



Agricultural college Planning
An Najah national university /Al Nassareya

Prepared By:

Khuloud Jamal Mahmoud Adawi

Supervised By:

Dr. Zahra' Zawawi

Dr. Ali Abdelhamid

**This Part of Research is Submitted with the Course (Graduation Project 2),
Department of Urban Planning Engineering, Faculty of Engineering &
Information Technology, An-Najah National University, Nablus**

May, 2018

قال تعالى: " وَقُلْ اَعْمَلُوا فَسَيَرَى اللهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ "

الهي لا يطيب الليل الا بشكرك ولا يطيب النهار الا بطاعتك ولا تطيب اللحظات الا بذكرك ولا تطيب الاخرة الا بعفوك ولا تطيب الجنة الا برويتك اهدي مشروعى هذا الى الله عز وجل .
الى من بلغ الرسالة وأدى الامانة ونصح الأمة الى نبي الرحمة ونور العالمين سيدنا محمد صلى الله عليه وسلم اهدي مشروعى هذا.

الى من جرع الكأس فارغا ليسقني قطرة حب.. الى من كلت انامله ليقدّم لنا لحظة سعادة.. الى من حصد الاشواك عن دربي ليمهد لي طريق العلم.. الى من كلله الله بالهبة والوقار.. الى من احمل اسمه بكل افتخار.. ارجو من الله ان يمد في عمرك لترى ثمارا قد حان قطفها بعد طول انتظار
"والدي العزيز"

إلى معنى الحب وإلى معنى الحنان والتفاني.. إلى بسملة الحياة وسر الوجود.. إلى من كان دعائها سر نجاحي وحنانها بلسم جراحي إلى أعلى الحبايب.. الى الصدر الحاني ..والقلب الكبير ..إلى ملاكي في الحياة ..الى من سهرت الليالي وشاركتني لحظات تعبي ودراستي
"أمي الحبيبة"

الى سندي وقوتي بعد الله .. الى من اظهر لي ما هو أجمل من الحياة "أخي"

الى من بهم أكبر وعليهم أعتمد.. الى الشموع التي تنير ظلمة حياتي.. الى من بوجودهم أكتسب قوة ومحبة لا حدود لها .. الى من عرفت معهم معنى الحياة .. الى رياحين حياتي
"أخواتي"

إلى الأخوات اللواتي لم تلدهن أمي .. إلى من تحلو بالإخاء وتميزوا بالوفاء والعطاء .. إلى ينابيع الصدق الصافي إلى من معهم سعدت ، وبرفقتهم في دروب الحياة الحلوة والحزينة سرت .. إلى من كانوا معي على طريق النجاح والخير.....
" صديقاتي "

الشكر والتقدير:

"كن عالما .. فان لم تستطع فكن متعلما، فان لم تستطع فاحب العلماء، فان لم تستطع فلا تبغضهم"

في مثل هذه اللحظات يتوقف اليراع ليفكر قبل ان يخط الحروف ليجمعها في كلمات ثم سطور سطورا كثيرة تنمر في الخيال ولا يبقى لنا في نهاية المطاف الا قليلا من الذكريات وصور تجمعنا برفاق كانوا الى جانبنا فواجب علينا شكرهم ووداعهم ونحن نخطو خطوتنا الأولى في غمار الحياة .

وأخص بجزيل الشكر والعرفان الى كل من أشعل شمعة في دروب عملنا والى من وقف على المنابر وأعطى من حصيلة فكره لينير دربنا الى الدكاترة والاساتذة الكرام في قسمي قسم هندسة التخطيط العمراني واتوجه بالشكر الجزيل الى (د. زهراء زواوي)، (د. علي عبد الحميد) اللذان تفضلا بالإشراف على هذا المشروع فجزاهم الله عني كل الجزاء ولهم مني كل التقدير والاحترام

الى الذين كانوا عوننا لي في مشروعي هذا ونورا يضيء الظلمة التي كانت تقف احيانا في طريقنا .

الى من زرعوا التفاؤل في دربنا وقدموا لنا المساعدات والتسهيلات والمعلومات، فلهم مني كل الشكر وأخص بالذكر (أ. صلاح الشخشير)، (م. لؤى حوراني) اللذان اسهما بشكل وفير في تشجيعي أثناء انجاز المشروع

كما اشكر جميع زملائي وزميلاتي على جميع النصائح والمساعدات العلمية والعملية

البحث بحثي، فلولا وجودهم لما احسست بمتعة العمل وحلاوة المشروع ، ولما وصلت الى ما وصلت اليه فلهم مني كل الشكر ..

Abstract:

An agricultural college is a college of further education where students learn farming skills (Definition of agricultural college from the Collins English Dictionary).

So the main goal of this project is making a planning proposal for agricultural college.

First, I provide a general view of agricultural education and agricultural colleges and found the location criteria for the agricultural college site .

I take these criteria and depend on them when I plan the site.

Then , I make the diagnosis and analysis phase and make it in a three levels (scales)

Regional ,local and site level , after them I zoom in on the site and analyze it from several objects like slope, soil, sun and wind direction

Then the project concept is integration with nature so I formed the layout of project to proportionate with the concept then I develop the concept to output the college street layout and the blocks and land use layout then determine the relationships between college zones and the services distribution between them.

The zones contain main buildings and some basic land scape details.

Finally, I make the final master plan in chapter 5 that contain street and blocks layout ,building, colleges distribution and some landscape details.

ملخص البحث:

الكلية الزراعية هي كلية يتعلم فيه الطلاب المهارات الزراعية، لذلك فإن الهدف الرئيسي للمشروع هو تقديم مقترح تخطيط كلية زراعية .

في بداية البحث تم عرض لمحة عامة عن التعليم الزراعي والكليات الزراعية وتحديد خصائص الموقع اللازمة لعمل كلية زراعية وتم الاعتماد عليها في تخطيط موقع الكلية .

بعد ذلك تم التطرق الى عملية التشخيص والتحليل اذ تمت على ثلاث مستويات (الاقليمي والمحلي والموقع) ثم تمت التركيز على تحليل الموقع ذاته من عدة مواضيع مثل (التربة، ميلان الارض واتجاه الرياح والشمس .

بعدها تم تحديد فكرة المشروع الا وهي التكامل مع الطبيعة ,اذ تم تطوير المشروع بناء على الفكرة وتحديد المناطق والمساحات المخصصة لكل نشاط او عنصر يتواجد داخل الموقع توزيع الخدمات بينها والخروج بالمخرج النهائي للشوارع والاحواض واستخدامات الاراضي واخيرا الى المخطط النهائي الذي شمل ما تم ذكره بالإضافة الى تفاصيل تتعلق بتنسيق الموقع .

Contents:

Chapter 1 :Research Introduction

| | |
|---|-----------|
| 1.1 Overview..... | 11 |
| 1.2 Research Problems..... | 11 |
| 1.3 Research Significance..... | 11 |
| 1.4 Research Objectives..... | 12 |
| 1.5 Research Plan and Methodology..... | 12 |

Chapter 2: Conceptual and Theoretical framework

2.1: General Information

| | |
|--|----|
| 2.1.1 Agricultural college | 13 |
| 2.1.2 the importance of agriculture in development | 13 |
| 2.1.3 Agricultural education | 13 |
| 2.1.4 Location criteria for agricultural college..... | 14 |

Chapter 3: Case studies

| | |
|---|-----------|
| Case study (1): Horticulture land use conflict “Logan City”..... | 15 |
| Case study (2):Grain Transport Darling Downs..... | 18 |
| Case study (3):Royal Agricultural College..... | 20 |

Chapter 4 :Project Site analysis

| | |
|--|-----------|
| 4.1 site justifications | 24 |
| 4.2 site diagnosis and analysis | |
| 4.2.1 At regional scale..... | 24 |
| 4.2.2 At local scale..... | 32 |
| 4.2.3 At site scale..... | 35 |

Chapter 5 :Project Proposal

5.1 : Project Concept.....37
5.2 : project concept development.....40
5.2.1 final street layout.....40
5.2.2 the zones that need it in the agricultural college41
5.2.3 Relationship between elements of site and the services distribution.....41
5.2.4 Area of animals location.....43
5.2.5 Area of agricultural lands and housing locations.....44
5.3: project master plans
5.3.1: Land use master plan.....46
5.3.2: final master plan.....47
5.3.3:master plan details.....48

References.....50

Maps :

| | |
|--|----|
| Map (1): west bank universities and colleges distribution..... | 25 |
| Map (2): an Najah campuses and it's functions..... | 26 |
| Map (3): target groups..... | 27 |
| Map (4): governorates surrounding the college..... | 28 |
| Map (5): college site for Jenin governorate..... | 29 |
| Map (6): college site for Tubas governorate..... | 30 |
| Map (7): college site for Nablus governorate..... | 31 |
| Map (8): Nablus communities and the distance from it's city to the site..... | 32 |
| Map (9): the communities surrounding Al Nassareya..... | 33 |
| Map (10): land cover and services surrounding the college site..... | 34 |
| Map (11): site location..... | 35 |

Pictures :

| | |
|---|----|
| picture 1:site area | 36 |
| picture 2:site slope | 36 |
| picture 3:site soil | 36 |
| picture 4:sun and wind direction on site..... | 36 |
| picture 5: college main street | 37 |
| picture 6: college main entrance | 37 |
| picture 7: street development with contour lines..... | 37 |
| picture 8: street width..... | 39 |
| picture 9: street development..... | 40 |
| picture 10: final street width layout..... | 40 |
| picture 11: final street layout..... | 41 |
| picture 12: blocks layout..... | 41 |
| picture 13: relationship between element of areas..... | 42 |
| picture 14: college areas forming..... | 43 |
| picture 15: animals area forming..... | 44 |
| picture 16:animals area with green built..... | 44 |
| picture 17:slope and views of agricultural lands and housing locations..... | 45 |
| picture 18:an agricultural lands and housing locations forming..... | 46 |
| picture 19:final college zones distribution..... | 46 |
| Picture 20:3 D shots..... | 49 |

Plans :

| | |
|--|----|
| Plan 1: land use master plan..... | 46 |
| Plan 2: final master plan..... | 47 |
| Plan 3: housing zone | 48 |
| Plan 4: agricultural zone | 48 |
| Plan 5:Animals zone | 48 |
| Plan6: veterinary building area | 48 |
| Plan 7: services area | 48 |
| Plan 8: Agricultural lands area | 48 |
| Plan 9: Agricultural college area | 48 |
| Plan 10: Park area | 49 |
| Plan 11: library building area..... | 49 |
| Plan 12: Administration building area..... | 49 |

Chapter 1 :Research Introduction

1.1 Overview:

[1] Agricultural Education is the teaching of agriculture, natural resources, and land management. At higher levels, agricultural education is primarily undertaken to prepare students for employment in the agricultural sector. Classes taught in an agricultural education curriculum may include horticulture, land management, turf grass management, agricultural science, small animal care, machine and shop classes, health and nutrition, livestock management, and biology.

[2] Agricultural education is common at the primary, secondary (including middle and high school in the United States), tertiary (including vocational schools and universities), and adult levels. Elementary agriculture is often taught in both public and private schools, and can cover such subjects as how plants and animals grow and how soil is farmed and conserved. Vocational agriculture trains people for jobs in such areas as production, marketing, and conservation. College agriculture involves training of people to teach or conduct research in order to advance the fields of agriculture and food science. General education informs the public about food and agriculture.

So an Najah National University realize the importance of agricultural education and need to create an agricultural college in the one of the best agricultural sites in Nablus governorate (at Al Nassareya village) to focus on agricultural studies and all sciences that relate to it so I will plan this college to it in my project .

1.2 Research Problem:

The agricultural sector in Palestinian cities is becoming down and the right understanding for agriculture methods and everything relate to it is few . Nablus city is one of the cities that suffer from little agricultural lands.

1.3 Research significance

- Create an optimal model for how we can planning agricultural college
- Few books, researches and references that take these project in consider.
- Create good environment for student without anything pollute it.

1.4 Research Objectives:

Main goal:

Make a planning proposal for agricultural college.

Objectives:

- Revision the theoretical terms for research subject.
- Analysis study area reality.
- Develop the planning dimension.
- Analysis the actual condition and determine the needed.

1.5 Research Plan and Methodology:

The research should produce in final a master plan for agricultural college planning that take in consider the elements distribution and basic landscape details and street layout.

The methodology begin from site analysis , project concept , developing concept and finally master plan.

Chapter 2 : Conceptual and Theoretical Framework

[3] 2.1: General Information:

2.1.1 Agricultural college :

The design of the agricultural college must be considered by two aspects: first a discussion upon structure use as well as the needs satisfied with it, in other words some college's potentials for cultivation in this region second theoretical bases discussion and formation of the building by itself.

