Chapter Three – Methodology

3.1 Research Methodology

The methodology of this research will be based on a descriptive versus analytical method. Therefore, the steps will be in the following sequence; data and information collection, qualitative and quantitative analysis using proper techniques and tools, and finally, concluding with results and recommendations.

3.1.1 Methodological Approach

Considering the main aim of this research which is formulating the needs assessment framework for the HE, this research will go beyond the descriptive survey approach. As for the survey approach, it is only useful in the needs assessment process which depends on collecting and analyzing data related to a certain community (Varenais 1977), (Warheit and Bell 1977).

On one hand, the needs assessment is defined by Minnesota State Planning Agency 1977 as the process of addressing the resources or service needs depending on identifying the prevalence of a certain condition of target area (Kimmel 1977).According to (Kaufman 1981), the needs assessment is a process in which the gap between the current outputs and the desired outputs should be closed.

The articulation of the needs assessment process can be expressed in terms of the methodological approaches that will be used. In order to precede the methodology, the term “needs” should be defined in the Palestinian context. The need is defined by the Human Services Institute (1975) as the human being identifiable condition

which limits the family member to meet his or her full potential. It is also defined by (Kimmel 1977) as an empty term, one without conceptual boundaries and it must be defined in a specific context usually by the use of absolute or relative (comparative) criteria or standards in order to have operational meaning.

Accordingly, the concept of the needs in this research is the capacity needs, which is defined by the United Nations of Educational, Scientific and Cultural Organization (UNESCO) "as a process through which individuals, organizations, and institutions responsible for educational planning and management at different levels of education are able to develop, maintain, and apply various capacities to achieve educational targets for society over the long-term in a sustainable way" ((UNESCO) 2013,p18)

The need's boundary is the HE sector and the NSP regulations with the combination of the regional and international standards which are used to realize the HE needs in Palestine.

3.1.2 Research Data:

This research has many steps to derive the conclusion. It begins with data collection, then data organization, and finally, data analysis. Every step will be illustrated in detail and summarized in **(Figure 3-1)**

Data collection:

The main information in this research will be obtained from two sources; the first one is the primary sources which are obtained by the researcher through fieldwork,

questionnaires, interviews and other means. The second one is the secondary data which are obtained from other existing reports and studies, such as census reports, publications, and official organizations' archives (Babikir et al 2009).

Primary sources of data:

Fieldwork was conducted to find out the space available in every HEI in order to determine the compatibility of the current space with the future HE enrollments.

Secondary sources of data:

- Desktop study that included HEIs and MEHE historical archived data about HEE number in different years, the archived data and reports conducted from the MEHE and PCBS about the transformation of the HEIs, and HE history regarding social indicators that affect the HEE.
- Reviewing previous studies related to the Palestinian HE sector.
- Exploring NSP related regulations and maps.
- Reviewing different studies related to cases in different counties in order to explore the different HE systems.
- Reviewing the theoretical literature related to the HE campus planning process and steps.

Data Organization

This phase depends on primary data organization and arrangement to obtain primary results that may lead to the final results and conclusions. The primary results are:

- Three issues will be discussed in the setting of a new strategic planning policy for the HE sector. The first issue, -which depends on NSP assumptions, forecasts HE enrollments up to the year 2025. Those enrollments will depend on theoretical analysis of the previous studies and reports in order to find the suitable forecasting technique that can be used in the projection process. Moreover, the archived data and reports from MEHE, NSP and PCBS that are related to the HEE and population number in previous years will also be used. The second issue is concerned with the distribution of those HEE among the current HEIs based on field work analysis to find the current available space in every HEI building. Finally, the third issue deals with setting a new policy frame work to determine a new campus location which will depend on theoretical analysis of previous studies, assumptions and NSP regulations.
- Management and governance will be conducted depending on setting a new policy framework for the distribution of HEIs among private and public sectors. It will be conducted by exploring a regional and international HE system around the world.
- The planning and management of the learning environment will be conducted through setting new space standards that will be considered a base line for future planning for any new HEI establishment. This result is obtained through field work analysis of the current space that is allocated for every student in some of the current HEIs and compared with the local, regional and international standards.

Data Analysis:

The gathered and organized data were analyzed to find the primary results which were analyzed to obtain the final conclusions and recommendations. These include the number of the needed HEIs in the year 2025 and a new policy framework for future planning of any new HEI location. The analysis was done by linking the gathered and organized data to find out the final results which will be the frame work for future planning for any new HEI (Baxter & Jack 2008).

The data analysis was conducted and therefore summarized in (**Fig3-1)**. This includes the following:

- A historical review: archival studies and reports were explored to set out the main components and characteristics of HE in WBG.

- Statistical analysis: archival data from the MEHE where analyzed and correlated to obtain the future number of the HEIs in the year 2025 that will be used to find the future needed space for the HEI buildings.

- Theories related to norms and regulations in Palestine and of different countries were compared to find out the suitable space for every FTS in the Palestinian HEIs. On the other hand, the NSP regulation is applied to control the future planning for any new HE institution.

- Discussion with the NSP General Manager to evaluate the proposed location.

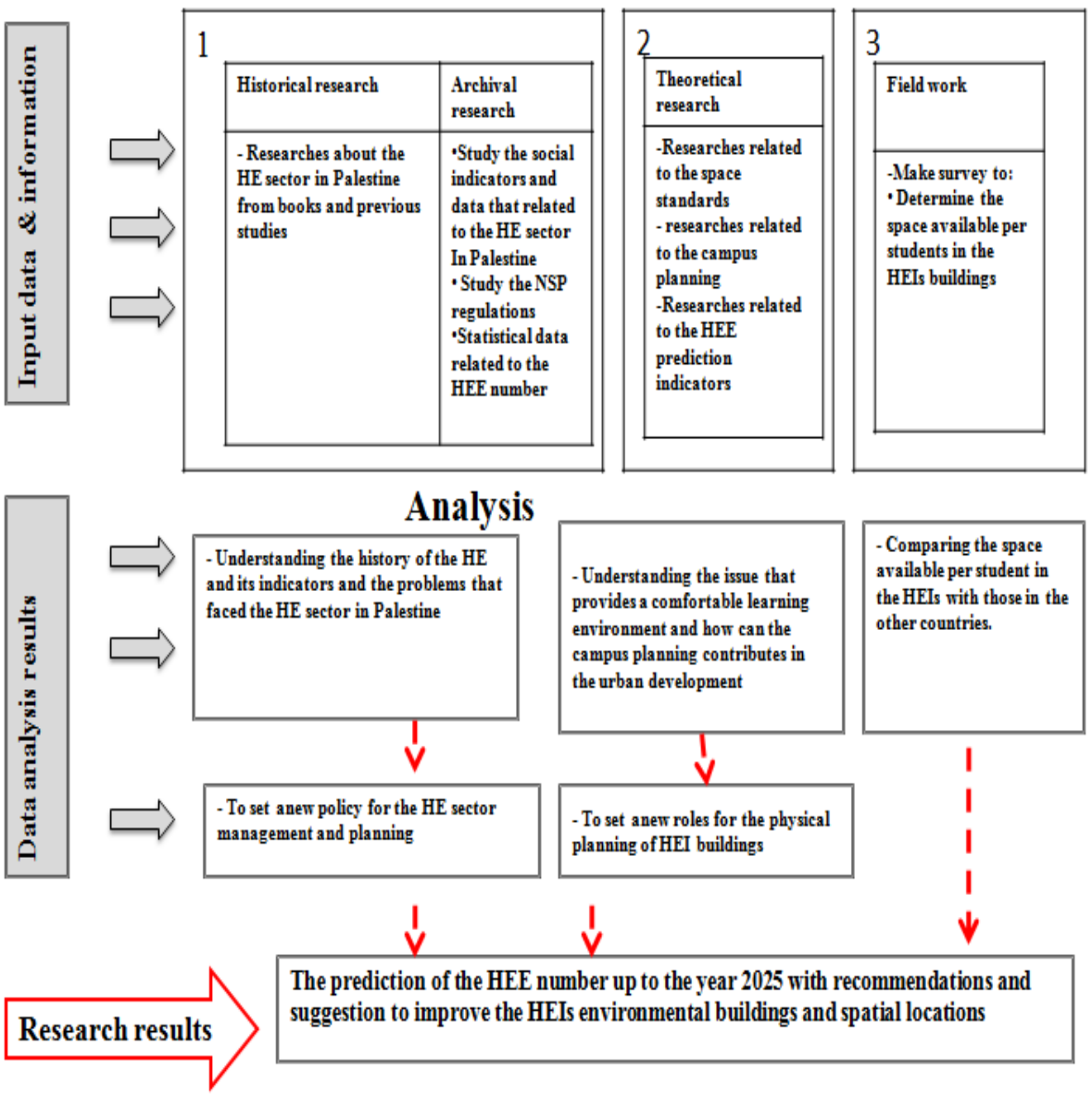


Figure 3-1: The methodology chart

3.2Research Techniques:

To conduct the assessment, three research techniques are used to forecast the HE enrollment number; the extrapolation and the regression analysis techniques. Moreover, the Multi- Criteria Evaluation technique is used to propose the best location for the future HEIs.

1- The Extrapolation Technique:

It is illustrated by Chen (2008) and Guo (2002) that many forecasting techniques can be used in forecasting higher education enrollments such as: ratio method, subjective judgment, cohort survival study, simulation model, fuzzy time series analysis and regression analysis. On the other hand, Ruiter (1998) said that the linear trend extrapolation is the simplest technique that can be used for forecasting, which can be applied depending on past data and then drawing the best fit to forecast the future. However, when applying this method, the period of time that the forecast will be based on should not be less than the period of time for which the extrapolation is done (Ruiter 1998). This method is used in the OCED (2008) to forecast the HE future enrollments depending on the demographic change which is one factor that affect the student enrollments. The projection approach that is used by OCED used the UN population projections as a base and calculated the enrollments with extrapolated trends (Cunska 2010). Another example of using population projections in determining the enrollments in higher and basic education is a similar approach

conducted by Ahugi and Filmer (1995). However, they chose projections of two age groups (6-24 and 25+) years. Another study regarding higher education enrollment projections models was done by Guo (2002). In this study, the author compared the accuracy of three models of projections and concluded that more complex models do not necessarily mean that they are more accurate than the simpler ones.

2- The Regression Analysis:

Regression analysis is a useful tool for forecasting enrollments. In this method, a key indicator is chosen and correlated with other variables in order to find the relationship between them. After that, the regression analysis is applied to find the expected number of students in specific years. The regression analysis depends on the qualitative and quantitative techniques in which the qualitative techniques determine the relation between variables and the quantitative method depends on the expectation of enrollments in a specific year (Guo 2002).

3- The Multi-Criteria Evaluation:

This is a useful method for evaluating more than one option and choosing the best one based on specific criteria. It takes into consideration more than one aspect to evaluate the choices, such as financial, environmental and social aspects. Another specific characteristics of the criteria is the weight, so that every criterion should have a certain weight assumed by the planner or a specific group (Ruiter and Sanders 1998)

3.3 Research Tools:

1- Microsoft Excel will be used for the application of forecasting techniques to project future enrollments that will determine the total space needed in the year 2025.

2- GIS (Geographic Information System) program is used to allocate the best location for future HEIs that will contribute in linking the state development plan mission and the HE sector in the context of the NSP.

4Chapter Four- Contextual Background

This chapter will illustrate the history of the HE sector in Palestine and its characteristics; in addition it provides an overview about the HE system in the Palestinian context and the HEIs types. The main context of this study is the higher education sector which will be analyzed and assessed in the framework of the (NSP) which is considered one of the socio economic development factors.

4.1 Historical backgrounds:

The Peel commission report of the Palestine Royal Commission to the United Kingdom Parliament described the need of higher education for Palestinians as a main source of concern: "The contrast between the Arab and Jewish systems of education is most striking at the top. The Jews have a university of high quality. The Arabs have none and the young intelligenzia of the country are unable to complete their education without the cost and inconvenience of going abroad" (Palestine Royal Commission 1936, p531). But the universities in Palestine didn't established since the year 1967 and most of Palestinian universities began as schools or community colleges, such as An-Najah University which was established as an elementary school in 1918 and became a community college in 1963 before its establishment as a university in 1977 (Robinson 2010)

Accordingly, up to the year 1972, Palestinian students were forced to complete their higher education abroad in Arab or even non-Arab countries. Palestinian students faced many difficulties by Israel on their freedom on entering and exiting the borders

because they thought that educated people will threaten Israel's security (Zelkovitz 2014) (Ghadban 1998). In 1972, Birzeit University, the first higher education institution had been founded, which only started as a college. After that, Bethlehem University emerged from Fryer College and it started as university at the year 1973 with 112 students only (Bethlehem University 2014). The third university was Al-Najah National University that opened its gates in the year 1977 and it was considered the largest university in the West Bank (Al-Najah University 2015). The Islamic University was the first university established in the Gaza strip in the year 1978.

The emergence of HEIs in the WBG increased the accessibility for higher education and reduced Israeli political obstacles on the exit and re-enter permits for Palestinian students. Not to mention that before the 1970s, only the elite Palestinians were able to pay the high costs of studying abroad.(Zelkovitz 2014).

The increase of accessibility to higher education for the Palestinians could be considered a method of resisting the occupation which sought to create an ignorant society by imposing political obstacles on the students' freedom of movement and education.

4.2 The Characteristics of the HE in Palestine:

The higher education sector in Palestine have many characteristics and faced many problems, this is apparent in a study executed by (Hashweh and Berryman 2003) that described the main characteristics of the Palestinian higher education through five indicators; access and capacity, equity, quality, relevance and governance.

The study showed that there is a need for more universities and colleges and there is a higher trend for tertiary education. On the other hand, it recommended expanding university collages and their facilities.

Moreover, it showed that higher education is equally accessible for both genders roughly who have an equal chance to receive a higher education certificate.

In regards to the quality of higher education, they have found that it has declined especially when studying the teacher\ student ratio in comparison with other countries and the percentage increase of part time teachers which only indicates a declined quality of education.

Another indicator examined in the study is the relevance of higher education programs to the labor market and coping with economic growth which have been relatively low. Moreover, there are quantitative and qualitative gaps between higher education graduates and the labor market needs. The study also showed that the governance of Palestinian higher education has many problems and it should be evaluated in order to harmonize it with the state mission and goals.

Another study about higher education in Palestine conducted by (Audiovisual and Culture Executive Agency) EACEA (2012) explains that the public funding for higher education is not sufficient for the basic needs of the universities and colleges. Moreover, the study explains that the major competing factor between higher education institutions day is profiting from students by increasing the number of programs to increase their enrollments without paying attention to the needs of society and the labor market. This has a bad influence on the quality of education because universities are acting more like businesses and less as higher education institutions.

4.3The Palestinian HE System:

The variety of the higher education institutions in Palestine (WBG) can be divided into two types; the first type is related to the granted degree whether it is a four to five year Bachelor degree or a Diploma which is two to three years of study. The second type is related to the field of study whether it is academic or polytechnics (in which a bachelor or diploma degree is granted in professional and technical fields). The Palestinian higher education system in general consists of the following types:

1- Universities that consist of more than three colleges or faculties and grant bachelor degree or higher in academic or polytechnic education.

2- Open Universities that consist of more than three colleges or faculties and grant bachelor degree or higher in the academic field.

3- University colleges that offer academic, technical or professional programs and award 2-3 year diplomas or honor bachelor degree.

4- Community colleges in which a technical or an academic degree is granted in at least one-year duration **(Fig 4-1)**.

There is inequality in the enrollments distribution in the higher education institutions in the polytechnics and the technical and vocational colleges when compared with the academic education **(Table 4-1)**

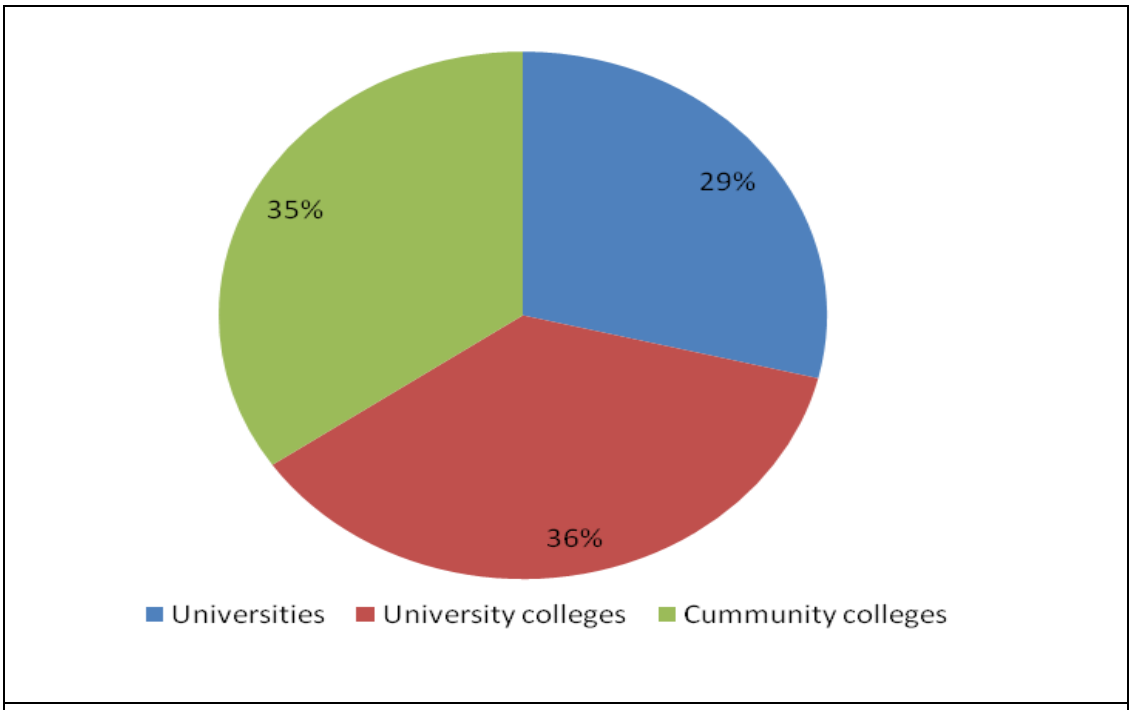


Figure 4-1: The distribution of the HEIs in Palestine (WBG)

Source: Author, based on MEHE archived data (2015)

Table 4-1: The distribution of students in the HEIs				
HEIs type	**Number**	**Enrollments**	**Polytechnics or vocational and technical**	**% of enrollments in the non academic education**
Universities	14	132,449	9803	7
University colleges	19	16,446	1915	12
Community colleges	18	12270	6944	57
Open university	1	60230		-
Source: (MEHE 2015)				

According to (MEHE), the institutional firm of the HEIs consists of three types; governmental such as Al-Aqsa University, public (established by non-governmental organizations) such as Birzeit University and private institutions such as the Arab American University **(Fig 4-2)**. The supervision and finance of the previous types of higher education institutions are organized as follows:

Governmental institutions: The government supervises and finances the governmental institutions in the WBG.

Public institutions: The majority of Palestinian HEIs are public. Those are established through the Israeli occupation by the NGOS or charity organizations. They receive partial funds from the government and depend mostly on fundraising. These institutions are supervised by several bodies such as, the MEHE, Ministry of

Labor, developmental organizations, private sector institutions, UNRWA, international nongovernmental organizations and charitable and religious associations.

Private institutions: These institutions are supervised and financed by several bodies such as, private companies, charitable societies, individual and religious dominations.

UNRWA: The United Nations Relief and Works Agency provides free vocational training courses and primary and secondary schooling education for the Palestinian refugees and it supervises and funds some of the Palestinian colleges.

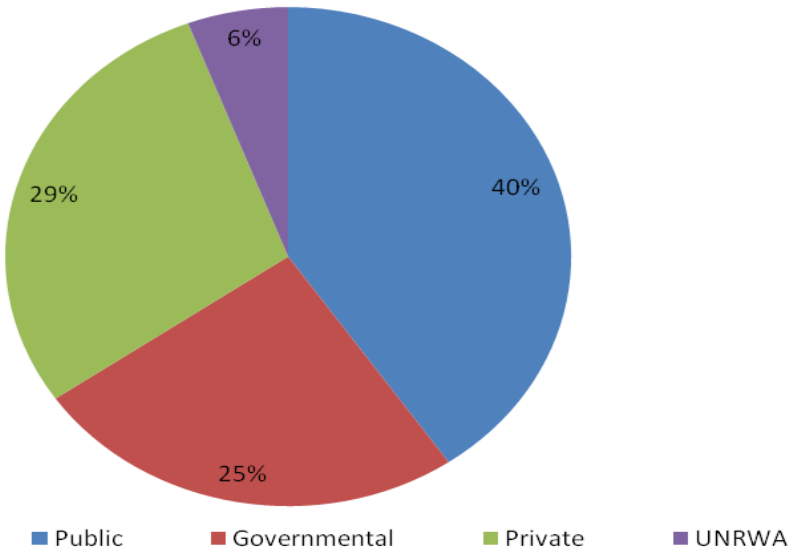


Figure 4-2: The Palestinian HEIs supervision type (2015)

Source: Author, based on MEHE archived data(2015)

4.4 The HEIs Types in Palestine:

The Palestinian HEIs are distributed in WBG and they are different in their types and supervision status, located and distributed as follows:

4.4.1 Palestinian universities:

There are 14 universities distributed in the West bank and Gaza, of which nine universities located in the West Bank and five universities located in the Gaza strip. For example, the Open University has a managerial center in Al-Bireh and its distributed in 22 centers, 17 of them are located in the West Bank and the others are located in the Gaza strip (**Appendix 1)**

4.4.2 University colleges:

There are 19 university colleges distributed in the West Bank and Gaza; in the West Bank, there are 4 governmental, 6 private, 2 public and one is under the supervision of the UNRWA. In the Gaza strip there are 6 university colleges; 4 are governmental, one is private and one is public. In the West Bank, there are 4 governmental university colleges (MEHE 2015) **(Appendix 2)**

4.4.3 Community colleges:

There are 18 community colleges in Palestine distributed in the West Bank and Gaza. Some of the community colleges are affiliated with universities and others are separated. They offer three types of education; technical, academic (including studies

in education and teaching) and vocational education offering a variety of disciplines such as, nursing and health, education, technology, tourism, business and commerce, and engineering as shown in (**Appendix4)**. The duration of study in community colleges takes two years and it needs a holistic exam to obtain the diploma certificate. The total enrolments in the year 2014 were about 12,206 and they contain 64 students in the vocational field. The majority of students are enrolled in the public universities and open universities (which are considered public also), and the minority of the enrollments are distributed in the private universities.

