A Storytelling Planning Process to Transform Environmental Values in to Sustainable Cities and Sustainable Behaviours

Shahrzad Faryadi *

Department of Environmental Planning, Management and Education, School of Environment, College of Engineering, University of Tehran
Received: 04 September 2018 - Accepted: 11 December 2018

Abstract

The concept of sustainability inspired most urban development plans after Rio 1992, although many such plans have not been too successful. An important reason for this is the disjuncture of science from culture and traditional knowledge and planners' inability to conceptualize the environmental values of societies. this research aims to explore storytelling's ability to aid in identifying of environmental values of communities and the ways they are developed through their traditional knowledge. Furthermore, it integrates the subjective and normative nature of storytelling with the objective and rational procedure of the planning process. To achieve this aim, the cultural pathways of storytelling for practice on cities within a narrative context are investigated, along with critical naturalistic discourse analysis, which corresponds with the primary levels of a profound planning process. An analysis of the conceptual commonalities and contrasts found in these approaches suggests that the intrinsic social features of storytelling can fill the normative gaps in the rational planning procedure to create a storytelling planning process. This approach is suggested as a general framework to forge a common language among people and planners' interventions into local environments based on community environmental values, especially in traditional cities.

Keywords: Storytelling; Environmental values; Planning process; Social circle; Traditional knowledge; Sustainable behaviour.

1. Introduction

In an effort to decrease cities' environmental problems and lead them towards sustainability, many scientific innovations and analytical planning models have been developed over the last three decades. Nevertheless, most cities still suffer from severe problems such as high energy consumption, increased waste production, degradation of green spaces, destruction and despoliation of natural recourses and social inequalities to name a few (Seifollahi & Faryadi, 2011). It seems that many environmental plans do not take a balanced, holistic approach to guiding development and moving towards sustainability (Berke, Godschalk, Kaiser, & Rodriguez, 2006). It will be discussed in this research that how one of the main causes of our environmental problems can be found in the inefficiency of planning approaches to communicate with both traditional knowledge and the environmental values of people who have shaped their place (see, for example, Bell & Morse, 2007; Brand & Thomas, 2005; Rees, 1999; Selman, 2000). Sustainability lies at the intersection of nature and culture, requiring a new philosophy that recognizes ecological limits, respects the unity of humans and nature, and strives to satisfy both social and economic needs (Berkes, 2012; Kimmerer, 2012). In this regard, Friedmann (2008) states that the first task of planning theory is to evolve a deeply considered humanist philosophy of planning and trace humanist philosophical implications for practice (Friedmann, 2008). Inspired by these approaches, this research aims to improve the understanding of environmental values as the normative motivation for environmental planning practices with a view towards improving the human-nature relationship. Furthermore, it will consider storytelling as a socialized planning process that could be developed to transfer local environmental values into a sustainable built environment and sustainable behaviour. Environmental values as subjective phenomena are primitive beliefs about the nature of the earth and the natural environment and humanity's relationship with the two. These relationships are formed within the cultural and natural contexts of communities and their social practices of everyday life, mostly in small communities such as neighbourhoods (Bell & Morse, 2007; Boeve & van Petegem, 2011; Faryadi, 2008; James, 2016; Macias & Williams, 2016; Stern, Dietz, & Guagnano, 1995). Environmental values are developed through traditional knowledge, which is included but not limited to discursive knowledge. It is believed that the disjuncture among science, culture and traditional knowledge lies at the heart of many ongoing environmental problems. Accordingly, a multi-epistemic literacy has called for the use of scientific tools to produce culture, with the wisdom to use those tools coming from traditional knowledge (Herman, 2016)**.** Thus, the role of communication and storytelling to promote learning from traditional knowledge has recently been emphasized. Interest in storytelling in planning has also grown over the last two decades. Stories are capable to shape meaning and clarify what does matter and what does not (Hulst, 2012). Accordingly such future-oriented stories guide readers' the significance sense of what is possible and desirable. They enable readers to envision desirable transformations in their cities and believe that their actions will actually have an effect (Throgmorton, 2003).

*Corresponding author Email address:sfaryadi@ut.ac.ir

However, storytelling as a means for people to achieve their own objectives has been less considered within the literature (Bulkens, Minca, & Muzaini, 2015). Thus, the question of how we can identify what is important and what is not is described in this research both in terms of environmental values and as the deep structure of urban sustainable planning efforts towards an environmentally sustainable built environment. It will be argued that if planning processes were to be developed based on communities' stories, and storytelling could be considered a complementary part of the planning process, joining scientific and traditional knowledge and planning with communities and their values. Thus, storytelling can be understood as a normative method within spatial planning practices. In this regard, Bulkens et al. (2015) find that even within a participatory planning system, formal and rational knowledge and expertise take precedence over biographical narratives and the emotional manifestations of people's daily experiences. To avoid this tendency, Filep et al. (2014) suggest that together with local communities, planners and designers should learn to read the stories of the past, articulate the stories of the present and envisage how those stories may develop with new characters and future plots. This approach is similar to Friedmann's description (2008) of the planner as one who translates concepts and knowledge generated in other fields into their own domain, rendering them both accessible to and useful for planning and its practices. In that regard, this paper aims to integrate the storytelling and planning process, which can be established and conducted based on community environmental values. To this end the three main levels of Davidoff and Reiner's (1962) choice theory of planning, value formulation, means identification and effectuation, which corresponds with both Filep et al.'s (2014) suggestions to investigate built narratives and Forester's (2012) critical naturalistic discourse analysis are incorporated to form a storytelling planning process framework. This process can be considered the forging of a common language for people and planners to reveal their environmental values and lead them towards sustainable cities and sustainable behaviours. In this way, storytelling can be considered as a social learning practice that is developed as a normative planning tool to reinvent the environmental values of communities, especially in traditional cities in which indigenous knowledge has been continuously transferred and communally sustained for centuries.

