

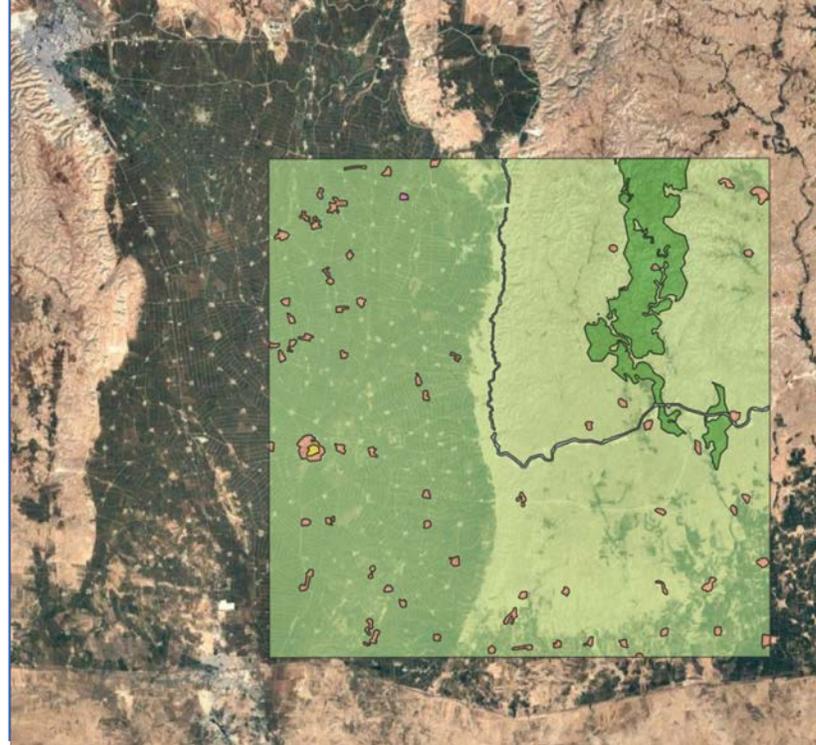
Development Scenarios for Harran, Southeastern Turkey

Harran has one of the highest population growth rates in Turkey (diagram on the right side). Up to 2050, the population is expected to double with respective needs for employment and housing. Currently, main income is generated by the agricultural and service (tourism) sector. However, without diversification in the first and strongly focused development of the latter existing problems will increase.

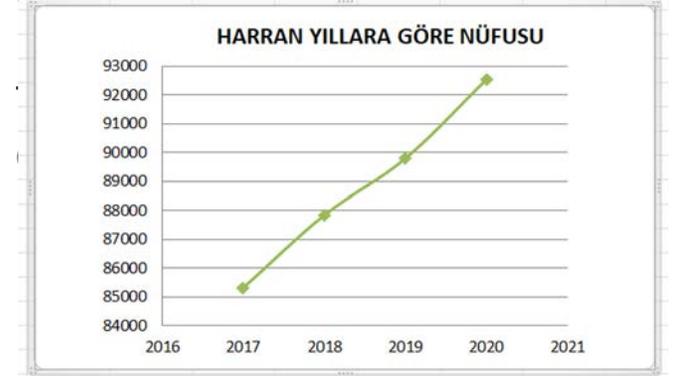
The greatest potential lies in the tourism sector. In order to reach its full potential a number of obstacles have to be removed: Urban design has to be changed to become harmonious within the cultural setting. No further encroachment of fertile lands should be permitted. The abundance of archeological sites have to be preserved and carefully restored. The number and quality of touristic facilities (hotels, restaurants, bicycle routes) have to be increased dramatically.

The transportation (weak link to province capital) and energy infrastructure has to be updated to accommodate expected numbers of residents and visitors.

Study area location in its context



The project area (1600 km²) covers mainly the District of Harran in Şanlıurfa Province. Whereas the western part consists of fertile lands of the Harran plain in the eastern parts, hilly grasslands dominate. It is part of the Fertile crescent. The province capital can be seen in the upper left corner and in the lower part, irrigated land ends at the Syrian border.