5 Chapter five - The Assessment of the Palestinian HEIs Needs

5.1 The Assessment of the Palestinian HEIs Needs

According to the methodological approaches in this research, the needs of the HEIs are analyzed in the framework of capacity. The capacity needs are carried out through three stages; the strategic planning policies, governance and management, and controlling the physical learning environment **(Fig 5-1)**.

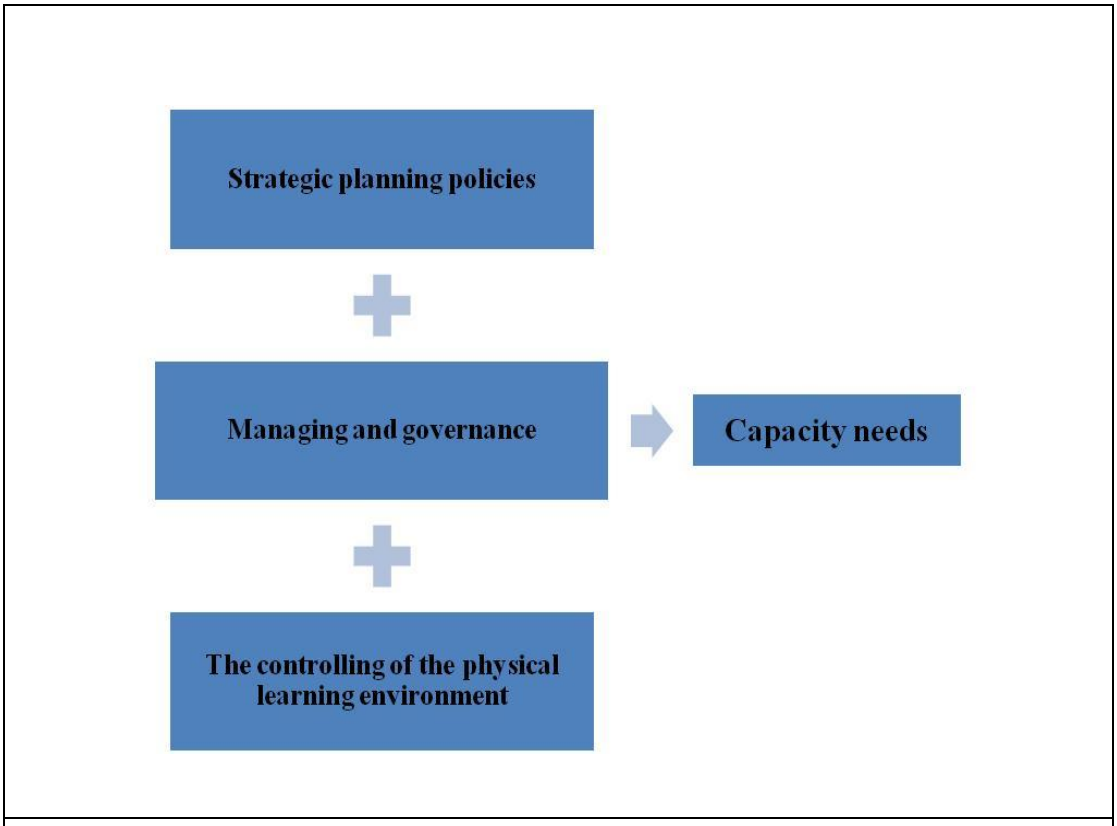


Figure 5-1: The capacity needs analysis components

Source: The author

On one hand, the strategic planning policies will deal with three issues; the enrollment projections and their distribution among the available areas in the HEIs up to the year 2025, the achievement of some socio-economic indicators through the

HE such as, social cohesion, gender equality and economic growth, and the linkage between the spatial location of the HEI with its contribution on urban development **(Fig 5-2)**. The second issue is the management and governance which will deal with the distribution of the HEIs between the private and the government sector. Moreover, the physical learning environment will be controlled through setting suitable space norms or standards for every student in the HEI building.

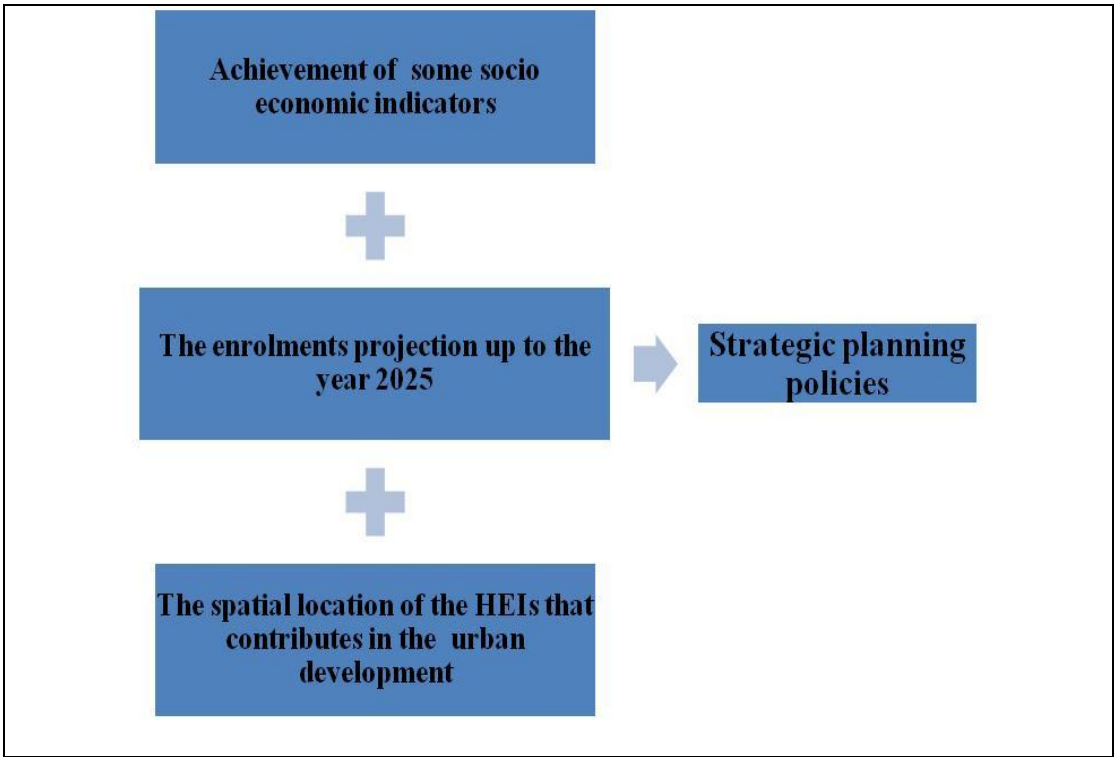


Figure 5-2: The strategic planning policies analysis components

Source: The author

5.1.1 The Socio Economic Conditions of the HE Sector

The socio economic condition in this research will deal with the contribution of the HE sector to the labor market, the unemployment rates, gender equality and social demand.

The Contribution of the HE Sector to the Labor Market

Higher education is considered a social protection mechanism for the Palestinian people due to its contribution in providing job opportunities. There are about (15,601) employees who are working in the Palestinian higher education institutions **(Fig 5-3)**.

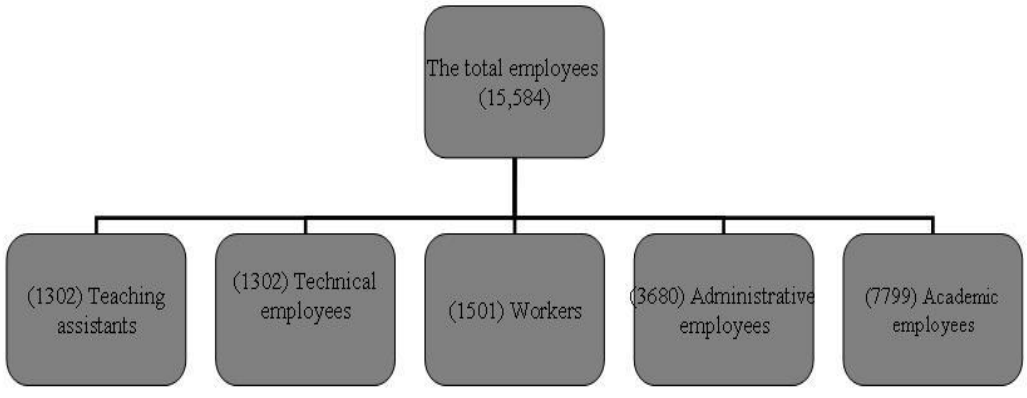


Figure 5-3: The contribution of the higher education sector to the labor market.

Source: MEHE year book (2014-2015)

The previous figure indicates that various jobs can be directly created in the HE sector, whether it is related to teaching or administrative.

The lack of programs that are relevant to the labor market leads to high unemployment percentage, which is reflected in the high unemployment rate for social science majors at (75%) (EACEA 2012).

Nowadays, higher education in Palestine have many obstacles and problems related to the labor market and financial resources reflected in the high unemployment rates **(Fig 5-4)**.

On the other hand, the highest unemployment rates are the ones in vocational education or training certificates which is about 34.8% and the least unemployment rates are found in the graduates holding a bachelor degree or more which is about 22.1% ((PCBS) 2006).

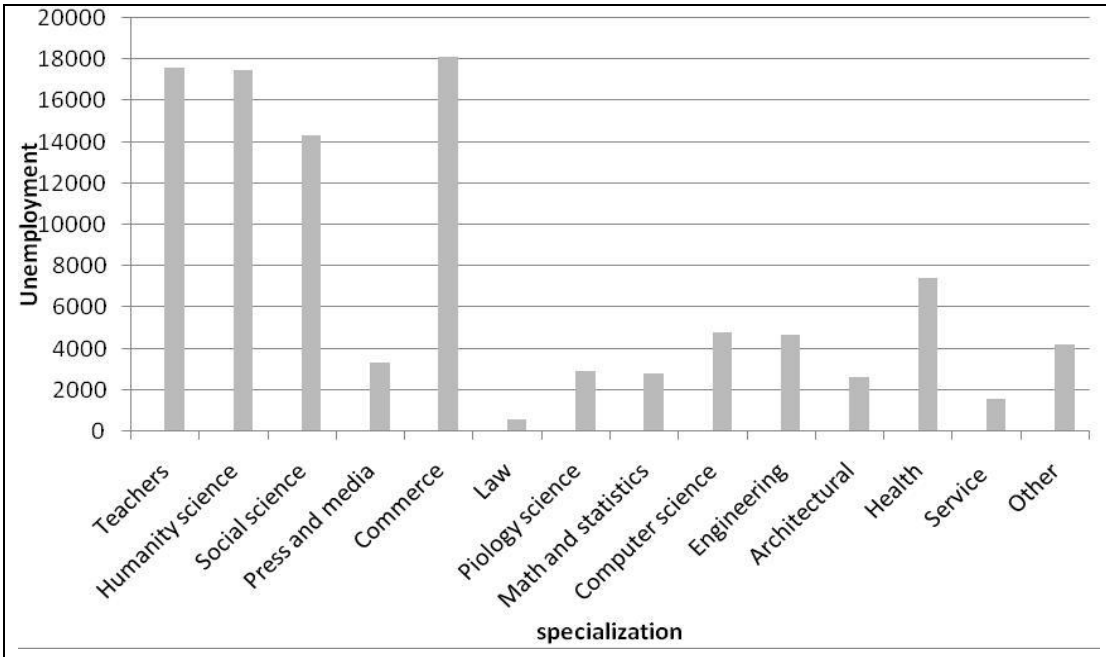


Figure 5-4: The relevance of the higher education specialization to the labor market

Source: Author, based on Data from (PCBS, 2014)

The Social Demand for HE:

The gross enrollment ratio of Palestine is about 4.9% of the total population which is considered high compared with the percentage of those in Arab countries. However, it seems to be a low percentage when compared with those in the developed countries **(Fig 5-5)** and (**Fig 5-6)**.

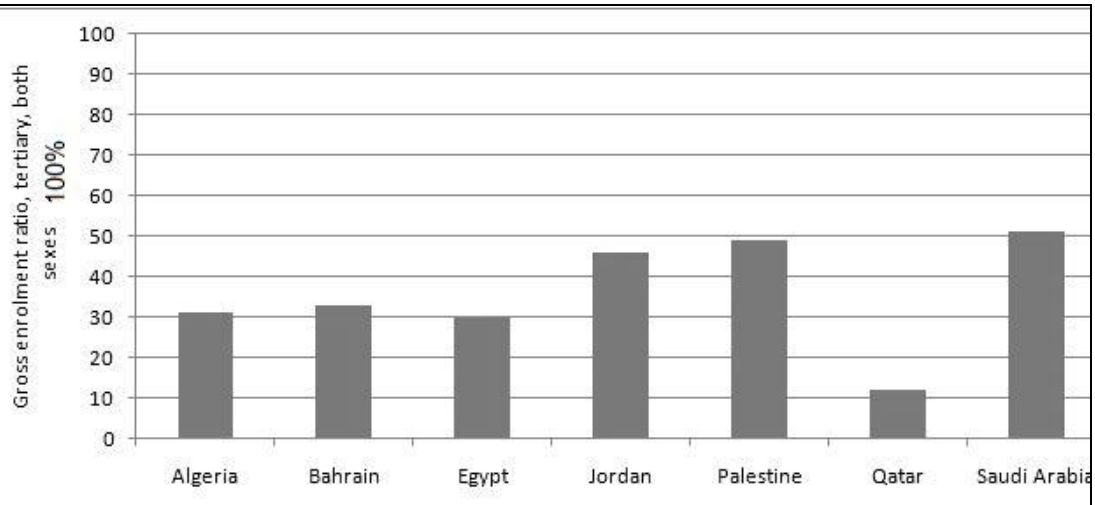


Figure 5-5: The gross enrollments ratio for some of Arab countries in the year 2012

Source: (UNESCO 2012)

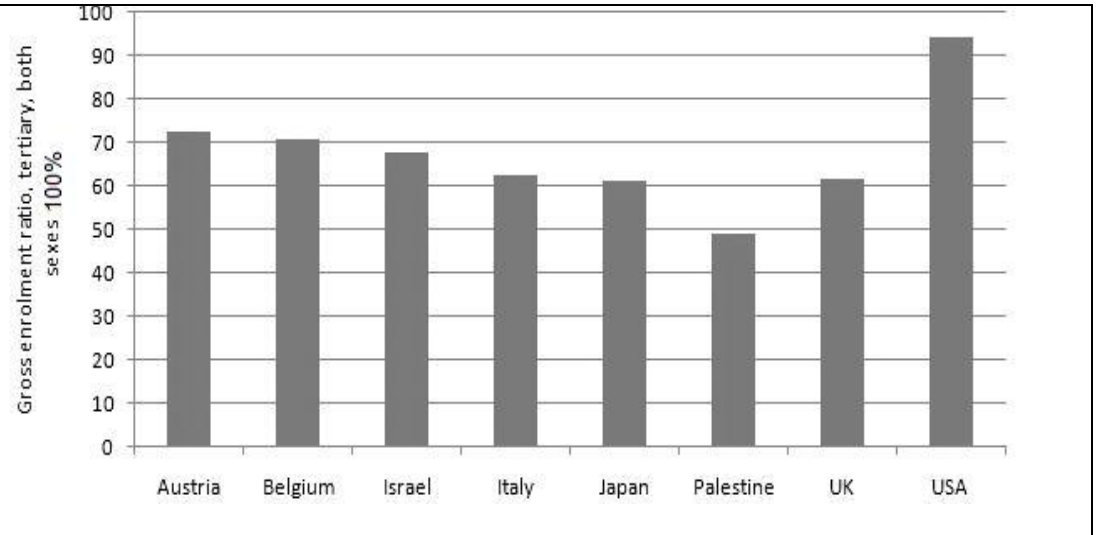


Figure 5-6: The gross enrollments ratio for some international countries

Source: (UNESCO 2012)

The demand for HE increases gradually among high school graduates **(Fig 5-7).** However, the student per teacher ratio is still high when compared with other development countries which is about 31 (MEHE) 2014/2015) **(Fig 5-8)**. Therefore, this high ratio indicates lower education quality due to the little interaction between teachers and students that can only be achieved in smaller groups.

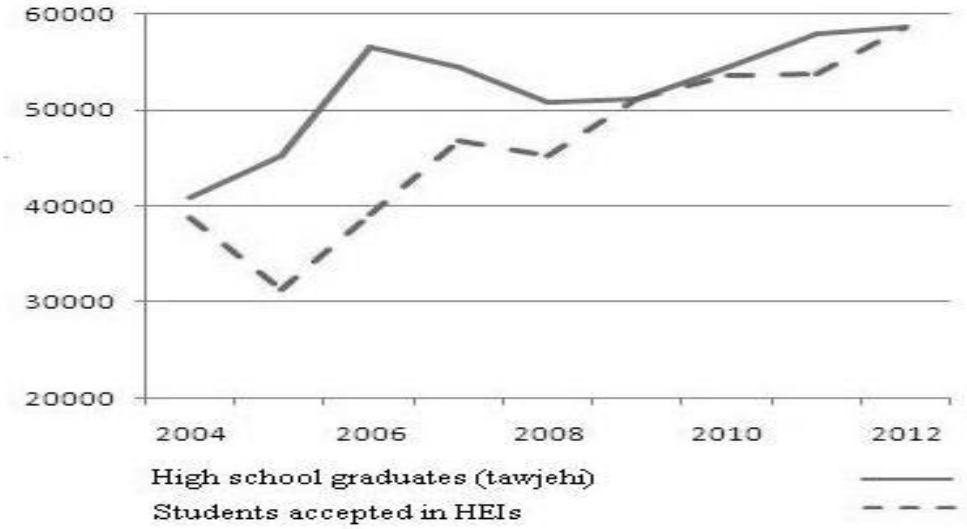


Figure 5-7: The relationship between the high school graduates and the HEIs acceptance

Source: (MEHE 2014)

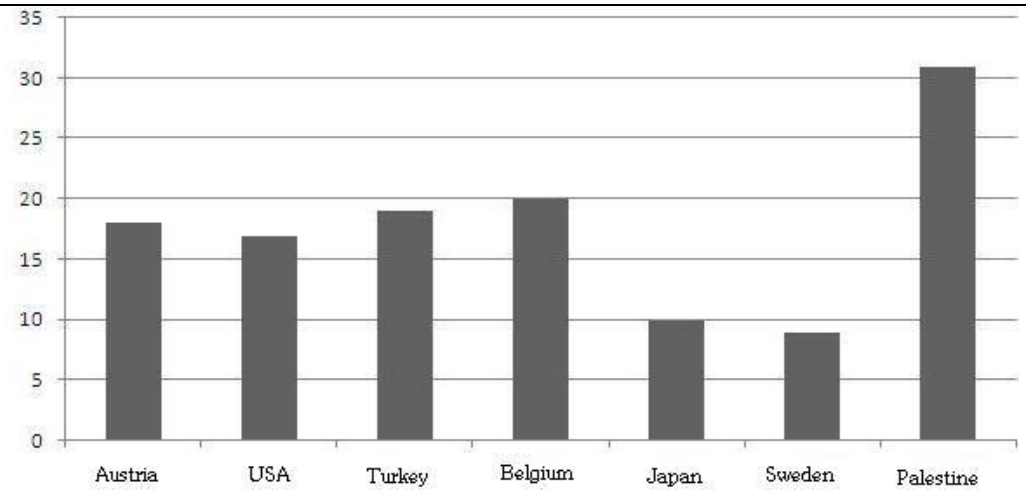


Figure 5-8: The student per teacher ratio in some developed countries compared with Palestine

Source: (OECD 2011)

It appears in **(Fig 5-8)** that the high student/teacher ratio is neglected in the Palestinian HEIs. Moreover, the accepted enrollment applications have gradually increased as it appears in **(Fig 5-7)**. As a result, the low capacity of higher education institutions to absorb increasing number of students leads to mass education rather than quality education. The situation becomes worse when the focus is on increasing enrollments rather than improving the overall quality of education.

Accordingly, the increase of high school graduates concurrently with the high demand for HE indicates that there is a rising social need for HE in the future.

Gender equality:

According to the higher education yearbook (2014-2015), the rate of Palestinian women participating in higher education is higher than men in almost all types of higher education institutions except community colleges as shown in **(Figure 5-9)**

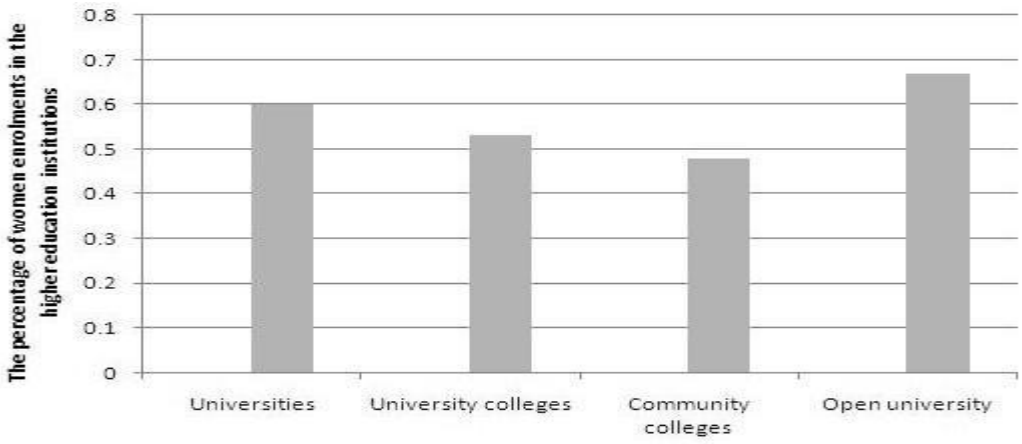


Figure 5-9: The percentage of women enrolments in the higher education

Source: (MEHE) 2014/2015)

Women enrollments are the highest in Open Universities when compared with the percentage in other higher education institutions. Moreover, the percentage of women in higher education institutions is about 60% of the total enrollments. If we look at the parity index (the ratio between women and men enrollments in higher education institutions), it is about 1.5 (MEHE) 2014/2015). When we compared the

parity index of women enrollment in higher education with other countries, it is still considered high as it appears in (**Tables 5-1)** and **(Table 5-2)**

Table 5-1: The parity index (GPI) in World regions

Country	**Gross enrolment ratio, tertiary, gender parity index (GPI)**
World	1.10
Africa	0.84
Asia	1.01
Europe	1.24
North America	1.29
South America	1.35
Developed countries	1.26
Developing countries	1.03
Arab States	1.05
Palestine	1.5

Source: (UNESCO 2013)

Table 5-2: The parity index (GPI) in some countries	
Country	**Gross enrolment ratio, tertiary, gender parity index (GPI)**
Israel	1.31
Jordan	1.15
Palestine	1.41
United Kingdom	1.35
United States of America	1.39
Austria	1.19
Bahrain	1.98
Belgium	1.29
Egypt	0.88
France	1.25
Source: (UNESCO 2012)	

5.1.2 The Enrollment Projection Up to the Year 2025

The enrollment projection helps future planning for HE such as determining the space needed in the upcoming years. Therefore, any forecasting technique can be applied in order to find the future enrollment number. Moreover, there are many indicators that can affect the enrollment projections, such as demographic changes, and economic and political conditions. Other factors affecting enrollment forecasting are the number of high school graduates, immigration and out immigration, employment and unemployment rates, the number of population in the cohort (18-24) and the number of applications for higher education. The previous indicators are

analyzed in the Palestinian HE context to find out the factors which have the most influence on the HE enrollment projection.

