Measuring the Sustainability Level of Samanbahce Residential Quarter in Nicosia - Northern Cyprus for Its Sustainable Revitalization

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ABSTRACT

Traditional historic urban quarters are unique places in terms of their cultural, architectural and historic values but at the same time they have a high level of architectural, urban, social and environmental decay with high level of marginalized population, rise in the aged population with low income, abandonment of buildings by the economically strong sectors of society, and the loss of traditional economic activities.

The urbanization initially and the division of Nicosia subsequently resulted in a downward spiral for the Walled City of Nicosia – the capital city of Cyprus, creating a decline in population, higher concentration of social problems, loss of commercial activities and employment, inappropriate uses and fluxes of migrants encouraged by the low rents, high number of vacant properties, absence of private investment and deterioration of its environmental quality.

Samanbahce, a unique traditional residential area at the edge of the Kyrenia Avenue in the Walled City of Nicosia, is a unique place not only due to its distinctive physical, urban and architectural characteristics, but also as being the first mass-housing area on the Island developed in 1930's by the British. Although being located next to the liveliest area of the Walled City, today, Samanbahce area is still suffering from physical and social decay after the implementation of the revitalization project by the European Union funded program "Partnership for Future" which was completed in 2004 under the responsibility of UNDP (United Nations Development Programme) and UNOPS (United Nations Office for Project Services).

The aim of this paper is to assess the current level of sustainability in Samanbahce residential quarter in the Walled city of Nicosia basing on the formerly established model for measuring the sustainability of historic urban quarters by the authors.

In line with this aim, the paper will first give a short theoretical review on the key words of sustainable urban revitalization and sustainability indicators. Secondly, the process for developing sustainable urban revitalization indicators is presented. Then, the paper will focus on Samanbahce residential area and measure its level of sustainability, which will lead to give guidance for its future development and sustainable revitalization. The paper will conclude with some proposals for the sustainable revitalization of the concerned area. The methodology of the study which will be presented in this paper is based on qualitative and quantitative techniques, including observations, physical, functional and social analyses on site, consulting some residents through informal / non-structured interviews, as well as indicator selection and measuring by using 1-5 scaling technique.

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According to this model, relevant sustainable urban revitalization indicators will be selected for assessing the sustainability of the case study through consulting some residents through informal / non-structured interviews and with authors. Observations, physical, functional and social analyses methods will then be used for measuring the indicators and assessing the sustainability level. The overall aim of the study is to guide the future planning, conservation, revitalization and development decisions about the concerned area.

SUSTAINABLE URBAN REVITALIZATION

Several practitioners have suggested the use of sustainable development as an economic stimulus for neighborhood revitalization (1,2,3,4,5). Very few, however, specifically explain how sustainable development is used in revitalization efforts. Roger Kemp is one scholar and practitioner who has provided a little more explanation of sustainable development and revitalization. He has set up ten basic framework principles which serve as the basis for building the urban environment. Those principles include:

_ Evoke a sense of place

_ Restore and establish the unique urban ecology

_ Invest in the public realm

_ Broaden the mix of uses

_ Improve connectivity

_ Ensure that buildings support city building goals

_ Build on existing strengths

_ Preserve and enhance heritage resources

_ Provide a balanced network for movement

_ Foster public safety (5).

Communities are beginning to realize that the decline of their neighborhoods needs to be addressed in a holistic way, looking at all the issues (environmental, social and economic) involved within the context of the entire local situation (2). Accordingly, the two different concepts-revitalization and sustainable development is related according to their holistic, comprehensive character. Based on this relation, in order to avoid the degradation, it is necessary to activate an economic and social process, finalized to the environmental and social preservation of historic neighborhoods. This approach is a transposition of the economic definition of sustainable development which conjugates at the same time social equity, environmental preservation (in this case urban environmental preservation), and economic development.

