



HUNGARIAN UNIVERSITY OF
AGRICULTURE AND LIFE SCIENCES

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**DEMAND AND SUITABILITY EVALUATION OF RECREATION
ACTIVITIES IN ASWAN CITY**

THESES OF Ph.D. DISSERTATION

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1. RESEARCH BACKGROUND

Recreation and Ecotourism have become one of the most significant economic sectors. It is noted that the Arab region attracts only 3% of the arrivals and international tourism revenues. Whilst the great cultural, natural, and historical resources that the region provides for the development of tourism can definitely catch much stronger flows of tourists from all over the Arab region as well as from outside it. Growing up over the centuries, Arab culture has created a rich tradition of urban culture in countries, including special architectural structures, and artisanal workshops. Moreover, the geography of the region contains a variety of natural forms, like the beaches of North Africa, magnificent rock formations, the underwater marine life and coral reefs of the Red Sea, and the various wildlife protected in nature reserves throughout the Arabic region. Whilst many countries such as Tunisia, Egypt, the United Arab Emirates, and Morocco, the development in the rest of the region has long been hindered by the cause of regional political instability.

The Arab region is ready to expand its industry in the tourism sector. These contain nature-based tourism and cultural heritage. However, achieving this goal will require sustainable planning strategies for different kinds of Recreation and Ecotourism Services (RES). Egypt is one of the Arab countries with a population that exceeds 90 million and still expanding rapidly. Hence, the government policies headed towards constructing new urban settlements to absorb this vast increase. However, according to recent surveys, planning doesn't consider the needs of citizens in the Arabic region, especially Egypt. Thus, the good quality of Egyptian life has been decreased over time.

This dissertation concentrates on evaluating RES in Arab countries. And I will apply a methodological approach that integrates land evaluation and demand evaluation of RES in Aswan city -Egypt, as an example of Arab countries. As the south-Egypt recreation destination, Aswan was focused upon it because it has many recreations, natural and attractive cultural sites, and vacation-oriented businesses. This study will attempt to answer a central question: Should the development of RES be continued as a means of uplifting human well-being in the lagging economies in the Arab

countries -Aswan as a case study? This utilized approach enables the Author to identify particular problems and policy areas that require analysis before planning is undertaken or implementation of changes is considered.

2. RESEARCH QUESTIONS AND OBJECTIVES

Objectives of the research will address based on the research questions as follows:

Research Question 1: Are the evaluation criteria addressed in the previous literature sufficient to develop a sustainable, diversified recreation service?

- Identify and implement criteria to evaluate RES.
 - Spatial criteria
 - Non-Spatial criteria
- Identify the most appropriate methods for RES evaluation.
- Calculate evaluation criteria importance and weights by using Analytic Hierarchy Process (AHP).

Research Question 2: Based on a land evaluation map, what are the potential reasons for locating some RES in suitable areas and others in non-suitable regions?

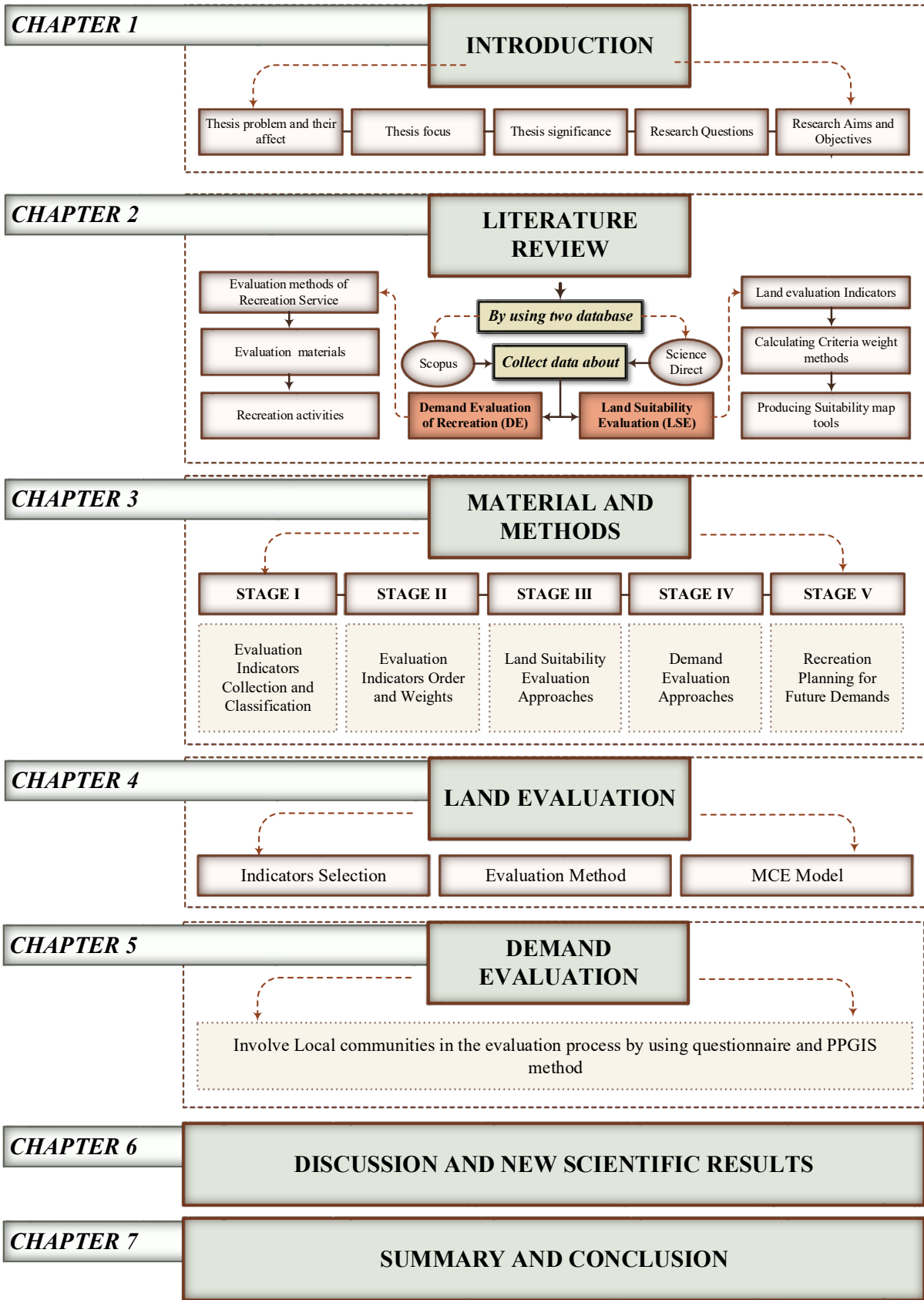
- Prepare criteria maps of RES within the study area.
- Create evaluation model by using ArcGIS
- Produce land evaluation map by integrating between land evaluation model and criteria.
- Identify the most suitable lands which could be used to fulfill future demands and needs of RES in Aswan city.
- Highlight the potential reasons for locating some RES in suitable areas and others in non-suitable regions based on a land evaluation map.
- Identify how the collected results help the planner and decision-makers in the local government for RES planning.