The Demographic Change:

According to (PCBS 2012), there is an increase in the population and fertility rates which reflects a future increase of the HEE **(Table 5-3)**

Table 5-3: The relationship between the HEE and the population

Year	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Total population	3719189	3825512	3935249	4050000	4170000	4301905
Total HEE	174,718	184,392	194067	213,973	217207	213581

Source: The author based on data from (PCBS 2014) and MEHE (2014)

Some studies take a specific cohort and not the whole population as explained previously in order to forecast enrollments, such as taking the age cohort (18-24) or (18-22) **(Table 5-4)**

Table 5-4: The relation between the population and the HEE

Year	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Total population	3719189	3825512	3935249	4050000	4170000	4301905
Ages 18-24 years old	524405	543222	562740	582,599	608,160	632,147
Ages 18-22 years old	362757	399766	417136	435,451	453,367	469,682
Total HEE	174,718	184,392	194067	213,973	217207	213581

Source: Author, based on Data from (PCBS, 2014) and MEHE yearbooks2014

The increase in the population number in the age cohort (18-24) in the Palestinian context reflects an increase in the HEE number **(Fig 5-10)**

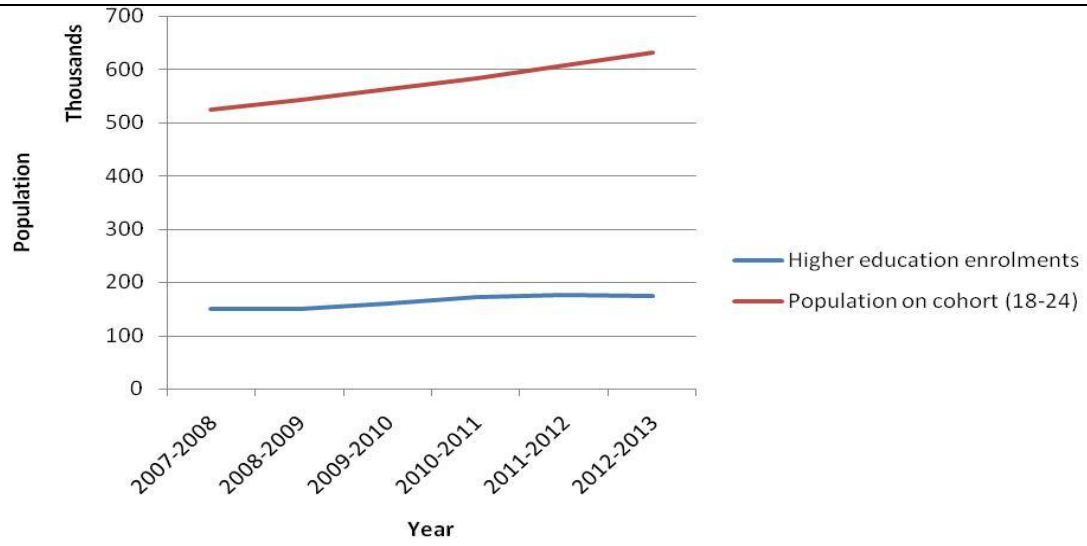


Figure 5-10: The relationship between the HEE and the population number on cohort (18-24) year

Source: the author based on data from (PCBS 2014) and (MEHE 2014)

The High School Graduates:

The increase in high school graduates will reflect an increase in the higher education enrollments **(Fig 5-11)**. If we consider the Palestinian context, the number of high school graduates appears as a major factor in the enrollment projections.

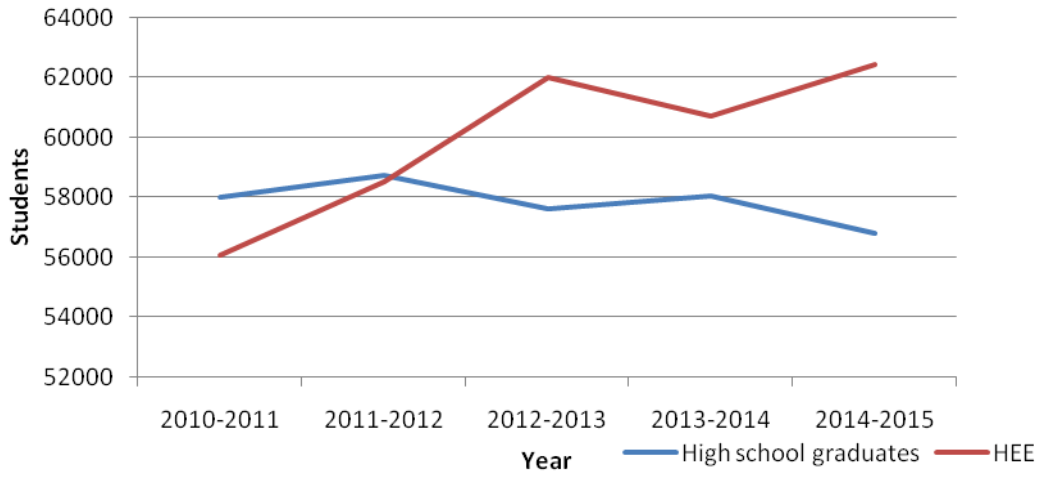


Figure 5-11: The relationship between the HEE in different years and the high school graduates

Source: The author based on data from (PCBS 2014) and (MEHE 2014)

The Economic Conditions and Unemployment Rates

This factor should be considered when the higher education institution decides to open new programs in order to link it with the labor market needs. In the case of Palestine, economic growth has changed between 2004 and 2012 but these fluctuations had no impact on the enrollment numbers **(Fig 5-12) and (Fig 5-13)**.

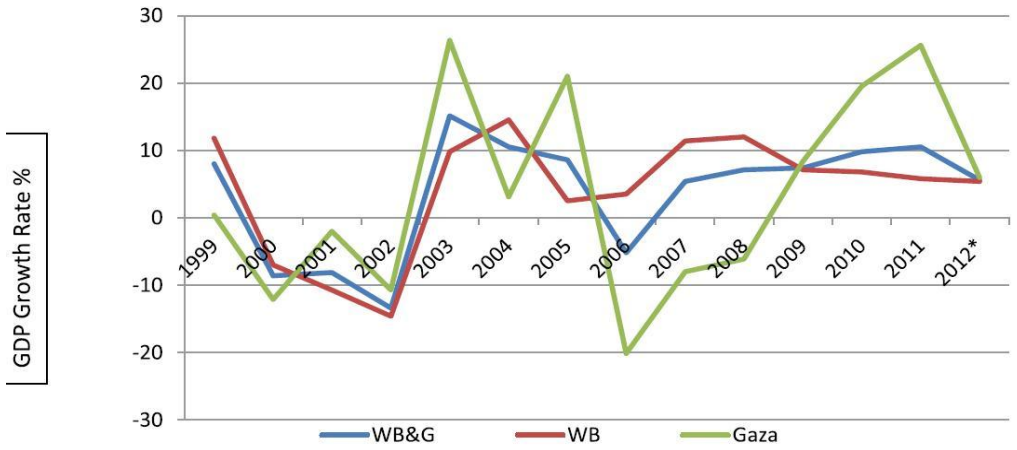


Figure 5-12: Real GDP Growth rate 1999-2012

Source: (World Bank 2012) based on PCBS data

The decreasing rate of the Gross Domestic Product (GDP) in 2006 had no effect on enrollment rates in the same year **(Fig 5-13)**.

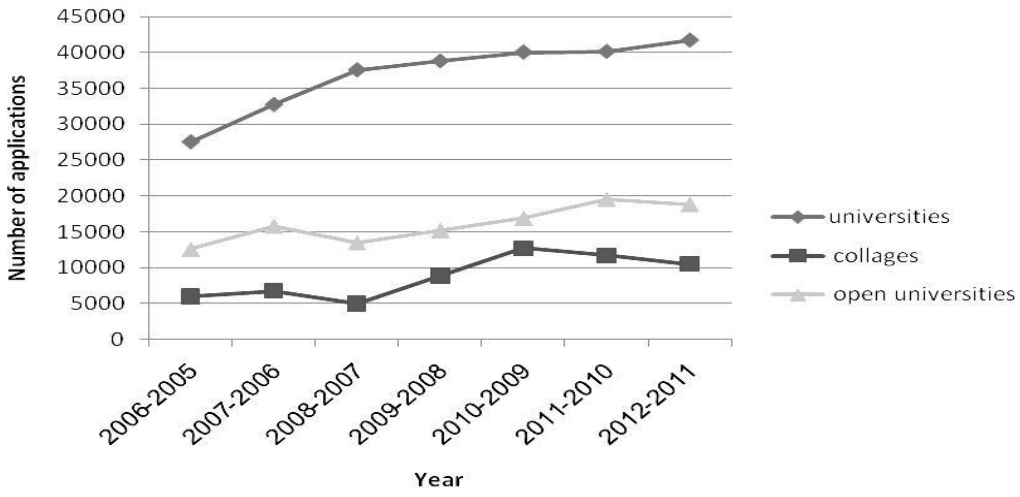


Figure 5-13: The increasing of the applications for the HEIs

Source: MEHE yearbooks2014- edited by the author

Between 2005 and 2006, there was an increase in the HEE rates despite the fact that GDP has decreased. Therefore, and based on that finding, we can conclude that there is no relationship between economic growth and the enrollment rate in Palestine.

The Employment Rates:

The need for qualified employees is one of the reasons for establishing new institutions and opening new programs. However, in Palestine, there is a weakness in the ability to link between the needs for the labor market and creating new programs or colleges (**Fig 5-14)**. Moreover, a high unemployment rate between the year 2005 and 2006 didn't affect the increase in the enrollment rate.

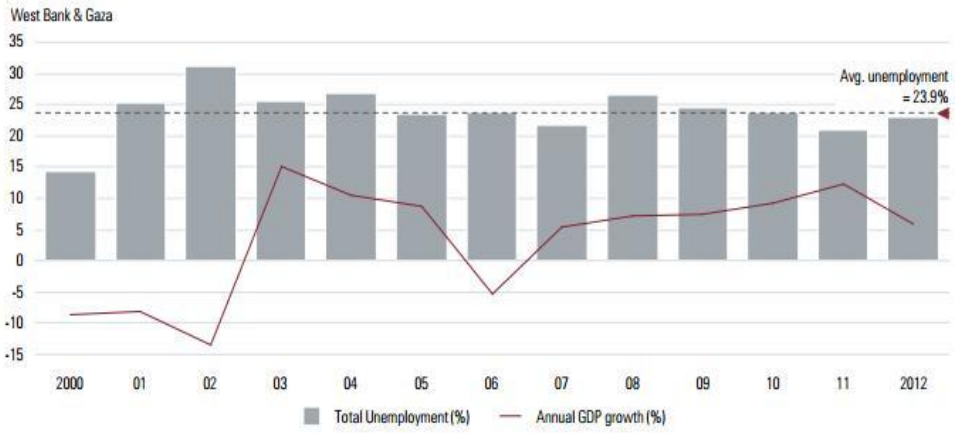


Figure 5-14: The unemployment rates in Palestine in different years

Source: (The Portland Trust 2013) based on (PCBS) data

The Political Conditions:

The uncertainty stemming from the political situation, the Israeli occupation and other confrontations between the Israeli forces and the Palestinians create obstacles for students to reach their universities. However, this had no effect on the enrollment rate. For example, during the Second Intifada in 2002, higher education enrollments were not affected and has increased gradually **(Fig 5-15)**.

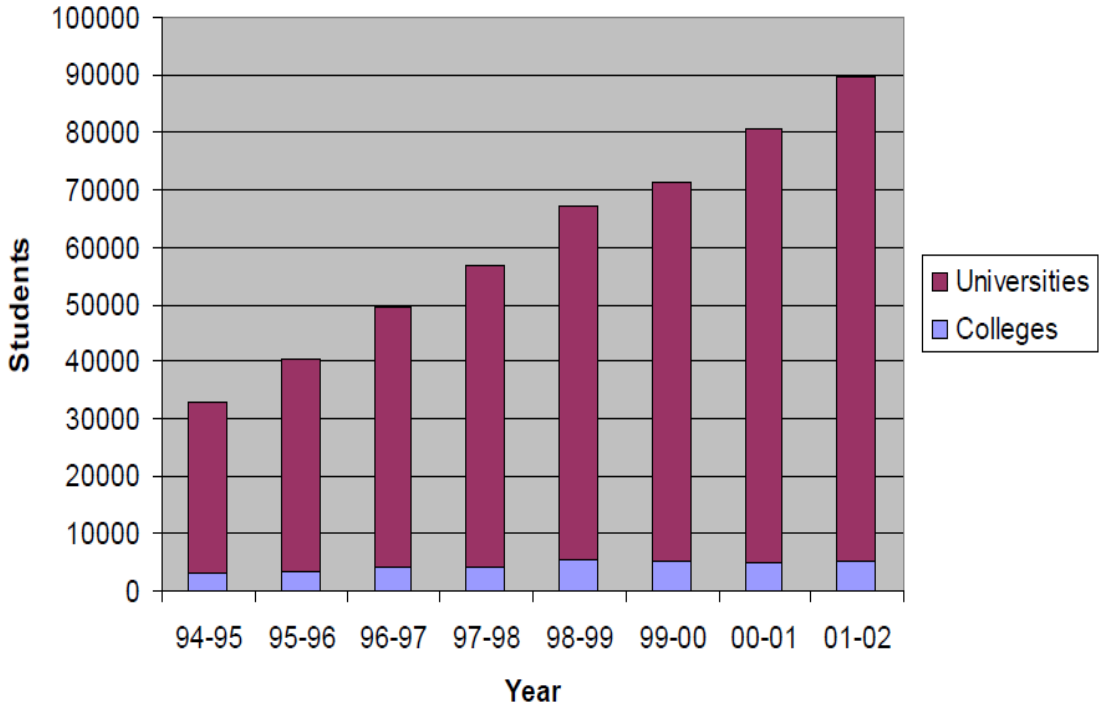


Figure 5-15: Students enrolled in HEIs in different years

Source: (Hashweh 2003) based on MEHE and PCBS data

According to the previous analysis of the Palestinian context, it appears that there are three indicators that have an impact on the HEE rates, as follows:

- The demographic change.
- The number of high school graduates.
- The number of population in the age cohort (18-24).

Considering the fact that immigration has an effect on the demographic change, according to the study by (Maalem 2012), the population of Palestine will reach 6

million in 2025 and there is an expected returnee number of one million. Therefore, the expected population is forecasted to be 7 million in WBG. This demographic change will increase the future HEE prediction.

To quantify the projection of HE enrollment number, many techniques can be used. The next section will explain those techniques.

5.1.3 The Forecasting Techniques Used in Enrollment Predictions:

Many forecasting techniques have been applied in order to forecast the enrollments that were explained in the theoretical chapter. The use of any method mentioned previously depends on the availability of data, the purpose for projections, the shape of the data and how data-related variables can affect the results, such as the economic, social, and political factors. In addition, the user skills and the cost of the technological programs have an impact. In this study, the available population forecasting data is the only reliable source so it will be used for forecasting the enrollments. Moreover, two methods are applied; the extrapolation technique and the regression analysis.

Applying the Linear Extrapolation Technique:

This technique is used based on historical data of student enrollments from the base year 2006 up to the extrapolated year 2025. This analysis is executed by Microsoft Excel and the projection of the HE enrollments depend on the historical data of enrollment in a ten-year period. Our findings indicate that enrollment projects have a

linear relationship with time. By using Excel, the correlation coefficient of the enrollments with time is (0.94) which indicates increasing enrollments **(Fig 5-16).**

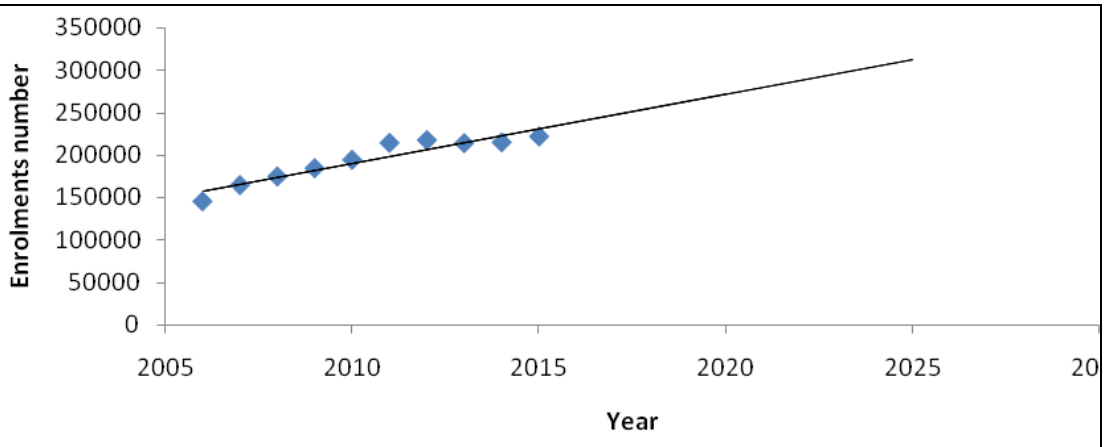


Figure 5-16: The student's projection number in the year 2025

Source: The author, based on data from the (MEHE yearbooks

The number of enrollments according to **(Fig 5-16)** is approximately equal to **320,000** students.

To find the number of enrollments in the year 2025, based on the population study that was conducted by Maalem (2012), the enrollment percentage from the population number is found as it appears in **(Table 5-5)**, then the percentage average is calculated and multiplied by the total number of population in the year 2025 which is 7 million. Therefore, the enrollment number at the year 2025 will be **.0485*7 million= 339,500 students.**

Table 5-5: The percentage of the enrollments number from the population number

Year	Enrollments	% of enrollments increase	population	% of enrollments/ population
2005-2006	145777	-	3,508,126	0.042
2006-2007	164,666	0.1	3,611,998	0.046
2007-2008	174,718	0.06	3719189	0.047
2008-2009	184,392	0.055	3825512	0.048
2009-2010	194067	0.052	3935249	0.049
2010-2011	213,973	0.1	4050000	0.053
2011-2012	217207	0.015	4170000	0.052
2012-2013	213581	0.017	4301905	0.050
2013-2014	214,551	-0.017	4,420,549	0.049
2014-2015	221395	0.032	4,550,368	0.049

Source: (PCBS 2015), (MEHE yearbooks) elaborated by the author

Applying Regression Analysis:

Regression analysis is a method used for forecasting. It depends on the relationship between the independent variables and the dependent variable which here, are the enrollments number. The relationship between variables is checked by using the excel program, and then the most influential factors are used to find the enrollments in the year 2025. This method will be first applied to find out how the independent variables are correlated and then find the variable that affects enrollments the most.

According to the analysis of the factors that affected the Palestinian higher education enrollments, it appears that the age cohort (18-24) years, the population number and the high school graduates are the main factors that affected the projection of the enrollments up to the year 2025 **(Table 5-6).**

Table 5-6: The variables that affected the enrollments in Palestine

Year	Students enrolled in HEIs	Population in cohort 18-24	Population number	High school graduates
2007-2008	174,718	524405	3719189	50823
2008-2009	184,392	543222	3825512	51184
2009-2010	194067	562740	3935249	54402
2010-2011	213,973	582,599	4050000	57979
2011-2012	217207	608,160	4170000	58721
2012-2013	213581	632,147	4301905	57603
2013-2014	214,551	649581	4,420,549	58039
2014-2015	221395	668657	4,550,368	56790

Source: PCBS, MEHE year books and MEHE archives data

The first step in the regression analysis is the correlation analysis which can be applied to find the relationship between the independent variables **(Table 5-7)**

Table 5-7: The Correlation analysis				
Factors	**Students enrolled in HEIs**	**Population in cohort 18-24**	**Population number**	**High school graduates**
Students enrolled in HEIs	1			
Population in cohort (18-24) years	0.89	1		
Population number	0.89	0.99	1	
High school graduates	0.5	0.25	0.22	1
Source: The author				

Conclusion: according to the above results that appear in **(Table 5-7),** there is a positive correlation between student enrollments and the population number, (0.89), which is the same correlation with the population in cohort (18-24) years. However, the enrollments and the high school graduates are not correlated.

The Regression Equation:

According to Table (5-7), the correlation between the enrollment number and the total population number is the same as the correlation with the population in cohort (18-24). Therefore, there is no need to use the two indicators in the correlation equation. Moreover, the population number up to the year 2025 is the only reliable forecasting value and so it will be applied in the regression equation.

The Regression Equation is: Y= -14463 + 0.053X

By substituting X= 7 million; the enrollments will be equal to 356,537 students. Accordingly, it appears that the number of students with returnees will be **(356,537)**

using the regression analysis, and **(339,500)** by the extrapolation techniques**.** By taking the average of the two results, the student number up to the year 2025 will be **(348,000)**. They are distributed in the Palestinian HEIs as follows depending on the current percentage of the enrollments in the HEIs **(Table 5-8).**

Table 5-8: The distribution of the enrollments among the HEIs

HEIs type	Number	Enrolments in the year 2014	The percentage of the enrollments from the total enrollments	Enrolments in the year 2025
Universities	14	132,449	60	208,800
University colleges	19	16,446	7	24,360
Community colleges	18	12270	6	20,880
Open university	1	60,230	27	93,960
Total	52	221,395	100	348,000

Source: (MEHE yearbooks)

The table above indicates that the high percentage of enrollments in universities is above 50% of the total enrollments while the lowest percentage are in community colleges which is about 6%.