2.1.2 the importance of agriculture in development

Among designed buildings for various usage and time, architects have been able to show some abilities of this field to explain and publish architectural concepts. A remarkable issue in the world is agricultural colleges and, indeed, an appropriate atmosphere for education, therefore academic buildings will be the most important ones in a country in order to educate specialists and effect directly on multilateral developments in countries. Obviously scientific and speculative factors cause notable growth. As a result it is necessary to invest and finance for academic issues improvement.

Some of these issues are to establish a great many schools, consider development projects, encourage prominent professors, provide sufficient educational/administrative/welfare facilities for sophisticated individuals in this system. An agricultural college, for example, must be able to train specialists in some fields such as recognition, and cultivation of vegetations and everything related to nature and anti-nature along with available samples, and these skills could be experienced through agricultural areas, convenient forests, intact nature, educational workshops, exhibitions, and conferences.

2.1.3 Agricultural education

Agriculture is taken into account as an old field of study of a country this antiquity has influenced architectural structures in many countries. To gain appropriate efficiency they have changed the use of old buildings as well as utilizing them optimally. In fact these buildings are proper to promote a country's or its agriculture's antiquity. But could these buildings be employed in such cases (for example, an academic structure, where development projects are important and it must be adapted to existing possibilities at any time)?

It is not impossible to create a space for a particular use (like a lab) based on a place where its spaces have been designed for other uses, and also it is good to design a room for a lab even it is a cubic and simple space. Thus what is an architect's task?

2.1.4 Location criteria for agricultural college:

Agricultural colleges need vast areas. In order to study on intact nature and cultivation farms, college buildings or at least some places related to workshop studies are often transferred out of polluted cities, in turn, sufficient welfare facilities are provided for them.

Chapter 3: Case Studies

[4]Case study (1):

Horticulture land use conflict “Logan City”:

Geographical context:

Green bank is a rural-residential area in Logan City in the southern peri-urban area of Brisbane. Lot sizes in the neighborhood range from 1.2 hectares to 4.6 hectares. The land use is a mixture of rural-residential, recreation and horticulture based on both open-field and enclosed greenhouse production of vegetables and fruit.

Planning Policy context:

The property of 4.4 hectares is in the Rural Residential Precinct in the Mount Lindsay Corridor Zone of the Beau desert Shire Planning Scheme (2007). On lots greater than 8,000m² in this precinct, agriculture and animal husbandry are exempt uses, however intensive agriculture is impact assessable. On lots less than 8,000m², agriculture and intensive agriculture are impact assessable, while animal husbandry is code assessable. Intensive Agriculture means the growing of plants or plant material within a building or structure or under artificial light, mushroom farming, turf farming or hydroponic farming.

Description of proposal:

The landholder proposed changing production from open field horticulture by the erection of structures enclosed with plastic sheeting to allow more intensive greenhouse production. Rationale of applicant: The landholder wished to improve the efficiency and productivity of the farming enterprise by achieving greater control of environmental factors through the enclosure of production practices within shade structures.

Views/engagement of neighborhood:

The development application attracted 75 submissions from neighboring and local residents, mostly raising issues of concern with the proposal. The main issues raised were that the proposed intensive horticulture business was not compatible with a rural residential area due to the use of chemical sprays for the control of plant pests and disease and the resulting spray drift into residential areas. Other issues raised included the impact on visual amenity of large plastic structures, noise, waterway and domestic water contamination, traffic and impact on land values.

Application of policy by Council/ approval body:

The Council considered that the proposal was inconsistent with the purpose of the Rural Residential Precinct by not providing a safe environment, nor protecting or enhancing the existing residential amenity of the area. In addition there was insufficient buffering between the operation and adjacent residential uses. Overall the proposal did not meet 24 of the intended outcomes for the area in the planning scheme.

Wider statutory involvement:

The application did not require referral to any other statutory body or agency. The issue of assessment levels for agriculture has been the subject of proposed changes to the planning scheme. The Council proposed that on lots less than 8,000m², agriculture be made code assessable, rather than impact assessable. This change was proposed to lessen the regulatory burden on open-field farming activities in the area while maintaining performance standards on spray drift and other potential impacts through amendments to the Agriculture Code. Agriculture on lots greater than 8,000 m² was proposed to be exempt (subject to the preparation of the new planning scheme). The new Logan Planning Scheme commenced in May 2015. In the new scheme cropping is self assessable in the Rural zone and on lots over 4 ha in the Cottage precinct of the Rural Residential zone; code assessable on lots smaller than 4 ha in the Cottage precinct; and impact assessable elsewhere in the Rural Residential zone. Intensive horticulture is code assessable in the Rural zone and on lots over 4 ha in the Cottage precinct of the Rural Residential zone; and impact assessable elsewhere in the Rural Residential zone.

Points of agreement:

There were very few points of agreement between the landholder and the Council.

Identified issues to resolve:

There is a need for acceptable and appropriate operation codes for agriculture and intensive agriculture in residential areas.

Outcome of application:

The application was refused

Outcomes for industry:

It will be very difficult for intensive agriculture to establish in areas designated for Rural Residential use, regardless of the size of the allotment. Agriculture or open-field farming will also remain under close scrutiny by local residents due to concerns about agricultural practices such as spray drift, odour and noise.

What should/could be changed?

1. At the strategic planning level, land use conflict is best avoided by maintaining adequate separation distances between agricultural production areas and encroaching residential uses. Land suitable for agriculture should not be converted to rural-residential use as production activities will either continue in these areas or smallscale, intensive uses will be attracted to establish on suitable locations on small allotments.

2. Where agricultural and rural-residential uses are permitted to co-exist by past planning decisions, land use conflict must be managed by setting clear operational conditions on agriculture in these circumstances by appropriate agricultural use codes. Beyond planning measures, there is a need for Councils and their communities to establish open communication channels to discuss complaints and negotiate outcomes satisfactory to both groups of land users.

[5]Case study (2):

Grain Transport Darling Downs:

Geographical context:

Grain production is concentrated on the Darling Downs and Central Queensland. Major grains are wheat and barley grown in winter and sorghum and maize grown in summer. In 2011-12 it was estimated that there would be 2,773,000 tonnes of winter grain produced and 2,926,000 tonnes of summer grain (DAFF, 2011). Grain is produced for both domestic and export markets.

What is the background and evolution of the issue?

Grain is traditionally handled as a bulk commodity by the bulk handling network involving storage sites located throughout the grain growing areas, three export shipping terminals and a rail and road transport network. Domestic supply chains are mainly handled by road transport to flour mills and feedlots on a daily basis to meet a relatively steady demand driven by domestic food demand. Export supply chains have traditionally been handled by rail transport from storages to ports predominantly in the January to June period. The average tonnage hauled by QR Limited between 1998-2005 was 1,130,000 tonnes in Queensland and 755,000 tonnes from the Darling Downs to the Port of Brisbane. The average tonnage exported from the Port of Brisbane between 2005-2008 was 689,000 tonnes.

Description of issue:

As a result of a series of low production seasons, grain industry restructuring and the growth of demand for coal transport, the proportion of the export grain harvest carried by rail has declined in recent years. The number of train sets available for grain transport from the Darling Downs has reduced from 11 to 5 per year while rail freight costs have increased. This has resulted in a large increase in road transport from the Darling Downs to the Port of Brisbane.

Who is impacted by the issue?

The key stakeholders in this issue are grain growers, commodity marketers, bulk handlers, road transport operators, infrastructure providers. Grain growers are impacted by higher freight costs. Road transport operators face increased congestion and safety issues at unloading points. Grain handlers and marketers face cargo assembly difficulties due to variation in grain quality and management of the variability of grain compared with grain on rail. Infrastructure providers face increased damage to road surfaces due to additional tonnages travelling by road.

What steps have been taken to address the problem?

Following deregulation, bulk handlers (e.g. Graincorp, Grainflow) have emerged as being the best placed to build cargoes and organise the transport and handling logistics to meet export orders.

What are the potential implications for the industry more broadly?

The ability for the industry to move large volumes of grain to the port and onto export destinations is critical to capitalize on strong early-season premium prices.

What is the key message from the case study?

Rail transport will remain a problem for the industry as, in good seasons, the movement of high volumes of grain over short periods in competition with coal transport is required; while in poor seasons there is less demand. Road transport augmenting rail transport will continue to be a feature of future grain harvests, particularly in good seasons.

What tools and processes could be used to support industry in improving this issue?

Bulk handlers and marketers need to negotiate increased certainty of train capacity with QR Limited based on predicted grain yields as early in the season as possible.

What should/could be changed?

1. With the growth in road transport, port unloading facilities need upgrading to resolve congestion and safety issues and to test, sort and assemble cargoes from complex grain quality and grade deliveries.
2. Department of Transport and Main Roads should preserve the current strategic rail freight corridor from Gowrie to Grandchester and investigate alternative train paths to the Port of Brisbane to alleviate congestion between grain and coal trains.
3. The mix of road and rail transport networks should be optimised by concentrating the transport of grain from farms and storages by road to a facility close to Toowoomba for loading onto rail (e.g. Wellcamp/ Gowrie).

[6]Case study (3):

Royal Agricultural College:

Using wood fuel to heat the next generation

The Royal Agricultural College was the first agricultural college in the UK and has been at the forefront of agricultural education since 1845. Over the years, the number of students and diversity of courses has continued to increase. It now offers foundation, undergraduate and postgraduate degrees to over 1,000 students from more than 40 different countries. Subjects not only include agriculture, but also agribusiness and food supply, equine, business and management studies and rural land and property management.

The college is located approximately one mile out of Cirencester and lies within the Cotswold AONB. The campus buildings are of various ages ranging from the early Victorian era through to recent additions and include both teaching and student accommodation buildings. As a result of plans to upgrade and extend a number of the teaching blocks the decision was taken to remove the old boiler plant and replace it with new “green heat technology” for a range of environmental, educational and financial reasons. Following a pre-feasibility study, it was decided to install a woodchip boiler to heat these buildings via a district heating system.

| | |
|----------------------------|--|
| Project/business | Royal Agricultural College |
| Location | Royal Agricultural College, Stroud Road, Cirencester, Gloucestershire, GL7 6JS |
| Technology/system | ETL Listed Froeling Turbomat 500 (500kW) Woodchip |
| MW produced | 550,000 kW h per annum |
| Benefits | Each year, it is estimated that there will be a CO ₂ saving of over 100 tonnes and at least £10,000 saved in heating costs. |
| Links and more information | http://www.rac.ac.uk/ http://www.wood-fuel.co.uk/ |

Table (1): some information about royal agricultural college

The Royal Agricultural College is a popular place to study; the numbers of students applying to the College have been steadily rising. In order to cope with this, it was decided to upgrade and extend a number of the teaching buildings and in turn improve facilities for both students and staff. As part of these proposals, the decision was taken to remove one of the old main oil boiler systems and replace it with a more sustainable energy source for a range of environmental, educational and financial reasons. Different technologies were explored but it was decided that a biomass boiler would be the most suitable solution.

A pre-feasibility study recommended a 500kW boiler (ETL Listed Froeling Turbomat 500) in conjunction with two new small oil fired boilers to provide back up. The backup was installed to aid peak load times and as a precaution as so many people rely upon the system for heating. A separate boiler house was built to house the woodchip boiler, buffer tanks, master controls and viewing area and a new below-ground wood chip store was put in adjacent to the boiler. The boiler system is fully automated and can be "remotely" controlled and monitored via a computer. Furthermore, the maintenance of the system is expected to be limited. The ash will only need to be emptied once a week and the boiler system serviced twice a year.

This project provides heat for a number of the College buildings which require heating from 8:00am until 7:30pm. The buildings consist of the library, gym, two lecture blocks, and the sports hall. The heat is distributed by an underground district heating system.

Econergy were the company commissioned to install the biomass system. The co-ordination and management of this project, along with the overall building was undertaken by the College's Director of Estates and their appointed external architects/engineers, Astam GBC. The woodchip is being supplied by Midlands Wood Fuel. The College is charged on an energy basis rather than volume of wood - the cost is just over 3p/kWh.

The College is expecting a carbon saving of at least 100 tonnes of CO₂ per annum. It is also anticipating making significant saving on annual fuel costs. However the initial capital cost of this biomass system is considerably greater than installing a new oil fired boiler. The total cost of the system amounted to over £500,000. The College were fortunate to be awarded a £150,000 grant under the South West Bio-energy Grant Scheme – without such assistance, the financial case for the

project would have been questionable. However receipt of this grant funding means that the College will not be eligible for annual Renewable Heat Incentive payments (unless of course it elects to repay the grant monies).