Research Question 3: Is the existing RE facilities' efficiency sufficient to develop and improve a diversified RE product?

- Indicate the influence of decreasing the recreational areas on residents.
- Indicate the residents' perceptions of RES and the management of the recreation areas.
- Highlight some of the significant factors of RES that influence users' awareness, attitudes, and perceptions.
- Highlight the importance of PPGIS as a more effective method for RES evaluation regarding collecting opinions from the citizens, compared to traditional public participation methods.
- Indicate the most common reasons for visiting recreation sites across demographic categories
- Illustrate the constraints that prevent people from practicing RES.
- Indicate the relationship between income and willingness to pay for RES maintenance.

Research Question 4: Based on land and service demand evaluation of RES in Aswan city, what are the general evaluation aspects of RES?

- Illustrate which RES are located in a suitable and unsuitable location.
- Indicate if the current RES needs more development and improvement efforts to fulfill current and future local demands or not.
- Identify the differences between the land and service evaluation.
- Indicate the intricate relationship between Land Suitability Evaluation and Demand Evaluation in the development of RES
- Illustrate the importance of integrating land and demand evaluation to achieve sustainable planning for RES.

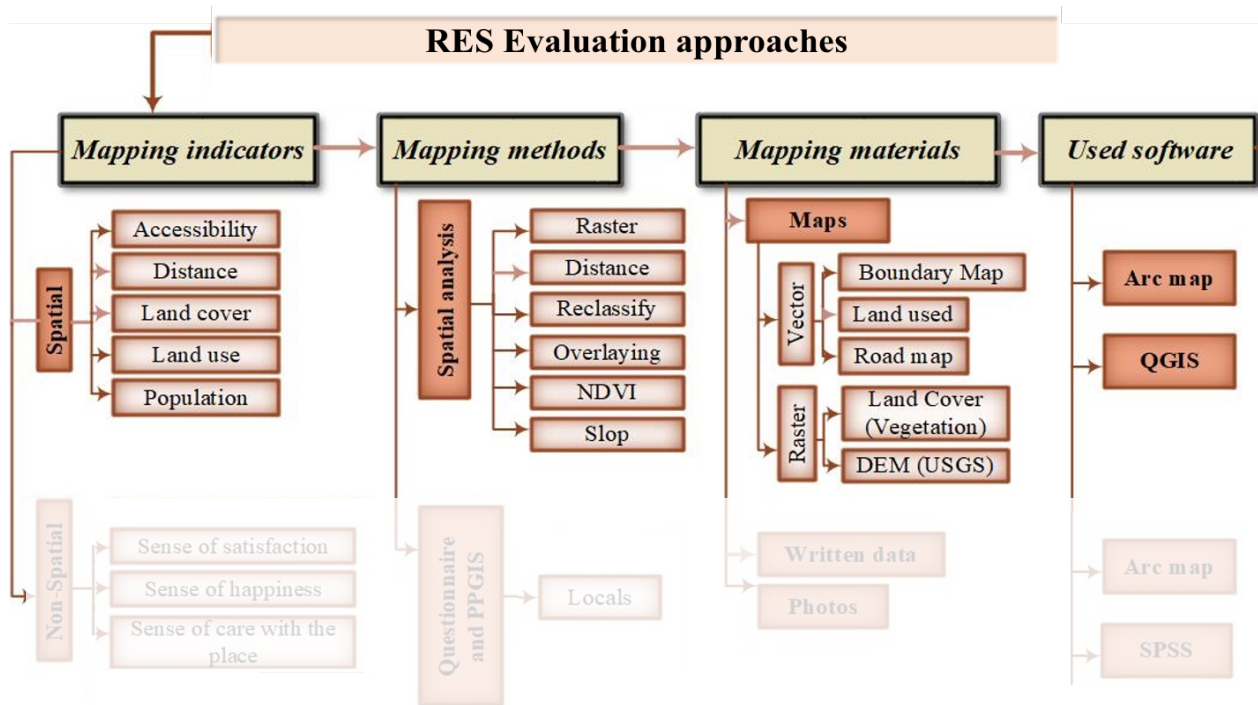


Structure of PhD research

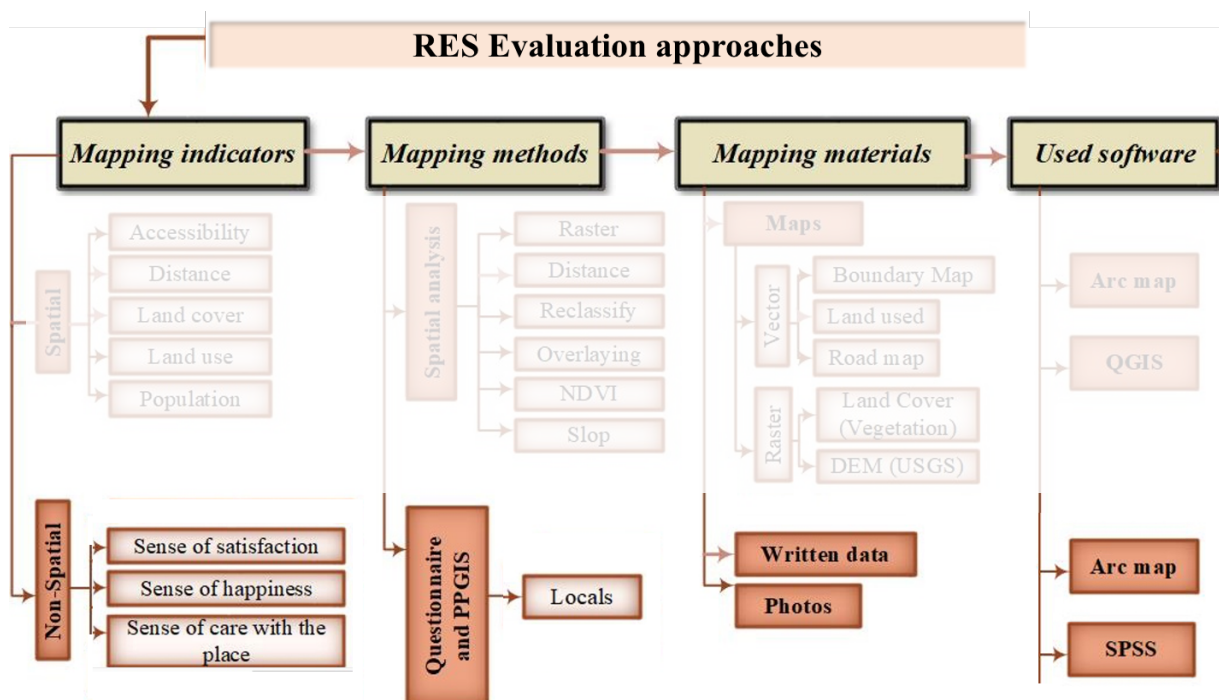
3. MATERIALS AND METHODS

The methodology consists of two main parts which are land evaluation part and demand evaluation part. The following Figures illustrates a methodology flowchart for both evaluation approaches.

PART 1: Land suitability evaluation (Involve Experts opinion)



PART 2: Visitor demand evaluation (Involve Locals opinion)



4. NEW SCIENTIFIC RESULTS (THESES)

The most important new scientific results of the present dissertation can be summarized in ten following theses as follows:

THESIS 1: Evaluation criteria for Recreation and Ecotourism Services (RES)

“Based on deep analysis of the scientific literature review and expert-based questionnaire results, I identified that there are many different kinds of evaluation criteria could be used in the evaluation process of RES which are environmental, social and economic criteria. I indicate the importance order of these criteria which is as the following: environmental criteria are the most important criteria, followed by social and economic criteria”

According to the literature review analysis, I divided each main group into criteria and sub-criteria. I identified five criteria that belong to the environmental group and 5 related sub-criteria (e.g., Vegetation, Soil erosion, and Elevation). While three criteria have been identified in case of social group and 7 related sub-criteria (e.g., Residential areas, Attractive sites, and Road). According to economic group, I identified 4 criteria and 11 related sub-criteria (e.g., Travel cost, Carrying capacity Viewpoint, and Landcover). An online questionnaire has been established to order the chosen RES evaluation criteria based on their importance. Only Experts in urban planning, recreation, and tourism have been involved in this questionnaire. In this study, 200 questionnaires form had been sent to experts' emails, and all criteria gave a rating value from 1 "least important" to 9 "Extremely important". The number of participants who started with the assessment and ranking of the evaluation criteria was just 53, whereas 41 evaluated the complete set of 12 criteria for at least one question. The participation/response rate was approximately 26%. Based on the scientific analysis of expert-based questionnaire results, I defined the order of the main criteria group based on their importance.