5.2 Controlling the Learning Environment Physical Buildings

The second step in the capacity needs assessment is related to controlling the physical building of the HEIs which is reflected in controlling the learning environment. Therefore, planning for the HEIs space needs is an important factor in controlling the learning environment. In order to control the physical building environment and determine the space needed for the future planning of the increasing HEE number, space standards and norms (different in every country), which are related to the space allocated for every student in the HEIs, should include the learning spaces and the recreation areas. In the case of Palestine, there are space standards allocated for every student in HEIs but they are not applied by the universities. In this research, these standards will be compared with other country standards in order to develop new ones that will be suitable for the future expansion of the university and it will satisfy a comfortable studying environment.

Moreover, the space standards are the second planning stage for new campuses or HEIs buildings. New space standards are developed by comparing the Palestinian standards with those in the regional and international universities **(Table 5-9)**

Table 5-9: The space per student from different HEIs	
HEIs	**Space per student from the whole campus area(m^2)**
Jordanian's HEIs	30
Saudi Arabia standards for private university	40
Toronto University	14.5
University of Texas	28
Hebrew university	23
National University of Singapore	55
High FTE students density from (Bechtel Corporation 1968)	16

The comparison of the above space allocated for every student in the previous universities indicates that the Palestinian standards are almost the lowest. Moreover, it is used to planning for dense HEIs according to Bechtel Corporation (1968) **(Appendix6)**. The next step is the comparison of the Palestinian standards with the Palestinian current university space that is allocated per student.

5.2.1 Proposing New Space Standard for Every FTS in the Palestinian HEIs

In this section, the author attempts to set a new policy for the space allocated per student in the Palestinian HEIs to control the physical building planning in order to achieve a comfortable learning environment.

The Evaluation of the Current Spaces per (FTS) in the Palestinian HEIs:

The evaluation will be carried through the analysis of the space per student in every HEI in the Palestinian context **(Table 5-10).**

Table (5-10): The space per FTS in the Palestinian universities

	Type	Year established	Location	Site area(1000m^2)	Students numbers (2013-2014)	Area per student(m^2)
Universities						
Al-Azhar	Public	1991	Gaza	80	14453	5.53
The Islamic University	Public	1978	Gaza	81.6	19273	4.2
Al-Aqsa	Governmental	1991	Gaza	260	18727	13.88
Hebron	Public	1971	Hebron	112	8102	13.8
Palestine Polytechnic	Public	1999	Hebron	86	3996	21.5
Bethlehem	Public	1973	Bethlehem	44	3233	13.6
Al-Quds	Public	1984	Al-Quds	192	11506	16.7
Birzeit	Public	1972	Birzeit	800	8982	89
Al-Najah	Public	1977	Nablus	155	21765	7.12
Arab American	Private	1997	Jenin	305	7182	42.5
Khadoori-University	Governmental	2007	Tulkarim	360	4552	79
Palestine University	Private	2008	Gaza	30	3156	9.5
Al-Istiqlal	Governmental	2007	Jericho	12	793	15
Gaza	Private	2007	Gaza	39.4	624	63

Source: The Palestinian universities and MEHE yearbooks

The space per FTS in the previous table is calculated using the whole campus site area. In order to have more detailed information about the current space available per

FTS in the Palestinian universities; four Palestinian universities have been selected and analyzed **(Table 5-11).**

Table 5-11: The space per students in some Palestinian universities

University name	The total building area including the green area(m^2)	Enrollments numbers	Area per student(m2)
Birzeit University	98669	9942	11
Al-Najah University	141987	21765	6.5
Palestine Polytechnic University	28795	3996	7.2
The Islamic University	105260	19273	5.5

Source: The author based on data from the planning units in the universities (2014) and the universities websites, MEHE yearbooks (2014)

The average from the international space standards and the average from the Palestinian universities are calculated **(Table 5-12)**

Table 5-12: The proposed space per FTS

Average area	Area per student (m2)
From the national and regional HEIs	30
From the Palestinian universities	7.5
The average of the above	19

The total average space as shown in **(Table 5-12)** is equal to **19m^2**. On the other hand, three scenarios are applied to assess a new policy for the HEIs future physical

planning and to forecast the whole space that will be needed for the future enrollments up to the year 2025. The first scenario is applied if the current space per student ($7.5m^2$) still exists in Palestinian universities. The second scenario is the application of the $19m^2$ and the second scenario is the application of the Palestinian standards which is $16m^2$ (**Table 5-13).**

Table 5-13: The needed area in the year 2025 for 348,000 FTS according to three scenarios

Source	**Area per FTS (m^2)**	**The total space needed (km^2)**
The average space from **Table (5-12)**	19*348,000	7
From the Palestinian universities	7.5*348,000	2.6
From The current Palestinian standards	16*348,000	5.6

Source: The author

Accordingly, the space of $7.5m^2$ is very far from the space applied according to international standards and Palestinian ones, and therefore, it will be neglected. The average from the Palestinian standard with the average space developed from international universities is calculated; which is $(16+19)/2=18m^2$. If we multiply it by the number of enrollments in the year 2025; 18* **(348,000)** = 6 km^2, it represents the total proposed future space for future universities. According to (**Appendix1 and Appendix 2)**, the total current space in the HEI is equal to 2.9 km^2 (neglecting community colleges because most of them are included with university buildings).

Therefore, if we applied the 18m^2 space standard and if the current universities are expanded in the future (if possible), we need approximately 3 $km^{2.}$

There are future needs for higher education institutions and it is reflected in the space needed which is an expected area of 3km^2.If we apply the (Bechtel Corporation 1968) study about the proper campus enrollments, it is proposed that it should not be less than 15,000 students. With that being said, in the case of Palestine, the average student per university is equal to 9,000 students and the average enrollment number per university in different countries similar to Palestine's area is 26,000 students **(Table 5-14).** Therefore, the average of the previous values is equal to (15,000+9000+26000)/3 = **16,000 students**. Accordingly, each future university campus proposed to have 16,000 students.

Table 5-14: The enrollments number at universities located in countries has the similar area of Palestine

Country	University	Enrollments	Number of Campuses
Austria	University of Innsbruck	28,000	1
Israel	Hebrew University	23,000 (Hebrew University 2015)	6
Singapore	National University of Singapore	27975 (NUS 2014)	3

Source: The universities websites

5.3 The Managing and Governance of the HE Sector:

Governance of higher education will deal with the distribution of the Palestinian HEIs between the public and private sectors, and it will discuss the transition of students from high school to HE.

There is a difference between countries in the distribution of the HEIs between the private and public sector (government sector) and this is exactly related to the state vision and policies. In some cases, the HEIs are mostly private such as in the Japanese and Syrian system but in other cases, it is mostly public which are found in the USA, Jordan, Israel, Turkey and Austria (**Table 5-15)**. The public HEIs can offer affordable learning for the students because it is established for non-profits and it is owned by the state or by non- profit organizations. However, studying in the private HEIs is more expensive. On the other hand, private HEIs can reduce the governmental financial aid and responsibilities.

Table 5-15: The distribution of students between the private and public sector in different countries

Country	The HEE in the public HEIs	The HEE in the private HEIs	The % of the HEE in the public HEIs / HEE in the private HEIs
Japan	778737	2,421,462	0.32
Jordan	162,000	68,000	2.38
USA	12,370,079	3,964,055	3.12
Israel	233085	48530	4.8
Palestine	195,908	15704	12.4

In the case of Palestine, which suffers from financial problems and depends mainly on foreign aid, similarly, the HE sector is dependent on the government and external aid. It is clear that it has the highest governmental HEIs percentage when compared with the countries in the table above. It is also clear that the privatization of HE can help in minimizing the financial problems, and it also minimizes the government's control on the HE process.

Governance also includes the year of transition of high school graduates to HE. It is illustrated that some countries allocate two to three years before this transition. For example, Israel allocates three years of military service before transition to HE. In the case of Singapore, technical education is required before entering HE and this is done to link the HE sector with economic development. In the case of Palestine, high school graduates enter HE directly after graduation.

5.4 The Capacity of the Current HEIs Buildings:

The space analysis of Palestinian universities is carried out to determine the capacity for each university in absorbing more students in the upcoming years. It is measured by applying the space norm, $18m^2$ per FTS, in order to set a distribution policy of future enrollments among the available current space in each university. The division of the total site area (which contains the built up area and the non-built up area) by the total enrollments number in each university can help in measuring the area per FTS in each HEI. It appears that all the Palestinian universities provide space for

enrollments less than the proposed space standard except, Palestine Polytechnic University, Birzeit University, Arab American University, Khadoury University and Gaza University **(Table 5-16).**

Table 5-16: The current capacity for each Palestinian university to absorb enrollments

University	Location	Site area(1000) m2	Enrollments (2013-2014)	Area/student (m2)
Al-Azhar	Gaza	80	14453	5.53
The Islamic University	Gaza	81.6	19273	4.2
Al-Aqsa	Gaza	260	18727	13.88
Hebron	Hebron	112	8102	13.8
Palestine Polytechnic	Hebron	86	3996	21.5
Bethlehem	Bethlehem	44	3233	13.6
Al-Quds	Al-Quds	192	11506	16.7
Birzeit	Birzeit	800	8982	89
Al-Najah	Nablus	155	21765	7.12
Arab American	Jenin	305	7182	42.5
Khadoury- university	Tulkarim	360	4552	79
Palestine University	Gaza	30	3156	9.5
Al-Istiqlal	Jericho	12	793	15
Gaza	Gaza	39.4	624	63

Source: The Palestinian universities web sites and MEHE yearbooks- edited

The analysis of the results above indicates that only five universities can absorb more enrollments in the upcoming year. On the other hand, the future capacity for each university depends on the university's desire for expanding and the possibility to expand within the urban fabric. The total students that can be absorbed by the current universities are equal to 63,505 students adding the value of 9,502 for university colleges **(Appendix 2).** When we subtract the forecasting enrollment number from

this number as well as subtracting the current HEE number 221,395, the remaining future number is equal to **53,600** students. According to the average space standard number that is equal to 18m^2, the proposed universities will be equal to **(53,600/16000 = 3)** Therefore, the needed universities are three with an area of 324,000 m^2 for each one. However, it is clear that those three universities can be divided into 6 universities if the current situation of the space per student remains as it is up to the year 2025.

5.5 The Spatial Location Characteristics of the Universities Having the Absorption Capacity:

5.5.1 Birzeit University:

Birzeit University is a public university located in the suburbs. It is about 20 km in the north of Jerusalem city and about 10 km from Ramallah city **(Fig 5-17)**. Moreover, it provides the highest area per student among the Palestinian HEIs which is about 11m^2, calculated from the built-up campus area and located within an area of 800 dunums (comprised of built up and non built-up). Therefore, it has the possibility to expand and absorb enrollments in the next year. The campus is located outside the city according to Heijer (2011). Moreover, the university location enhances the possibility of expansion from three sides **(Fig 5-18).**

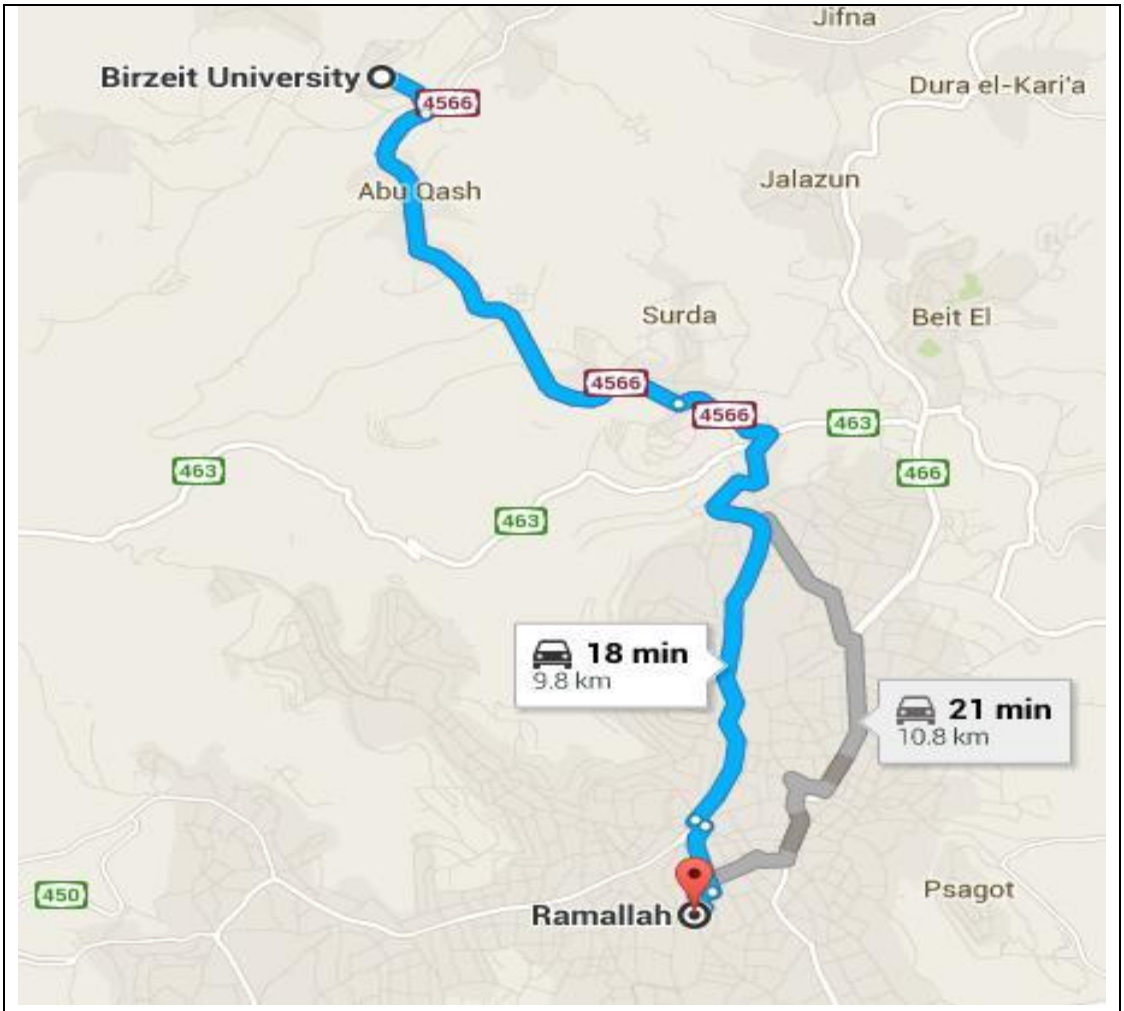


Figure 5-17: The Location of Birzeit University relative to Ramallah city

Source: Google maps

Figure 5-18: The possibility of the expansion for Birzeit University

Source: Google maps- edited by the author

5.5.2 Arab American University:

The Arab American University (AAU) is a private university located about 9 km from Jenin city within the suburbs **(Fig 5-19)**. It provides an area per student of 42.5 m^2 from the total site area that contains built up and non-built up area. In addition, it is located within an area of 300 dunums, including non-built-up area, and therefore, has the possibility to expand and absorb enrollments in the upcoming years. The

campus is located outside the city. Moreover, the university location enhances the possibility of expansion from four sides by establishing new buildings **(Fig 5-20).**

Figure 5-19: The Location of AAU relative to Jenin city

Source: Google maps

Figure 5-20: the possibility of the expansion for AAU

Source: Google maps- edited by the author

5.5.3 Palestine Polytechnic University:

The Palestine Polytechnic University (PPU) is a public university which consists of two campuses and is located close to Hebron city within an urban area (**Fig 5-21)** and **(Fig 5-22)**. Moreover, it provides an area per student of 21.5 m^2 from the total site area that contains built up and non-built up area. In addition, it is located within an area of 86 dunums with two campuses but it is not all built yet. Therefore, it also has

the possibility to expand and absorb enrollments in the upcoming years. The university has two buildings integrated within the city (Heijer 2011). However, the university's main building location reduces the possibility of expansion **(Fig 5-22),** but there is an empty area within building number B site area in which the university can establish new buildings **(Fig 5-24).**

Figure 5-21: The Location of PPU building B relative to Hebron city

Source: Google maps

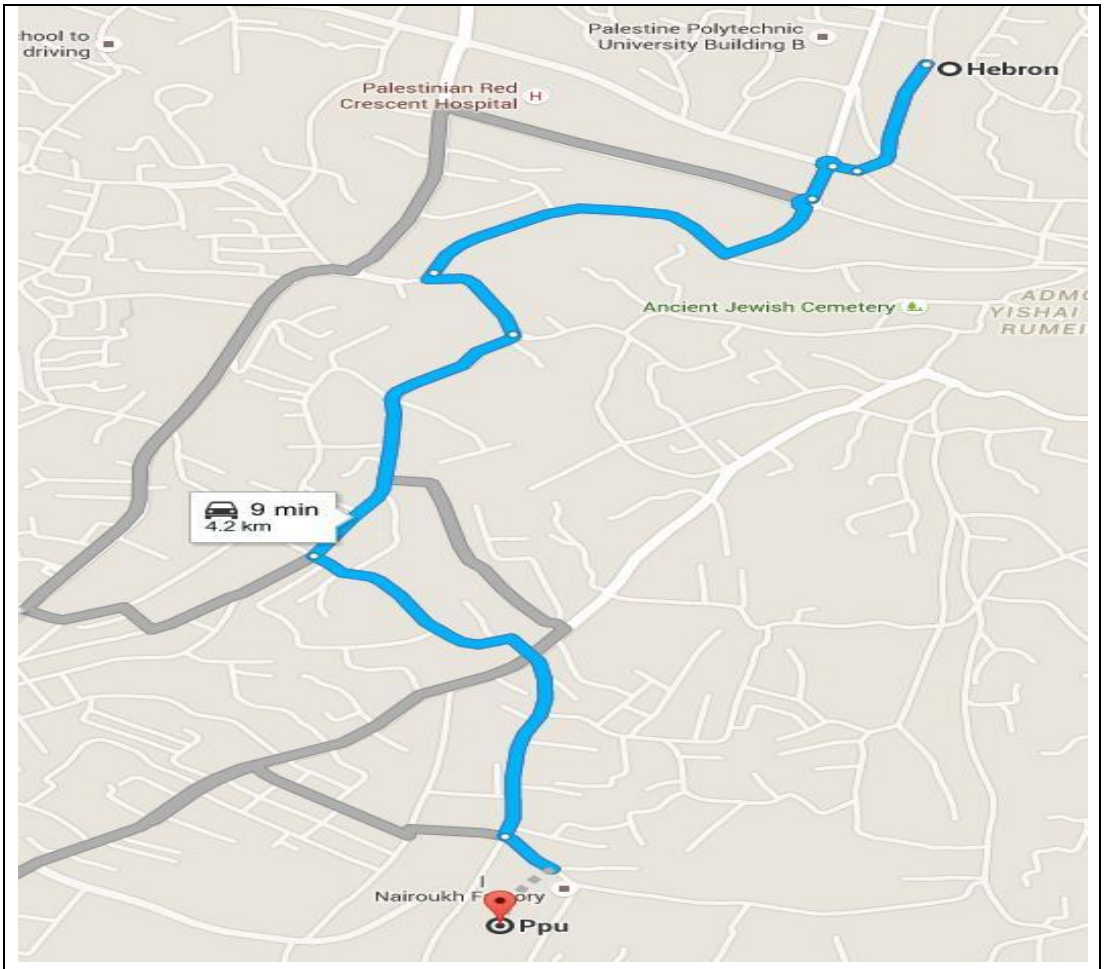


Figure 5-22: The Location of PPU building A relative to Hebron city center

Source: Google maps

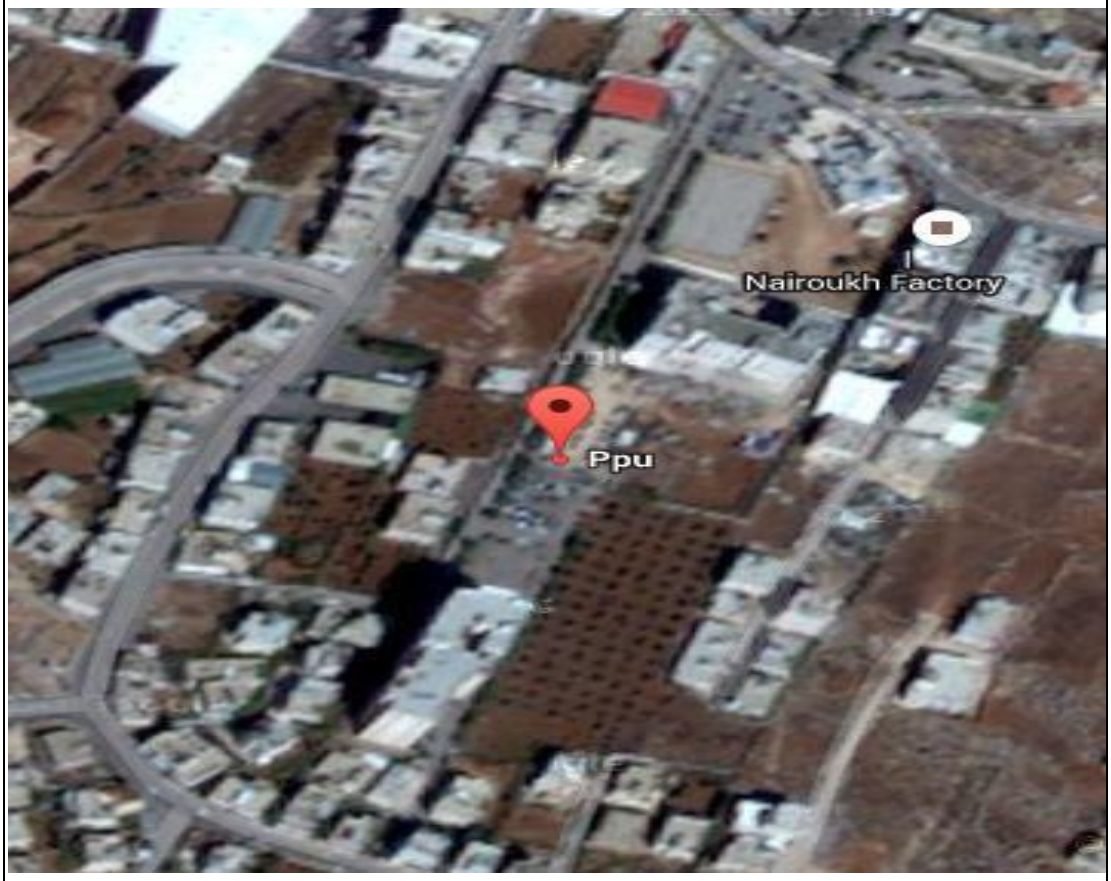


Figure 5-23: The impossibility for expansion of PPU building A

Source: Google maps- edited by the author

Figure 5-24: The possibility for establishment of new buildings in PPU building B site area