Due to the overall building project and the requirements of the grant, the building works for the biomass system started in September 2010 and had to be completed by the end of January 2011. The biomass system was fully functioning by the end of February 2011.

Problems, successes and solutions

The cost of a woodchip boiler is often two to three times more expensive than a conventional boiler. In addition, for this project, there was a need for a fuel store and an underground district heating network, as a number of buildings are heated by the boiler. This significantly increased the overall capital costs and thus the availability of potential grant support was an important consideration. However, the main sources of grant aid were all discretionary and dependent on the availability of grant funds and the demand for them, so it was difficult to predict the likelihood of securing grant funding in advance of undertaking the project. Furthermore the timing constraints resulting from the grant offer provided a very restrictive timeframe for undertaking the works – in this case, works were not permitted to commence until September 2010 and had to be completed by February 2011. In addition, the biomass system works needed to be co-ordinated with the overall building refurbishment works. Despite these issues, the biomass system was successfully installed and was fully functioning by the end of February 2011. In the future, the introduction of the renewable heat incentive, as an alternative to the former capital grant schemes, should provide much more certainty for those considering similar projects and in turn encourage many more new schemes.

There were also a couple of technical issues. Firstly, some adaptations needed to be made to the boiler house. Once the building had been built there were concerns that there was not enough ventilation and so, in order to overcome this, some walls had ventilation panels installed. In addition, the fuel store is quite small for the required heat load. In winter it will need to be filled once a week so good communications and relations with the wood fuel supply company will be crucial.

What are the benefits and how have these occurred?

1. Benefits to the College and its students

There are many benefits for the College. Firstly, it will result in a significant reduction in carbon emissions which in turn will help the College achieve its overall carbon reduction targets. Secondly, it will reduce its energy costs. Thirdly, it is seen as a valuable educational resource which aligns well with the subjects that the College offers to its students – indeed the biomass system has already been incorporated into some of its teaching programmes. Furthermore a number of workshops, seminars and conferences aimed at people involved in the land management and renewable energy sectors have already been organised.

2. Benefits to the wider community

The College is training people to work in a variety of rural based sectors. The education of these students may encourage them to consider biomass as a fuel source later in their working life and thus inspire other installations in the future.

As mentioned above, the College will also be running events for external visitors to learn about woodfuel and renewable technologies.

Further Questions and Conclusions

Has the Project inspired any other work?

As the boiler has only recently been installed, it is too early to assess whether it has inspired any other projects. It is hoped, however, that some of the large numbers of students and other people who will become familiar with the project will be prompted to consider this technology in the future.

Has the Project inspired any future plans or further steps?

The College is planning to build a new accommodation building and, as the proposed location of this building is relatively close to the biomass boiler, there is an opportunity to extend the biomass system to provide heat for this building also. However, if this does go ahead there will be a need to extend the fuel store.

What would the message be to others interested in undertaking a similar project?

Planning and careful research are key as there is a range of important factors to consider. These include the:

- type and choice of biomass boiler, but also the related infrastructure, including the fuel store, the controls and associated pipework and how these integrate with the existing heating system;
- choice of suppliers, installers and the fuel supply company.

Finally it is important to carefully research the costs, grants and any other financial support available (such as the RHI and Green Loans etc.). In addition, they also recommended looking at other installations and talking to those involved in the process so that a full understanding of the technology and what is involved can be gained. The College put a lot of effort into getting all these matters right.

Conclusion

The College's experience is that installing a biomass system can be a very worthwhile project, with the "new green technology" expected to deliver a range of educational, environmental and financial benefits. It is therefore hoped that this will be viewed as a flagship project to help inform and inspire others.

Chapter 4 :Project Site analysis

4.1 site justifications

There are several of justifications for selection this project and it's site , there are as follow:

- ✓ It located in the northern Jordan valley
- ✓ A constrain way for Palestinian on their land.
- ✓ The area is an agricultural
- ✓ The first one in the west bank.
- ✓ The agricultural sector is becoming down
- ✓ The site owned by an Najah national university so the site is specified .

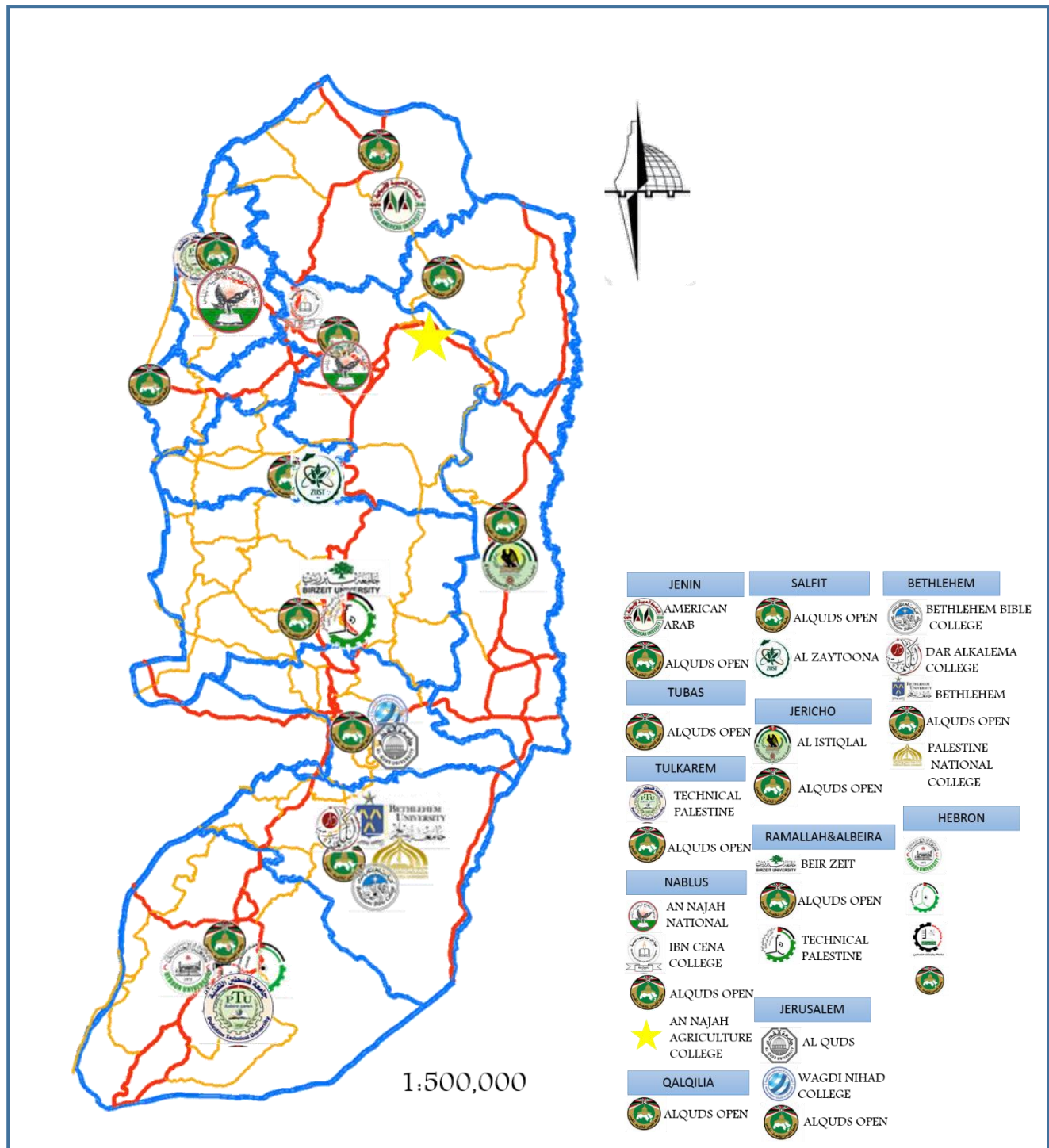
4.2 site diagnosis and analysis

I analysis the site at several scales (Regional, Local, Site) as I will explain it in these section.

4.2.1 At regional scale:

First I will show the universities and colleges distribution at the west bank specially an agricultural ones (see map 1) , as we show there are three agricultural universities and colleges and there are :

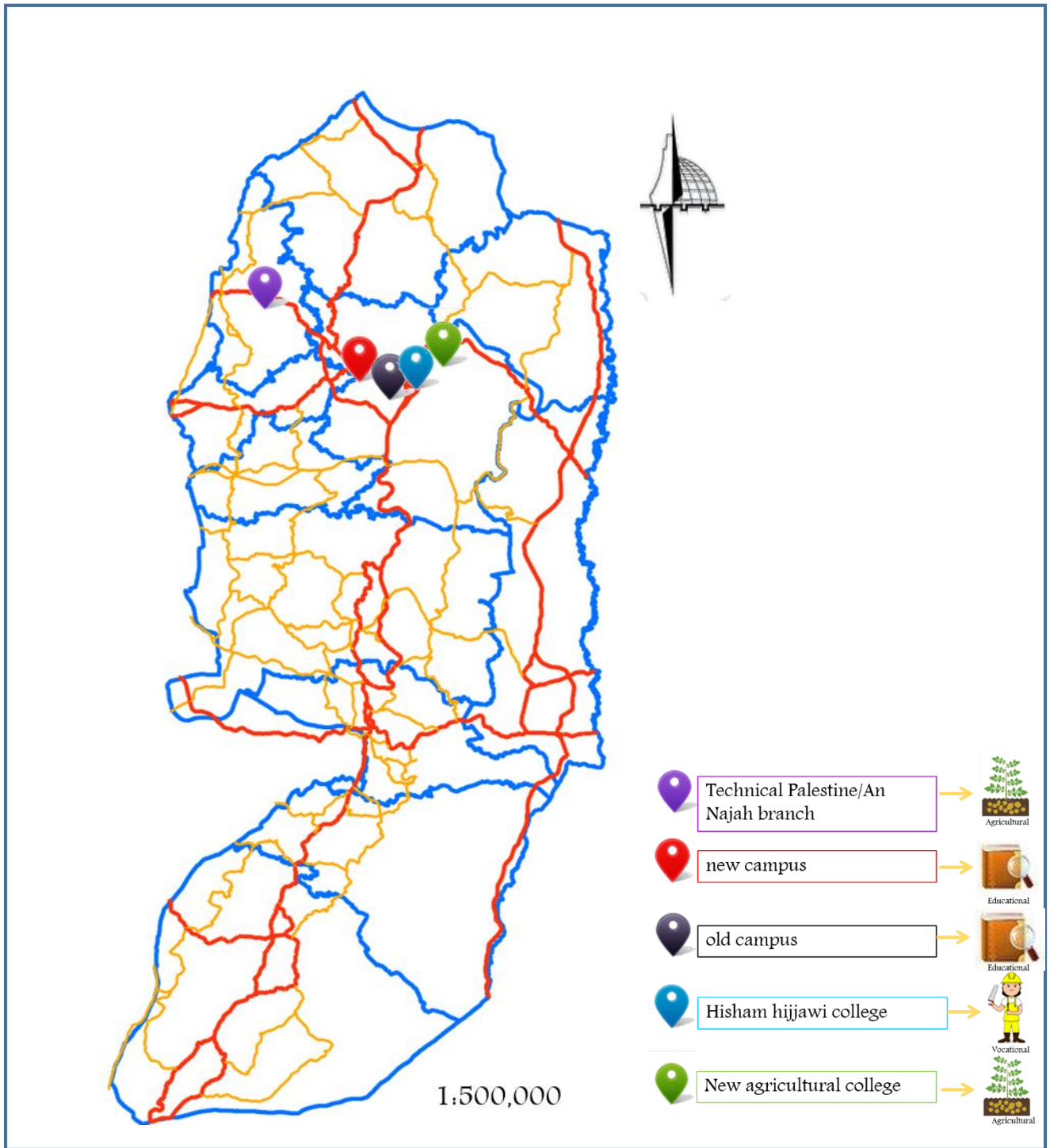
- ✓ An Najah national university in technical Palestine university.
- ✓ Technical Palestine university(Al Arroob).
- ✓ An Najah agricultural college (that I work on it).



