The Role of User Participation on Social Sustainability: A Case Study on Four Residential Areas

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Abstract—The rapid growth of the human population and the environmental degradation associated with increased consumption of resources raises concerns on sustainability. Social sustainability constitutes one of the three dimensions of sustainability together with environmental and economic dimensions. Even though there is not an agreement on what social sustainability consists of, it is a well known fact that it necessitates user participation. The fore, this study aims to observe and analyze the role of user participation on social sustainability.

In this paper, the links between user participation and indicators of social sustainability have been searched. In order to achieve this, first of all a literature review on social sustainability has been done; accordingly, the information obtained from researches has been used in the evaluation of the projects conducted in the developing countries considering user participation. These examples are taken as role models with pros and cons for the development of the checklist for the evaluation of the case studies. Furthermore, a case study over the post earthquake residential settlements in Turkey have been conducted.

The case study projects are selected considering different building scales (differing number of residential units), scale of the problem (post-earthquake settlements, rehabilitation of shanty dwellings) and the variety of users (differing socio-economic dimensions). Decision-making, design, building and usage processes of the selected projects and actors of these processes have been investigated in the context of social sustainability. The cases include: New Gourna Village by Hassan Fathy, Quinta Monroy dwelling units conducted in Chile by Alejandro Aravena and Beyköy and Beriköy projects in Turkey aiming to solve the problem of housing which have appeared after the earthquake happened in 1999 have been investigated. Results of the study possible links between social sustainability indicators and user participation and links between user participation and the peculiarities of place.

Results are compared and discussed in order to find possible solutions to form social sustainability through user participation. Results show that social sustainability issues depend on communities' characteristics, socio-economic conditions and user profile but user participation has positive effects on some social sustainability indicators like user satisfaction, a sense of belonging and social stability.

Keywords—Housing projects, Residential areas, Social sustainability, User participation.

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I. INTRODUCTION

THE concept of sustainable development has gained an importance in national and international scale following the publication of the Brundlant report. In this report sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." [1].

Concept of sustainability and sustainable development has been used very often for different purposes and reasons in various fields for 29 years since the report has been published. No matter what is the meaning being attributed to these notions, common idea in sustainable development literature favors that sustainability has three main dimensions which consists of social, financial and environmental issues which are also considered to be related to each other in some way [2].

Traditionally, sustainable development concept takes interest in environmental issues such as recycling, efficient use of energy, water resources, carbon emission and structure design and targets ecologically sustainable designs which minimize the damage done to ecology accordingly. Aside from environmental disasters occurring due to increase in world population and urbanization rate, increase in social problems is at stake too. The matter of social sustainability has come into prominence with the recent contributions of researchers from various disciplines and it has begun to be considered as one of the most important elements of sustainable development. Conception of modern sustainable development which takes social aspect of sustainable development into consideration too includes subjects regarding increase in life quality such as education, fitting into society.

Social sustainability states that future generations maintaining same or better conditions compared to present generation in terms of important life quality indicators such as human rights, education, health, democracy and social cohesion. The reason of that there is no common language and a universal measurement system in determining objectives of social sustainability, defining what social sustainability is and measuring it is that social, socioeconomic and cultural data varies depending on space and time as a nature of it. Even though there is not an agreement on what social sustainability consists of, it necessitates user participation by its people-oriented considerations.

The user participation and its relation with social sustainability

A. Definition and Context of User Participation

While in the dictionary participation is defined as to take part in or become involved in an activity, in daily life it means someone to play an active role in the activities which are related to them.

In the first quarter of the twentieth century, links between environmental problems and social problems have been searched, thus some new approaches on the urban and architectural design have started to be experienced. User participation in design is one of these approaches. Although there are some finished and ongoing projects, user participation in architecture represents the ideal situation for many architects and is discussed by the academicians worldwide [3].

Nowadays, with the effect of the increasing world population and industrialization, the urbanization rate is increasing and the large part of the population are living in large cities and also accordingly construction of buildings is done faster than before by mostly ignoring the user's needs and opinions.

Taking a look at the shaping of the cities from the user's perspective, we have witnessed that people cannot play an active role in creation of their own living environment. Design and construction process mostly exclude people's expectations. Such an environment constructed without communicating the users does not make contribution to the social life and even worse it leaves the user to unsolvable problems [4].

The aim in the design with user participation is to combine interdisciplinary theory and the application systematically and include users into planning and the design of the user's physical environment. By this way, the users become the active individuals who trust in themselves about shaping their environment and also the act of planning will become a learning process for both users and designers [5].