- A. The importance order of the environmental evaluation criteria of RES is as the following (the order from the most important to the least important); comfort (53.7%), pollution (51.2%), availability (29.3%), biodiversity (24.4%), and topography (14.6%) sequentially.
- B. Social criteria importance order, I defined that security (41.5%) is the most important social sub-criteria followed by accessibility (36.6%) and compatibility criterion (22.0%)
- C. In the case of economic criteria, I summarized that land use of the surrounding area (37%) is the most important sub-criteria, followed by efficiency (31.7%) and utility (17.1%). However, the site's price (9.8%) has been scored as the lowest importance sub-criteria.

THESIS 2: Evaluation criteria and sub-criteria utilized in the land evaluation process of RES.

“According to the literature review analysis, I Justified that only the spatial sub-criteria could be used in the land evaluation process, which are biodiversity, availability, comfort, pollution, topology, and accessibility. And I considered nine sub-criteria as the raster layers utilized as input layers in the land evaluation model”

- A. I analyzed more than 200 publications to collect the possible evaluation criteria for different kinds of RES.
- B. I divided the collected criteria into spatial and non-spatial criteria.
- C. Nine main spatial sub-criteria were utilized in the land evaluation of RES. All environmental sub-criteria were included in the evaluation process which are vegetation (landscape scenery element), soil erosion, water bodies (landscape scenery element), active pollution point, and elevation. However, in the case of social, I considered 3 sub-criteria in the evaluation process which are distance from residential area, distance from attractive sites (landscape scenery element), and distance from road. In case of economic group, I involved only landcover criterion (landscape scenery element) in the evaluation.

THESIS 3: Multi-Criteria Evaluation (MCE) model of RES

“I developed a Multi-Criteria Evaluation (MCE) model in the ArcGIS environment to be applied in the land evaluation process in this study by integrating between AHP method, which was being used for calculation RES sub-criteria weights, and ArcGIS, which was utilized to produce land suitability evaluation map”

- A. By utilizing the AHP method, I calculated the weights of the sub-criteria (W). The criteria with a high weight value were comfort (W=0,265), security (W=0,217), and pollution (W=0,126), respectively. However, the sub-criteria with the lowest weight values are as the following: topography (W=0,013), site's price (W=0,020), and compatibility (W=0,025), respectively.
- B. For the creation of the evaluation model, five main steps were utilized, which are as the following: (1) Identify the spatial criteria to be converted to layers in ArcGIS environment; (2) Order all the selected criteria based on their importance; (3) Calculate the weight of each criterion by using AHP method based on the collecting criteria order; (4) Converted all the collected spatial criteria to raster layers in ArcGIS environment; (5) Input both of raster layers of spatial criteria and criteria weights value in the created MCE model as Input data to create the land suitability evaluation map.
- C. I demonstrated, based on the collected results from the analysis, that the integration between Multi-Criteria Evaluation (MCE) and GIS contributed to a more robust understanding of current recreation site distribution patterns and suitable areas for potential RES to fulfill future demands.