Map (1): west bank universities and colleges distribution

source: researcher

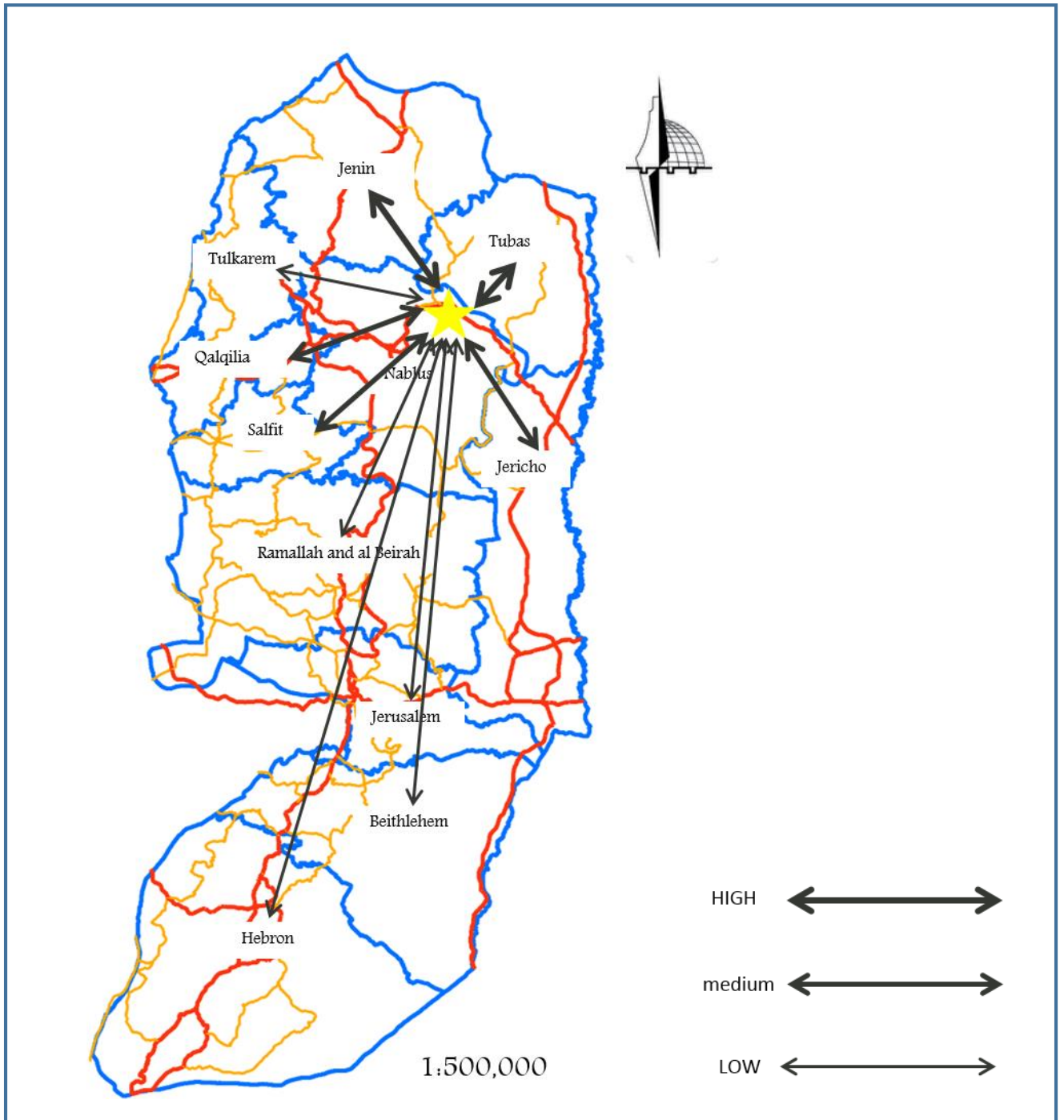
Then I will show an Najah National Universities and colleges distribution in west bank governorate and explain it's functions (see map 2).



Map (2): an Najah campuses and it's functions
source: researcher

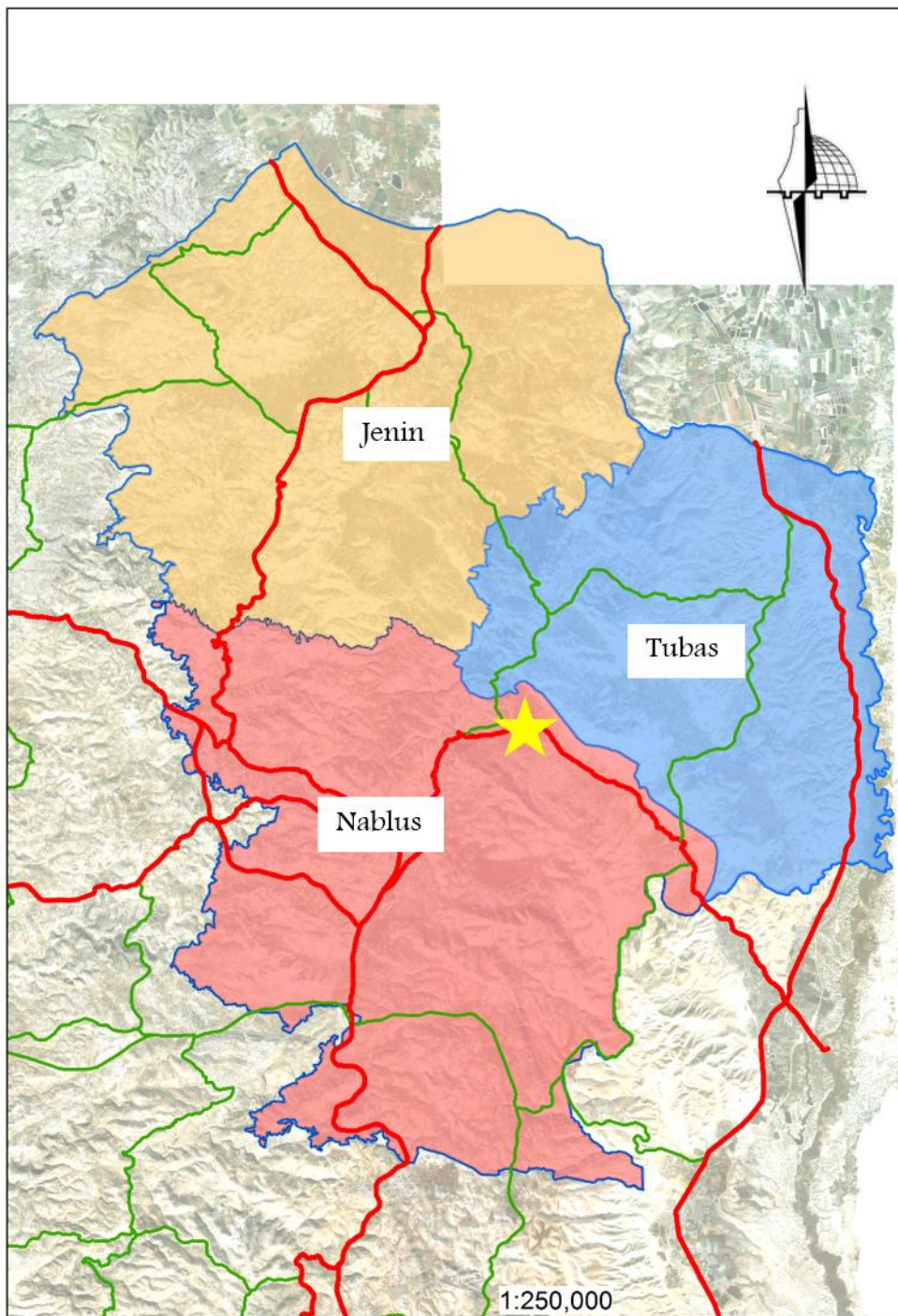
Then we should talk about the target groups that benefit from this project .

As we show Tubas and Jenin are in a high group that benefit from the project and this refer to there agricultural nature , then Qalqilia, Salfit and Jericho set in moderate group ,finally Nablus, Ramallah, Jerusalem, Beithlehem and Hebron in low group.



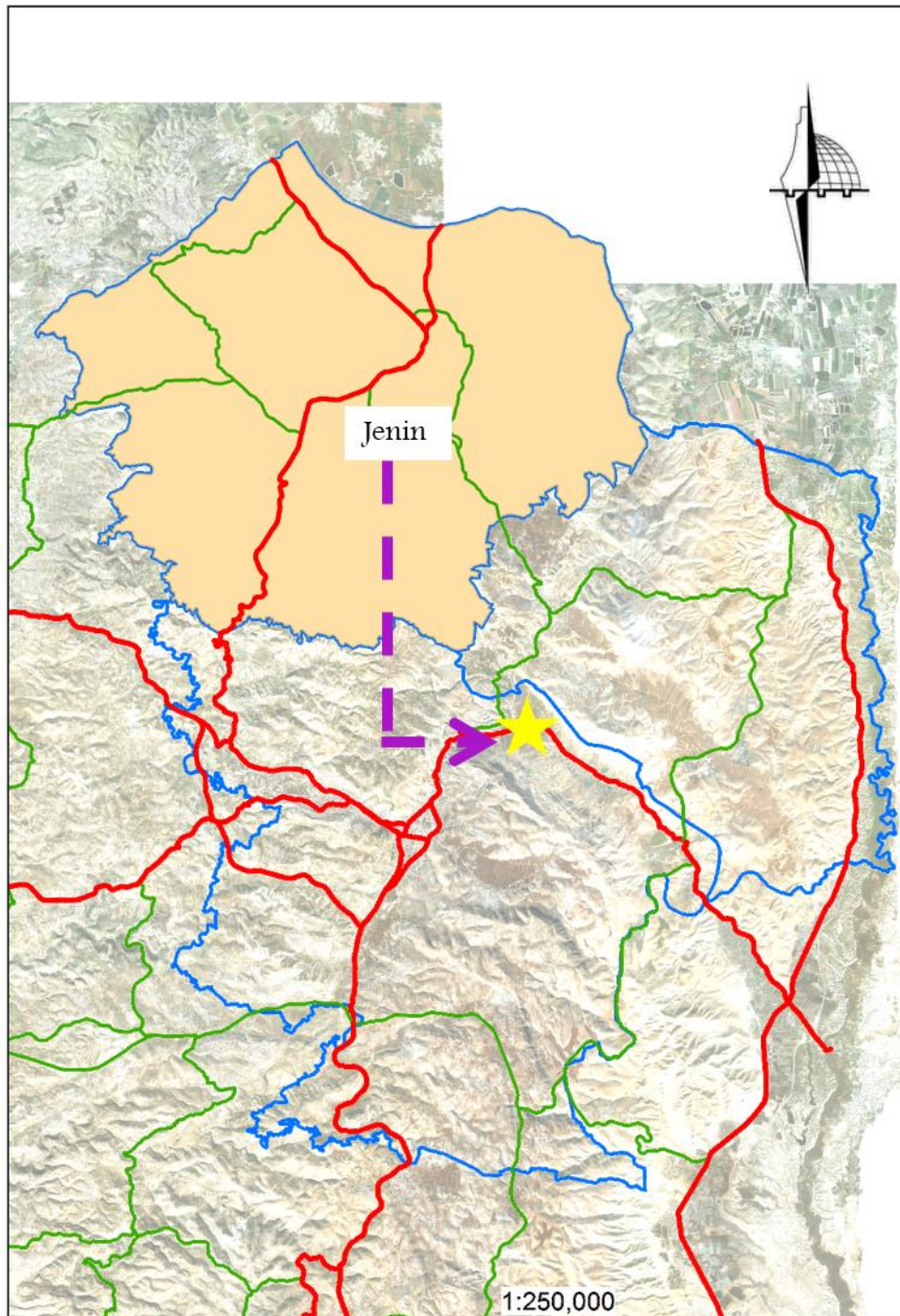
Map (3): target groups
source: researcher

Finally, I need to make zoom in to see the college location between three surrounding governorates (Nablus, Tubas, Jenin) (see map 4)