B. Social Sustainability and User Participation

User participation issue which has critical importance on achieving social sustainability has been interpreted by various researchers in different ways and the relationship between social sustainability and participation has been tried to be explained. Also, user participation issue has been accepted as one of the indicators of social sustainability.

Davidson and Wilson [6] define the social sustainability as a cultural relationship system which encourages positive aspects of different cultures with engaged governance, describe participation issue as democracy and participation in governance.

Chan and Lee [7] explain effect of user participation in the decision process on the social sustainability. And they state that participation of people in the process of design of the urban area in which they live increases the satisfaction ratio of the wish and the needs of that community therefore strengthens sense of becomingness to the community, that participation of people in the process of design of urban area in which they live increases the satisfaction ratio of the wish and the needs of that community therefore strengthens sense

of belongingness to the community, On the other hand, Cuthill [8] points out the importance of democracy and user participation in decision making process. Also he states that engaged governance contributes building of shared senses, social capital and human capital by allowing the co-operation of the individuals in the community.

Murphy [9] states that user participation has a critical importance in the context of sustainable development, defines the user participation as one of the four main concepts of the social component of sustainable development together with social inclusion, equity and awareness of sustainability. He also states the aim is to include as much social group as possible into the decision-making process for a socially sustainable development. Moreover, by stating that this approach results in a system which both public and government have profit, he indicates that including the citizens and different social groups into the decision-making process will increase the possibility that people support the environmental innovations. At the same time, it will increase the social inclusion; hence, it will increase the possibility of accepting the government policy as legal by civil society. Chan and Lee [7], Cuthill [8] and Dempsey et al. [10] also state, similar to Murphy [9], that increasing user interaction will make contribution to social inclusion hence to social sustainability, by allowing different social groups to involve in the decision-making process.

Even though it is a social phenomenon the issue of user participation also has an important effect on achieving the environmental sustainability. Many observers state that user participation has an effect on achieving environmental aims. Besides, in international documents it is emphasized that in order to achieving social sustainability, civil society and government have to cooperate Murphy [9]. Enyedi [11] also states that the practices of urban design should be developed with cooperation of the people and the government in the subjects that is related to different local characteristics. In this context, when the users want to participate in decision-making process, it is inevitable that they cooperate with the government. How the users and the government contact with each other and how the participation is achieved are specific topics which are determined by local characteristics.

According to the information obtained from the literature search, in Table I, the researchers who have investigated the user participation in the context of social sustainability and the words which explain the researcher's approaches are listed. As can be understood from Table I, there are various subtopics in the user participation issue such as participation in social activities, participation in government, participation in decision-making mechanisms, participation in design processes of the environment and etc. According to the information obtained from the literature search, user participation's positive effects on other social sustainability indictors can be listed as Table II.

The user participation subject, which has so much meaning in the context of social sustainability, can be examined under following five subtopics:

• Democracy

- Participation in society
- Participation in design

- Inclusion-Solidarity
- Collective group activities

TABLE I
LEVELS OF PARTICIPATION

Author /Researcher	Levels of participation	Author /Researcher	Levels of participation
Sachs (1999) [12]	Democracy	Partridge (2005) [17]	Participation
Littig and Griessler (2005) [13]	Participation	Bostrom (2012) [18]	Equal opportunities to participate in a democratic society
McKenzie (2004) [14]	Civil participation	Colantonio (2007) [19]	Participation and empowerment
Bramley and Power (2009) [15]	Community participation	Baines and Morgan (2004) (Missimer (2003) [20])	Participation and empowerment
Chan and Lee (2008) [7]	Participation to design	Omann and Spangenberg (2002) [21]	Participation
Cuthill (2009) [8]	Participation, Democracy	Thin vd. (2002) (Colontonio (2007) [19]	Participation-Solidarity
Dempsey et.al.(2011) [10]	Participation, Local democracy Active community organizations	Hans-Böckler-Stiftung (2001) [22]	Equal opportunities to participate in a democratic society
Vavik and Keitsch (2010) [16]	Participation to decision-making process	DFID (1999) [23]	Inclusion

[*]This table is based on [7], [20], [9] and [19].