THESIS 4: Determination the characteristics of land suitability area of RES

“After deep analysis of the suitability map results, I justified that three main characteristics have to be in the appropriate places for recreational services, which are (1) environmental problems such as pollution do not exist, (2) high vegetation density and green space is urgently needed, and (3) the areas are close to the water bodies”.

- A. I divided the land suitability evaluation map into four classes: not-suitable, low-suitable, suitable classes, and most-suitable.
- B. Not suitable class indicates a land parcel that relatively does not fulfill many land evaluation criteria that is not suitable for developing RES. Low-suitable class it is an intermediate level between the Not suitable and Suitable classes. Suitable class indicates a land parcel that fulfills many land evaluation criteria to optimize the existing recreation resources to properly develop and promote a mass kind of RES. That could provide various opportunities for creating RES in these sites with some modification. Most-suitable class indicates a land parcel of high suitable that is located a considerable distance from natural and culture attractive sites close to residential areas and water sources and easy access to from the towns and that is suitable for developing RES.
- C. I demonstrated, based on the collected results from the analysis, that the integration between Multi-Criteria Evaluation (MCE) and GIS contributed to a more robust understanding of current recreation site distribution patterns and suitable areas for potential recreation and ecotourism services to fulfill future demands.

THESIS 5: Determination of the main categories which could be utilized in the future demand evaluation of RES

“I justified that assessing the quality and demands of RES by involving users and local communities is necessary to attain managerial goals and objectives, ascertain the benefits of recreation facilities and programs, and for evaluation purposes relative to accountability”.

- A. There are four main categories utilized in the RES demand evaluation process, which are: (1) Visitors' preferences and perceptions; (2) Reasons to participate in RES; (3) Constraints of RES participating; (4) Willingness to pay for maintenance of RES.
- B. I developed a semi-structured questionnaire and PPGIS to collect data from residents, which could be utilized in the service demand evaluation of RES.
- C. I involved 146 habitants in the evaluation process, and I asked them several questions.

THESIS 6: Identification of the preferred kind of RES across the demographic characteristics of the sample

“Based on the demand evaluation, I justified that there is a significant difference in the preferred kind of outdoor recreation activities and sports across the demographic characteristics of the sample”.

When I asked the responders to indicate which recreation activities and sports they prefer to perform on the recreational sites, the answers are differed based on the genders (male, female), age group (underage, adults, youth, and older), and kind of group (family/ social group, individual, educational group).

- A. According to the preferred kind of RES, the respondents who state themselves as a family/social group have an overwhelming level of interest in waking and having a picnic. like Family/social group, the individual kind group has an overwhelming level of interest in both waking and having

a picnic. Education group has an overwhelming level of interest in both waking and having a picnic.

- B. There are no significant differences between gender and the age group in the case of the preferred kind of RES. While both genders have an overwhelming level of interest in both waking and having a picnic, they do not prefer to practice camping and water sports (boating and swimming). However, there is a significant difference between the age group. p soccer and basketball, and walking. Like Youth, adults have an overwhelming level of interest in all kinds of RES, especially waking and having a picnic. However, the elderly people preferred four kinds of RES which are waking, having a picnic, camping, and visiting historical sites.
- C. According to the preferred kind of recreational sports, there is no significant difference between both gender and the age group in the case of the preferred kind of outdoor recreation sports. There is a high relationship between females and football and aquatic sports, which means most females were very interested in both kinds of sports. Like females, males were very interested in both football and aquatic sports. In the case of the age group, the underage has an interest in only three kinds of recreational sports: biking, football, and aquatic sports, respectively. Moreover, like adults, the youth age group has an overwhelming level of interest in practicing football and aquatic sports. However, in the case of the older age group, most of the elderly are not prefer any kind of recreational sports, maybe that's because the health problem.

THESIS 7: Identification of the reasons and constraints of RES participation.

“Based on the PPGIS results analysis, I justified that there are many reasons and constraints that prevent people from visiting and practicing recreation activities in Arab countries. And there is a significant difference between both genders and age-groups results”

In Arab countries, there are many reasons for visiting RES sites. The order of most common reasons is; enjoy the outdoors or nature; walk or bike for exercise; play sports; participate in family activities;

picnic and general leisure activities; use a specific facility; meet friends; or attend special events, respectively. Moreover, many constraints prevent locals from practicing RE activities which are lack of time, financial problems, health problems, being too old, insufficiency of recreation areas, lack of companion and others like traffic, crowdedness respectively. Note the first three reasons are the most common constraints.

- A. I defined that there is a significant difference between the gender in case of the reasons of visiting recreation sites. For example, I justified that the majority of males said that they were visiting a recreational site for walking or biking for exercise. However, most females said they were visiting a recreational site to enjoy the outdoors or nature. However, the underage was visiting recreation sites for only two reasons: practicing walk or bike for exercise and playing sports. Moreover, like youth, adults were visiting recreational sites for four main reasons: enjoying the outdoors or nature, walking or bike for exercise, playing sports, and participating in family activities.
- B. By comparing the mean value of constraints by using SPSS, I identified that the constraints with the lowest mean score were insufficient recreation areas, lack of time, and financial problems. This indicated that the respondents tend to believe they were constrained from practicing RES because they didn't have enough time and enough money besides the problem of insufficiency of recreation areas. The following constraint with the lowest mean score (4.00, 5.00) was "being too old" and "health problems". This revealed that most respondents also felt this to be significant.
- A. I justified that the constraint that scored the highest mean score (7.00, 6.00) were "other like traffic and crowdedness problem" and "lack of companion". This indicated that respondents reported that both mentioned reasons were not a major constraining factor on RES participation.