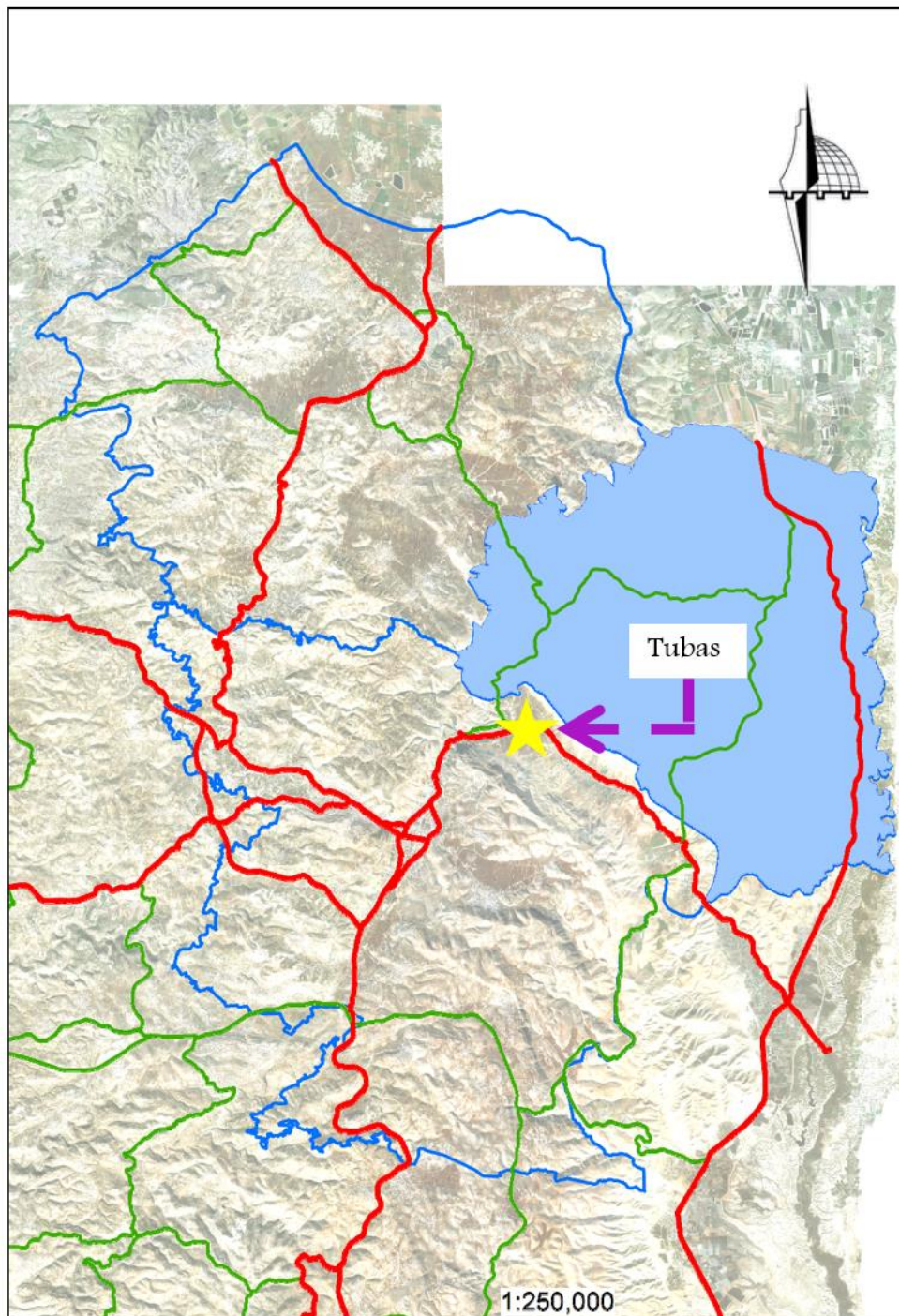
Map (4): governorates surrounding the college
source: researcher

The site locate in southern east of Jenin governorate (see map 5)



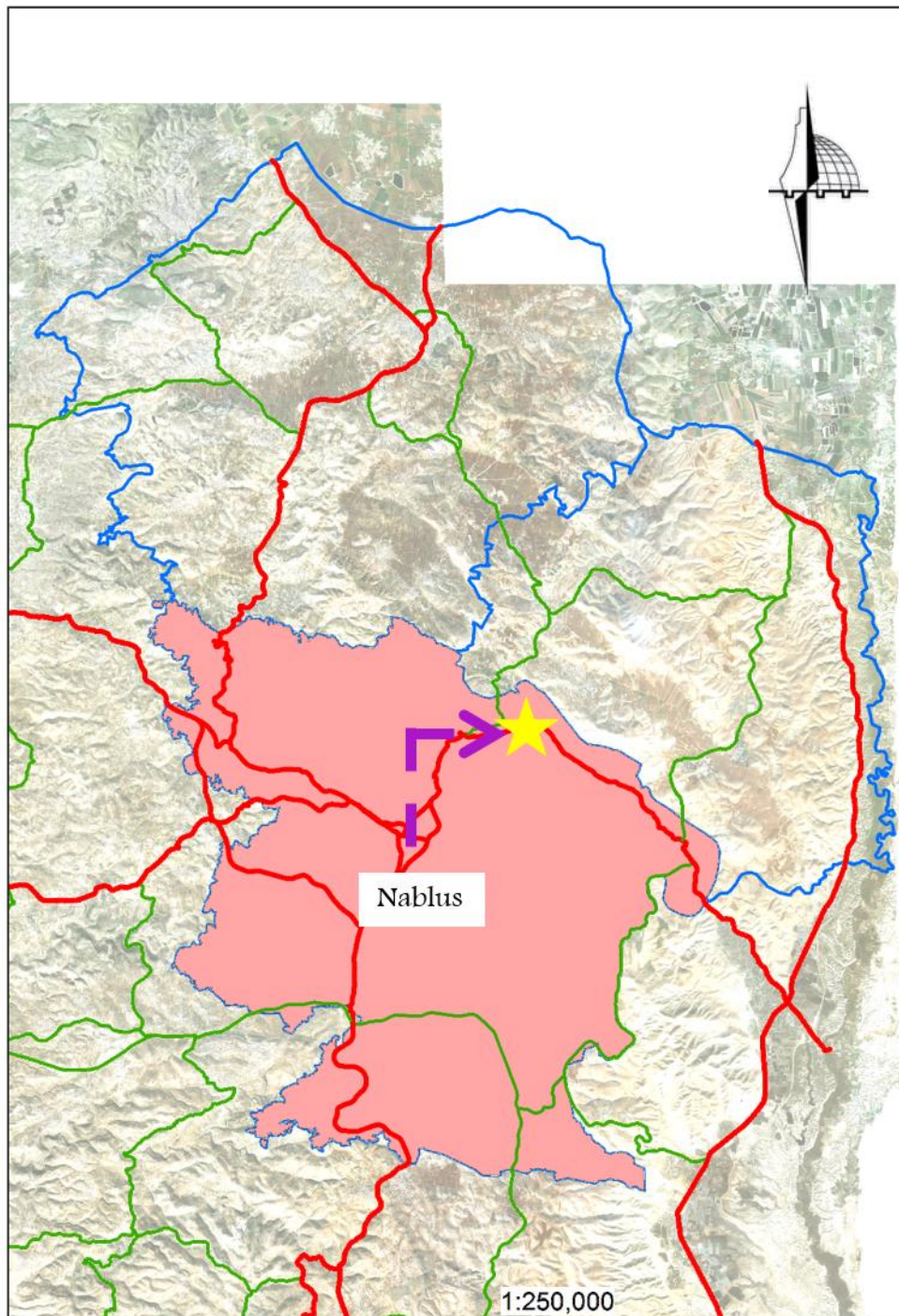
Map (5): college site for Jenin governorate
source: researcher

The site locate in southern west of Tubas governorate (see map 6)



Map (6): college site for Tubas governorate
source: researcher

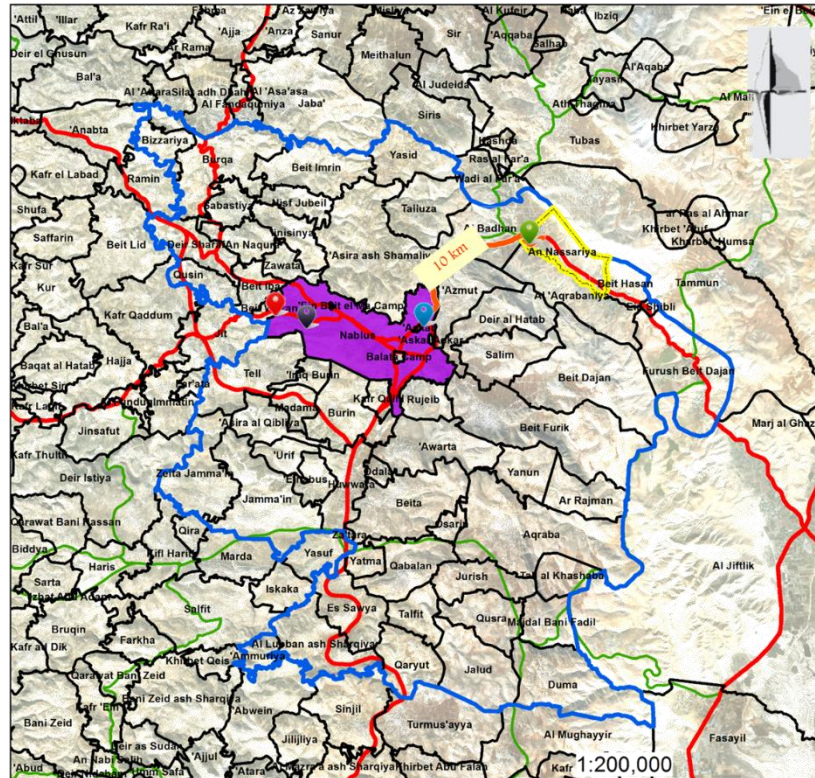
The site locate in Nablus governorate in northern east of it (see map 7)



Map (7): college site for Nablus governorate
source: researcher

4.2.2 At local scale:

first I need to explain Nablus communities and the distance from Nablus city to the college site in al Nassareya village and as we show in (map 8) the distance is 10 km.



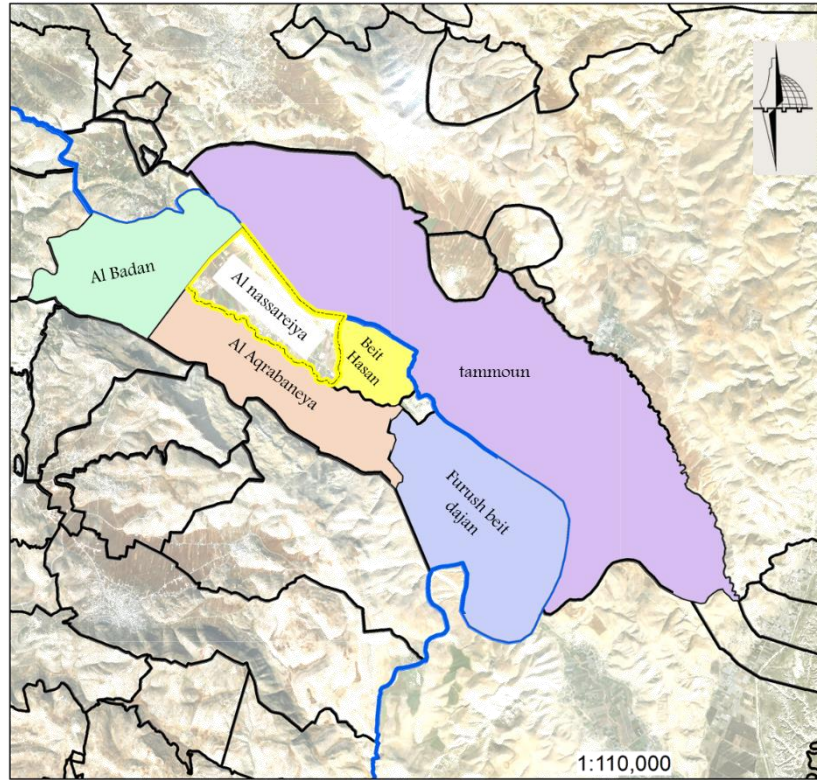
Map (8) : Nablus communities and the distance from it's city to the site source: researcher

Then I need to explain Al Nassareya village and the communities surrounding it

The communities are :

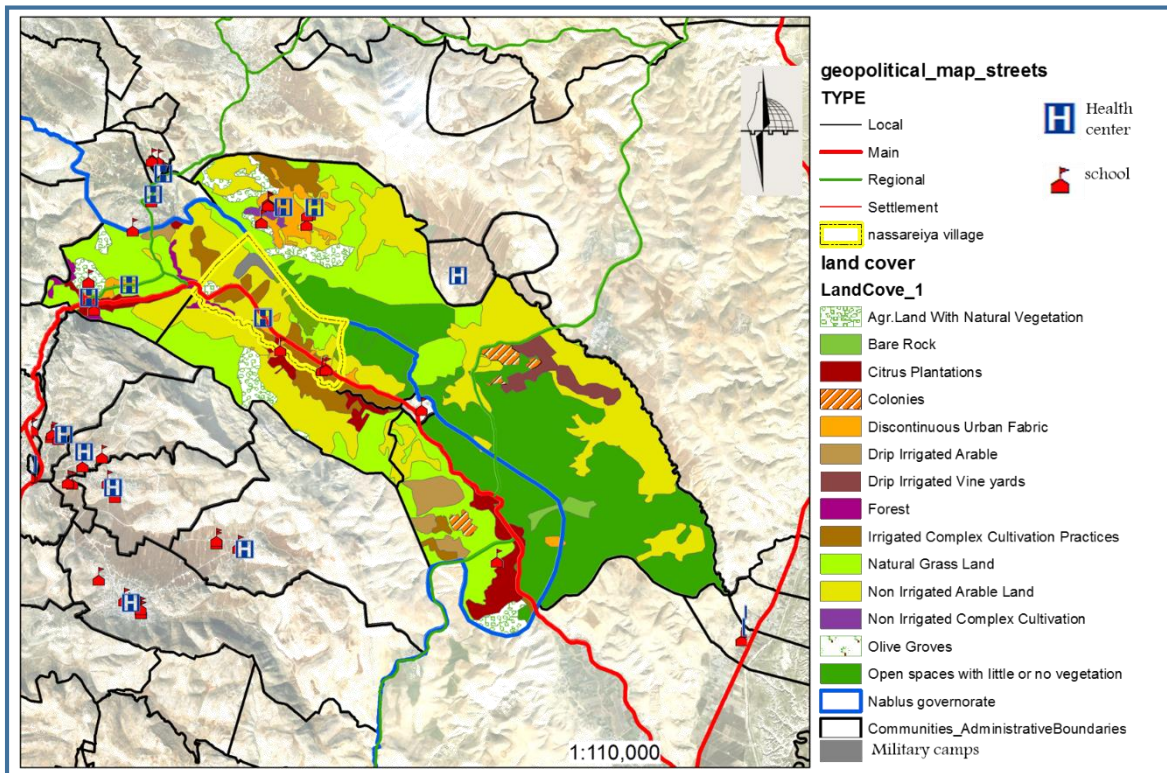
- ✓ Tammoun
- ✓ Furush Beit Dajan
- ✓ Beit Hasan
- ✓ Al Badan
- ✓ Al Aqrabaneya