Sustainable urban revitalization clarifies the continuity and change as processes that form the basis of any urban culture and society. It can only be achieved if there present urban life in conserved area (6). Therefore, to achieve a well effective and sustainable urban revitalization, the historic urban quarter should be taken into consideration as a whole with its physical, economic and social structure as being in urban revitalization (7). In other words, sustainability of historic urban environments can only be possible with a "sustainable urban revitalization" process. This process involves sustainable physical revitalization, sustainable economic revitalization, and sustainable socio-cultural revitalization at a time (7 (Figure 1).
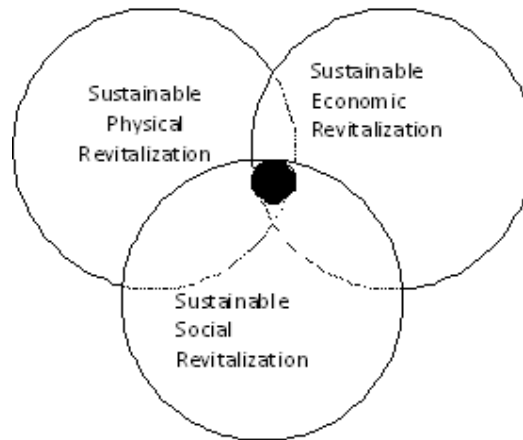
: Sustainable Urban Revitalization (7).

Figure 1: The model for sustainable urban revitalization for historic urban quarters.

After defining the sustainable revitalization concept, based on the aim of the paper, which is the assessing the sustainability level of historic urban quarters, it is necessary to define sustainability indicators and present the model for developing sustainable urban revitalization indicators.

Model for Development of Sustainable Revitalization Indicators for Historic Neighborhoods

According to some scholars, the good sustainability indicators should be relevant, valid, consistent, reliable, comparable, measurable and comprehensive (8,9,10,11,12). They are developed usually as site specific, and are designed to measure progress toward sustainability in one urban area may not be appropriate for another city (9). To be useful, indicators must be able to tell us, (a) whether sustainability in settlements is improving or deteriorating in relation to certain sustainability criteria or desirable targets, and (b) how these trends are linked to trends in spatial structure, urban organisation and lifestyles.

Sustainability indicators for a community are used to give an overall indication of that community's economic, environmental and social conditions with respect to sustainability - taken as a whole they tell whether these systems can likely be maintained over the long term or if they are being degraded. Since we can not actually assess when a community has become truly "sustainable", sustainability indicators can not tell us how far we have to go but they can let us know if we are moving in the right direction (13).

Indicators can be useful and successful if they are selected as specific for an area (9). Accordingly, the authors have developed a framework for the selection of sustainability indicators to assess the level of sustainability in historic urban quarters.

The site specific indicator selection process has eleven steps that were developed by authors of this paper (7, 13):

Identification of the community's *goal*: ''Indicator selection process" includes community participation and, the suitable indicators are determined by consulting the community (14). The goal will be defined according to consult some residents through informal / non-structured interviews.

- Identification of *objectives of the goal*: Depending on the defined goal for a specific case area, the objectives are needed to achieve this goal.

- Determining the *causing factors* of the each objective depending on the characteristics of a specific case study area.

- *Construction of indicators* by enquiring about the causing factors. For example, to answer the question "is the economy healthy?" an indicator which could be utilized is unemployment rate. According to Mitchell, et al., in the cases where indicators are not readily available, new indicators may need to be constructed, "this construction should be done in consultation with those having relevant subject-knowledge" (14).

- Having the *initial indicators list*. This initial list generally consist some indicators which may not be relevant for a case study area. In order to understand their relevance the next step should be completed.

- *Evaluation of indicators*: Testing out the relevance, validity, consistency, clarity, comprehensiveness, attractiveness by media and comparability (11,12) of the initially selected indicators.

- Having *the final indicators list* for a specific case area.

- *Meaning and objectives of the selected indicators* for case area.

- *Selection a method for measuring the indicators*.

- *Analyzing the natural, built and socio-economic environment* of a case study through multi-dimensional analyses methods (i.e. historical and locational analysis; land-use survey; architectural survey and evaluation; survey of traffic and transportation; social survey; Lynch analysis; urban pattern analysis, townscape analysis, lost space analysis, etc.)

- *Measuring the selected indicators* and finding out *the level of sustainability* in selected case study area.

In the following lines, Nicosia in general and Samanbahce quarter in particular will be introduced before discussing the indicator selection process for the case study area.