Requirements

- Convert 20 % of irrigable land into orchards (pecan, almonds, pistachios),
- Manage water resources carefully and retain agricultural drainage water for irrigation,
- Enhance the touristic infrastructure (boutique hotels, visitor centers, bicycle routes),
- Preserve the archeological heritage,
- Reach 3 millions of tourist/year by 2050 with at least 500,000 overnight stays,
- Connect Harran city and its satellite city by means of light rail with Şanlıurfa and thereby, with the high-speed train network of Turkey,
- Build a new satellite city outside of the fertile Harran plain accommodating 50,000 inhabitants,
- Make the Harran District energy self-sufficient based on photovoltaic plants and on-roof installations.

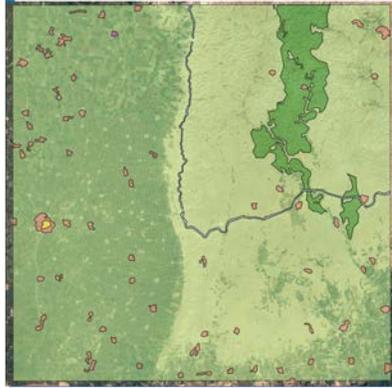
Innovations

- AGR 1 2035/2050: ORGANIC AGRICULTURE
- AGR 4 2035/2050: CARBON FARMING
- AGR 5 2035/2050: AGROTOURISM
- WAT 3 2035/2050: AGRICULTURAL WATER CONSERVATION AND BEST PRACTICES
- MIX 1 2035: MIXED USED DEVELOPMENT
- MIX 14 2035: COMPACT SUSTAINABLE NEIGHBORHOODS
- MIX 16 2035: SUSTAINABLE URBAN INFRASTRUCTURE
- TRA 4 2035: PASSENGER RAIL CORRIDORS

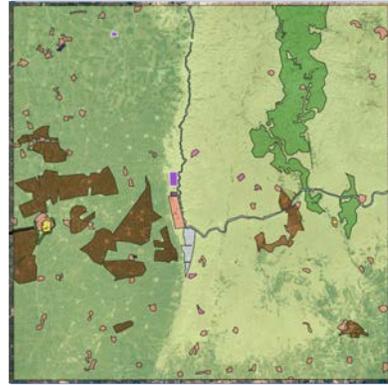
Harran University/Turkey



Location map



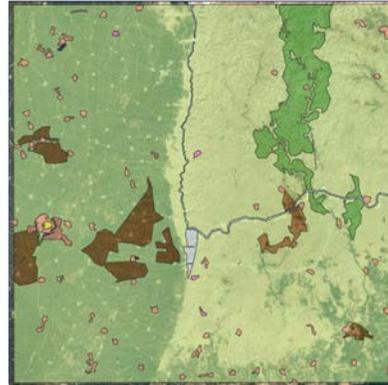
Current 2020



Early adopter 2035



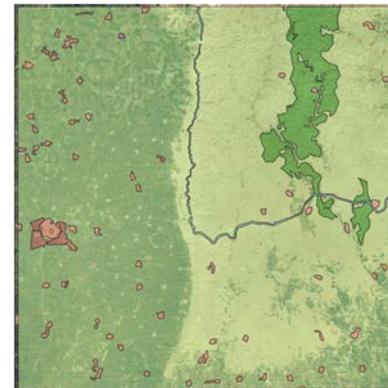
Early adopter 2050



Late adopter 2035



Late adopter 2050



Non-adopter 2050

- Water Infrastructure
- Agriculture
- Green Infrastructure
- Energy Infrastructure
- Transport Infrastructure
- Industry and Commerce
- Institutional
- Residential, mixed
- Orchards
- Tourism/Archeology

This project is based on the ongoing cooperation between Harran University and Harran District. Study of existing development plan revealed the lack of precise spatial directives. Therefore, much time was spent on conduct spatial analysis using GIS. Then, already planned projects and additional new ones were to be combined in spatial designs under the participation of all relevant stakeholders. Preliminary consultation with the district administration of Harran and Metropolitan City of Şanlıurfa took place. However, due to the severe lockdowns during the last months the planned workshop with stakeholders had to be postponed. Instead, a simulated workshop with a master student class under the guidance of several teachers using GeodesignHub produced the presented results.