As we show in (map 9)



Map (9) :the communities surrounding Al Nassareya
source: researcher

finally, in (map 10) I explain land cover and services surrounding the college site



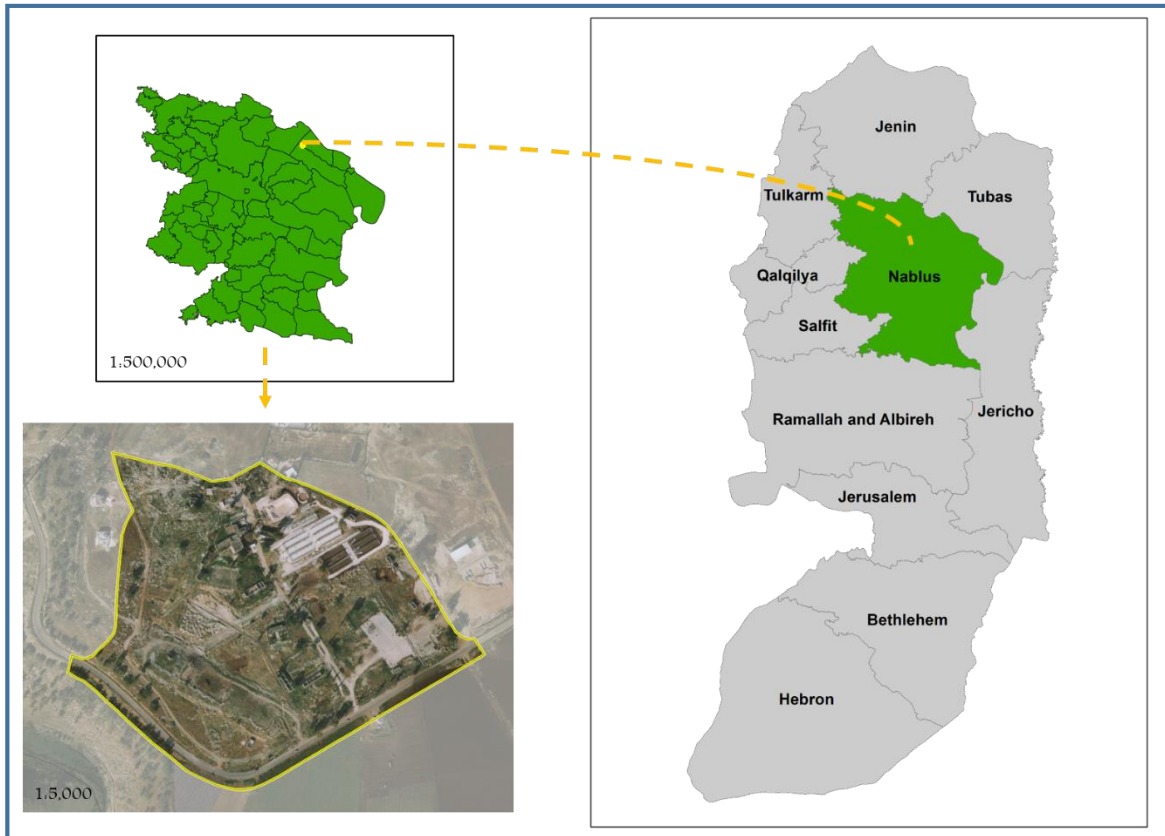
map (10) : land cover and services surrounding the college site
source: researcher

4.2.3 At site scale:

Here I need to make zoom in on the specific project land (agricultural college land)

As we show the map explain the land site for Nablus governorate and the west bank

(see map 11)



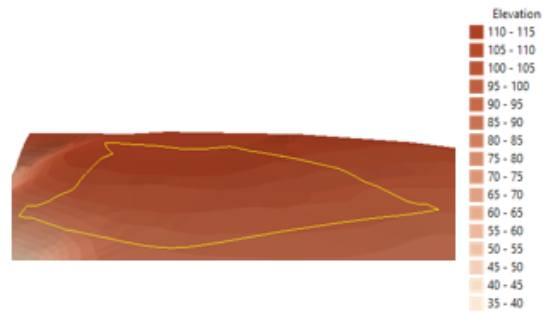
Map (11) : site location
source: researcher

Here I need to explain information about site:

- ✓ Its area is 123 Donum (see picture 1)
- ✓ It has very ease slope (see picture 2)
- ✓ It's soil is permanently clay (see picture 3)
- ✓ The wind direction on it is northern west (see picture 4)



picture 1:site area
source: researcher



picture 2:site slope
source: researcher



picture 3:site soil
source: researcher



picture 4:sun and wind direction on site
source: researcher

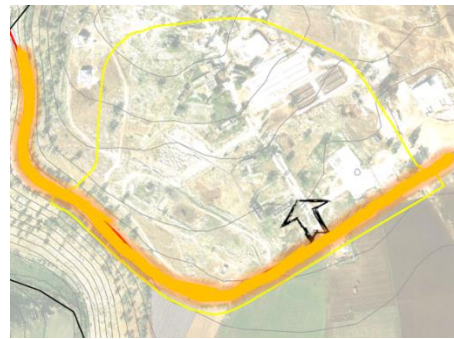
Chapter 5 :Project Proposal

5.1 : Project Concept

The project concept formed from the main street (Al Badan street) that the site set on it I take it and I increase it's width so this street form one of project streets and main street too for the site(see picture 5) , and there are an entrance to the site so I confirms on it and take it as a main entrance to the college (see picture 6).

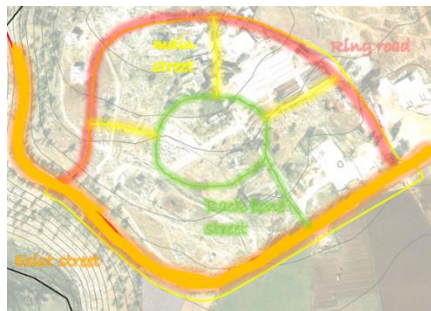


picture 5: college main street
source: researcher



picture 6: college main entrance
source: researcher

then , the contour lines helps me too to form the interior college street (see picture 7).

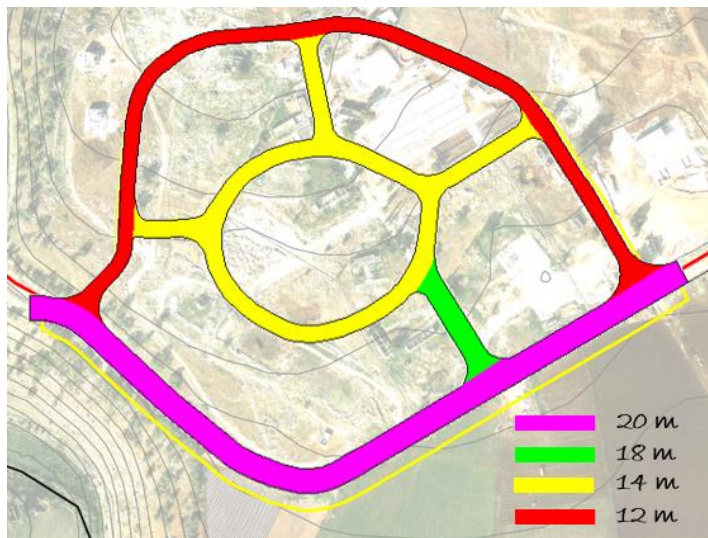


picture 7: street development with contour lines
source: researcher



source: researcher

The main entrance help me for determine the back bone street (green), the land boundary form the ring road (red) and other street that opened with contour form interior main street for the agricultural college.

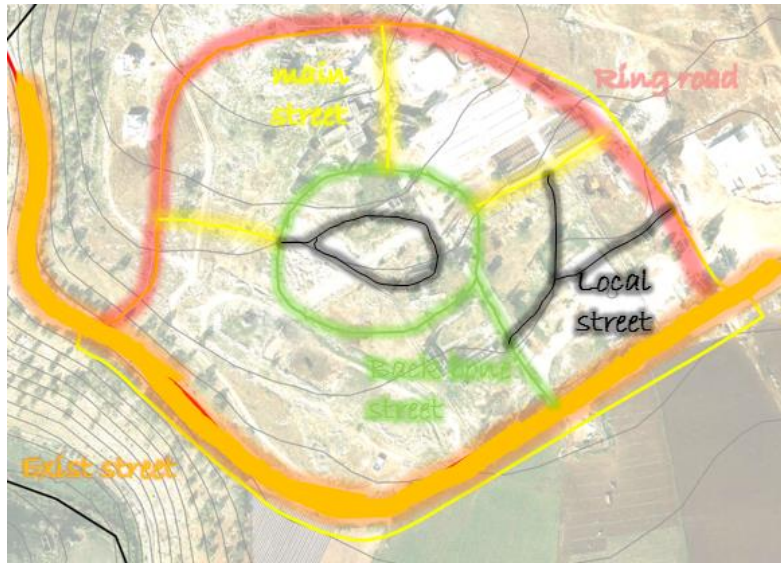


picture 8: street width

source: researcher

as we show in (picture 8) the street width classification is order descending from high width (20m), then main entrance to the college center (18m), then (14m) and finally the ring road (12m).

so the concept is integration with nature.

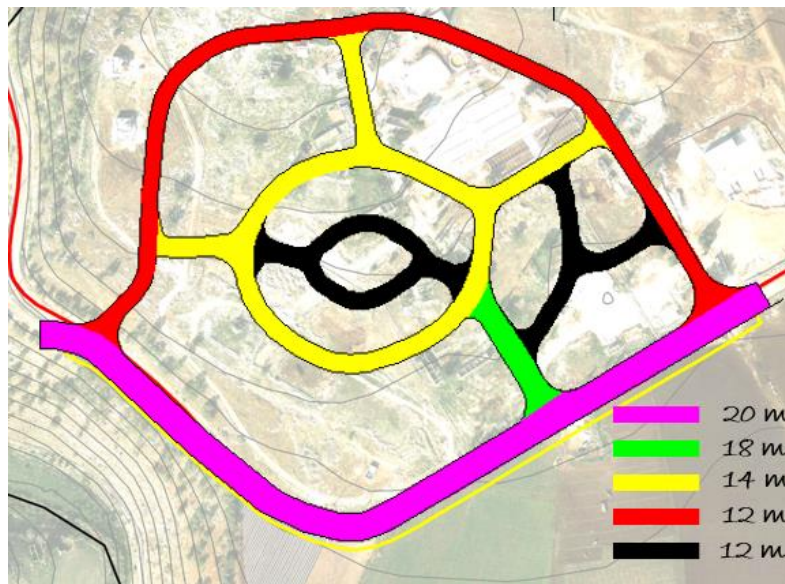


picture 9: street development

source: researcher

After we determine the basic street layout I need to make more interior street (black) to make the layout in final output.