Samanbahce Quarter in the Walled City of Nicosia

Nicosia, the capital city of Cyprus- lies roughly at the center of the island (Figure 2), with a rich history that can be traced back to the Bronze Age. It only became Capital of the island in the 11th century AD. The Lusignans turned it into a magnificent city with a Royal Palace and over fifty churches. Today it blends its historic past brilliantly with the bustle of a modern city. The heart of the city, enclosed by 16th century Venetian walls, is dotted with museums, ancient churches and medieval buildings preserving the traditional, historic atmosphere of past cultures. Yet this old heart is currently Europe's last divided city, with the northern (Turkish) and southern (Greek) sections separated by a UN buffer zone.
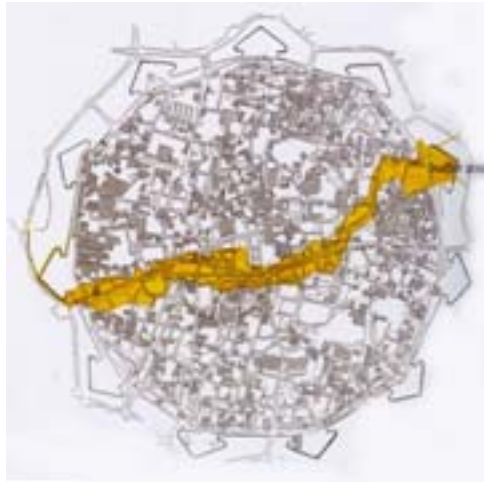
Figure 2: The Walled City of Nicosia (the green line- buffer zone).

For many years, the Walled City of Nicosia has been subject to physical decay and socio-economic decline, conditions, which resulted in loss of population and employment and deterioration of the architectural and environmental quality of the historic center of Nicosia. Associated with the changes in the socio-economic composition of the residents - low income, large household sizes - and the attitudes of the absent property owner towards their property and the Walled City itself, the city has been losing its spatial structure and environmental characteristics (15).

The Samanbahçe residential district is the first mass-housing in Cyprus developed during the British Period in 1930's by Evkaf (Foundation). Originally, these houses were built to cover the needs of low-income families, with an understanding of "social housing developments". Considering the urban layout of the area, 70 one-storey houses are arranged in four larger and three smaller blocks along narrow streets of 4 meters width. The streets are organized around a centrally located fountain in a grid system. (Figure 3). Eight of these houses added on the northern part of the whole layout were added later, in 1950's, with a slightly different spatial organization, to complete the blocks.

Figure 3: Plan of Samanbahce Houses and the view from street (15).

The traditional terrace houses of the district were built through traditional building materials such as adobe, lime plaster and lime stone. The roofs of the houses were covered with traditional round tiles, under which wooden beams and rush mat were used. The buildings (houses) were originally built without any running water system, later on all houses are connected to the Municipality water line.

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Nowadays, Samanbahçe traditional residential district, lying in the north-west edge of the Walled City at the rear of the main street of Kyrenia Avenue, is faced with some problems. The main problems in the area are physical deterioration and decay; small sizes of the dwellings and lack of regular maintenance, which are the dominating indicators of physical and functional obsolescence, lack of community facilities and lack of awareness and educated people count for the weaknesses of the area.

The following lines will present sustainable revitalization indicators selection process of Samanbahce district and assessment of its sustainability level.

Sustainable Revitalization Indicators Selection Process of Samanbahce

The general sustainable urban revitalization indicators list for the Samanbahce Quarter is developed by examining the international policies. Each community should determine its own sustainability definition before determining the sustainability indicators (9). Therefore, before selection of the relavnt indicators for Samanbahce, a total of 45 sustainable urban revitalization indicators are identified; and then, according to WCED multidimensional (economic, social and environmental) approach, World Bank's 4 capital approach (physical, social, human and natural) and the OECD's Pressure-State- Response model, these indicators are grouped under these dimensions.

For the selection of relevant sustainable urban revitalization indicators for the Samanbahce Quarter, the indicator development process starts with the *determination of community goal(s)*, or in other words, determination of the principles and definition of the sustainability that the community accepts. In due course, the following goal is established by the authors of this study trough brain storming depending on the socio-economic and environmental condition of the area. Meeting and hearing were done with residents and their comments received and revised for determining the goal and also for the list of indicators as in Table 1.

Accordingly, the goal is defined as:

"To create a sustainable residential district with preserved natural, built environment and cultural characteristics by restoring the existing buildings with local/historic characteristics, upgrading fabric, parks and open space; to invite/have cultural and social activities, create affordable housing area that is also safe and unpolluted as well as to make historic district economically livable area both now and in the future."