Harran Scenarios

Urban development and a new satellite respect the cultural heritage and supports increased touristic activities. Agriculture shifts to orchards and managed grasslands. Light rail systems are linked with the province capital. Harran has become energy-wise self sufficient based on PH systems.

Sustainable development will be implemented in all sectors. However, due its delayed start some lands will only have limited potential due to increased salinization. Unfavorable urban development will have a negative impact on the expansion of the tourism sector.

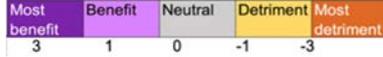
No diversification of agricultural products will take place. Archeological sites will not be conserved sufficiently. New urban development will encroach on fertile lands. Energy and transportation infrastructure will not be updated to be environmentally friendly.

SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
1	0	-1	-1	0	0	-1	0	0	0	-1
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3	0	0	-1	-1	-1	0	0	-1	0	-1
4	0	0	0	0	0	0	-1	0	0	0
5	0	0	-1	0	-1	0	0	0	-1	-1
6	0	0	0	0	0	0	0	-1	0	0
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15	0	-1	1	0	0	0	0	0	0	-1
16	0	0	0	0	0	0	0	-1	0	0
17	0	0	0	0	0	0	0	0	0	0

SDG 2020

Sustainable Development Goals

- 1: No Poverty
- 2: Zero Hunger
- 3: Good Health and Well-being
- 4: Quality Education
- 5: Gender Equality
- 6: Clean Water and Sanitation
- 7: Affordable and Clean Energy
- 8: Decent Work and Economic Growth
- 9: Industry, Innovation and Infrastructure
- 10: Reduced Inequality
- 11: Sustainable Cities and Communities
- 12: Responsible Consumption and Production
- 13: Climate Action
- 14: Life Below Water
- 15: Life on Land
- 16: Peace and Justice Strong Institutions
- 17: Partnerships to achieve the Goal



SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
1	0	1	1	0	0	1	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0
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Early adopter 2035

SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
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Late adopter 2035

SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
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Early adopter 2050

SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
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5	0	0	1	0	1	0	0	0	0	1
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15	0	1	1	0	0	0	0	0	0	1
16	0	0	0	0	0	0	1	0	0	0
17	0	0	0	0	0	0	0	0	0	0

Late adopter 2050

SDG	WAT	AGR	GRN	ENE	TRAN	IND	INST	RES	TOUR	ORCH
1	0	-1	-1	0	0	-1	0	0	-1	-1
2	0	0	0	0	0	0	0	0	0	0
3	0	0	-1	-1	-1	0	0	-1	0	-1
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5	0	0	-1	0	-1	0	0	0	0	-1
6	0	0	0	0	0	0	0	-1	0	0
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11	0	0	0	-1	-1	-1	0	-1	-1	0
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15	0	-1	-1	0	0	0	0	0	0	-1
16	0	0	0	0	0	0	-1	0	0	0
17	0	0	0	0	0	0	0	0	0	0

Non-adopter 2050

Early adopter SDG

By developing the agricultural and tourism sector, this scenario will have the most positive impact on SDG 1,5 and 8. SME with a high participation of women will benefit from these developments. SDG 13 will be addressed by the conversion of field crop based systems to orchards resulting in 1 million newly planted trees. Connection with light rail systems and energy-wise self-sufficiency will contribute to SDG 9.

Late adopter SDG

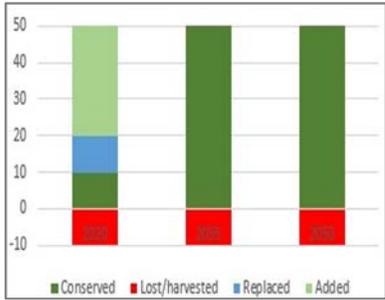
All the above mentioned positive impacts on certain SDGs will apply to this scenario as well. However, the impact will be delayed and diminished because some negative developments (like salinization of soils) will be irreversible.