THESIS 8: Identification the main factors that effect on the willing to pay for RES maintenance in Arab countries.

“Based on the result analysis, I demonstrate that three main factors affect the willingness to pay for RES maintenance in Arab countries, which are; activity offering special interest to me, activity located in a more convenient location, and activity close to me. That means it is important to consider these factors in future social planning for new RES sites”

- B. In order to find the main factors that affect the willingness to pay for recreation activities maintenance, the survey instrument allowed the respondent to choose one of the five proposed factors (offering special interest to me, located in a more convenient location, activity close to me, offering activities for kids and others).
- C. By asking the participants about the factors that influence the amount they would pay for recreation activities, the majority of respondents stated: “offering special interest to me” factor as the most important recreation activities they would pay for (42 out of 146), followed by both of “located in more convenient location” and “activity close to me” (37, 34 out of 146 respectively).
- D. I defined that three most important factors affect the willingness to pay issues, which are offering special interest to me, located in a more convenient location, activity close to respectively.
- E. Based on a multiple linear regression model by using SPSS, I demonstrated that there was not a significant relationship between “willing to pay” for recreation maintenance and the monthly income.

THESIS 9: Investigate the importance of PPGIS as approach for recreation suitability evaluation of RES

“Based on PPGIS results, I justified that there are many benefits of using PPGIS in the land evaluation process. Moreover, I determined the correlation between site characteristics and visitors' feelings. Furthermore, I indicate the connection between the preferred sites of different kinds of RES and the site properties”

- A. There are many benefits of using PPGIS in the land evaluation process. These benefits are as the following: (1) PPGIS gives the planners possibilities to early involve citizens in the planning process; (2) Provides the opportunity to see new patterns of planning using GIS-analyses; (3) PPGIS can also warn the planners early on serious matters (such as uncovering areas) or questions which may be missed otherwise; (4) Combination of several participation methods (e.g., public meetings and PPGIS) can give a better picture of what is needed in the city since all mainly interested groups in the society are allowed to participate.
- B. The PPGIS results show several areas can be identified as places where the visitors feel peaceful and relaxing. These areas are primarily located along the river beach and islands, and these areas are all located very close to each other. Notable is that they are also located close to the city center and main road in the city.
- C. For example, I asked respondents to indicate where they prefer to ride a horse carriage and camel riding. The analyzed results indicate that the most preferred sites for those kinds of recreation activities were located around the river beach. However, when I asked the participants to show which areas, they prefer to meet friends and family, the answers differed. The analyzed results indicate that the majority of respondents prefer islands like Seheil Island and Aswan Botanical Garden Island as the most preferred site for meeting friends.

THESIS 10: Determination of new approach development for optimizing the suitable sites for different kind of RES

“After the future demand analysis of RES, I developed an approach for optimizing the suitable sites for different kinds of RES. This approach integrates between the Land Suitability Evaluation (LSE) map of RES and the visitor demands evaluation map”.

This approach concentrates basically on map overlaying in the ArcGIS environment. More specifically, I overlaid both of land suitability evaluation map of RES and the visitor demands map. The results yielded by map overlaying provide strong evidence that all the proposed sites, which the visitor chose by using PPGIS to fulfill future demands, are located in the most suitable areas based on the land suitability map.

- A. Overlaying analysis can be conducted by using spatial analysis tools in the ArcGIS environment.
- B. I considered the following items when producing the proposed recreation activities map: (1) the preferred recreation activities and facilities (from service demand evaluation); (2) the constricts of practicing recreation activities (from service demand evaluation); (3) the suitability map results (from land evaluation), and (4) the future visitor demands (from future demands evaluation using PPGIS).

Research Questions	Objectives	Scientific results (THESIS)
<p><u>Questions 1:</u></p> <p>Are the evaluation criteria addressed in the previous literature sufficient to develop a sustainable, diversified recreation and ecotourism service?</p>	<ul style="list-style-type: none"> - Identify and implement criteria to evaluate RE facilities. - Identify the most appropriate methods for RE evaluation - Calculate non-spatial criteria importance and weights by using AHP 	<p><u>THESIS 1:</u> “Based on deep analysis of the scientific literature review and expert-based questionnaire results, many different kinds of evaluation criteria could be used in the evaluation process of RES which are environmental, social and economic groups, based on their features. The importance order of these criteria is as the following: environmental criteria group is the most important criteria, followed by social and economic criteria group”</p> <p><u>THESIS 2:</u> “According to the literature review analysis, I conclude that only the spatial sub-criteria could be used in the land evaluation process which are biodiversity, availability, comfort, pollution, topology, and accessibility. And I considered nine sub-criteria as the raster layers which utilized as the input layers in the land evaluation model”</p>
<p><u>Questions 2:</u></p> <p>What are the potential reasons of locating some recreation and tourism services in suitable areas and others in non-suitable areas based on land evaluation map?</p>	<ul style="list-style-type: none"> - Prepare criteria maps of RE facilities within the area. - Create evaluation model by using ArcGIS - Produce land evaluation map by integrating between land evaluation model and criteria. - Identify the most suitable lands which could be used to fulfill future demands and needs of RE facilities in Aswan city. - Highlight the potential reasons of locating some recreation and tourism services in suitable areas and others in non-suitable. 	<p><u>THESIS 3:</u> “I developed a Multi-Criteria Land Evaluation model in ArcGIS environment to utilize it the land evaluation process in this study by integrate between AHP method, which was utilized for calculation RES sub-criteria criteria weights, and ArcGIS, which was utilized to produce land suitability evaluation map by using the developed model”</p>