In the second step, based on the above selected goal, objectives defined as **sustainable economic revitalization, sustainable physical revitalization** and **sustainable social revitalization** (Table 2). After identifying the objectives, the causing *factors* of each objective are determined. In due course, causing factors have been identified through researching different types of indicators project of different organization (OECD, CERIO, UNCHS, EEA, WHO, etc.). As a result of this search, different causing factors for the historic district/quarter have been identified- such as economy, cost of services are the causing factors of the economic sustainability; environmental quality, building, transport are for the physical (environmental) sustainability and crime, health, housing, income and household are for the social sustainability (see Table 2)). While determining these causing factors, the issues of the physical, economic and social revitalization process are also taken into consideration. Then, the construction process of indicators is completed as Mitchell's suggested for all causing factors by asking some questions to the determined causing factors. As a result of this step, the initial indicator list that includes 45 indicators for sustainable urban revitalization of Samanbahce Quarter is determined.

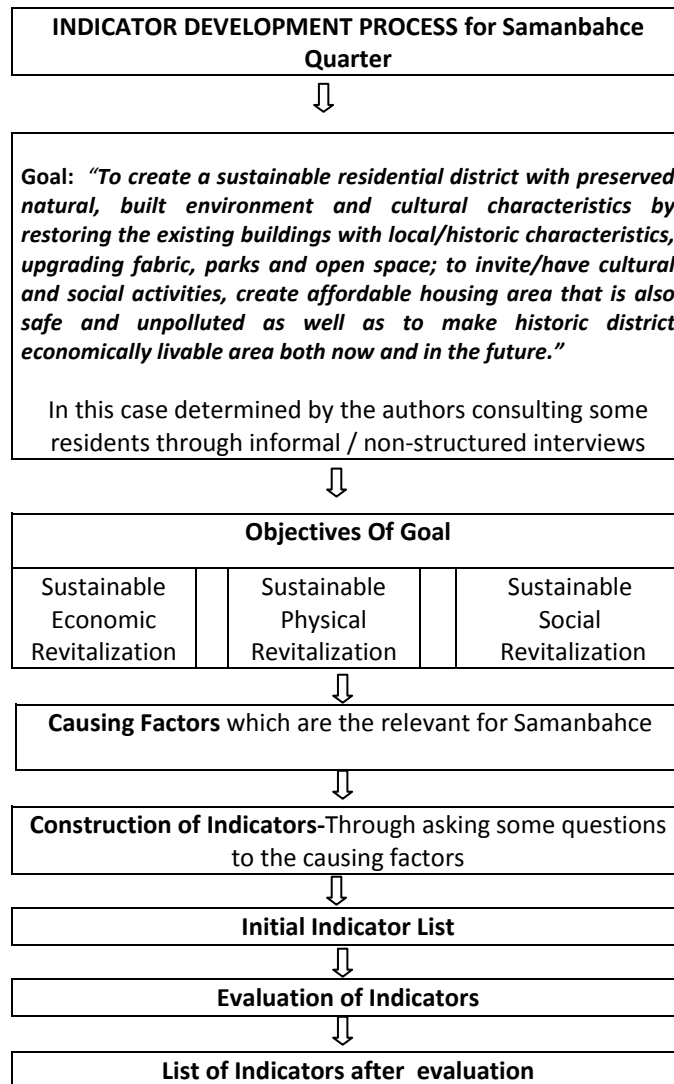Table 1: Indicator development process of sustainable urban revitalization.

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INDICATOR DEVELOPMENT PROCESS for Samanbahce Quarter

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Goal: *"To create a sustainable residential district with preserved natural, built environment and cultural characteristics by restoring the existing buildings with local/historic characteristics, upgrading fabric, parks and open space; to invite/have cultural and social activities, create affordable housing area that is also safe and unpolluted as well as to make historic district economically livable area both now and in the future."*

In this case determined by the authors consulting some residents through informal / non-structured interviews

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Objectives Of Goal		
Sustainable Economic Revitalization	Sustainable Physical Revitalization	Sustainable Social Revitalization

⇩

Causing Factors which are the relevant for Samanbahce

⇩

Construction of Indicators-Through asking some questions to the causing factors

⇩

Initial Indicator List

⇩

Evaluation of Indicators

⇩

List of Indicators after evaluation

Table 2: Causing factors for economic, environmental and social sustainability.