Non adopter SDG

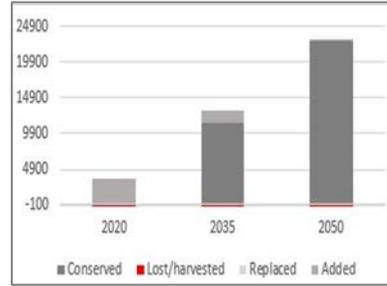
Under this scenario, not any positive impact on SDGs will be achieved. On the contrary, poverty and inequality, especially gender inequality, will increase. Basic infrastructure will be available. However, new technological developments will be taken into consideration.

Project-level assessment

Project tree numbers

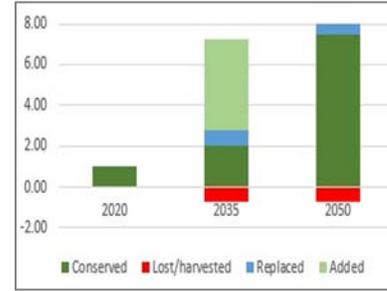


Project carbon capture

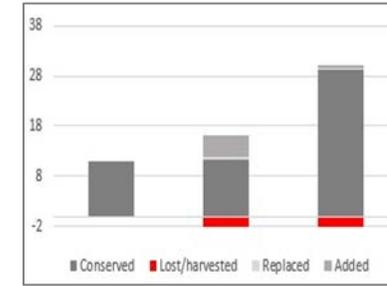


National-level assessment

National scale trees

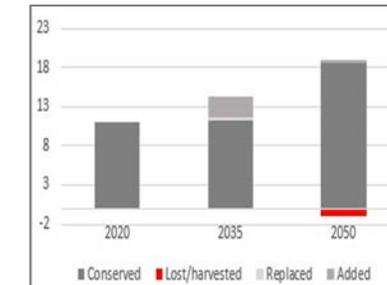
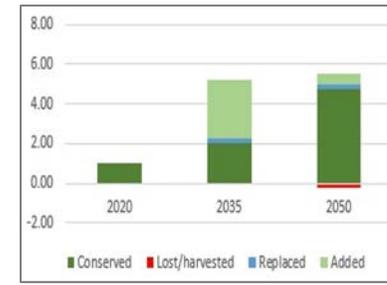
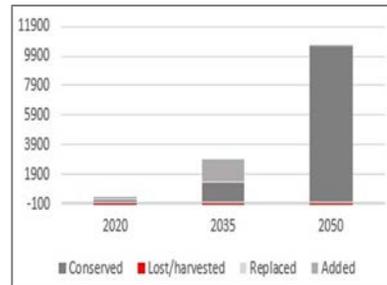
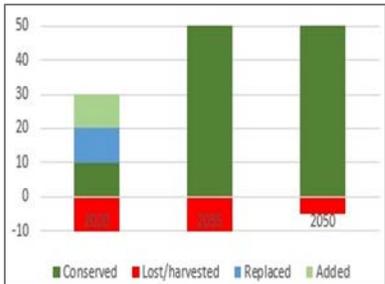


Carbon per capita



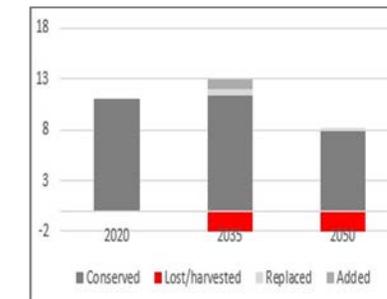
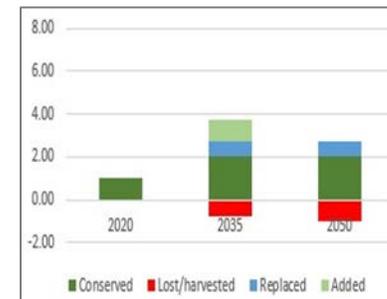
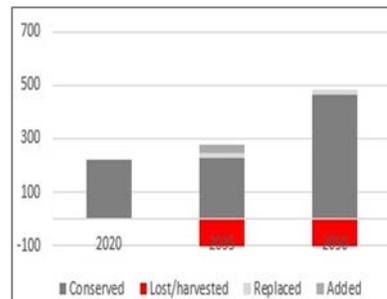
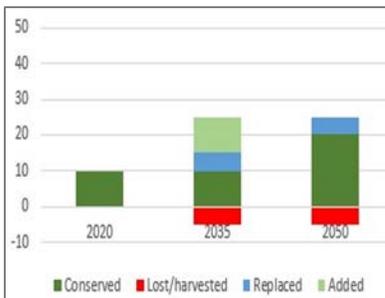
1 million trees (pecan, almonds, pistachios) will be planted in 2020. By 2035, 13,133 t of carbon will be sequestered, as the height of the trees is 8 m. By 2050, they will exceed 15 m and 22,947 t of carbon will be sequestered.