Research Questions	Objectives	Scientific results (THESIS)
<p><u>Questions 3</u></p> <p>Are the existing RES facilities' efficiency sufficient to develop and improve a diversified RE services product?</p>	<ul style="list-style-type: none"> - Indicate the influence of decreasing the recreational areas on local residents - Indicate the local residents' perceptions of RE facilities and the management of the recreation areas. - Highlight some of the major factors of RE facilities that influence awareness, attitudes, and perceptions of users. - Highlight the importance of PPGIS as more effective method for RES evaluation regarding collecting opinions from the citizens and tourists, compared to traditional public participation methods. - Indicate the most common reasons for visiting recreation sites across demographic categories - Illustrate the constraints that prevent people from practicing recreation activities - Indicate the relation between the income and willing to pay for recreation services maintenance 	<p><u>THESIS 4:</u> “Assessing the quality and demands of recreation and ecotourism services by involving users and local communities is necessary for the attainment of managerial goals and objectives, ascertaining the benefits of recreation facilities and programs, and for evaluation purposes relative to accountability”.</p> <p><u>THESIS 5:</u> “Based on the PPGIS results analysis, I justified that there are many reasons and constraints that prevent people from visiting and practicing recreation activities in Arab countries. And there are a significant different between both genders and age-groups results”</p> <p><u>THESIS 6:</u> “Based on result analysis, I demonstrate that there are three main factor that effect on the willingness to pay for RES maintenance in Arab countries which are activity offering special interest to me, activity located in more convenient location and activity close to me. That mean it is important to consider these factors in the future urban planning for new RE sites”</p> <p><u>THESIS 7:</u> “Based on PPGIS results, I indicate that There are many benefits of using PPGIS in land evaluation process. Moreover, I determined the correlation between site characteristics and the visitor's feel. Moreover, I indicate the connection between the preferred sites of different kinds of RES and the site properties”</p>

Research Questions	Objectives	Scientific results (THESIS)
<p><u>Questions 4:</u></p> <p>Based on land and service demand evaluation of RE in Aswan city, what are the general evaluation aspects of RE services?</p>	<ul style="list-style-type: none"> - Illustrate which RE facilities located in the suitable and not suitable sites based on land evaluation map. - Indicate if the current RE services need more development and improvement efforts to fulfill current and future local demands or not. 	<p><u>THESIS 8:</u> “After analyzing the visitor demands and visitor preferences of RES, I developed an approach for optimizing the suitable sites for different kind of recreation and ecotourism activities. This approach integrate between the Land Suitability Evaluation (LSE) map of RES and visitor demands map.”</p>

5. CONCLUSION AND RECOMMENDATIONS

A summary of the findings related to this study's theoretical and practical implications is provided to highlight the key results of this study. Suggestions for future research are provided to assist in advancing the field related to image formation and destination selection. This study aimed to investigate the evaluation approaches of Recreation and Ecotourism Services (RES). The results indicate that there is not research has examined both land evaluation of RES and demand evaluation in the planning process of RES.

5.1 Summary

This section attempts to answer the research questions identified at the beginning of the dissertation. Each question is presented, along with the conclusion regarding that specific question right underneath.

The First Question Follows

Are the land evaluation criteria that were addressed in the previous literature sufficient to develop a sustainable diversified recreation and ecotourism service?

The answer is NO. The results show that it is necessary to integrate land evaluation of recreation and ecotourism services by utilizing special evaluation criteria and demand evaluation by using non-spatial criteria to achieve sustainable planning for future recreation and ecotourism sites. To justify this result:

- A. I Identify and implement criteria to evaluate RES based on previous literature review analysis.
- B. I classified the collected criteria based on their feature to spatial and non-spatial criteria.
- C. I involve experts in urban planning and recreation management in online questionnaire to order the collected criteria based on their importance.
- D. I calculate the criteria weights by utilizing AHP.

The Second Question Follows

Based on a land evaluation map, what are the potential reasons for locating some recreation and tourism services in suitable areas and others in non-suitable areas?

Based on my result analysis, there are many factors that result in locating some RE facilities in the most suitable areas, and these factors as the following: (1) close to water bodies, (2) close to natural and attraction sites; and (3) close to roads. So, the areas, which fulfill the previous factors, are located in the most suitable land for RE facilities. However, the areas which do not fulfill the previous factors are found in non-suitable areas for RE facilities. To answer this question:

- A. I developed an MCE model for creating a land evaluation map of RES.
- B. I convert all spatial criteria to maps in the ArcGIS environment
- C. I input these criteria maps and their weights in the MCE model to create a suitability map.
- D. I overlaid both of current RES map and the produced suitability map to determine which current recreation and ecotourism sites are located in suitable land and which are not.

The Third Question Follows

Based on the demand evaluation of recreation and ecotourism services in Aswan city, what are the general evaluation aspects of the demands?

Based on the demand evaluation using a semi-structured questionnaire with local communities, it has been assumed that there are specific differences between locals in attitudes, perceptions, reasons for participating in RES, constraints that prevent locals from practicing RES, and willingness to pay to support the maintenance of RES. **To approve this finding:**

- A. I prepare a semi-structured questionnaire to ask the users about their perceptions, reasons for participating in RES, constraints that prevent locals from practicing RES, and willingness to pay to support the maintenance of RES
- B. I utilized the PPGIS method to collect data about the preferred site for different kinds of recreation and ecotourism services in Aswan City.
- C. I integrated the results obtained from the questionnaire method and PPGIS method to

highlight the future demands of recreation and ecotourism services.

The Fourth Question Follows

According to the land evaluation and demand evaluation of RES, what are the most appropriate sites for future RES in the study area?

By overlying both of the land evaluation maps of RES- created by utilizing the MCE model- and demand evaluation map- created by using the PPGIS method, the results show that the most suitable areas for future recreation and ecotourism sites are located close to water bodies and natural and attraction sites. That means, in the case of both evaluation approaches – land evaluation and demand evaluation – distance from water bodies criterion and distance from natural and attraction sites criterion are the most important criteria for the assessment of recreational and ecotourism services.