CAUSING FACTORS		
Economic Sustainability	**Environmental (Physical) Sustainability**	**Social Sustainability**
Economy Cost of Services	Environmental quality Transport Building	Income Crime Health Household Housing

After determining the indicators list, the next step is the evaluation process. The indicator evaluation criteria questions are applied for 45 indicators in order to find out if these indicators are relevant, accessible and measureable for the case area.   After evaluating the indicators, 29 selected or evaluated

indicators then are scored by using the scaling 1-5 (from the poorest to excellent). Using a scale of 1 to 5 in a sustainability study, the following definitions could be applied to qualitative assessments of some activity or process:

1.< 1 unsustainable in all respects,
2. approaching unsustainable conditions,
3. partially sustainable,
4. sustainable in most aspects,
5. highly sustainable,

The scoring of the sustainability of overall the historic quarter is the sum of the scores of each part. If there are 29 indicators, the highest score is 145. It is important to note that a score of 175 is practically impossible to reach. However, any score of 145-117 is considered as highly sustainable, 116-89: sustainable in most aspects, (87-59: partially sustainable), (30-58) approaching unsustainable conditions), (29-1: unsustainable in all respects). A highest result could produce the most sustainable historic urban quarter.

Since some of the result of the analysis based on the percentages, the data should be converted to common scale. That means, the percentages must be adapted to above mentioned scale system. Therefore, the following definitions are developed for the percentages:

1   < 20 unsustainable in all respects,
2   21 – 40 approaching unsustainable conditions,
3   41 – 60 partially sustainable,
4   61 – 80 sustainable in most aspects,
5   81 – 100 highly sustainable.

After selecting the relevant indicators for the case study area, analyses of its natural, man-made and social structures which are three main dimensions of sustainability and revitalization are necessary to understand the current condition of the historic quarter. As discussed in the previous sections, the sustainability of historic urban quarter can be obtained by measuring the level of physical/environmental, economic and social sustainability levels as a whole.

Sustainability Level in Samanbahce Residential Quarter

In order to determine the man-made characteristics of the area- façade, structural condition, land use survey has been used. For the socio-economic condition, a questionnaire is prepared for determining the respondent's expectations from future, and their level of income, demographic structure, satisfactions from services and their home place.

Demographic structure of the citizens, users of / within the area, the existing economic activities and employment pattern, the attitudes and opinions of users about satisfaction of the services and their sense of place have been aimed to find out through questionnaire survey. The results of the questionnaire survey have been evaluated through SPSS Program and interpreted as follows:

Average *household size* is 3.24, which is considerably smaller against that of the whole Walled City (5.19). There are 59.7 % are married couples living either with their children and 21.3% couples who are retired people and 20% single (elderly ones).

As a most important indicator of the prevailing low social class status in the area, the vast majority (58.90 %) (economically active residents) are unskilled workers. The vast majority of the residents are graduated from elementary school (47.3%), which is in tight correlation with occupational ranking.

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For the whole Walled City of Nicosia, nationality is a sensitive issue, since the area became a pole of attraction for the workers from main land simply because of the lowest rents and property values in the whole city. However, contrasting with the Walled City, the survey shows that, although there have been changes in the area in this respect during the last two decades, vast majority of the families (57.6 %) are still original Turkish Cypriots.

According to the survey, 75 .5 % of the families have been living in the area for over twenty years. Whereas, 25.5 % of the total population is living in the area for ten years or less.

Although almost all families showed satisfaction with regard to their living environment, aside from the size of the houses, which is said to be "too small", only a considerable proportion of the families (46.3 %) prefer to stay in the same dwelling in the future. To a larger extent, another vast majority of the families (43.7 %) show interest in living in the newly developing suburbs of Nicosia.

The results of the questionnaire survey also include information on the tenure, sanitary conditions and maintenance of the dwellings.

The residential in the area belong to the property of Institution of Evkaf, therefore, residents pay rent to this institution. The amount of rent varies between 40 TL (about 25 USD) and 165 TL (about 40 USD). 30 % of the families live in the houses with paying a rent between 10-40 TL (15-25 USD)..

Considering sanitary conditions, although almost all houses were modified their kitchen, bathrooms to a certain degree, the houses have running water in their kitchens, baths and W.C.s. Before modifications, kitchen and bathroom are separately located from main dwelling (Figure 4); they are in the small back garden, now some of the families omit the garden and use it for enlarging/attaching the kitchen and bathroom to dwelling.

Figure 4: Kitchen and bathroom at the rear garden.