TABLE II
USER PARTICIPATION'S POSITIVE EFFECTS ON OTHER SOCIAL SUSTAINABILITY INDICATORS

The levels of user participation process	Social sustainability indicator which can be achieved with user participation
Decision-making process	Legitimacy of the project, Sustainability of the community, User satisfaction, Sense of belongingness, Identity, Social inclusion, Societal stability
Designing process	User satisfaction, Identity, Sense of belongingness
Building process	Employment
Usage process	When users transform and embrace the final project, it means that social sustainability is achieved to a large extent

II. UNDERSTANDING THE LINKS BETWEEN SOCIAL SUSTAINABILITY AND USER PARTICIPATION THOUGH CASE STUDIES

A. A Traditional Approach to Ensuring User Participation: Hassan Fathy and New Gourna Village User Participation Indecision Making and Designing Processes

New Gourna Village is located in Luxor on the West Bank of the Nile River, within the World Heritage property of Ancient Thebes in Egypt. The Village was designed and built between 1946 and 1952 by the famous Egyptian architect Hassan Fathy [24].

Hassan Fathy, who gained popularity with his efforts on poverty and architecture by his projects and ideas, has shown that the architects should work on the problems of transformation of the community, the solutions of accommodation problem of poor people, improvement of living conditions [25].

He was thinking that modern architecture approaches cannot satisfy the needs of the people who live in rural areas and the fact that it is not economic in the context of construction technique and materials. Hence, he had experimented various applications upon local materials, traditional construction techniques, and traditional residence types. Although the usage of local information by Hassan Fathy does not mean active user participation in the design, it increases both the applicability of the end product and the ratio of satisfaction of user's needs [25].

The ideas which are defended in the book "Architecture for the poor" [26] have inspired a lot of architect groups. The fact that the name of the book has been changed to "Construction together with the public" in the French translations is a good indication that the mission of Hassan Fathy has been understood better through time [27].

Fig. 1 Contemporary aerial photo of New Gourna [24]

Fig. 2 Street in New Gourna in the 50 s [24]

The construction of New Gourna village started in 1946 has been left half-finished at the end of the passing five years because of the bureaucratic obstacles and decrease in the contribution of the public [25].

In the book "Gourna a tale of two villages" [28] published in 1969 in which all the processes have been explained by Fathy who visited New Gurna in 1961, it is stated that living standard and the culture of the poorest villagers in the world can be lifted up thanks to user participation. It is also stated that user participation in the construction process means new approach to the problem of rural residence and this approach includes more than cultural and economic problems which the architects are interested in [25].

1. User Participation in Building Process

At the beginning of the project, Hassan Fathy interviewed with villagers and collected data. He has developed some designs appropriate with life style of them. He has also aimed that when villagers play an active role in the construction process, they world also acquire a profession [25].

According to the architect, social and economic conditions necessitate that crafts which the villagers leave come to life. For this reason, the architect has thought that the young villagers should learn these crafts because they can no longer live on by grave robbery. According to Fathy, if the designs are made appropriate with the era, these crafts will become the main source of income [25].

The aim of the model created by Hassan Fathy is to decrease the cost of the project and making villages participatory in the building activity, acquiring a profession to the villagers. In this model, traditional ranch houses, construction technique and plan types have been used; therefore, user satisfaction and sense of belongingness have been increased. The active participation of users in the process of construction has contributed to employment which is one of the most important components of the social sustainability.

B. User Participation Making Informal to Formal and Livable with Ensuring on Usage Process: Quinta Monray Housing

Quinta Monroy is an informal settlement which is placed at the city center of Iquique, Chile where the shanties have appeared. In 2000, one hundred families have been living in shanties with unhealthy conditions in the area of five thousand square meters. All the families living there have forced on moving to another place because the settlements have been placed at a valuable place like city center. However, all the efforts aiming to move the families to the suburban have failed, therefore government converted the settlement into a legal place instead of moving the families [29].

In 2003, Chile government have hired Elemental, which is the company established by Alejandro Aravena and supported by COPEC and Pontifica Universidad Católica de Chile, in order to construct dwellings for the low-income community with one hundred households on 1250 square meters terrain. Budget for infrastructure, land and buildings consisted of 7500 dollars per unit [30].