Source: Google maps- edited by the author

5.5.4 Palestine Technical -Khadoury University:

Khadoury University is a governmental university located in the western part of Tulkarem city within an urban area close to the Green Line that separates the Palestinian lands from the Israeli occupied land **(Fig 5-25)**. Moreover, the campus provides an area per student of 79 m^2 from the total site area that contains built up and non-built up area. Moreover, it is located within an area of 305 dunums but it is not all built yet. Therefore, it has the possibility to expand and absorb enrollments in the upcoming years. The gated campus is within the city border according to Heijer (2011). It is clear that the university location enhances the possibility of the expansion from two sides by the establishment of new buildings **(Fig 5-26)**

Figure 5-25: The Location of Khadoury University

Source: Google Earth- edited by the author

Figure 5-26: The possibility of the expansion for Khadoury University

Source: Google Earth- edited by the author

5.5.5 Gaza University:

Gaza University is a private university located about 2 km from Gaza city within an urban area **(Fig 5-27)**. The campus provides an area per student of 44 m^2 from the total site area that contains built up and non-built up area. Moreover, it is located within an area of 39.4 dunums but it is not all built yet. Therefore, it has an empty area for the establishment of new buildings to absorb enrollments in the upcoming

years. The campus is located within the city border and it is considered a gated campus. It is clear that the university location prevents the expansion of the campus area, but it allows building new buildings within the empty spaces **(Fig 5-28).**

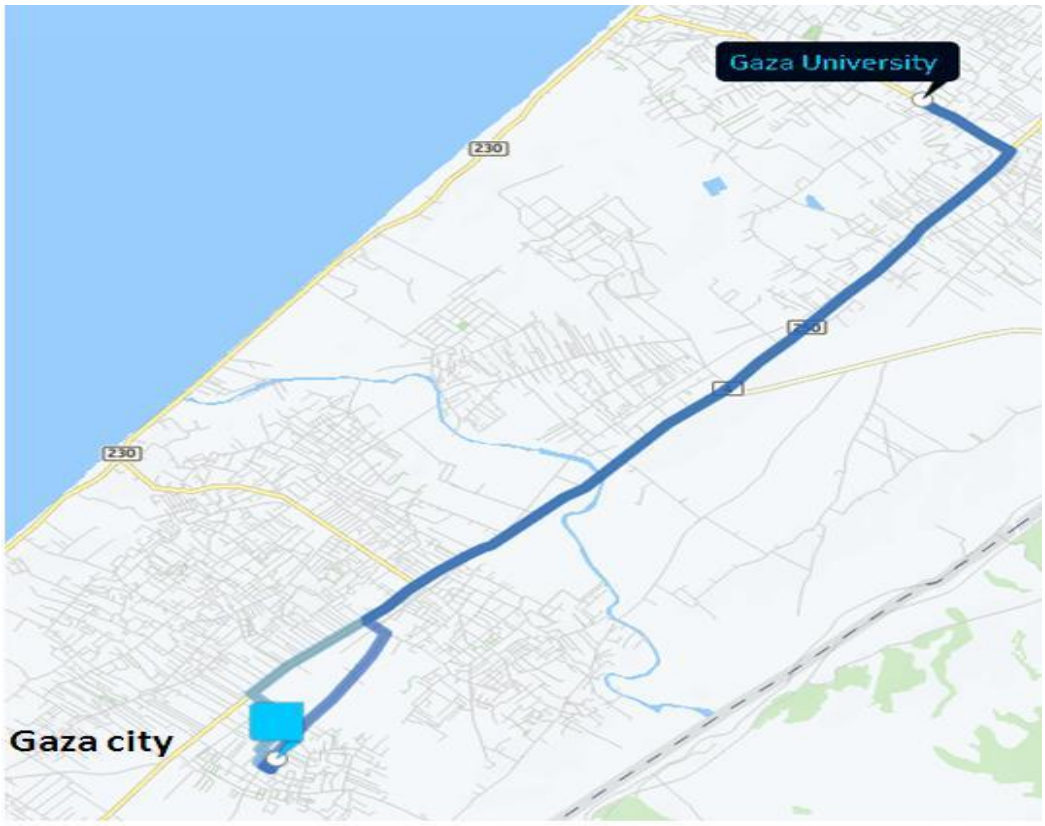


Figure 5-27: The Location of Gaza University relative to Gaza city center

Source: Google maps

Figure 5-28: The possibility of establishment of new buildings within the campus area

Source: Google maps

Chapter six-The Spatial Distribution of the Enrollment

6.1 The Proposed Distribution of the HE Enrollments:

According to the previous chapter, the current HEIs can absorb 73,007 students up to the year 2025 and they will be distributed among the HEIs with an available area **(Table 6-1).**

Table (6-1): The current capacity for each Palestinian university to absorb enrollments up to the year 2025

University	Location	Site area(1000)m^2	Enrollments (2013-2014)	Area/student (m^2)	The enrollments number that the HEIs can absorb
Palestine Polytechnic	Hebron	86	3996	21.5	781
Birzeit	Birzeit	800	8982	89	35462
Arab American	Jenin	305	7182	42.5	9762
Khadoori-university	Tulkarim	360	4552	79	16000
Gaza	Gaza	39.4	624	63	1500
The university colleges					9502

Source: The Palestinian universities web sites and MEHE yearbooks- edited by the author

The previous table shows that five universities can absorb students, but each university differs in the way that it can be expanded to absorb those students. Some of these universities have the possibility to expand its campus within the site area, such as, Birzet University, AAU and Khadoury University **(Fig 6-1).** Others can add more buildings on the same campus area or choose new locations such as Gaza University and PPU **(Fig 6-2)**

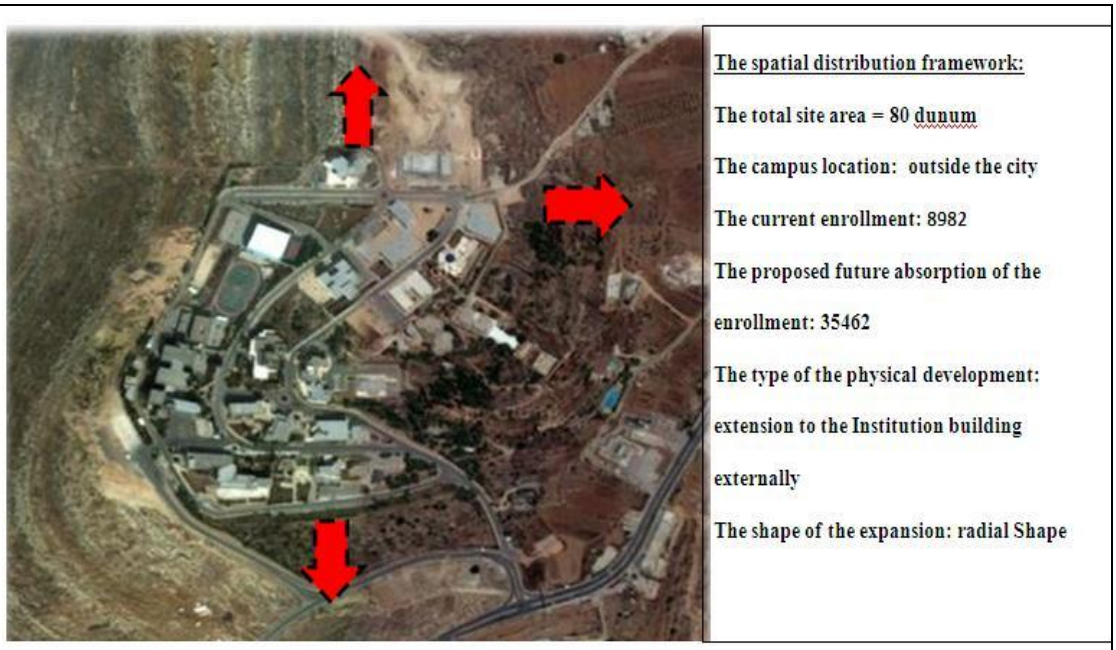


Figure 6-1: The spatial distribution framework for Birzeit University

Source: The author

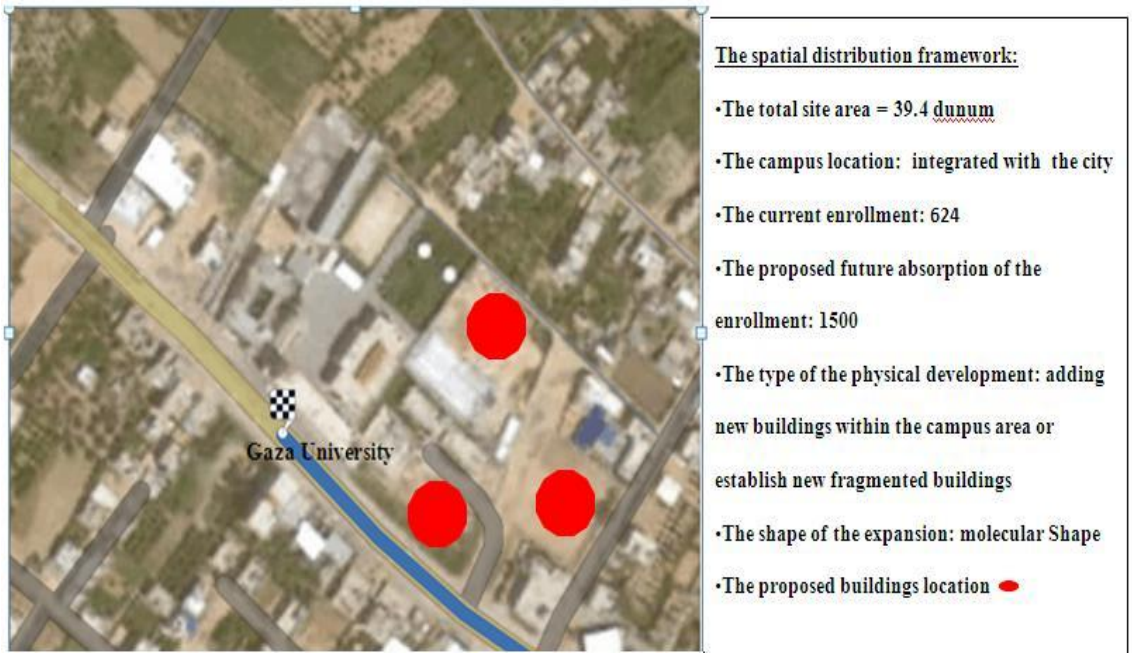


Figure 6-2: The spatial distribution framework for Gaza University

Source: The author

The figures above indicate that Birzeit university campus area can expand to reach the standard campus population. However, Gaza University has a small campus and a small number of HE enrollments. As has been mentioned above, it can expand its campus by choosing new locations on other sites.

As will be explained later, there are three HEIs that have the possibility for expansion in the surrounding area without selecting new locations **(Table 6-2).**

Table 6-2: The table shows the HEIs expansion type		
The HEIs	**The location**	**The type of expansion**
Birzet University	Rural area	From three sides (Molecular)
AAU	Rural area	From four sides (Molecular)
Khadoury University	Urban area	From two sides (Radial)

The table above indicates that rural HEIs have a bigger possibility for future expansion and it has more flexibility in urban development in the same area. Moreover, this supports those HEIs in increasing their student population in order to become large and famous. Accordingly, the current HEIs can absorb more students if they expand their campuses in the areas surrounding them. On the other hand, the campus enrollments produce more population and this can reflect on the needs for infrastructure and other facilities. Therefore, the expansion should be limited and subjected to certain criteria. If we considered that the total HEI enrollment of 15,000 students produce a campus population in the surrounding areas equal to 52,500, it becomes clear that Birzeit University can produce community related population of 124,117 if it expanded to reach the optimum enrollments number which is approximately a third of Ramallah governorate.

6.2 The Evaluation Criteria of the Proposed HEIs Locations:

The proposed locations should be planned to absorb about **53,600** HEE, therefore, those locations will be evaluated by applying the Multi-Criteria Evaluation method which depends on specific considerations. Many indicators control the selection of any new campus location on a specific community such as; land, site appeal, infrastructure, community development and control (land use), circulation, community facilities and utilities, the environmental considerations, the urban development trends, the public support, demographics... etc.

Accordingly, five indicators are considered when planning for new HEI in the Palestinian context location are:

1- The land
2- The infrastructure
3- The agglomeration
4- The socio- economic condition
5- Policies

The Land:

The land can either increase or decrease the site's value. It is considered a major factor for Palestinians because of the Israeli violence on Palestinian lands which is concentrated in Jerusalem **(Table 6-3)**. Therefore, the lands that have more Israeli settlements should have the potential for locating the new higher education

institution on it. Another indicator related to land which can affect the selection is the cost which will be analyzed based on the availability of governmental land. This is because it can promote the selection of an area needed and cooperate with the private sector for the establishment of the new HEI **(Appendix 7)**. Moreover, the availability of the proposed land area in proportion to the built up area can help in judging on the availability of the open and free areas **(Table 6-4)**. The site appeal which is related to the beauty of a certain location is analyzed depending on the percentage of the landscape within an area **(Appendix 8)**

Table 6-3: The Israeli violence on the WB governorates

WB governorate	Israeli settlement Km^2
Jenin	3.959
Tubas	7.518
Tulkarm	3.619
Nablus	16.248
Qalqiliya	11.770
Salfit	18.147
Ramallah and Al-Bireh	31.268
Jericho and Al-Aghwar	23.425
Jerusalem	40.011
Bethlehem	18.158
Hebron	14.142

Source: ARIJ (2009)

Table 6-4: The built up area of the WB governorates			
WB governorate	**Area Km^2**	**Palestinian built up area Km^2**	**% the of built up area**
Jenin	573	27.872	5
Tubas	366	5.170	1
Tulkarm	245	19.101	8
Nablus	614	25.438	4
Qalqiliya	174	8.466	5
Salfit	202	8.719	4
Ramallah and Al-Bireh	849	47.850	6
Jericho and Al-Aghwar	609	7.99	1
Jerusalem	354	35.646	10
Bethlehem	608	25.37	4
Hebron	1068	83.224	8
Source: ARIJ (2009) - edited by the author			

The Infrastructure:

The availability of water and sewage networks can promote the selection value of a certain location. The communication lines are important as well. This indicator depends on the availability of a main street network near the proposed location. **(Appendix 9)** and **(Appendix 12)** for Gaza governorates.

The Agglomeration:

This indicator is analyzed by three factors, the existence of HEIs in a certain governorate, the HEE number and the population densities. Depending on the hypothesis that the HEI shouldn't be located in a crowded area because it will generate more people on that location; the lower density locations have more potential in the Palestinian context **(Table 6-5)** and **(Fig 6-6)**

Table 6-5: The population densities of the Palestinian governorates

Governorate	Population density (capita/km2
Gaza	8457
North Gaza	5,947
Dair Al-Balah	4,560
Rafah	3,524
Khan younis	3,161
Jerusalem	1,215
Tulkarem	740
Hebron	709
Qalqilia	667
Nablus	630
Jenin	534
Ramallah	407
Salfit	347
Bethlehem	328
Tubas	161
Jericho	88

Source: (PCBS 2015)

The table above indicates that the lowest population density is in Jericho and the highest is in Gaza. Therefore, the potential for Jericho is higher than other governorates.

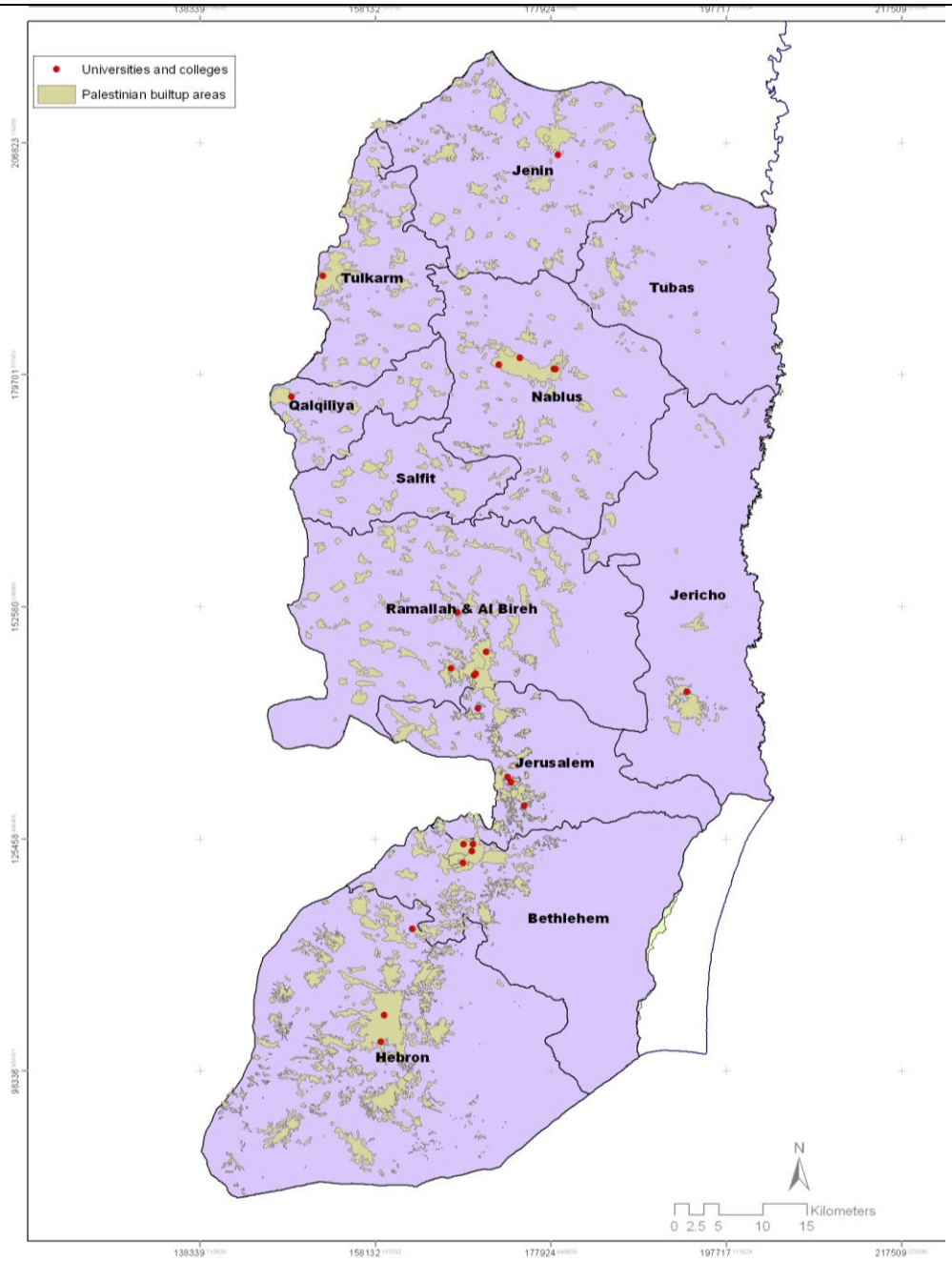


Figure 6-3: The distribution of the built up areas through the Palestinian governorates.

Source: MoP, MoLG, edited by the author

Therefore, the number of the HEE in each governorate will be compared with those in other governorates **(Table 6-6)**

Table 6-6: The number of the enrollments in each governorate

Governorate	Area(Km2)	Population	Population density (capita/km2	Number of the HEIs	Enrollments numbers
West Bank					
Jenin	573	311,231	534	1	7954
Tubas	366	64,719	161	0	0
Tulkarem	245	182,053	740	1	5571
Nablus	614	380,961	630	4	22436
Ramallah	174	348,110	407	8	13721
Jerusalem	849	419,108	1,215	6	11601
Jericho	609	52,154	88	1	860
Bethlehem	608	216,114	328	7	5476
Hebron	1068	706,508	709	5	14197
Qalqilia	174	113,574	667	1	204
Salfit	202	70279	347	0	0
Gaza Strip					
North Gaza	62	362,772	5,947		
Gaza	74	625,824	8,457	9	60998
Deir Al-Balah	56	264,455	4,560	2	1259
Khan younis	56	341,393	3,161	2	6183
Rafah	60	225,538	3,524	2	6806

Source: (PCBS 2015) & (MEHE 2014/2015) yearbook

The Socio-economic:

This indicator is related to the impact of the HEI on the surrounding community and it will be analyzed according to two factors: the unemployment rates and the poverty rates. According to the National Development Plan, poverty and unemployment are major factors to be minimized (MoP 2014). Therefore, the participation of the education sector in the Palestinian GDP exceeds 7% and this is more than the participation of the agricultural sector (PCBS 2014)

The unemployment and poverty rates among the Palestinian governorates are varied and the highest average is found in Gaza strip **(Table 6-7)** and **(Table 6-8)**.

Table 6-7: The unemployment rates

Governorate	Unemployment rates
Khan younis	32
Dair Al-Balah	26.1
North Gaza	28.5
Rafah	33
Gaza	26.4
Hebron	21
Tulkarem	22.2
Jenin	13.5
Salfit	16
Bethlehem	19.2
Qalqilia	21.8
Ramallah	16.4
Nablus	14.8
Jerusalem	13.2
Tubas	15
Jericho	13.3

Source: (PCBS 2011)

According to the previous table, the lowest unemployment rates are found in Jericho and the highest are found in Rafah.

Table 6-8: The poverty rates	
Governorate	**Poverty rates**
Jenin	20.5
Tulkarem	16.4
Qalqilia	15.9
Nablus	18.4
Ramallah	6.6
Jerusalem	3.1
Jericho	13.3
Bethlehem	13.3
Hebron	20.4
Gaza	25.9
North Gaza	27.6
Middle Gaza	37.9
South Gaza	41.4
Source: (PCBS 1998)	

The highest poverty rates appear in Gaza and the lowest in Jerusalem.

The Policies

This indicator will deal with the land use regulations which are, in this research, related to the NSP regulations. Therefore, the natural reserves **(Appendix10)** and the biodiversity areas **(Appendix 11)** will be excluded as well as **(Appendix 12)** for Gaza governorates.

On the other hand, the HEIs are distributed randomly in the West Bank but concentrated near each other in the Gaza strip **(Fig 6-3) and (Fig 6-4).** Therefore, it is one of the NSP policies to balance the urban development among Palestinian governorates.