(see picture 10) the final street width lay out



picture 10: final street width layout

source: researcher

5.2 : Project Concept Development

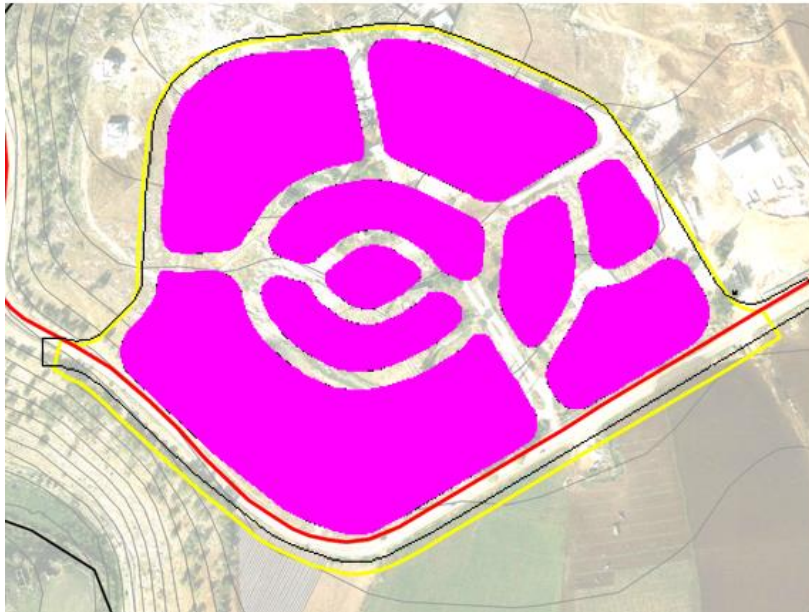
5.2.1 final street layout:



picture 11: final street layout

source: researcher

as we show the street shapes blocks (see picture 12)



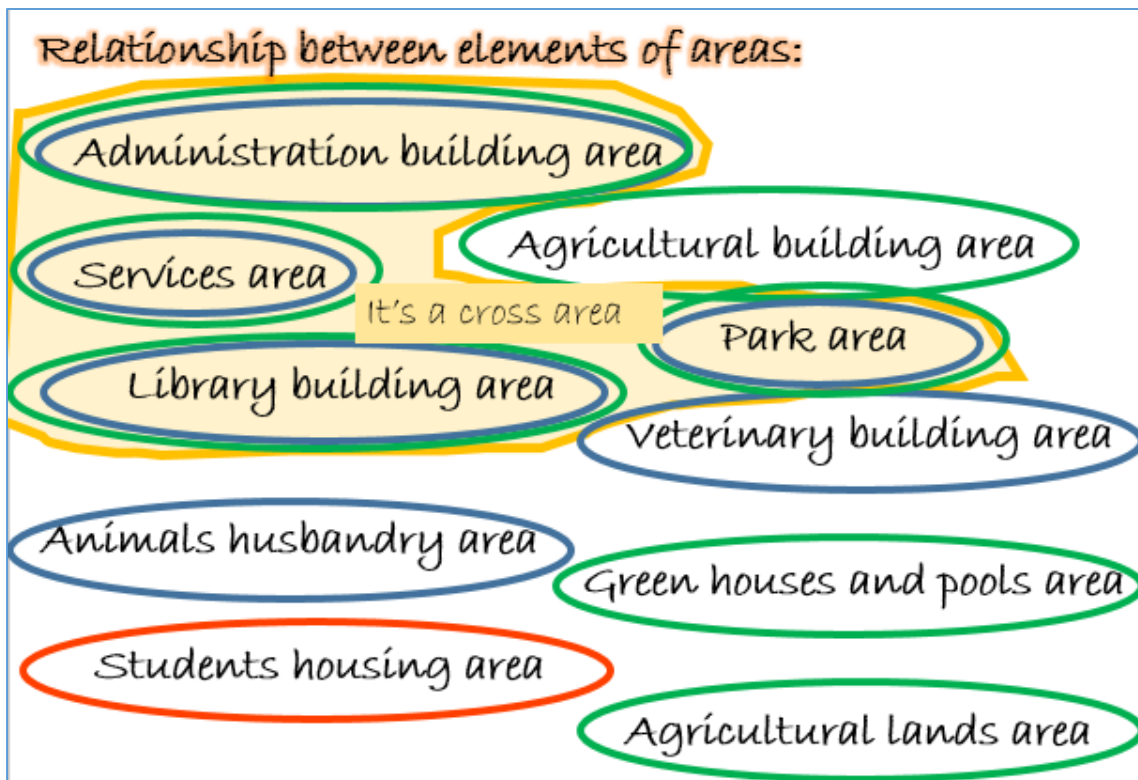
picture 12: blocks layout

source: researcher

5.2.2 the zones that I need it in the agricultural college are:

- ✓ Services area (contain mosque , services building , library and park).
- ✓ Agricultural areas (contain agricultural college building , green houses and pools area and agricultural lands for crops).
- ✓ Areas for animals (contain agricultural college building , green houses and pools area and agricultural lands for crops).
- ✓ Housing area.

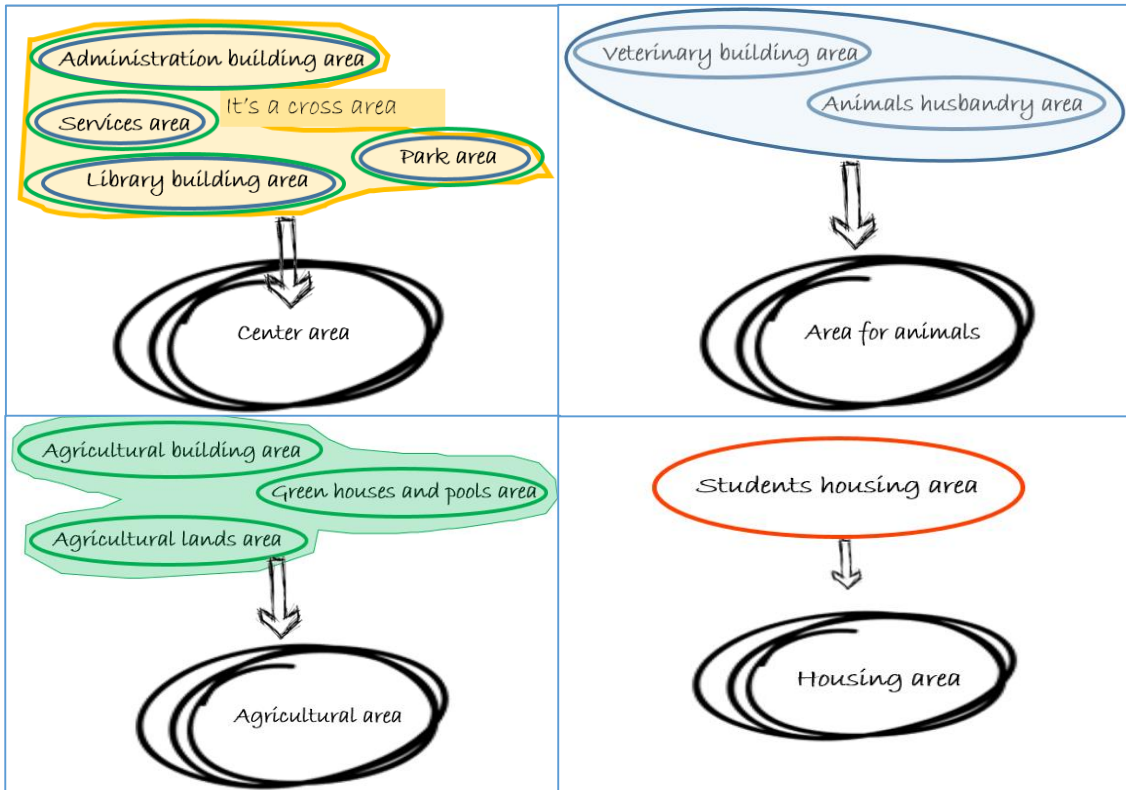
5.2.3 Relationship between elements of site and the services distribution:



picture 13: relationship between element of areas

source: researcher

After we know the relationship between element of areas we should join them with zones distribution (see picture 14).



picture 14: college areas forming

source: researcher

the picture explain the main building of the college and the services that should be in buildings zones or surrounding them.

5.2.4 Area of animals location:

As we show the wind is northern west and it take the bad smell with it so the best location for it is in the southern area (see picture 15)



picture 15: animals area forming

source: researcher

but we need to protect people that use the main street from the bad smell by making green built (see picture 16)



picture 16: animals area with green built

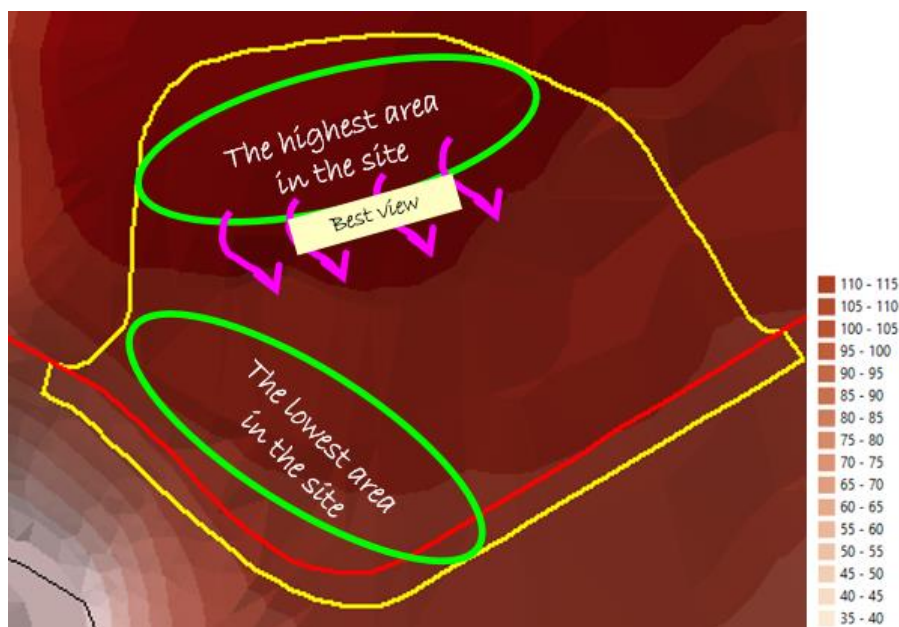
source: researcher

5.2.5 Area of agricultural lands and housing locations:

As we talk in chapter four in the analysis phase that the slope of site is ease and there are a very simple slope so I determine the highest area in the site and the lowest area (see picture 17) to know where is a best location for agricultural lands and housing ,

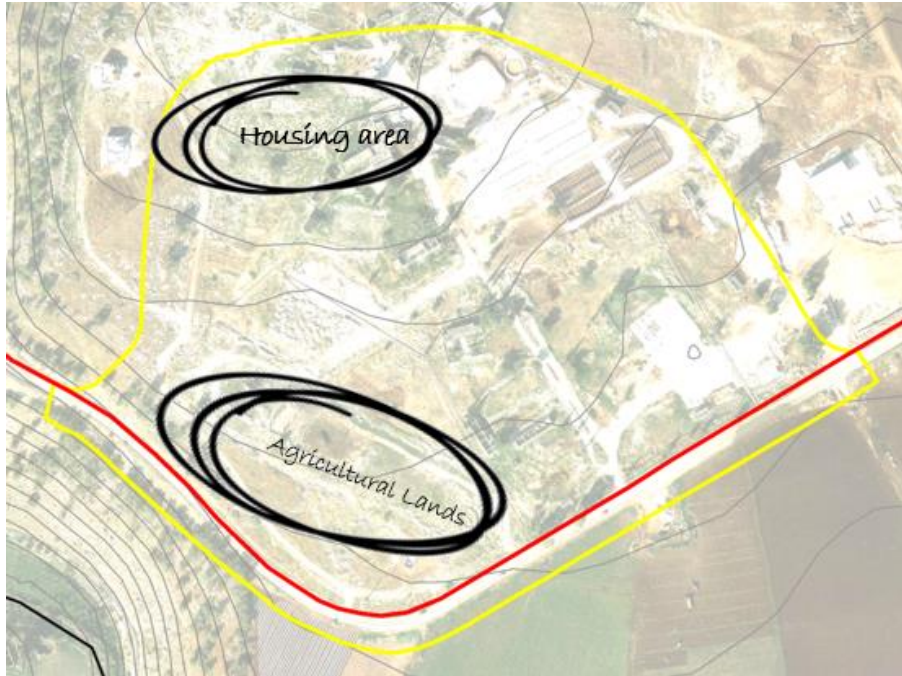
The lowest area is proportionate for agricultural lands because of the very ease a slope and have more area for the harvest and the highest area proportionate for housing area because it have a best view (see picture 18) , then , the final college zones distribution being explain (see picture 19) and the land use master plan being completely

(see plan 1) .