Elemental have had to produce new solutions because of the limited budget and their desire of not building low quality house. In the new solution, Aravena preferred building a half of a good house instead of a total of a bad house; hence, the other half of the good house is thought be completed when the user has enough budget [30].
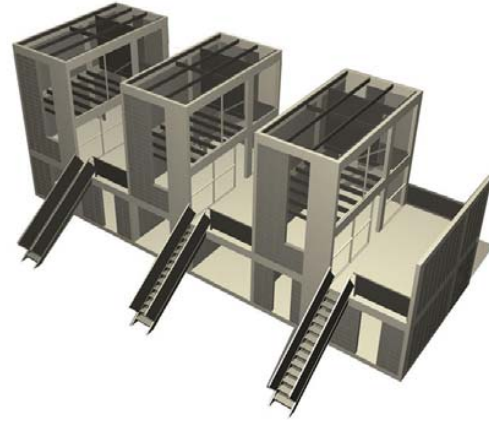

Fig. 3 Perspective of Quinta Monroy [31]

Fig. 4 Site plan of Quinta Monroy [31]

In this new solution, instead of a thirty square meter small house, a seventy two square meter big house whose half has been finished is built. The parts which are hard to construct such as kitchen, bathroom, and stairs are constructed by the government and the remaining parts of the house will be constructed by the users according to their needs and budget in progress of time. With this approach which increases the satisfaction ratio of users, the project has been finished in a short period time.

Fig. 5 Quinta Monroy before the users' intervention [31]

Fig. 6 Quinta Monroy after the users' intervention [31]

Elemental's approach allows the users to shape their home depending on their needs and budgets over time. By doing so, it has become one of the examples in which the architecture can be a solution to the problem of poverty and lack of dwelling. By creating these advantages, Quinta Monroy has become a role model to the upcoming projects [32].

C. Using Technology to Ensuring Affordable Housing and Socially Sustainable Community: Beriköy

Beriköy Project has been started by YAY (Creating livable habitats) foundation established by Rukiye Devres at one and half kilometers away from Söğütlü, Adapazarı, Turkey. It is also known as Beriköy Sharing Society Project and it has been planned in 30000 square meter area, a new settlement for the poor people who were left without home because of the earthquake in 1999 [34].

The aim of the project was that people who have been affected from the earthquake will become a homeowner by paying 90 dollars per month for 20 years.

Beriköy project designed by Jan Wampler from Massachusetts Institute of Technology has been supported by Çevre ve Kültür Değerlerini Koruma ve Tanıtma Vakfı (ÇEKÜL) and, Habitat for Humanity International. However, only 8 of 50 dwellings could be finished because of lack of financial resources and the project has not been completed until today (Figs. 7-9).

1. Features of the Project

Fig. 7 Steel structure of Beriköy [33]

Fig. 8 Photo of the unit during the construction [33]

Beriköy is a project that which has been started by eleven architecture and engineering students in September, 1999 and, as Jan Wampler says, reflects a progressive approach. The group has worked for three months in order to determine the concept of the settlement and the first design ideas. In January, 2000 the projects have been brought to Turkey and opinions of some academician from Istanbul Technical University and various professionals have been 50 dwellings were planned; each dwelling living 60-90 square meters in two stories. Dwellings were coming together as a group of two or four units. In dwellings, balcony, sun roof and other facade options have been left to the users' preferences [34].

Engineering students from the work group have been responsible from reflecting the ideas to the design on energy production, energy consumption, water supply, waste collection etc. [34].

Jan Wampler said that the main purpose of the project is to supply home to the people who have been affected by the earthquake, and also while by doing so, to create public awareness in which people are aware of the importance of usage of natural resources, appropriate ground and local materials. His desire is to help creating the culture of architecture in the society. He wanted that users participate in the construction of their buildings and are sensitive to the energy conservation and interaction with environment. In this view, strong and flexible framework types have been created to allow the users to set up the internal design of their houses according to their preferences [34]. It is also aimed that an extra source of livelihood is created by the techniques which has been learned while the users were participating the construction of their houses [34].

Fig. 9 Site Plan of Beriköy [34]

2. Cooperative Approach and Selection of Participants

The work group have planned a cooperative system in which the users take mission in construction of their dwellings in order to decrease the costs and achieve the social economic affordability of the project. To achieve the social sustainability of the project, the work group have planned that the ones who will be accepted to the settlement have common needs, and similar social economic conditions. In order to be accepted to the settlement, the users had to lose their home because of earthquake, to have an income to afford payments, to have the conscious of cooperative and to have the desire of taking mission in the construction process. In order to take this mission, the users had to learn some basic production techniques and to work in helping services. The conductors of the project have planned to provide various education and social psychological support programs which will be the basis for a micro industry during the construction process of Beriköy [34].