Although, the revitalization project by the European Union funded program "Partnership for Future" which was completed in 2004 under the responsibility of UNDP (United Nations Development Programme) and UNOPS (United Nations Office for Project Services), it was just for physical renovation such as development of infrastructure, repairing doors, windows and painting façade only from the street and changing roof tiles (Figure 5). They did not make any restoration for rear facades, structural condition of dwellings therefore the façade and structural conditions of the housing-complex found as bad condition according to the physical analyses. Actually when we are walking along streets we can only see some dampness and moisture effects on the walls but when we check the inside and the garden facades we can see more deterioration (Figure 6). The residents also mentioned that, the insulation of the houses from the roof is damaged when the repair was done by the UNOPS due to removing the soil on the rush mat material to the tiles and wood. They are mentioning, all sounds from neighbor's heard from their homes.

Figure 5: Samanbahce during restoration (16).

Figure 6: Current condition of rear part of the dwellings.

The vast majority (51.6 %) carries out maintenance only when it is necessary. Since the revitalization of the quarter done in 2004 by UNDP, now a day, the poor physical conditions of the buildings has considerable proportion (32.8%).

After finishing the above mentioned analyses in three systems- physical, economic and social of Samanbahce quarter, *the scaling of each indicator* for three structures is made by the help of the results and documentary search with some statistical data. For example, the household connection to the services is in partially sustainable condition (3) according to the measurements and analysis in Samanbahce as can be followed by Table 3.

Table 3: Evaluation and ranking the Indicators.

Social Indicator: Household connection to services	
CRITERION	ASSESSMENT
Data Quality	
Accessible & Affordable	Questionnaire survey needed to collect data; Percentage of households that are connected to: (a) piped water; (b) sewerage; (c) electricity; and (d) telephone within their housing units
Comparable (standardized)	Yes; standardized and easily comparable to other communities
Consistent & Reliable	Somewhat; depending on the method and resources used, data could be consistent and available long-term; data from prior years is unlikely to exist
Credible	Yes; limited access to, or poor quality of, infrastructure services in developing countries can be major impediments to business productivity, and major sources of frustration to the population.
Measurable	Yes; indicator is framed in a way that is measurable with numerical data
Relevant	Yes;
Valid	Somewhat; will depend on method and resources used to collect data
Usefulness to the Community	
Balance local and nonlocal concerns	Yes; purely local measure, improving this ratio will not degrade other communities
Compel, Interest, Excite	Yes; easily used by the media
Focus on Resources and Assets	Yes; focuses infrastructure (positive)
Lead by Focusing on Causes	Yes; directly implies to minimize the level of frustration of an urban population
Make Linkages and Relationships	Yes; directly combines economic, social as well as environmental factors
Understandable	Yes; easily understandable to the community as a whole
Level of measurement	Applicable for neighborhood level or per capita
Measurement Units	Households connected to electricity (% per year, total numbers) Households connected to piped water (% per year, total numbers) Households connected to sewage (% per year, total numbers) Households connected to telephone (% per year, total numbers)
Ranking of Indicator for Samanbahce	*5-highly sustainable condition*

All selected, relevant 29 indicators are measured with the help of the analyses, survey results and documentary research and the sum of the ranking is collected in Table 4.

Table 4: Checklist to measure sustainability in the Samanbahce residential quarter.

SCORE BETWEEN 1-5	TOTAL 29 INDICATORS (29*5)=145
1 = < 20-1 % unsustainable in all respects	1 = < 29-1 % unsustainable in all respects
2 = 21% –40% approaching unsustainable conditions	2= 30-58% approaching unsustainable conditions
3 = 41% –60% partially sustainable	3 = 59-87% partially sustainable
4 = 61% –80% sustainable in most aspects	4 = 88% –116% sustainable in most aspects
5 = 81% –100% highly sustainable	5 = 117% –145% highly sustainable,
ECONOMIC	**Samanbahce Residential Quarter**
Unemployment rate	
Unemployment Rate	4
Ratio of active population/inactive population	4
Employment diversity	3
Development Costs	
Maintenance costs	3
Infrastructure costs	4
Sum of Economy	18/25 (sustainable in most aspects)
ENVIRONMENTAL/PHYSICAL	
Environmental quality	
Energy-transport	3