Early adopter scenario



20,000 trees will be planted in 2020. Until 2035, 460,000 trees will be added. Since the trees are still short, 2,892 t of carbon will be sequestered. By 2050, they will exceed 8 m in height and 10,559 t of carbon will be sequestered.

Late adopter scenario



10,000 trees will be planted in 2020. Until 2035, 20,000 trees will be added. Since the trees are still short, only 281 t of carbon will be sequestered. By 2050, they will exceed 8 m in height and 485 t of carbon will be sequestered.

Non adopter scenario

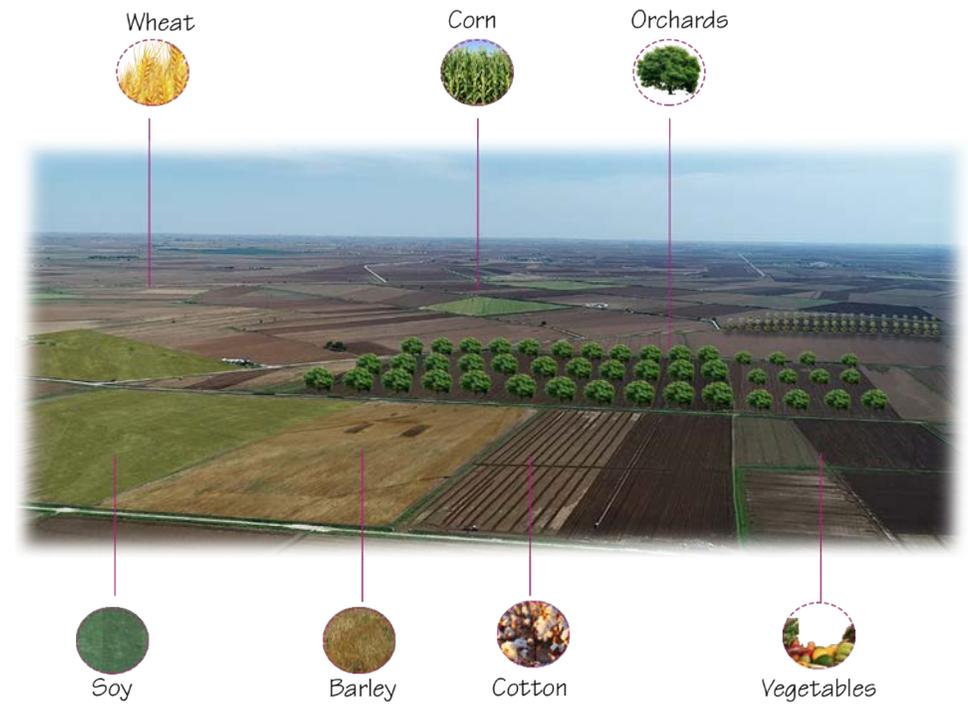
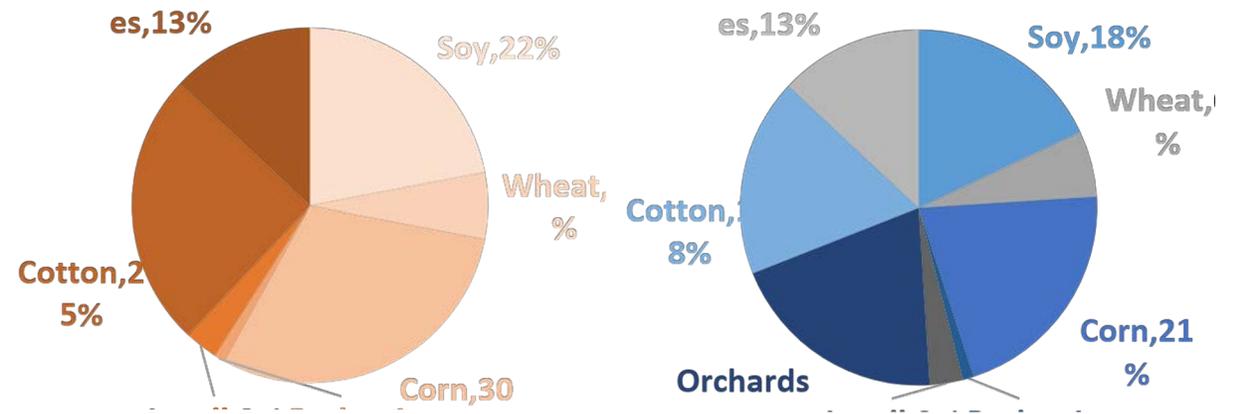
Method Description