3. Results of the Beriköy Project

Beriköy Project which has started by support of some charitable foundations and people from various regions has not been completed because of financial insufficiency. According to the contractor, this financial insufficiency has been caused by the law which states that it is forbidden that the foreign companies donate money to the charities in Turkey. According to the local government, there has been no contact between the local government and the conductors of the project. Hence, this was another reason of the failure of the project. After the project has been stopped, some problems have appeared in Beriköy such as transportation and security problems. The fact that the chosen area for project is far away from the city have affected the appearance of these problems [35].

The cost of Beriköy Project, in which it has been aimed to creating a society which is respectful to the environment and the nature, has been increased because of the environmental-friendly technology, which are mostly used in prestigious projects in Turkey [34].

Usage steel structure in production process can be discussed. Using steel structure has the advantage that users can change their unit's plan as they desire. On the other hand,

it has the disadvantage of being expensive and requiring expertise. Hence, it can be said that using steel structure may not be an appropriate option for this case. And user participation on built process will not be enough for providing employment.

D. Designing Settlement and Dwellings with User Participation: Beriköy

After the destructive earthquake in 1999 in Turkey, 389 renters have come together and built a cooperative. After 11 years long legal struggle, they have been given a terrain on which they could construct their dwellings. Then, some meetings have been done, determining the criteria for cooperative membership and planned the recreation areas [36].

Düzce Design Studio has been established by people, who have come together with the request of the cooperative, from various disciplines such as architecture, civil engineering, planning, social sciences, law etc. And a survey has been done with the participation of 300 people by the experts in order to determine the society's demographic and social economic conditions and also financial payment conditions [36].

1. Designing the Site Plan and Floor Plans with User Participation via Game

In order to achieve the user participation, a game called "Simülasyon" (Simulation) has been designed. The aim of the game is to take the users' opinion about the environment and their dwelling into consideration in order to create the site plan and built concept. (Figs. 10, 11)

Fig. 10 Users are playing the game named "simulasyon"[36]

Seven groups, maximum of 25 people in each group, are involved in the game and the participants have been supposed to think about the common areas and green zones on the terrain model at the scale of 1/200. Thanks to this game, some information has been obtained such as whether the users wants high buildings, whether there will be pool and sport complex, the location of recreation areas, green fields, car park and whether the settlement is surrounded by wall or not [36].

Fig. 11 Users are playing the game named "simulasyon" [36]

The design team said that taking the users' opinions into consideration made them happy and made the game very efficient. Moreover, 10 different site plans initiating from residents' ideas (Fig. 12) have been converted into three dimensional models and the resulting models have been analyzed. In the next phase, with the help of the analysis obtained from the game, real alternative designs have been prepared in the direction of users' desires [36].
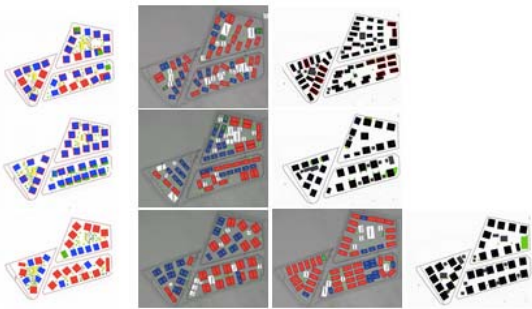

Fig. 12 Users' different approaches on site plan [36]

With the help of the data obtained from the game, five different site visuals and drawings have been presented to the cooperative members' plan design have been made. Design sheets consisting of 3 dimensional and the opinions of the cooperative members on settlement project have been discussed. Then, the project has passed to the next phase: playing the game about the design of indoors. By playing to the game, it is aimed to collect information on the habit of usage of indoors [36].

From the information obtained from the second game, various plans types have been prepared and these plans, perspectives of indoors and the final revision of site plan have been discussed by the cooperative members. As can be understood from these explanations thought the project, a participation-based study has been conducted. After the questions, opinions and suggestions of the members have been

listened and reached a consensus, a final project has replaced the alternatives [36].

The members of the cooperative and some volunteers have given information about the details of the project to the local government and they have had an exchange of ideas (Fig. 13). After the technical drawings have been completed, the license to start the building process has been acquired. It is aimed that user participation will be achieved also in the building process [36].