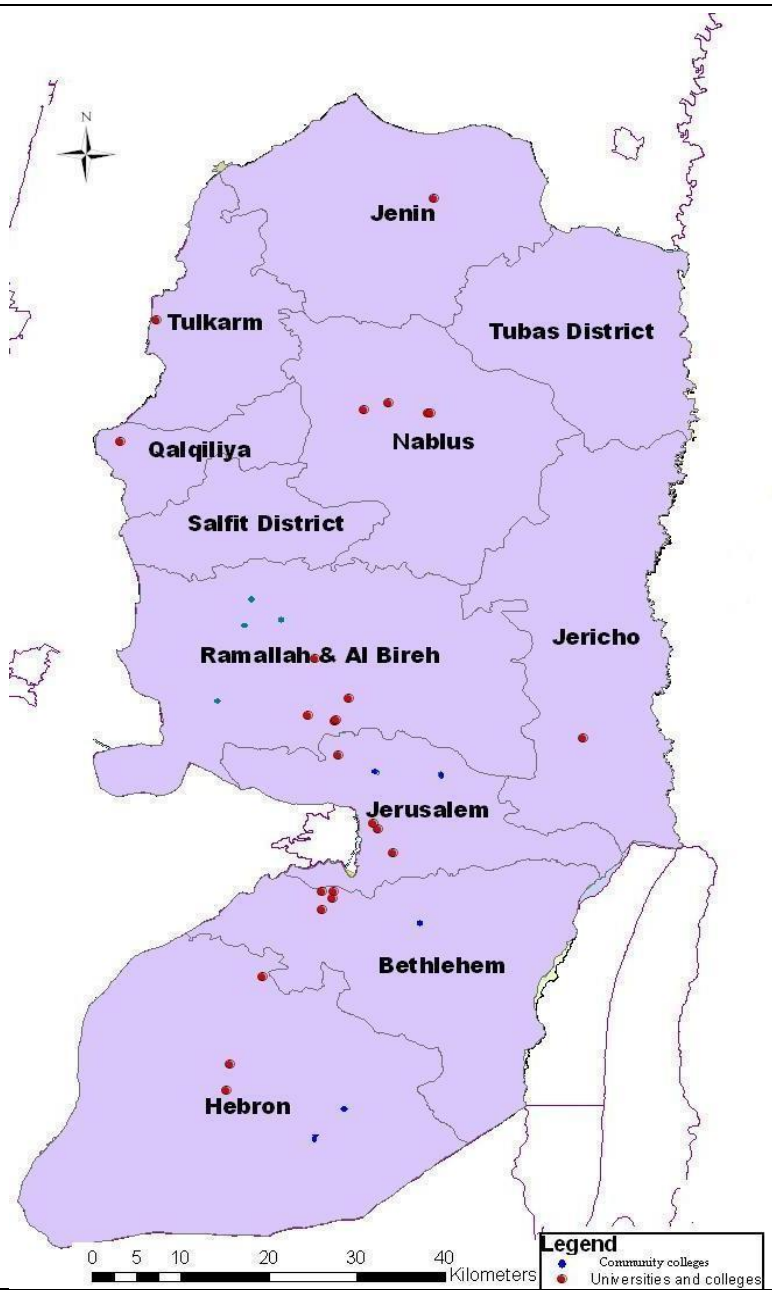


Figure 6-4: The Distribution of the HEIs in WB

Source: MoP & MEHE- edited by the author

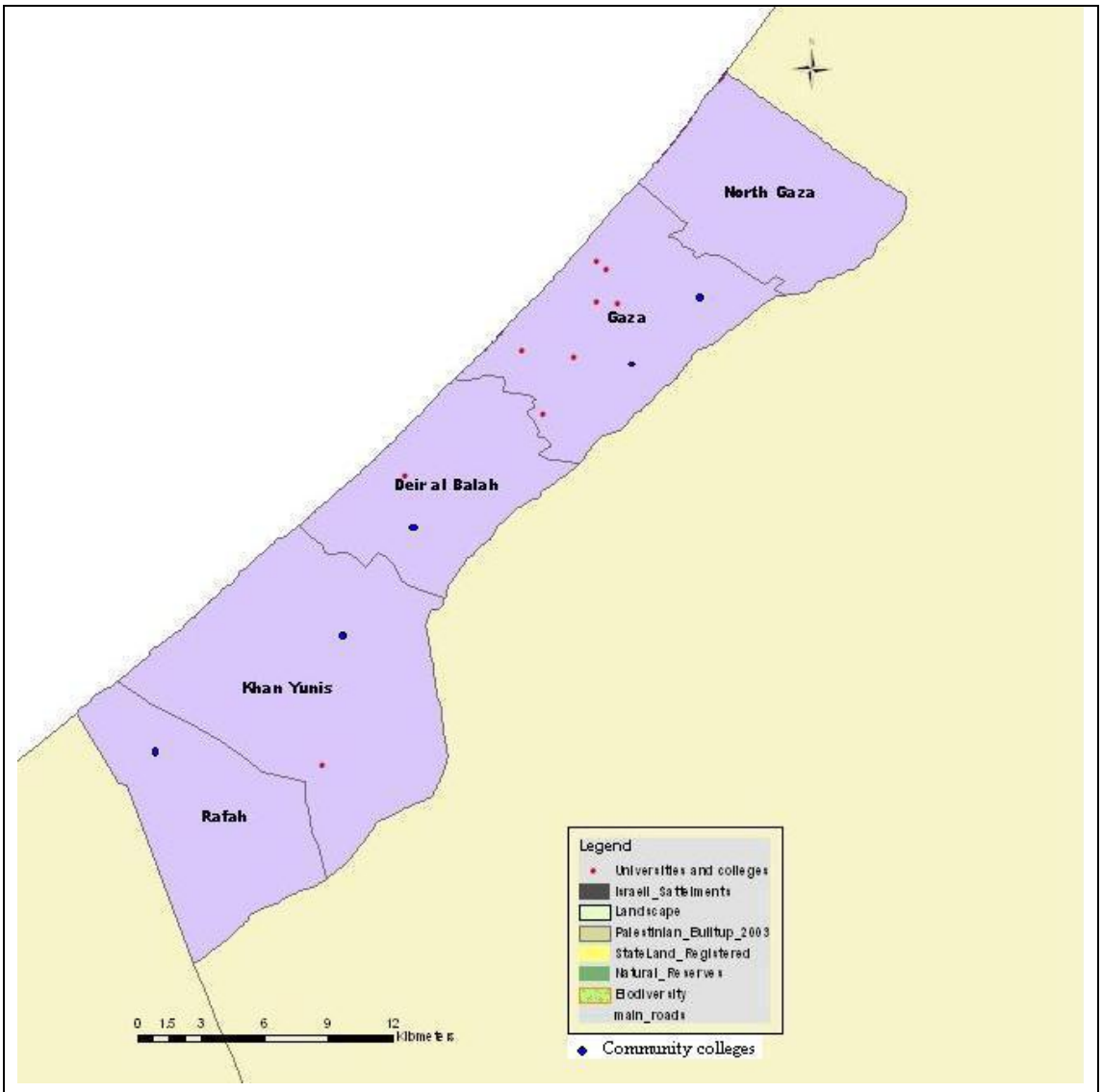


Figure 6-5: The distribution of the HEIs within Gaza Strip

Source: MoP & MEHE- edited by the author

6.4 The Site Allocation of the New HEIs Locations:

The site allocation stage is applied depending on the Multi-Criteria Evaluation results, so the previous indicators are checked on the WBG governorates **(Table 6-9).**

Table 6-9:The checklist indicators that influence the allocation of new HEI site locations

Indicator	**Sub indicator**	**Level of measurement**	
Land	Item	Points	Weight
	Availability of site- size area (Km^2) the % of the built up area	>10 %(1). 5-10%(2).<5%(3)	30%
	Site appeal (the relative location to the landscape)	The larger(3), moderate(2), low(1)	
	Land cost relative to governmental land	The larger(3), moderate(2), low(1)	
Accessibility to infrastructure	proximity to main road(Km)	>2(1). 1-2(2). <1(3)	10%
agglomeration	The enrollments number	>10,000(1). 10,000-1000(2). <1000(3)	25%
	Population densities capita/km^2	>2000(1). 2000-500(2).<500 (3)	
	Availability of HEIs	>5(1). 5-1(2). <1(3)	
Socio economic	unemployment	30%>(1), 30-20%(2), <20%(3)	15%
	poverty	40%>(1), 40-20%(2), <20%(3)	
Policies	Biodiversity areas %	The larger(1), moderate(2), low(3)	20%
	Israeli settlements(km^2)	>20 (3), 15-20(2), <15(1)	
	Natural reserves%	The larger(1), moderate(2), low(3)	
Total			100%

Source: (NSP 2014), (Bechtel 1968), (Saleh 1998)- elaborated by the author

The indicators above are applied on the Palestinian governorates and the total points for every indicator are weighed. The indicator's points are calculated depending on

the previous data; for example, if we choose Hebron governorate, the land points are calculated basedon the three sub indicators; the percentage of the built up area **(Table 6-4)**, the site appeal which is evaluated depending on the landscape areas **(Appendix 8)** and **(Appendix 12)** the percentage of the governmental land **(Appendix7)** and **(Appendix 13)** for Gaza governorates.

Accordingly, the built up area for Hebron governorate is 8% **(Table 6-4).** According to **(Table 6-9),** it receives (2) points. The site appeal is calculated based on the availability of the landscape in a certain location and on the NSP maps **(Appendix8)** in the appendix. Hebron has the lowest landscape areas, so it should have the (1) point for the site appeal. The governmental land is calculated depending on NSP maps **(Appendix7)**; so this sub indicator has (1) point.

The infrastructure calculation depends on the availability of main roads **(Appendix9)** within a distance of 3km. Therefore, empty lands with the potential for establishing new HEI in Hebron governorate is far away from the main street; this means it receives (1) point**.**

The agglomeration calculation is carried out based on the number of HEE in that governorate and the population densities. So, the higher agglomeration number has the lowest number. According to **(Table 6-6),** the total HEE in Hebron governorate is about 14,000 students so it should have (1) point. The population density in Hebron is equal to 709 according to **(Table 6-6)**, so it should have (2) points. Moreover, it has five HEIs according to **(Table 6-6)**; so it has (1) point.

The socio- economic condition was calculated depending on **(Table6-7)** and **(Table 6-8)**; this means that poverty and unemployment should have (2) points each.

The policies' numbers were calculated based on the NSP regulations regarding the percentage of the protected land in each governorate. This means that if the governorate has more protected land, it should have the lowest number. This factor was analyzed depending on **(Appendix10)** for natural reserves and **(Appendix 11)** for biodiversity, see also **(Appendix 12)** for Gaza governorates. Hebron governorate receives (2) points for biodiversity and (2) points for natural reserves. Moreover, NSP considered Israeli settlements as violence against Palestinian lands located within the 1967 boarders. Therefore, the presence of many Israeli settlements on a particular governorate's land gives high score points for this sub indicator. Accordingly, Hebron governorate has (1) point for the presence of Israeli settlements **(Table 6-3):**

The total score for Hebron governorate is equal to the summation of the previous indicators: (Land points) + (Infrastructure points) + (Agglomeration points) + (Socio-economic points) + Policies points. By substituting the numbers above and applying the same criteria on the other governorates, **(Table 6-10)** is prepared.

Table 6-10: The total weighed scores of the Palestinian governorates.							
Location name	**Land (30%)**	**Infrastructure (10%)**	**Agglomeration (25%)**	**Socio economic (15%)**	**Policies (20%)**	**Total**	**weighed total scores**
Khan younis	3	1	5	6	3	18	3.65
Dair Al-Balah	3	1	5	6	3	18	3.65
North Gaza	3	1	7	5	3	17	3.9
Rafah	3	1	5	6	3	18	3.65
Gaza	3	1	3	5	3	15	3.1
Hebron	4	1	4	4	5	18	3.9
Tulkarem	4	3	6	5	5	22	4.75
Jenin	6	3	7	3	4	29	4.95
Salfit	5	3	9	4	7	28	5.95
Bethlehem	7	1	6	3	4	21	4.85
Qalqilia	4	3	8	4	6	25	5.2
Ramallah	5	3	5	3	7	23	5
Nablus	8	2	5	3	6	24	5.55
Jerusalem	5	2	4	2	7	20	4.55
Tubas	8	1	9	4	5	27	6.15
Jericho	9	2	9	2	7	29	6.75

Accordingly, the governorates that score more than five points will be considered as options for allocating future HEI sites. Regarding the capacity needs assessment that was explained previously, three locations will be needed up to the year 2025. Therefore, the highest three scores will be prioritized over other governorates **Table (6-11).**

Table 6-11: The highest scores governorates	
First choice	Jericho, Tubas, Salfit **(Figure 6-6)**
Second choice	Nablus, Qalqilia, Ramallah **(Figure 6-7)**

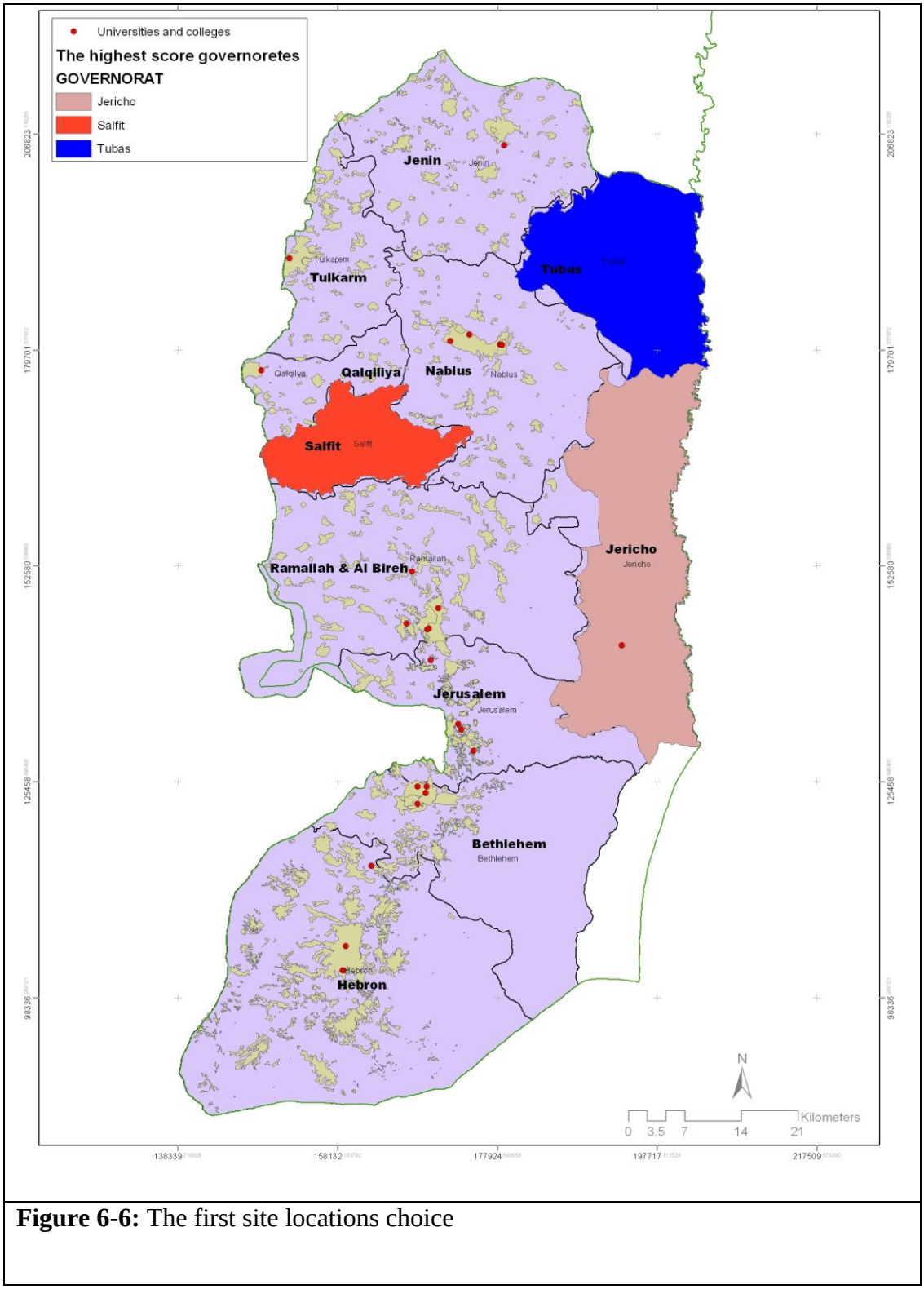


Figure 6-6: The first site locations choice

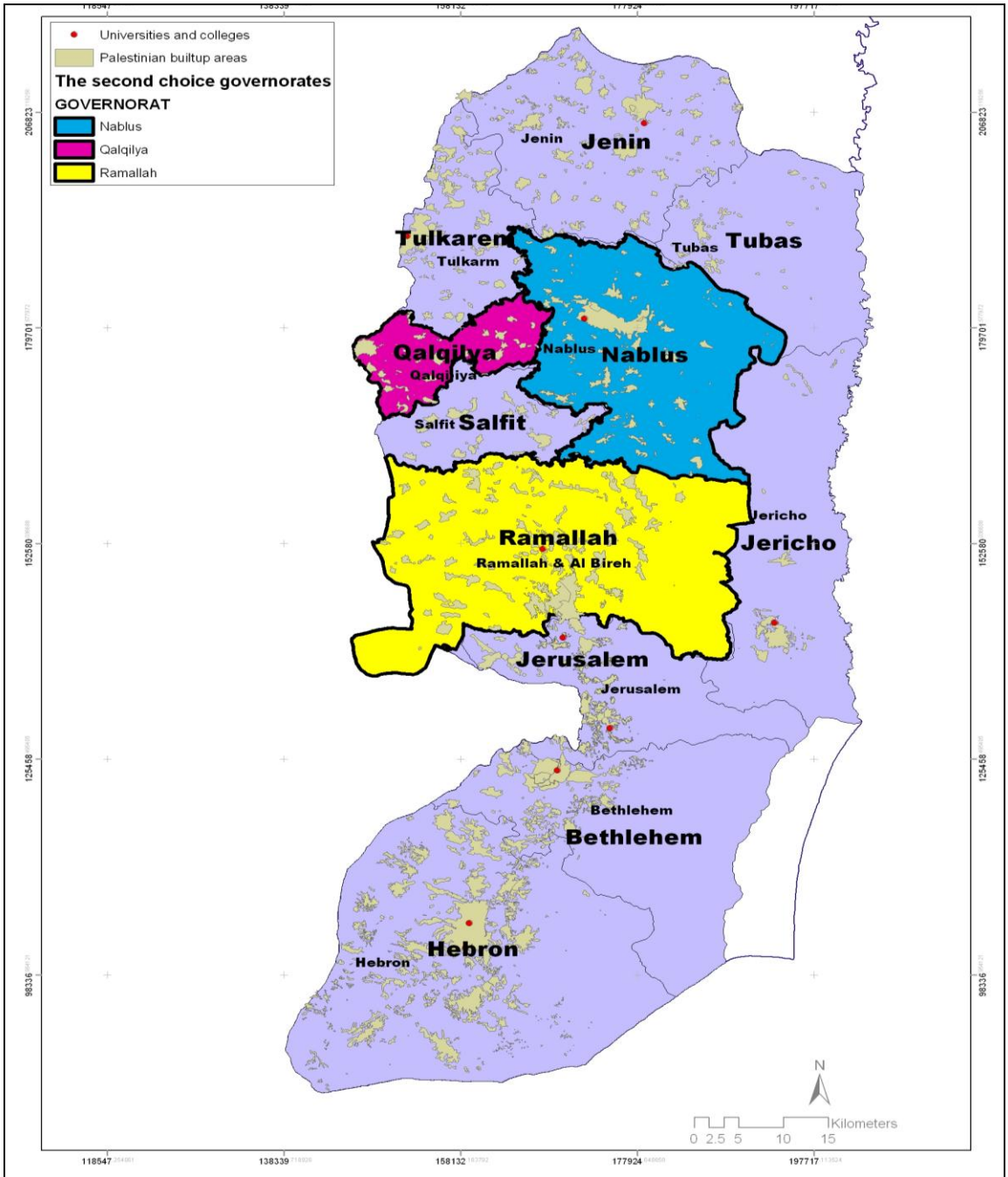


Figure 6-7: The second site locations choice

6.4.1 The First Choice Governorates' Characteristic:

Jericho: Jericho has the most potential for establishing new HEIs due to its site appeal and the presence of only one university in the city. Moreover, it is threatened by Israeli violence. The HEI can be located in the Northern Part of Jericho because there is low built-up area concentration there. The next **(Fig 6-8)** shows four proposed locations in the southern part of Jericho with an area of more than 4 km^2 each. There is also available land in the southern part due to its low built-up area concentration. Accordingly, these sites may attract people to move there when the proposed HEI is established.