5.2 Utilization of Results and Practical Implications

5.2.1 Utilization of Land Suitability Evaluation Results

The recreation land evaluation process used in this study demonstrated how MCE approaches could be incorporated into the GIS planning and decision process to evaluate the current state of RES based on spatial criteria. Additionally, combining MCE and GIS contributed to a more robust understanding of current recreation site distribution patterns and suitable areas for potential RES in the future. Moreover, this study provides a foundation for planners and decision-makers to continually develop and improve the urban planning approaches for future RES sites. Furthermore, this study identified, weighed, and ranked the spatial criteria of land evaluation for RES in Aswan city based on different kinds of site evaluation criteria. The present study produces a land evaluation map to be used in assessing the current state of RES in Aswan city, depending on several spatial criteria. The evaluation methodology utilized in this study, which is conducted for land evaluation of RES, can also be applied to other land evaluation processes. GIS-based AHP as an MCE approach is involved in this evaluation study. The main benefit of this evaluation approach is that it can be applied quickly using the data processing in the ArcGIS environment.

Based on my study regarding the land evaluation of RES results, the planner and decision-makers can follow the following recommendations:

- A. Utilize GIS-based land evaluation for suitability analysis modeling in land-use development and assessment plans of RES sites in the study area for future urban planning.
- B. Establish other RES to allow expansion of the urban area in Aswan city, ensuring all study areas are covered with recreation and tourism facilities, and motivating the urban planning development of these kinds of services.
- C. Make an ecological and environmental connection between all current recreation and tourism sites, potential sites, and cultural and natural attraction sites in the study area.
- D. Consider the mentioned evaluation criteria and their order when planning for new sites for RES in Aswan city.
- E. Integrate the natural and cultural attractive sites in Aswan city and the suggested or potential recreation and tourism sites and consider the land evaluation criteria which affect the suitability of the planned areas.

5.2.2 Utilization of Demand Evaluation Results

It was stated in previous chapters that many recreation and ecotourism services strive to create equal access for all and to enhance the quality of life of individuals who utilize their services. As such, this study has several implications for the practice of recreation and ecotourism. First, this study again suggests that individuals are unique but also similar; therefore, it is important to assess each individual's special needs, interests, and preferences within recreation and ecotourism services. In this study, it was evident that the participants had preferences regarding specific activity involvement and social interaction. Many participants enjoy recreation services that offer opportunities to improve aspects of their self-concept and human wellbeing. Secondly, this study purposes that individuals and locals in Arab countries may prefer activities involving social interaction opportunities. Therefore, when planning recreation areas, it is suggested that recreation professionals provide opportunities and

particular sites for users to meet other people, such as friends and family. Recreation planners should accommodate inclusive recreation opportunities in the same planned area when considering adaptive planning options.

Also, this study helps define a clear picture of the factors that constrain individuals in Arab countries from practicing different kinds of recreation activities as often as they desire. As mentioned above, financial constraints and transportation issues were significant constraining factors. A discount lift pass or discount season access for individuals may be wise for recreational areas. This may increase the interest of those that already participate and those who may have an interest and feel that participating in recreational services may be too expensive. Addressing the transportation or accessibility issue may be a more difficult challenge for recreation and ecotourism service providers. Many Arab world's offer a bus or van system that picks up at various locations. Ensuring these already existent transportation options are truly accessible to all people would be a great starting point. Recommendations on planning and design of recreational areas based on the study data are as follows:

- A. Give the high different kinds of RES in future planning strategies in the study area.
- B. Activities that respect culture and nature and promote culture and nature should be organized predominantly for the visitors.
- C. Administrators should be learned about the environment and resource management to make accurate decisions and to present their knowledge to the locals and the visitors accurately
- D. Infrastructure service quality and facilities should be increased (Transportation, accommodation, waste treatment, food and beverage facilities, etc.).
- E. Determine a percentage of the proposed services in the future which have to be without entry fees.
- F. Make the priority to choose any new site for the RS that is close to roads and transportation to reduce the transportation cost as much as possible for the user.
- G. Make the utilization of the RS free for everyone under the age of 24 and Pension people.

H. Distribution of the proposed RS over the study area to ensure a fair and sustainable distribution of RS for all residents and to reduce the cost of transportation

5.3 Suggestions for Further Research

Although there are many potential applications of this research in developing more effective evaluation policies, there are some limitations. The majority of limitations to this research are given by insufficient financial resources and time to conduct more in-depth data collection. First, variations of residents' attitudes and perceptions between various areas would have better understood if a more significant number of the selected areas located to a different extent were included, such as urban and pre-urban areas. Often, subtle changes in the local cultural or economic characteristics of the selected areas can considerably impact human attitudes and perceptions. Thus, as my research study area is restricted to the urban areas, results might not be entirely suitable for making assumptions about rural or pre-urban areas. Second, although participation among residents was relatively high, constraints imposed by Covid 19 not only made traveling between urban areas difficult and reduced the data collection period to three weeks. As a result, the number of residents who participated in this research could be considered relatively low than the population density in the study area. To overcome the limitations of this study, future research should investigate people's attitudes and perceptions and WTP for improving the effectiveness of RES at larger spatial and temporal scales. The scope of this study can be expanded in various ways. Additional studies could enhance our understanding of the leisure and recreation experiences and quality of adaptive recreation services from the perspectives of individuals in others research area.

6. LIST OF PUBLICATIONS

6.1 Articles In International Journals

- [1] **ASMAA, ABUALHAGAG; ISTVÁN, VALÁNSZKI**, (2022): Land evaluation of recreation and ecotourism services using a multi-criteria evaluation process: a case study of Aswan city, Egypt. In: Journal of Environmental Geography, 14: 1-2 p.
- [2] **ASMAA, ABUALHAGAG; ISTVÁN, VALÁNSZKI**, (2021): Overview analysis of cultural ecosystem services: Mapping indicators and categories classification. In: Polish Journal of Natural Sciences, 36 : 3 pp. 333-358. , 26 p.
- [3] **AHMED, ASMAA H.; MAHMOUD, HATEM; ALY, ABDEL MONTELEB M.**, (2016): Site Suitability Evaluation for Sustainable Distribution of Hospital Using Spatial Information Technologies and AHP: A Case Study of Upper Egypt, Aswan City. In: Journal of Geographic Information System, 8 : 5 pp. 578-594. , 17 p.
- [4] **ISTVÁN, VALÁNSZKI ; SÁNDOR, JOMBACH ; KRISZTINA, FILEPNÉ KOVÁCS ; ASMAA, ABUALHAGAG; Fernando, A. Mendez Garzón; Gabriella, Balha**, (2019): Cultural Ecosystem Services and Local Identity - A ppGIS Case Studay from Budapest Metropolitan Region. In: Fábos Conference on Landscape and Greenway Planning, 6 p. Article 14.