Energy-space heating	4
Pollution levels	4
Climate Change	3
Green gas emission	3
Transport	
Pedestrian and bicycle friendly streets	3
Accessibility of the area	4
Public transportation	1
Transportation (Variety of mode of transportation)	4
Sum of Environment	29/45 (sust. In most aspects)
SOCIAL	
Crime	
Crime rate	4
Citizen satisfaction with the local community	3
Safety	3
Health	
Accessibility of green space	3
Availability of local services	3
Household connection to services	5
Number of people using recreation facilities	2
Housing	
Floor area per person	2
Housing tenure types	3
Housing affordability	4
Income	
Household income disparity	4
Rent-to-income ratio	4
Household	
Cultural/Racial Diversity	2
Civic Involvement	1
Duration in Neighborhood	4
Sum of Social Structure	47/75 (partially sust.)
TOTAL	**84/145** (partially sust.)

Accordingly, *testing of economic sustainability indicators* clarifies that Samanbahce has score of 18 out of 30 according to the scaling. If this scores of economic sustainability has been converted to common scale such as;

Since there are 6 indicators (unemployment rate, ratio of economically active population, employment diversity, maintenance cost and infrastructure cost) under the economic sustainability, and the top score has been determined as 5 for each indicators for this study, the high sustainable situation will be (5*5)=25. If 25 is converted into percentage ranking system then the following results will be achieved:

1= <1-5% unsustainable in all aspects
2= 6%-10% approaching unsustainable condition
3= 11%-14% partially sustainable
4= 15%-19% sustainable in most aspects
5= 20%-25% highly sustainable

The result shows that Samanbahce has score of 18 out of 25 that refers sustainable in most aspects in terms of economic structure.

Testing of environmental (physical) and social indicators shows Samanbahce has 43 from physical indicators and 41 from social indicators. When the score of environmental (physical) sustainability of Samanbahce, that is 29/45 (4 = 25%–32% sustainable in most aspects) have been converted to scoring system, it has been found that it has scale of 4 and and social sustainability (47/75) is (4=partially sustainable) considering the social sustainability.

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Testing out the sustainability in Samanbahce residential quarter clarified that the level of environmental (physical) and social sustainability are in partially sustainable condition (score of 3) and economic sustainability is in score of 4 that is sustainable in most aspect. Then, the overall sustainability in the city has the score of 3 (71% -105%) that is in partially sustainable situation.

Problems and Proposals

Samanbahce traditional housing area, just like many other similar residential areas or other areas within the Walled City, is faced with many problems. The main problems in the area are physical deterioration and decay; small sizes of the dwellings and lack of cultural and social activities and safe environment with low-income families are neither able nor aware of how to maintain their dwellings. With their small sizes as well as lack of regular maintenance (64.8% of the residents make maintenance when it is needed), the houses fail to meet the contemporary needs, indicating the functional obsolescence of the area.

Besides, the Institution of Evkaf who is the landlord of the area shows a negligent attitude against the area, most probably due to the very low rate of return it gets from the dwellings. As an entrepreneur the Institution is interested in maximizing its rate of return from its property. However, since the houses with their existing services attract only low income families willing to pay low rents, and since any amendment to the housing complex is subject to the permission of Supreme Council of Immovable Properties and Monuments due to its attitude of being listed, high expenditure for physical improvement of the area sounds to be not feasible for Evkaf (15).

Since the sustainability and revitalization are two related concepts and have share same dimensions, the level of sustainability can bring into a more sustainable condition with the help of revitalization approach. Therefore, the sustainable revitalization of Samanbahce residential district should be handled in order to make the area more attractive, livable and sustainable condition.

In that case, revitalization of the area will be indexed to the **rehabilitation** of the area through **refurbishment**, which means 'conservation and consolidation - the physical intervention to the actual fabric of the buildings and the area to ensure the continued performance of its structure and fabric'. However, it should be noted that the area had this process with the help of UNDP but the area again need some refurbishments especially for consolidation of structural system of dwelling and restoration of façade.

As discussed before, for sustainable revitalization, the area needs to be handling as a whole to be successful in this aim. Therefore, socio-economic structure of Samanbahce quarter is needed to be revitalizing according to the analyses results and the level of sustainability (partially sustainable). Accordingly, the only way to save and revitalize this precious area with its traditional tissue is to employ 'in general' **'functional diversification'** as a relevant strategic approach for its revitalization. Functional regeneration means to bring some new uses to support the quarter's economic base.

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