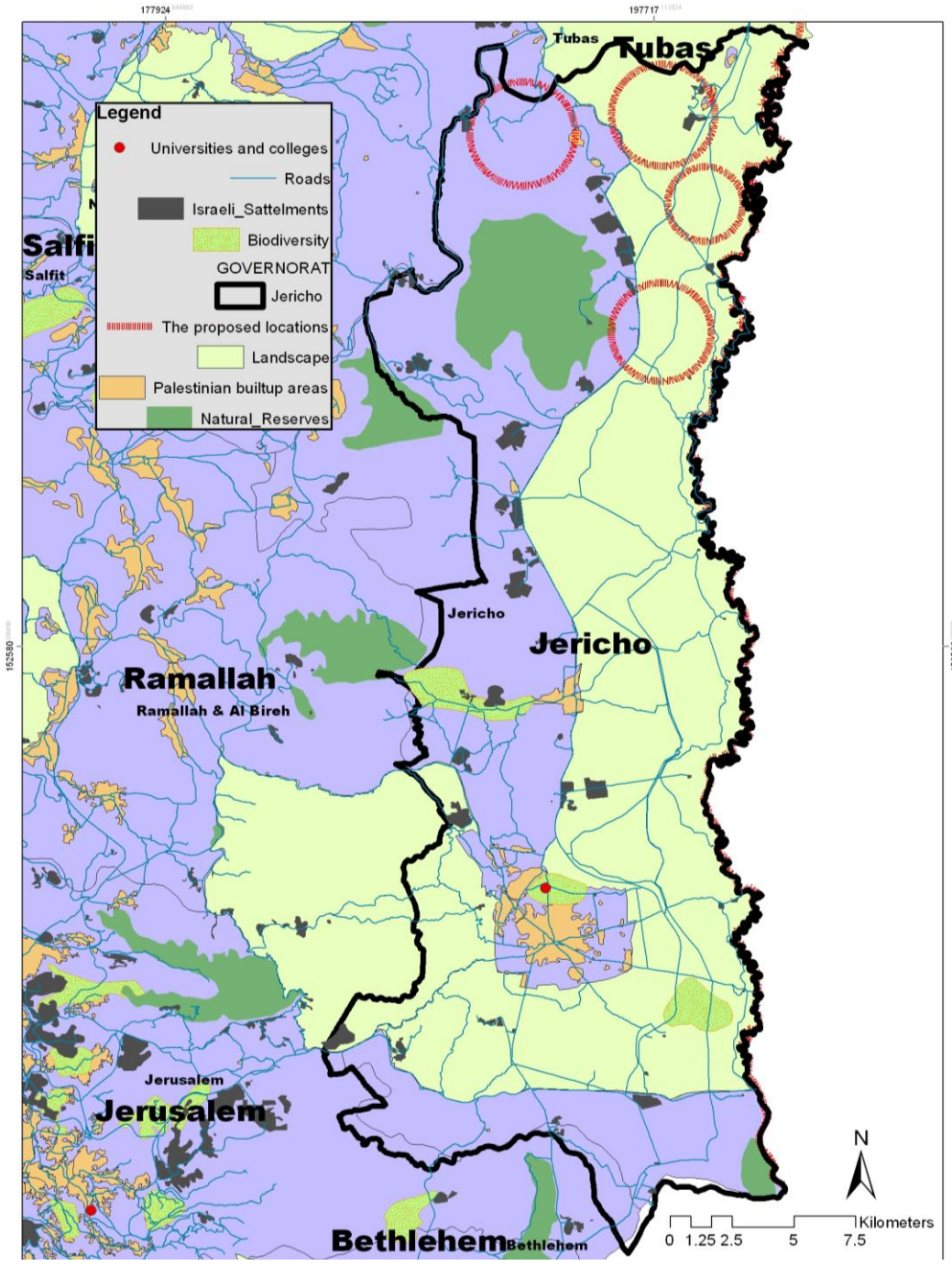


Figure 6-8: The first choice locations within Jericho Governorate

Source: MoP - Edied by the Author

Tubas: is located within an area of 366km^2 in the southern part of the West Bank. The percentage of the built up area doesn't exceed 1% of the total area **(Table 6-3)** and the population is concentrated in the northeastern and the central part **(Fig 6-9)**. Tubas governorate has many factors attractive for investors to establish new HEIs on its land. For example, it has a beautiful site appeal, a large percentage of its land is owned by the government and the main street network is distributed evenly through its area. Three proposed locations can be located in the eastern and southern part in order to attract population and urban development.

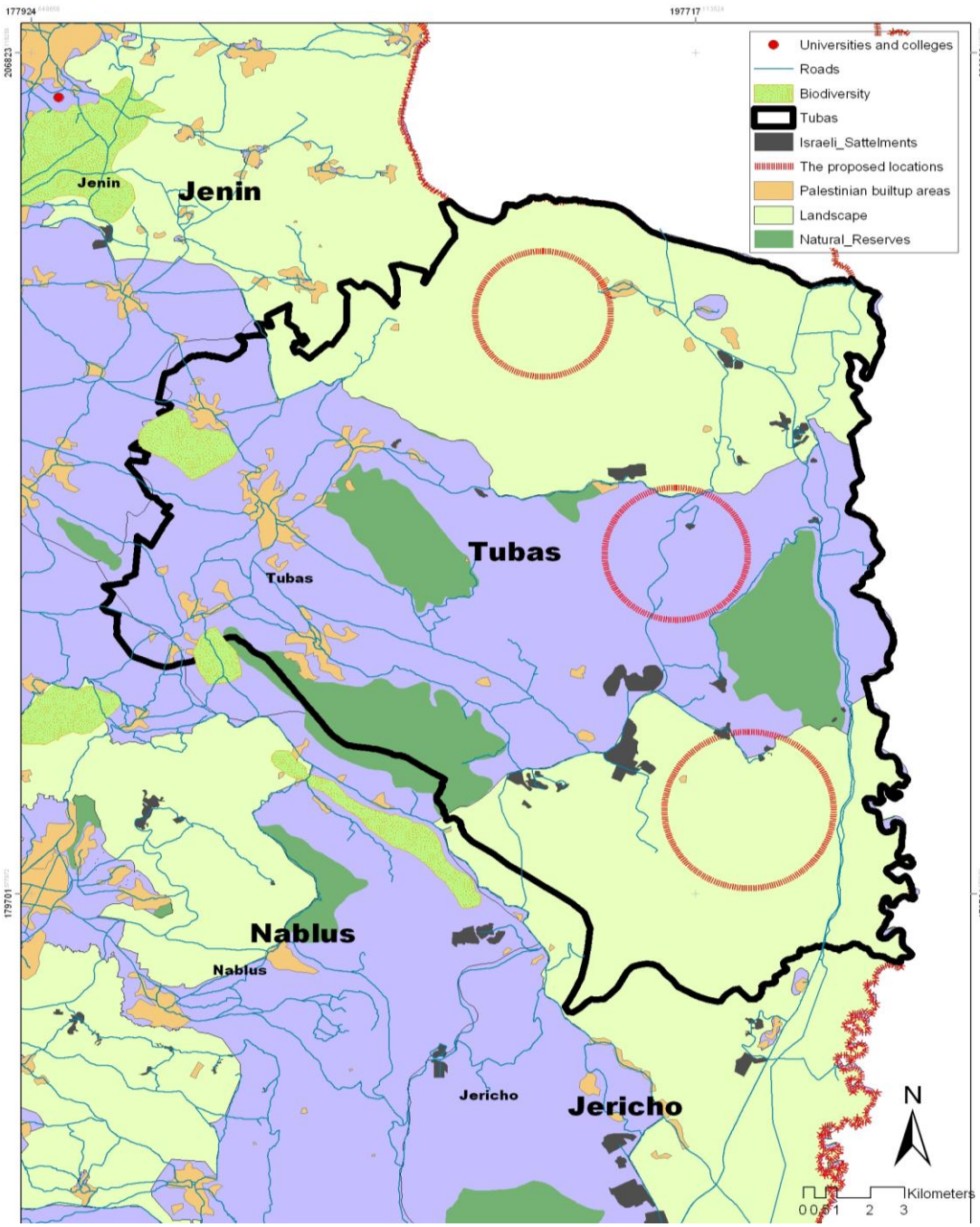


Figure 6-9: The second choice location within Tubas Governorate

Source: MoP- Edited by the Author

Salfit: It is the second smallest governorate in terms of area with only 202 km2. The percentage of the built up area doesn't exceed 9% of the total land area. There are no HEIs built in Salfit yet **(Fig 6-10)**, but there is a proposed university that will be established in the upcoming years on its land. The proposed location is located in the western part.

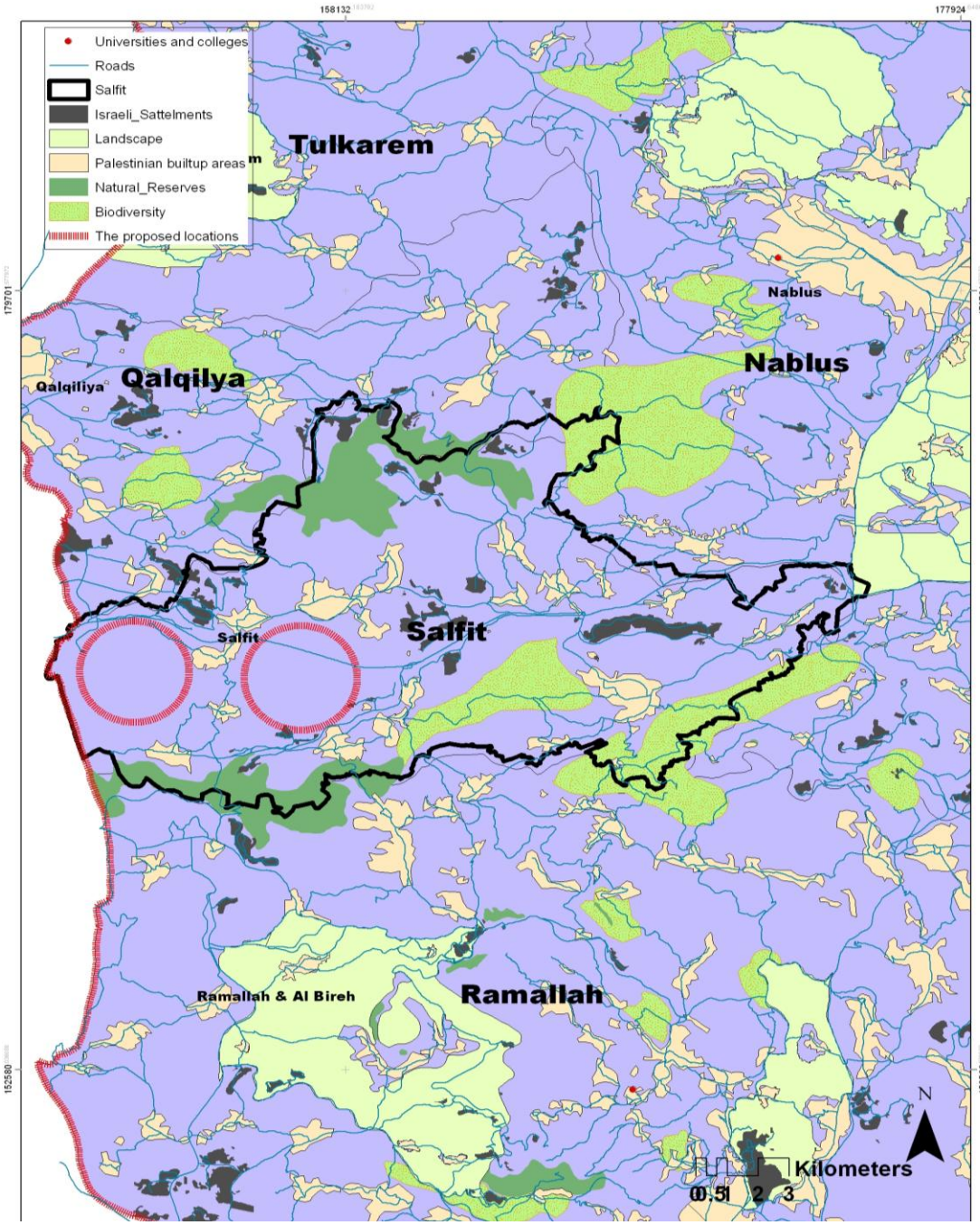


Figure 6-10: The Third choice location within Salfit Governorate

Source: MoP- Edited by the Author

6.4.2 The Spatial Site Location Characteristic for the Needed HEIs:

The urban site can add value for HEIs because the existing infrastructure such as streets, sewage, water networks and other utilities will be of great benefit. However, it is more expensive than the suburban areas and using a large site area suitable for future planning would be difficult. Conversely, the suburbs or rural sites have more potential for expansion but it needs more effort and construction costs to provide utilities and infrastructure services, and in some cases, on-campus housing.

According to the current HEIs, it appears that suburban sites provide a bigger area per student than urban sites. For example, the Islamic university is located within an area of 81.6 dunum while Birzeit University is of 800 dunum **(Fig 6-11).**

(Fig 6-11-A): Urban campus	**(Fig 6-11-B):** Rural campus

(Fig 6-11): Campus types

Source: Google Maps

7. Conclusions and Recommendations

Many conclusions and recommendations related to the enhancement of the higher education sector and the planning for the higher education intuitions are issued by this research and those are explaining in the following:

7.1 Conclusions

1. The Palestinian higher education system is diverse with many types of HEIs. There are universities that are categorized as technical and/or vocational. Others are categorized as university colleges that provide bachelor's degrees in many fields such as nursing, education and applied science. The third type are the community colleges of which the majority of them provide an academic education and the other provide technical and vocational education as shown in **(Appendix4).**
2. There is high demand for higher education among Palestinians and the majority of the HEE are women. The Palestinian HE system can be classified as mass education because there is a high student per space ratio among the Palestinian universities and almost all of the universities and colleges in the same governorate provide the same disciplines.
3. Most of the HEIs are built without planning considerations to absorb the future HEE needs. Therefore, they cannot bear future increases in the same campus location. Moreover, most of them do not match the Palestinian

standards in the physical building considerations and they provide small space per FTS which all lead to an uncomfortable learning environment.

4. The majority of the HEIs are distributed among the high population density governorates and this leads to unbalanced population densities among the Palestinian governorates.

7.2 Recommendations

1- Community colleges should only provide vocational or technical education.

2- There is no problem in increasing the number of community colleges but it is recommended to stop building new universities with enrollments that do not exceed 1,000 students.

3- The universities and university colleges in the same governorate should be merged in order to decrease discipline repetitions.

4- The existing universities should minimize their enrollments in order to have the capacity area to provide students needed facilities such as laboratories and research centers.

5- Any new university should provide a minimum space per student and the facilities that are needed.

6- Any future university should emphasize on research-based education and provide the needed equipment and tools to facilitate those research activities.

7- Any new campus should be planned for potential expansion of 18,000 enrollments as well as the related community that will be generated by the campus population.

8- The future locations should be chosen in rural areas in order to solve the space per FTS problem and to provide more space for future expansion. In addition, the tourism and agricultural sectors would have high contributions related to future economic prosperity but no attention is given to them by the HEIs disciplines.

9- On- Campus housing should be provided in rural areas to provide a comfortable learning environment.

10- To achieve sustainable HE development, the needs of the labor market should be considered.

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Appendix

Appendix-1: Palestinian universities and student distribution

Universities						
Name	Type	Year established	Location	Site area(1000m^2)	Enrollments (2014)	The area per student
Al-Azhar	Public	1991	Gaza	80	13,789	6
The Islamic University	Public	1978	Gaza	81.6	19,432	4
Al-Aqsa	Governmental	1991	Gaza	260	20,081	13
Hebron	Public	1971	Hebron	112	8,595	13
Palestine Polytechnic	Public	1999	Hebron	86	4,085	21
Bethlehem	Public	1973	Bethlehem	44	3,284	13
Al-Quds	Public	1984	Al-Quds	192	11,251	17
Birzeit	Public	1972	Birzeit	800	10,994	73
Al-Najah	Public	1977	Nablus	155	21,859	7
Arab American	Private	1997	Jenin	305	7,954	38
Palestine Technical - Khadoori - University	Governmental	2007	Tulkarim	360	5,571	64
Palestine University	Private	2008	Gaza	30	3,797	8
Al-Istiqlal	Governmental	2007	Jericho	12	860	14
Gaza	Private	2007	Gaza	39.4	897	44
Al-Quds Open University	Public	1975			60,230	

Source: MEHE year books

Appendix-2: Palestinian university colleges and student distribution						
University colleges						
Name	**Type**	**Year established**	**Location**	**Site area(1000m^2)**	**Enrollments (2014)**	**The area per student**
Palestine Technical-Al-Aroub	Governmental	1995	Hebron	95	494	193
University College for Educational Sciences - Men Training Center	Governmental	1996	Ramallah	16.3	664	25
Palestine Technical Deir Elbalah	Governmental	1996	Deir Elbalah	10	1259	8
University College for Educational Sciences - Women Training Center	UNRWA	1992	Ramallah	59	750	78
Ibnsina Nursing & Midwifery	Governmental	1997	Ramallah	4	302	13
Palestine Collage for Nursing	Governmental	1997	Khan younis	8	413	19
Nursing College -Al-Makassed Hospital	Public	2000	Al-Quds	16	133	120
Al-Da'wa Alislamieh College	Governmental	1999	Qalqiliah	4	204	19
College of Islamic Call			Gaza		1063	
Modern University Collage	Private	1983	Ramallah	5	694	7
Bethlehem Bible	Private	2000	Bethlehem	4.5	54	83
Palestine Ahliya University Collage	Private	2007	Bethlehem	52	1859	28
Wajdi Nihad Abu Gharbieh Tech. Inst	Private	2004	Al-Quds	1	50	20
University College of Applied Sciences	1999		Rafah	103	6729	15
Dar al-Kalima University College of Arts & Culture					206	
Latin Patriarchate Seminary			Beit jala		13	
Source: MEHE year books						

Appendix-3: Palestinian community colleges				
Name	**Type**	**Year established**	**Location**	**Enrolments (2014)**
Hajah Andaleeb Al - Amad Nursing College	Public	2001	Nablus	112
Gaza Community College – UNRWA pass tawjehe	public	1953	Gaza	331
Gaza College for Tourism	private	2004	Gaza	80
School of Community Health	public	1984	Ramallah	15
Hisham Hijjawi Technology College	public	2001	Nablus	197
Hebron Nursing College	Private	1994	Hebron	69
Ibrahimieh Community Business Administration College	private	1931	Jerusalem	60
Inash El Usra College	public	1990	Ramallah	64
Faculty of Intermediat Studies - Al-Azhar Univ. Gaza	governmental	1996	Gaza	1528 with two periods morning and evening
An-Najah National Community College	public	1981	Nablus	268
College of Applied Professions - PPU	public	1978	Hebron	945
Talitha Kumi Community College - Beit Jala	Private	2000	Beit jala	32
Al-Ummah College	governmental	1983	Jerusalem	107
Al-Rawdah College for Vocational Sciences	private	1949	Ramallah	238

College of Dar Al Dawa &Humanities	public	2002	Rafah	80
Al- Aqsa Intermediate Studies College	governmental	2007	khan younis	5770
Nursing College Caritas baby Hospital	public	1970	Bethlehem	28
Source: The community colleges websites and the MEHE yearbook (2014-2015)				

Appendix-4: The type of community colleges and their disciplines

Community college name	**Location**	**Program**				
		Classification	Computer science, engineering	Humanities and commerce	Medical science, nursing	Tourism
Arab College of Applied Sciences	Rafah	Academic	✓	✓		
Hajah Andaleeb Al-Amad-Midwifery	Nablus	Academic			✓	
Gaza College for Tourism	Gaza	Academic	✓	✓		✓
School Of Community Health	Ramallah	Academic			✓	
Hisham Hijjawi Technology College	Nablus	Technical	✓			
Hebron Nursing College	Hebron	Academic			✓	
Ibrahimieh Community Business Administration College	Jerusalem	Academic		✓		
Inash El Usra College	Ramallah	Vocational			✓	
Faculty of Intermediat Studies	Gaza	Academic	✓	✓	✓	
An-Najah National Community College	Nablus	Academic	✓	✓		

College of Applied Professions - PPU	Hebron	Technical	✓			
Talitha Kumi Community College	Beit Jala	Technical				✓
Al-Ummah College	Jerusalem	Academic	✓	✓		
Al-Rawdah College for Vocational Sciences	Ramallah	Vocational		✓		
College of Dar Al Dawa & Humanities	Rafah	Academic		✓		
Al- Aqsa Intermediate Studies College	khan younis	Vocational and technical		✓		✓
Nursing College Caritas baby Hospital	Bethlehem	Academic				✓
Al-Makassed Nursing College	Jerusalem	Academic				✓

Source: The community colleges websites and the MEHE yearbook (2014-2015)

Appendix-5: Comparison of the enrollments in the Palestinian university and the standards

University name	Enrollments (2014)	Meet the standards
Al-Azhar	13,789	×
The Islamic University	19,432	✓
Al-Aqsa	20,081	✓
Hebron	8,595	×
Palestine Polytechnic	4,085	×
Bethlehem	3,284	×
Al-Quds	11,251	×
Birzeit	10,994	×
Al-Najah	21,859	✓
Arab American	7,954	×
Palestine Technical -Khadoori -University	5,571	×
Palestine University	3,797	×
Al-Istiqlal	860	×
Gaza	897	×
Al-Quds Open University	60,230	✓

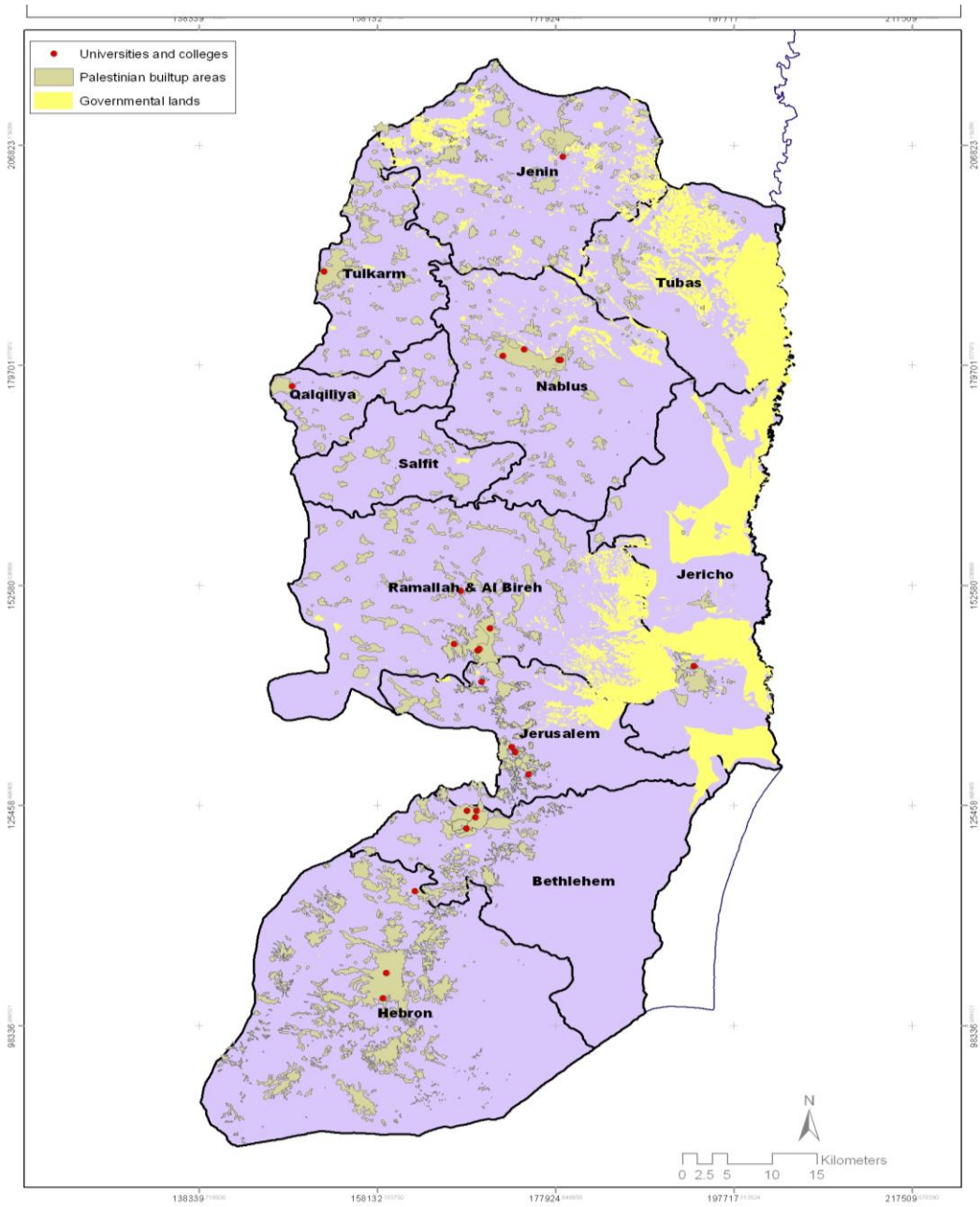
Source: MEHE yearbook (2014/2015)