Fig. 13 Giving information about the project to local government [36]

E. Results of the Case Study

The data obtained from the case study are shown in Table III. Two of the selected projects (New Gourna, Quinta Monroy) were conducted with the government's request, while Beriköy project was conducted from differing foundations and Beyköy project was conducted due to people who had effected from the earth-quake

Beyköy project is aimed to design with users' participation via games and it gives users a chance to design their unit's plans and facades at the designing process. And Quinta Monroy project gives users a chance to design their unit's plans and facades at the usage process. while other two projects (New Gourna and Beriköy) provide users some alternatives.

User participation in the building process is aimed at all of the selected projects two of the projects (New Gourna and Beriköy) aimed to provide employment and other two projects aimed to decrease cost of the project.

Quinta Monroy project which is giving users to opportunity to design and construct half of their dwellings is providing chance users to evaluate and change their house at the usage process.

III. CONCLUSION

This paper has shown the role of user participation on social sustainability and has investigated some dwelling projects from developing countries in the context of user participation.

TABLE III
SELECTED PROJECT'S PARAMETERS ABOUT USER PARTICIPATION

	New Gourna	Quinta Monroy	Beriköy	Beyköy
Year	1946	2003	2003	2015
Country	Egypt	Chile	Turkey	Turkey
Construction system	Adobe	Concrete	Steel Frame	Concrete
Content	Village for 700 families (recreation areas)	98 dwellings	50 dwellings + recreation areas	389 dwellings + recreation areas
User Participation at Decision Making process	-	-	-	+
User Participation at Designing process	-	-	-	+
User Participation at Building process	+	+	+	+
Participation at usage process	-	+	Unknown*	Unknown *
Cooperative System	-	-	+	+
Government financial support	+	+	-	+**
Settlement's location	Moving new location	Rebuilding same location	New settlement	New settlement
Aim of the project	Moving from archeological site	Rehabilitation of shanty	Post-Earthquake settlement	Post-Earthquake settlement

* The project hasn't finished yet ** Government gave project terrain with a long term loan

User participation on decision making, designing and building processes have an important role on archiving social sustainability such as providing legitimacy of the project, sustainability of the community, archiving user satisfaction, sense of belongingness, identity, social inclusion, societal stability, and employment. Also the cooperation in-between actors such as architects, local government, residents and contractors when creating new settlement has positive effects on social sustainability of the community. On the other hand, the understanding of social sustainability and how it will be applied varies according to culture and socio-economic conditions of the society. In this regard, archiving social sustainability is much more complicated in developing countries, where poverty, infrastructure problems and lack of financial resource remain unsolved compared to developed countries.

Lessons have been learned from investigated projects when creating new settlements with user participation can be listed as 7 subtopics

1. The decision-making process is critical in ensuring social sustainability. For example, in order to make socially sustainable settlements the relationship between the city and planned residential housing should be decided with the participation of users.

2. Providing user participation via various methods when designing the project increases the rate of social sustainability of the project. Because the users know their exact needs. But when creating new settlements speed is the key theme. Designing with users can take more time compared to traditional designing process. One Another problem related to user participation is that the users will not have enough time to spend effort for design process. However, user participation in design process can be achieved more quickly with interviews with users to identify their needs and also, projects can provide opportunities for change related to user requirements with flexible designs.

3. The participation of users in the building process will improve social inclusion, create community awareness and give participants the ability to act together. On the other hand, it will help them to learn construction work which will lead to getting employed in the construction work. But ensuring user participation in built process depends on socio-economic conditions of the community. For instance, in Turkey, it will not be realistic to expect that, all users will participate the construction process. However, in order to provide a sense of community, on a voluntary basis, users can be expected to work on simple tasks that do not require technical knowledge during construction phase.

4. Usage process, is the process where all actors are disabled except users and users have a chance to evaluate the final product. In order to ensure social sustainability when creating new settlements users should have a chance to converting the space to meet their needs. It is necessary to ensure the legal and technical arrangements which allows the users intervene.

5. Provision of housing cooperatives to socio-economic accessibility and to avoid in order to preserve the gains settlers have achieved the user would be appropriate. In this sense cooperative system can be useful for providing socio-economic sustainability of the project.

6. Traditional dwelling typologies can be transformed for archiving user participation or users can be included in designing process. While using traditional construction systems and local materials have positive effects on projects' budgets, using new technological and environmental friendly systems can make benefits in long term such as creating new industry and employment.

7. One other important factor is which lead to success when archiving user participation is co-operation in between actors. Local governments, designers and constructers should work in cooperation. Besides, regulations and construction laws should be designed to allow user participation and therefore social sustainability. Users should be encouraged to be part of the community and creation processes of the built environment which they live.

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