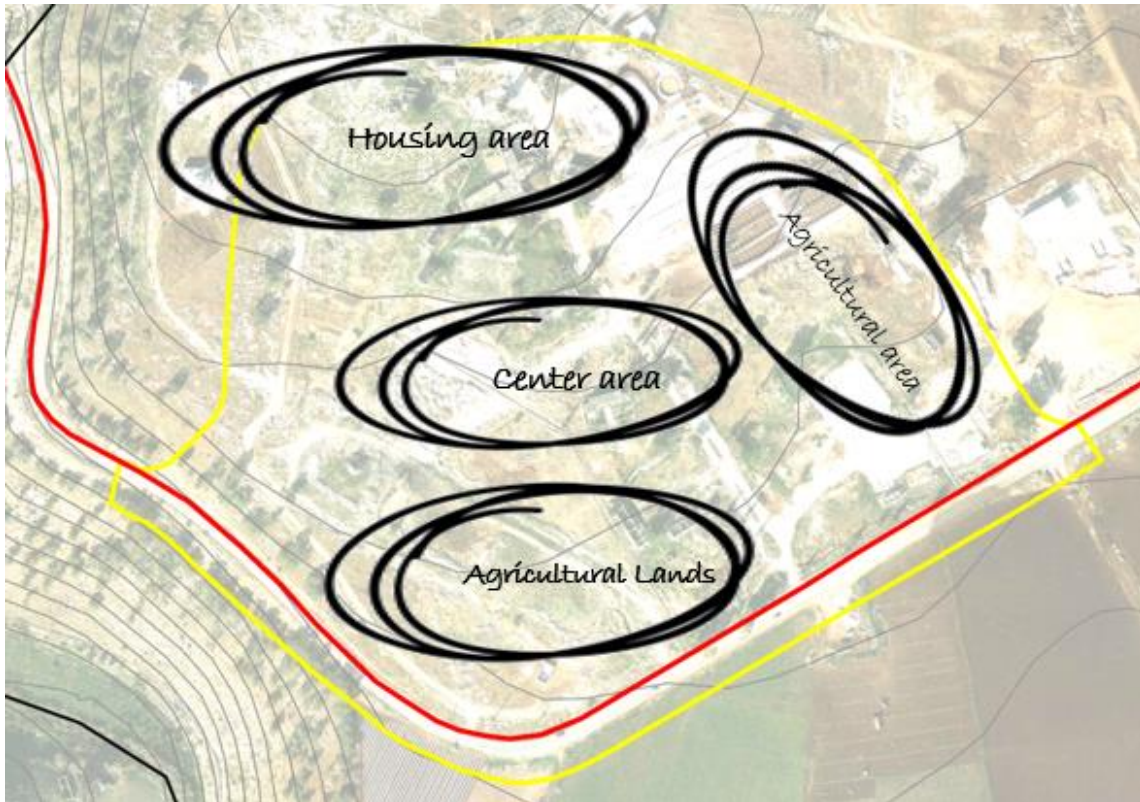


picture 17:slope and views of agricultural lands and housing locations

source: researcher



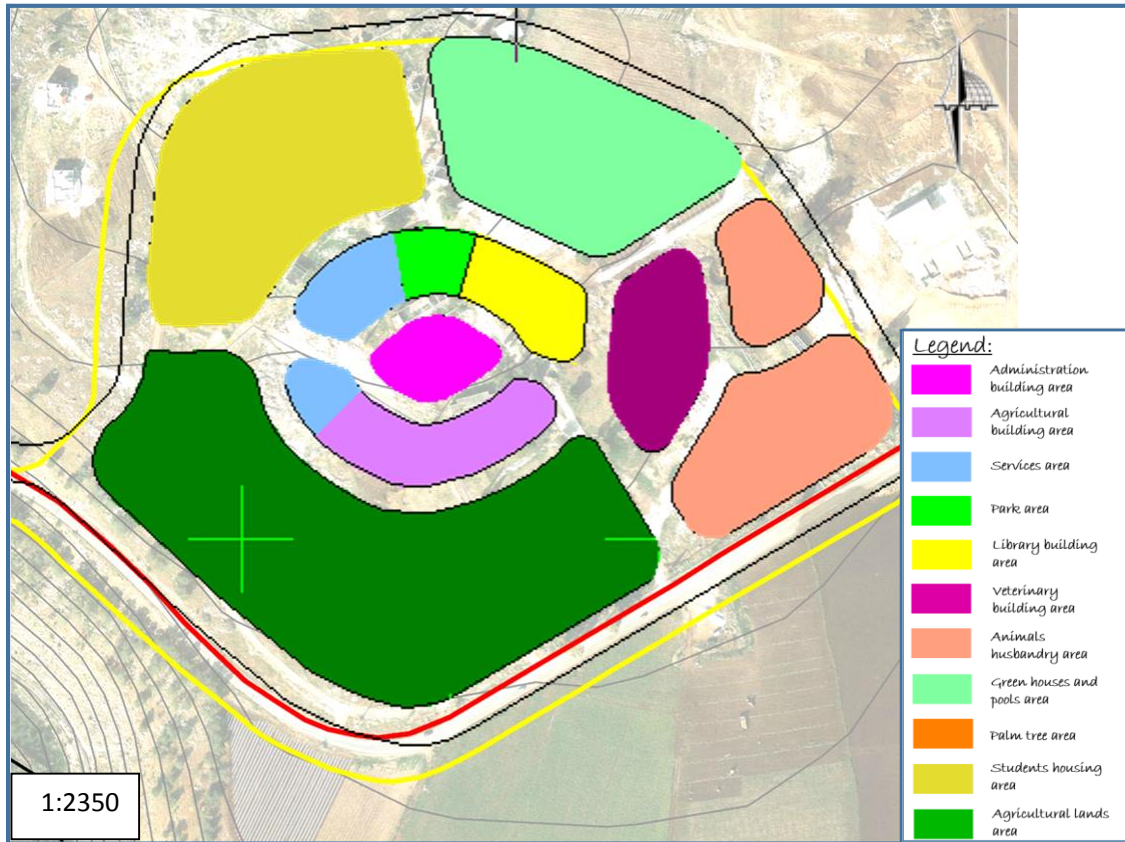
picture 18:an agricultural lands and housing locations forming
source: researcher



picture 19:final college zones distribution
source: researcher

5.3: project master plans

5.3.1: Land use master plan



Plan 1 : land use master plan

source: researcher

5.3.2: final master plan



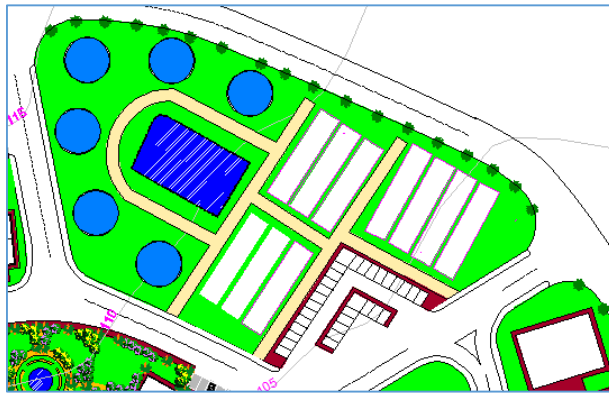
1:2250

Plan 2 : final master plan
source: researcher

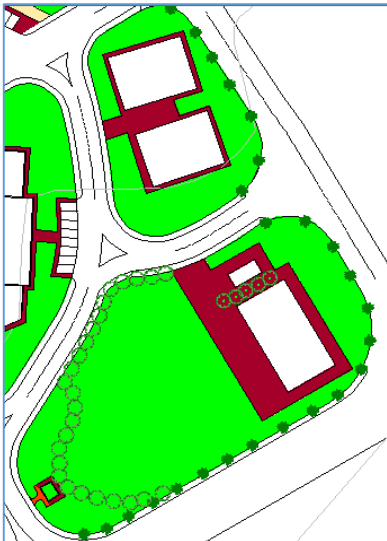
5.3.3:master plan details



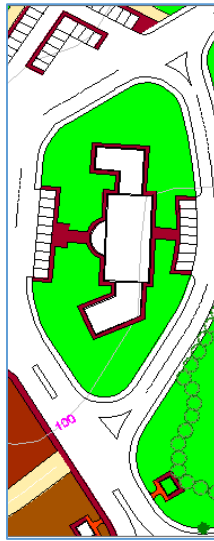
Plan3: housing zone



plan 4: agricultural zone



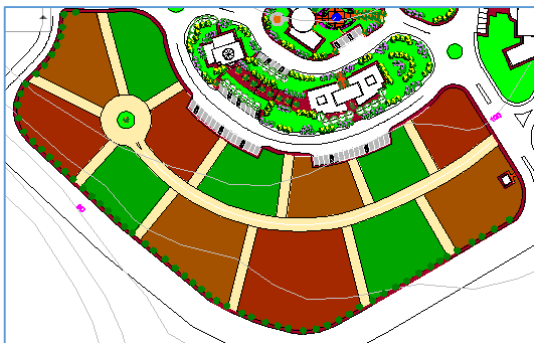
Plan 5: Animals zone



plan6: veterinary building area



plan7: services area

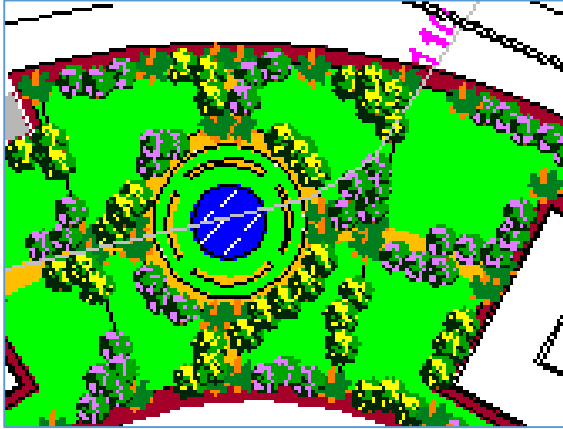


Plan 8: Agricultural lands area

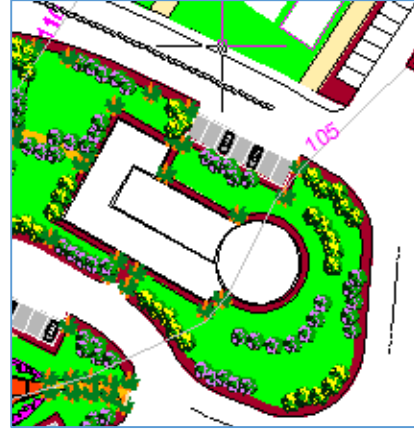


plan 9: Agricultural college area

source: researcher



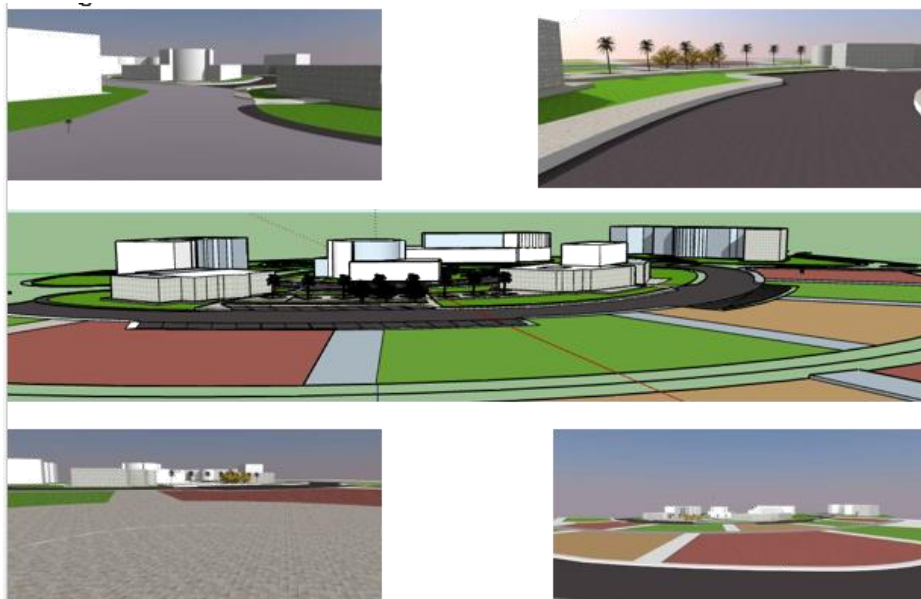
Plan 10: Park area



plan 11: library building area



Plan 12: Administration building area



Picture 20: 3 D shots

source: researcher

References :

[1] Wikipedia

[2] Wikipedia

[3] Saba Jahangir, (2015), The Importance of Architecture in the Design of an Agricultural College

[4] Queensland Farmers' Federation, (2015), Case Studies in agricultural planning

[5] Queensland Farmers' Federation, (2015), Case Studies in agricultural planning

[6] regensw delivering sustainable energy, Royal Agricultural College