Appendix-6:The development space standards for established new HEI

1	University population- FTE students	High	Medium	Low	High	Medium	Low	High	Medium	Low
		15,000	15,000	15,000	20,000	20,000	20,000	25,000	25,000	25,000
2	Basic area requirements									
	A- Campus core standards 1- Building intensities 2- Site area	High 35	Medium 53	Low 106	High 47	Medium 70	Low 141	High 59	Medium 88	Low 176
	B- On- campus housing standards 1- Percent Student Housed 2- Housing densities 3- Housing site area(Acres)	Low High 5	Medium Medium 31	High Low 156	Low High 7	Medium Medium 42	High Low 208	Low High 9	Medium Medium 52	High Low 260
	C- Parking Standards 1- Parking allocation 2- Additional Parking Site Area	Low None	Medium 44	High 104	Low None	Medium 59	High 139	Low None	Medium 73	High 173
	Sub-Total Basic Area(Acres)	40	128	366	54	171	488	68	213	609
3	Other area allowance									
	A- Athletic and recreation 1- Allowance 2- Site Area	Low 14	Medium 28	High 48	Low 18	Medium 37	High 64	Low 23	Medium 46	High 80
	B- Research centers 1- Allowance 2- Site area(Acres)	None 0	Low 2	Medium 9	None 0	Medium 5	Medium 9	None 0	Medium 5	High 14
	C- Research Development Area 1- Allowance 2- Site area(Acres)	None 0	Low 75	Medium 150	None 0	Medium 150	Medium 150	None 0	Medium 150	High 300
	D- Medical center 1- Allowance 2- Site area(Acres)	None 0	Low 11	Medium 46	None 0	Medium 23	Medium 46	None 0	Medium 23	High 69
	E- Sports Facilities 1- Allowance • Golf • Sports Arena • Stadium 2- Site area(Acres)	None None None 0	None None None 0	Low Low Low 70	None None None 0	Low Low Low 70	Low Low Low 70	None None None 0	Low Low Low 70	Medium Medium Medium 185
	F- Services and Utility Facilities 3- Allowance 4- Site area(Acres)	None 0	Low 15	Medium 20	None 0	Medium 20	Medium 20	None 0	Medium 20	High 25
	Sub-Total Allowance Area(Acres)	14	131	343	18	305	359	23	314	673
	Sub-Total Basic Area(Acres) and Allowance(Acres)	54	259	709	72	476	839	91	527	1282

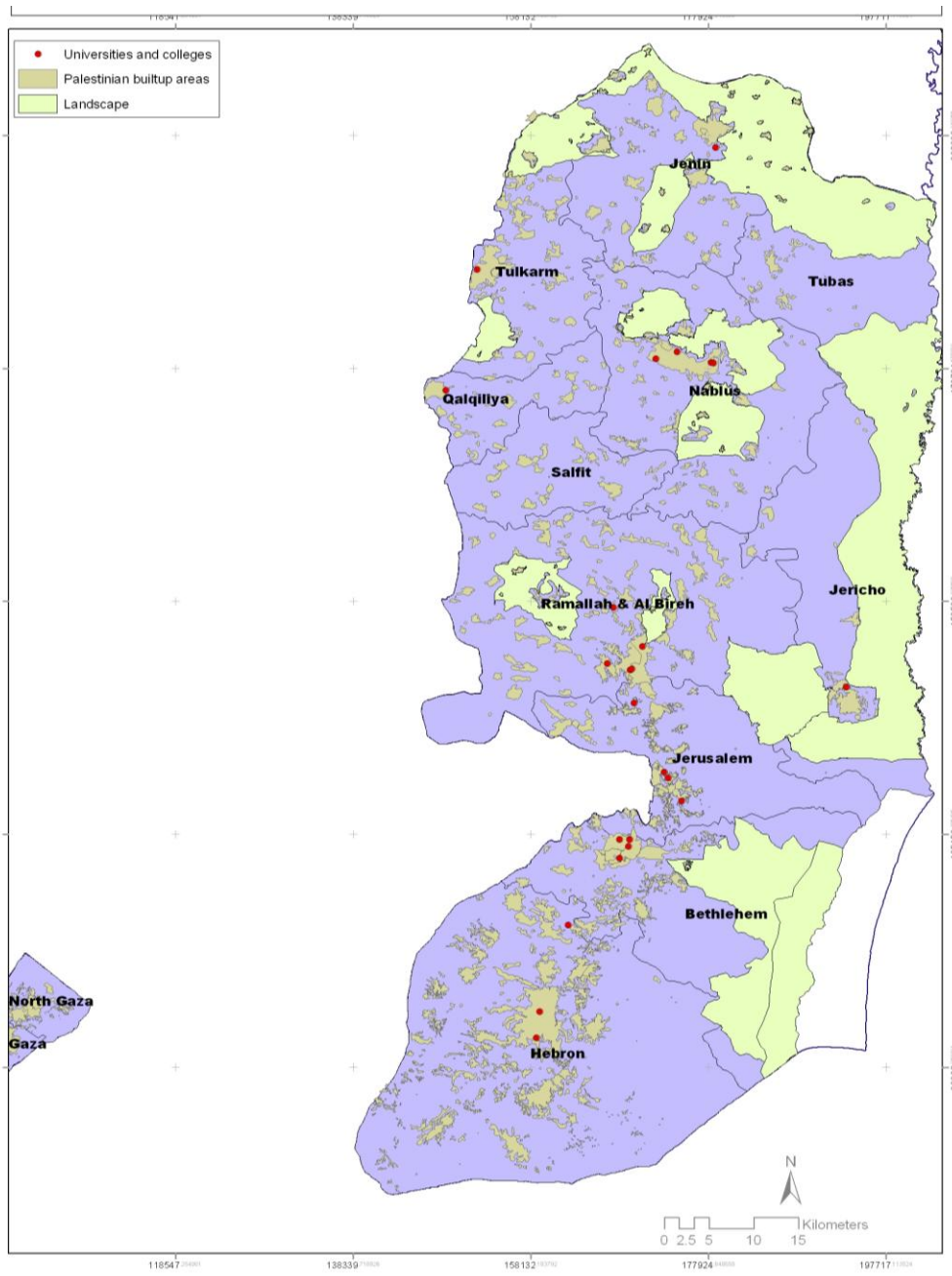
	G- Reserve Lands 1- Allowance 2- Site area (Acres)	None 0	Low 15	Medium 20	None 0	Medium 20	Medium 20	None 0	Medium 20	High 25
	Total Campus Site Area(Acres)	59	324	993	79	595	1175	100	659	1795

Source: (Bechtel 1968)



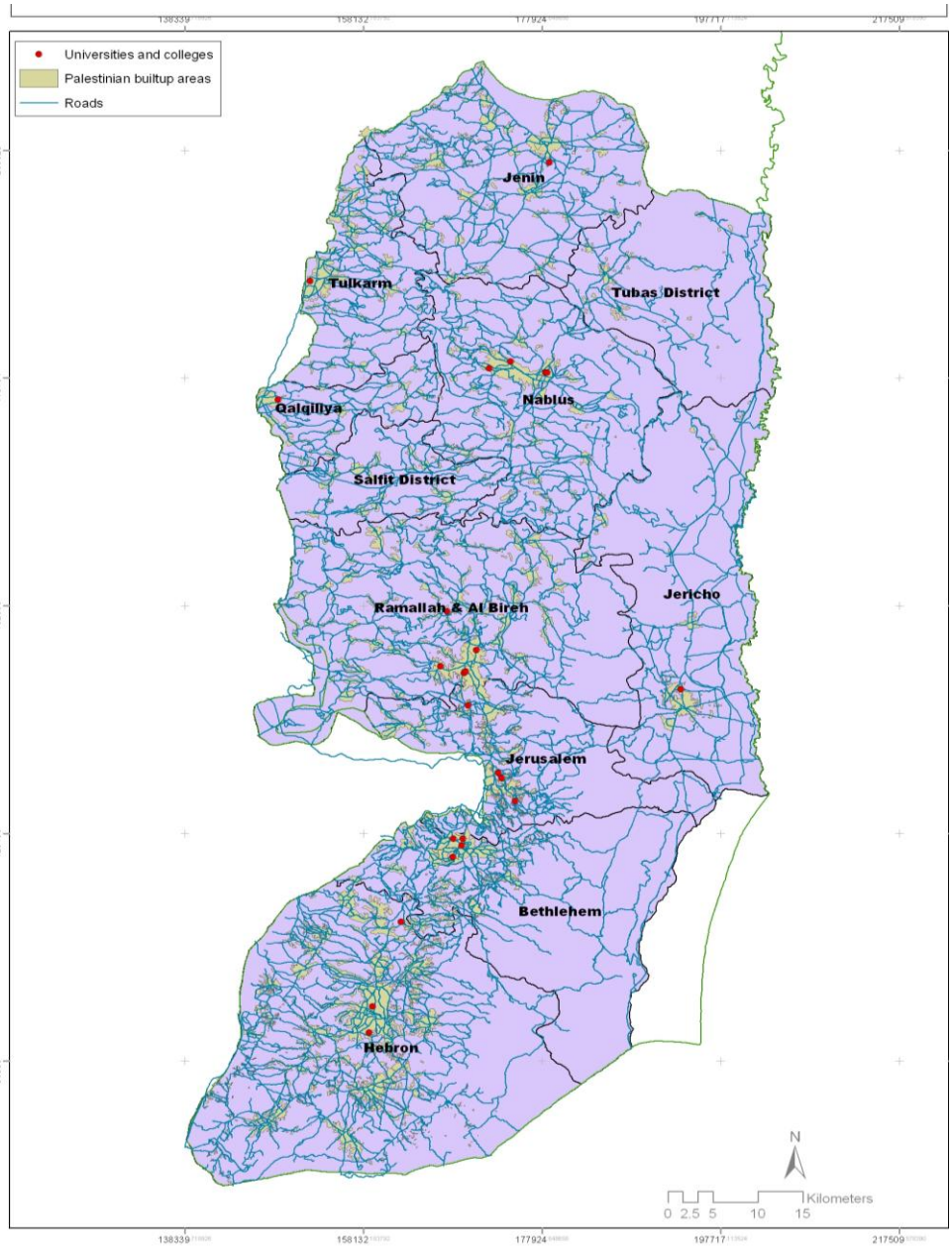
Appendix-7: The governmental land among the Palestinian governorates

Source: MoLG- Edited by the author



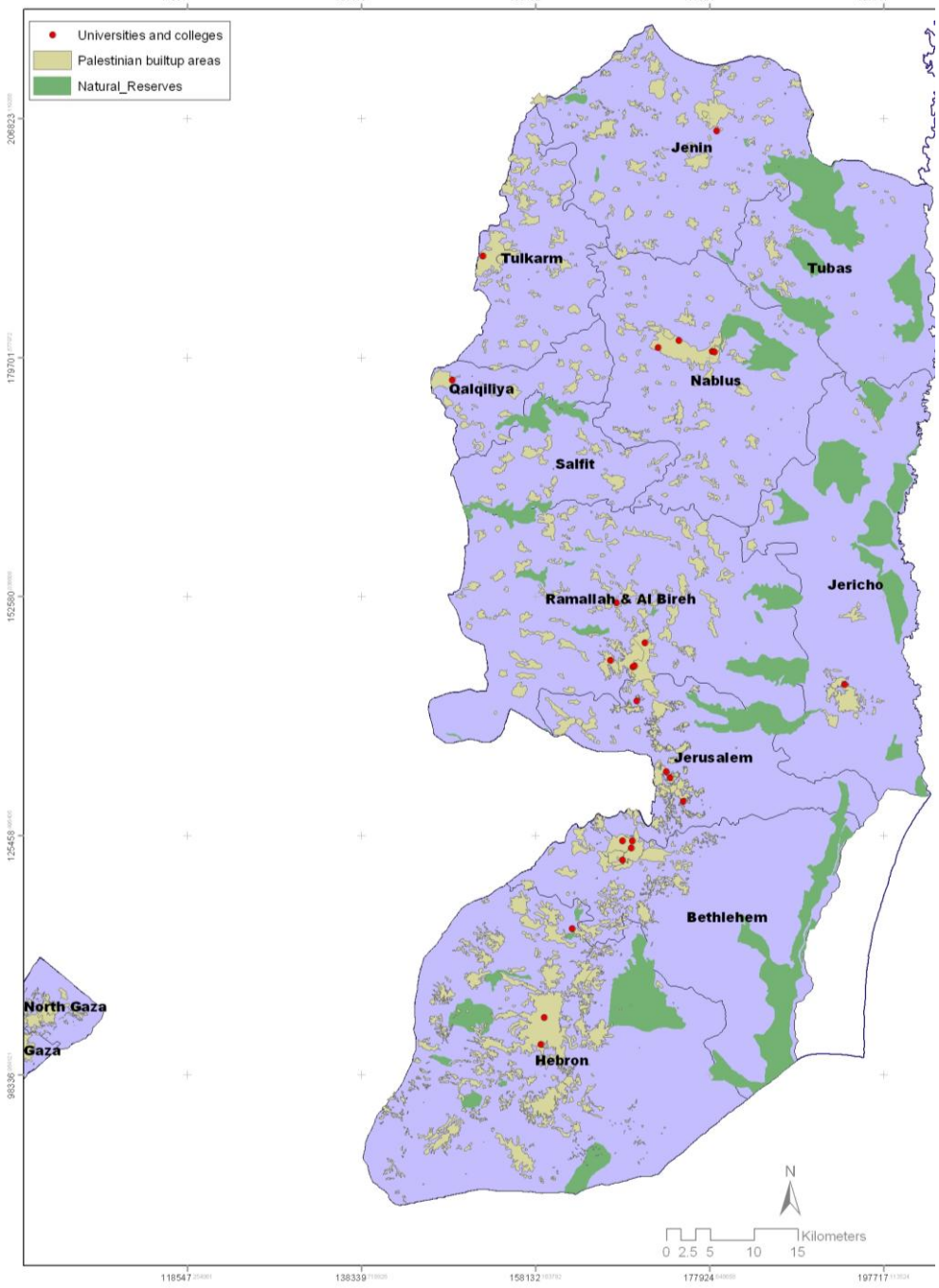
Appendix-8: The landscape areas among the Palestinian governorates

Source: MoP- Edited by the author



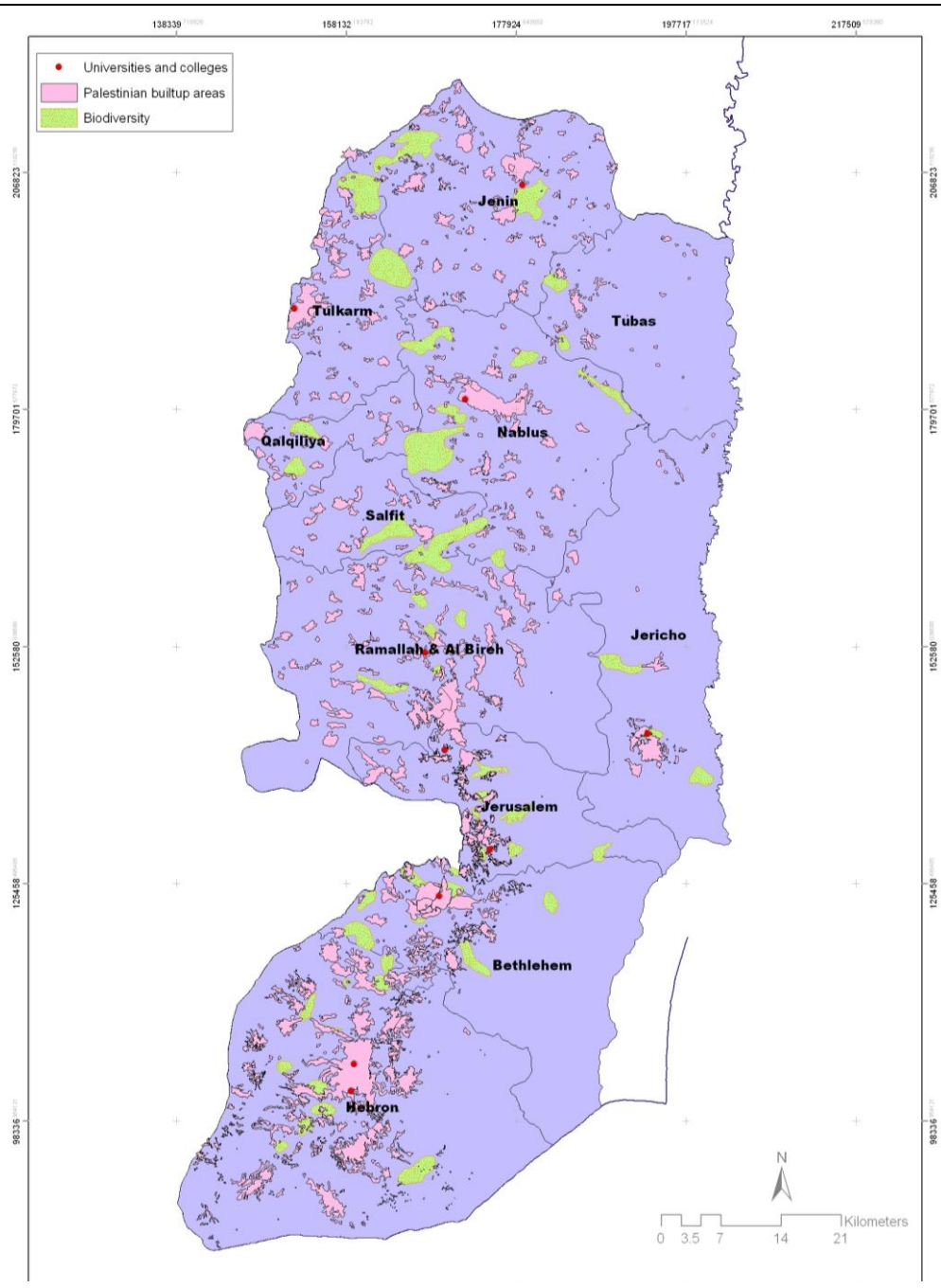
Appendix-9: The main street network among the Palestinian governorates

Source: MoP- Edited by the author



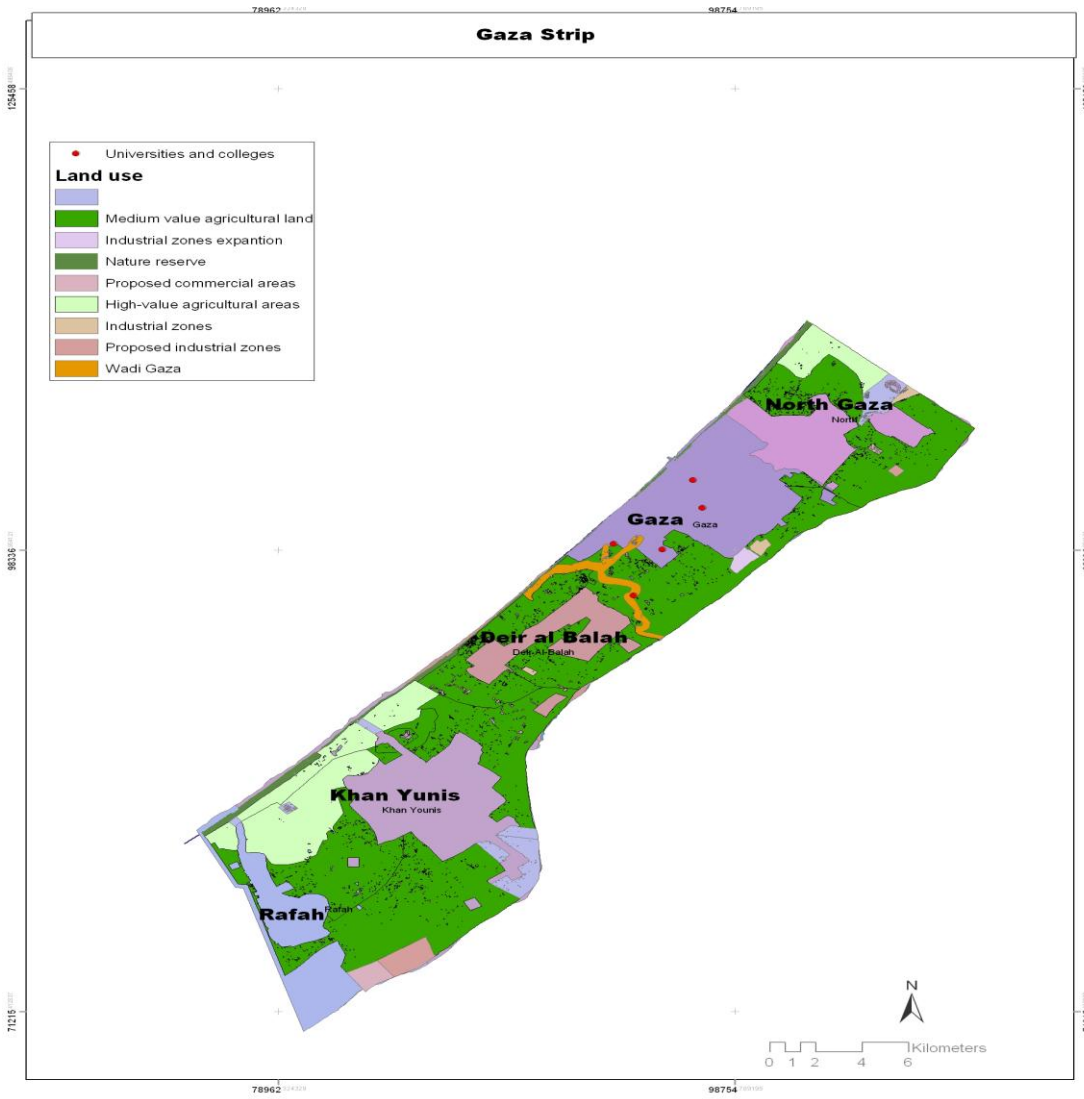
Appendix-10: The Natural reserve land among WB governorates

Source: MoP- Edited by the author



Appendix-11: The biodiversity areas among WB governorates

Source: MoP- Edited by the author



Appendix-12:Gaza governorates spatial characteristics

Source: MoP- Edited by the author