This project was initiated by members of the Metropolitan Municipality of Şanlıurfa who raised concerns about unsustainable developments in Harran. It was carried out during a master class on Geodesign in the spring term 2021 within a period of 4 months, in which teachers from other disciplines were involved. At the beginning, a comprehensive GIS database had to be created because previous development plans almost did not include any maps.

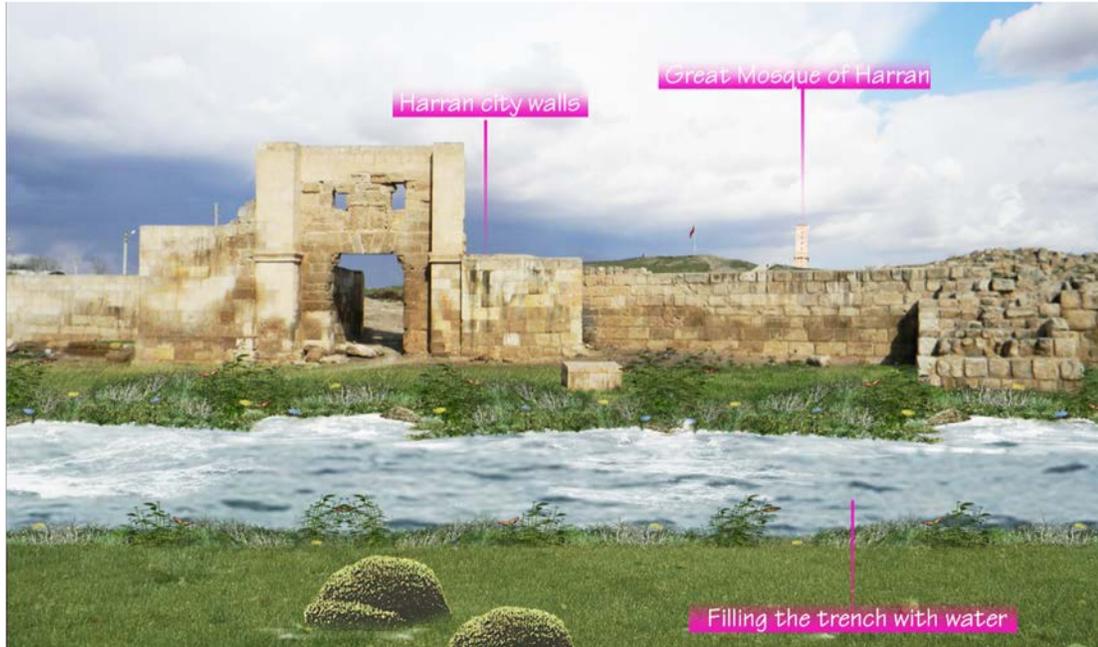
Due to the ongoing pandemic with the exception of one site visit, the course was conducted online. Insufficient Internet connections showed a significant negative impact on the learning curve of students.



Existing and planned product portfolio



Archeology based and Agro-Tourism



Tourism based on archeology and agro-tourism will become the major income source for Harran. For this, archeological sites have to be carefully restored. This might include flooding of the middle-age moat. Opening of new biking and hiking trail will take profit of well-managed grasslands around the existing Tektek Mountains National Park. Planting of pecan, almonds and pistachios orchards will help to create a new image of “Green Harran”. At the same time, such a change of the agricultural pattern aiming at having 20 % converted to orchards could generate a much higher income in this sector.