6.2 Peer Reviewed Conferences

- [5] **ASMAA, ABUALHAGAG ; ISTVÁN, VALÁNSZKI**, (2021): An analytical framework of cultural ecosystem service mapping methods. In: Fodor, Marietta; Bodor-Pesti, Péter; Deák, Tamás (ed.) SZIEntiêc Meeting for Young Researchers: ITT Young Talents Meeting, pp. 8-23, 16 p.
- [6] **ASMAA, ABUALHAGAG ; ISTVÁN, VALÁNSZKI ; AMOAKO-ATTA, ERNEST**, (2021): A non-material beneêts of ecosystem services in the urban and peri-urban area: A literature review and future research challenges. In: Fodor, Marietta; Bodor-Pesti, Péter; Deák, Tamás (ed.) SZIEntiêc Meeting for Young Researchers: ITT Young Talents Meeting Budapest, Hungary, pp.

24-39. , 16 p.

- [7] **ASMAA, ABUALHAGAG ; LÁSZLÓ, KOLLÁNYI ; ISTVÁN, VALÁNSZKI, (2020):** Toward the Sustainability of Cultural Services in Developing Countries; Challenges and Threats. In: III. International Conference on Ecology, Ecosystems and Climate Change - Ecology '19, pp. 73-84, 12 p.
- [8] **ASMAA, ABUALHAGAG ; ISTVÁN, VALÁNSZKI ; AMOAKA-ATTA, ERNEST, (2019):** Statistical evaluation of pre-selection criteria for suitable land of outdoor recreation and tourism. In: Fodor, Marietta; Bodor, Péter (ed.) SZIENTiêc meeting for young researchers - Meeting of Young Talents (ITT), 353 p. pp. 35-48. 14 p.
- [9] **ASMAA, ABUALHAGAG; ISTVÁN, VALÁNSZKI, (2022):** Visitor preferences and perceptions of outdoor recreation activities by using a semi-structured questionnaire: aswan city as a case study. In: Fodor, Marietta; Bodor-Pesti, Péter; Deák, Tamás (ed.) Lippay János - Ormos Imre - Vas Károly (LOV) Scientiêc Session: Summaries, Budapest, Hungary, p. 26-39. 14 p.
- [10] **AMOAKO-ATTA, ERNEST ; ASMAA, ABUALHAGAG; SZILVÁCSKU, ZSOLT, (2021):** The DPSIR Framework in Support of Sustainable Tourism Planning and Development in Asuogyaman: A Methodological Review. In: Fodor, Marietta; Bodor-Pesti, Péter; Deák, Tamás (ed.) SZIENTiêc Meeting for Young Researchers: ITT Young Talents Meeting, pp. 66-75. , 10 p.
- [11] **AMOAKO-ATTA, ERNEST; ASMAA, ABUALHAGAG; SZILVÁCSKU, ZSOLT, (2019):** Dilemmas of Spatial Planning in Ecotourism Development: Ghana in Perspective. In: Fodor, Marietta; Bodor, Péter (ed.) SZIENTiêc meeting for young researchers - Meeting of Young Talents (ITT), pp. 20-34, 15 p.
- [12] **VALÁNSZKI, ISTVÁN; JOMBACH, SÁNDOR; MRS. FILEPNÉ, KRISZTINA KOVÁCS; ASMAA, ABUALHAGAG; MENDEZ GARZON, FERNANDO; BALHA, GABRIELLA, (2019):** Community mapping to assess the relationship between local identity and cultural ecosystem services. In: Fazekas, István; Lázár, István (ed.) The operation and image of landscapes, Debrecen, Hungary: Hungarian Academy of Sciences DTB Earth Sciences

6.3 Abstract Conference Papers

- [13] **ASMAA, ABUALHAGAG ; ISTVÁN, VALÁNSZKI, (2021):** Service Quality Evaluation of Outdoor Recreation Activities by Using a Semi-Structured Questionnaire: Aswan City as a Case Study. In: Fodor, Marietta; Bodor-Pesti, Péter; Deák, Tamás (ed.) Lippay János - Ormos Imre - Vas Károly (LOV) Scientiêc Session: Summaries, Budapest, Hungary, p. 15
- [14] **ASMAA, ABUALHAGAG ; LÁSZLÓ, KOLLÁNYI ; ISTVÁN, VALÁNSZKI, (2019):**Ecosystem services and human well-being in (peri-) urban areas using green infrastructure : a literature review. In: Transgreen International Conference on Natural Infrastructure Connectivity, Budapest, Hungary, pp. 18, 1 p.
- [15] **GABRIELLA, BALHA ; ASMAA, ABUALHAGAG, (2019):** Developing a green infrastructure network for the Koppány creek as an ecological corridor. In: Transgreen International Conference on Natural Infrastructure Connectivity Budapest, Hungary), pp. 19-20, 2 p.
- [16] **ISTVÁN, VALÁNSZKI ; SÁNDOR, JOMBACH ; KRISZTINA, FILEP-KOVÁCS ; ASMAA, ABUALHAGAG; FERNANDO, MENDEZ ; GABRIELLA, BALHA,(2019) :** Cultural ecosystem services and local identity - A ppGIS case study from Budapest Metropolitan Region. In: Book of Abstracts 6th Fábos Conference on Lanscape and Greenway Planning, pp. 155-156. , 2 p.
- [17] **VALÁNSZKI, ISTVÁN ; JOMBACH, SÁNDOR ; MRS. FILEPNÉ, KRISZTINA KOVÁCS ; ASMAA, ABUALHAGAG; MENDEZ GARZON, FERNANDO ; BALHA, GABRIELLA, (2019):** Community mapping to assess the relationship between local identity and cultural ecosystem services. In: VIII. Hungarian Landscape Ecology Conference: Summaries Kisvárda, Hungary: Hungarian Academy of Sciences DTB Earth Sciences Commission, p.p. 40