Project Participants

•Teachers

- Prof. Dr. Mehmet Ali Çullu
- Assist. Prof. Dr. İbrahim Yenigün
- Assist. Prof. Dr. Fred Ernst

•Students

- ADNAN ASLAN
- OLGU GÜR
- MUHAMMED FURKAN YILMAZ
- İBRAHİM DEMİROĞLU
- ŞEVVAL UĞUREL
- ROZERİN AYDOĞAN
- SÜMEYYE ÖNEL
- ESMA AĞALTUN
- SONGÜL NARYAPRAĞI
- ESRA TUĞALAN

•Organizations

- Metropolitan Municipality of Şanlıurfa
- Municipality of Harran

Supporting material

•Acknowledge any funding sources

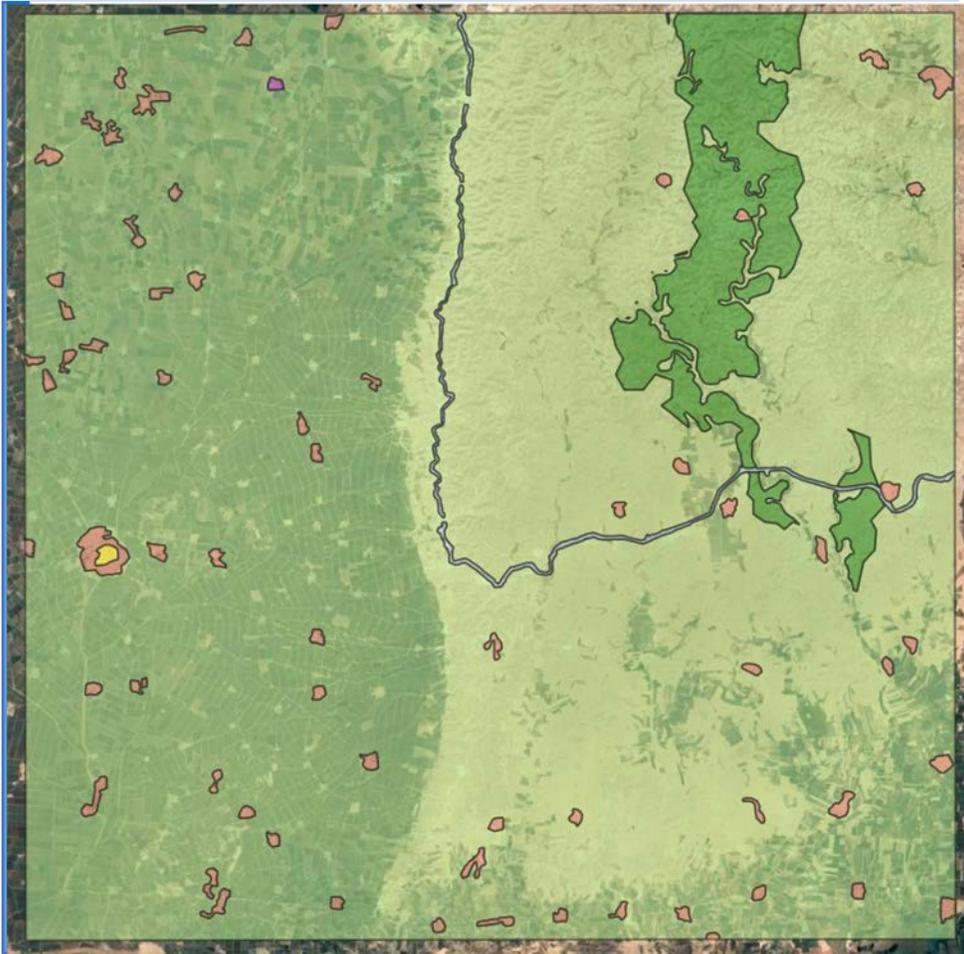
- Municipality of Harran

•Identify sources of data

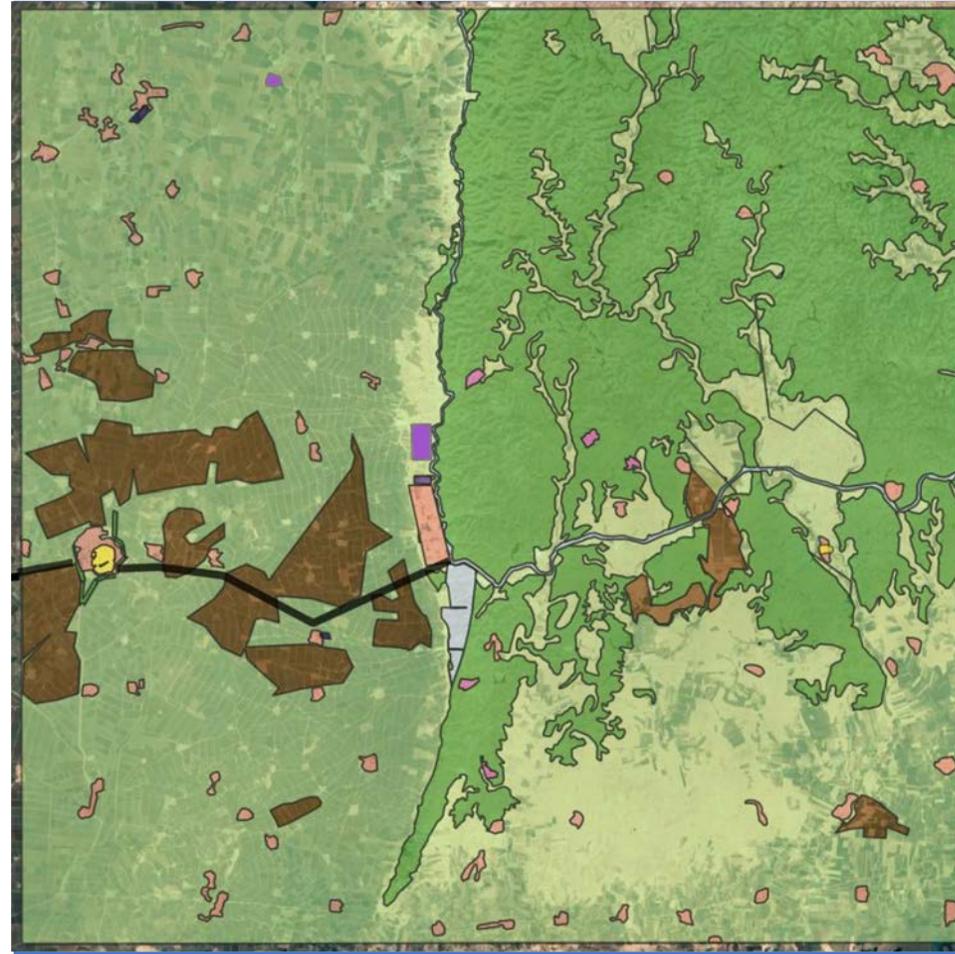
- İstatistiklerle Şanlıurfa 2018. Karacadağ Development Agency. Diyarbakır. 2018.
- HARRAN YÖNETİM PLANI 2016 - 2021. AnaDOKU. Şanlıurfa. 2016.
- USIAD (2008). GAP Raporu GAP'ta Ne Oldu. Bölgede Ekonomik, Stratejik ve Siyasal Gelişmeler. 1. Baskı: Mart 2008 ISBN 978-975-98399-3-2 Yayınlayan: USİAD Ulusal Sanayici ve İşadamları Derneği Editör: Dursun YILDIZ Hazırlayan: ADA Strateji 0312. 417 0041

•Indicate key software used

- ArcGIS, QGIS, GeodesignHub
- Sketchup, Photoshop



Current 2020 situation



Negotiated or recommended plan



There are two important issues: 1) Development of settlements and archeological sites lay the foundation for a strong tourism sector. 2) More visible due to its big spatial coverage are the conversion of field crops to orchards and the sustainable management of grasslands thus, becoming part of the green infrastructure due to its high biodiversity.