2. Theory

2.1 Criticism of Sustainability Discourses

Following the Rio Summit of 1992, the concept of sustainability has increasingly become a goal of official city plans, informing architecture, urban planning and design along with other, newer disciplines (Wheeler & Beatley, 2004). However, the resulting world order significantly fails to meet the long-term needs and goals of the ideals of sustainable development (Bell & Morse, 2007). The primary reasons for this trend are believed to be the origins of the concept of sustainability as relying heavily on science, which reveals a world that is both more complex and less tractable than the one that scientific-industrial society has traditionally assumed (Brand & Thomas, 2005; Rees, 1999). In this respect, Davoudi (2000, p.123) states, "the 'ecological modernization' approach to sustainability reinforces the technical and regulatory face of the system". Such approaches seek solutions that are based on physical remedial measures, not on people's capacity to affect environmental improvements. Indeed, environmentalists have too often viewed people as the problem rather than the solution (Selman, 2000). Thus, although scientific ecological knowledge is a powerful discipline for the diagnosis and analysis of environmental degradation, it seems far less successful in devising sustainable solutions that lie at the intersection of nature and culture (Kimmerer, 2012). Critics have revealed the tendency of many sustainability discourses to pretend that environmental planning is both value-free and purely objective (Lein, 2003). Consequently, the different interests and environmental values of contemporary communities cannot be properly known through scientific planning methods. Considering the institutional sphere, Bell and Morse (2007) also criticize sustainable development plans that are conventionally promoted with time- and resource-bounded projects in the form of blueprints and planning frameworks. As they state, even if such projects were successful in action, there is the danger of normative stances represented by blueprints not matching the real values of the people whom the projects intend to benefit. However the definition of sustainability might be deployed selectively by planners or politicians incompatible with the materialization of dominant institutional ideologies which is leading toward growth and capital accumulation. Such a direction is what maintains the existing status quo of social inequalities and limited regard to the environment (Gunder, 2006). In this regard, as Brand and Thomas (2005) state, sustainability discourses not only are abstract arguments and social practice but also are expected to express the interests and value systems of communities. To address the idea that sustainable behaviours must be based on environmental values, the next section identifies those environmental values and discusses how they can be translated into behaviour.

2.2 The Interconnection of Environmental Values and Sustainable Behaviour

Values are general, clear and relatively sustainable statements that can be extracted from religion, cultures, and political parties. Specific behaviours stem from various values and such behaviours can be subject to comparison. Ultimately, people develop preferences for certain values, and by extension, for certain behaviours (Vickers, 1968). In this way, environmental values are regarded as being significant precursors of environmental behaviour. Environmental values are defined as primitive beliefs about the nature of the earth and the natural environment and humanity's relationship with the two (Boeve & Van Petegem, 2011; Stern et al., 1995). Primitive beliefs that are rooted in the inner core of an

individual's belief system represent an individual's basic conceptions of physical and social reality (Boeve & van Petegem, 2011; Rockeach, 1968). Hence as Opdam, et al. (2013) assert understanding the dynamics of human and natural system as an integrated phenomenon needs both the knowledge of environmental processes and the knowledge of human behaviour, values, and norms (Opdam, et al., 2013). Accordingly, assessing the appropriateness of a person's attitudes towards a natural entity requires an appeal to the concepts of status and/or bond, and not only that of value (James, 2016). In this regard, Boeve and van Petegem (2011) show that children's environmental behaviour varies across cultural contexts, and such behaviour is inspired by their environmental values. Accordingly, they claim that environmental education initiatives along with planning practice and theory need to be rooted within the cultural and natural context of the target community, not only focusing on real life and environmental issues within that context but also taking into account the culturally specific pathway towards achieving successful environmental behaviour. The focus of environmental movement groups is now more inclined towards collective practices and institutions that provide for the basic needs of everyday life (Schlosberg & Coles, 2016). As another important idea Williams (2016) suggest that social capital (face-to-face interactions among community members) might be an important mechanism for understanding shifts towards pro-environmental behaviour especially in neighbourhoods. Social capital also is considered as a capacity that promotes cooperation between individuals and institutions (as planning agents) of a society (Ardebili & Naseri, 2016).These findings also focus on the relationship between people and their everyday urban environment and neighbourhood-scale of planning, where bottom-up approaches can guide the development plan (Cilliers, Timmermans, van den Goorbergh, & Slijkhuis, 2015). Thus, the translation of public preferences along with their values into public policy and planning generally means working within smaller areas (Forman, 2008). It is believed that such approaches would release sustainability from the strict dependency of science and enrich it with the multiple understandings arising from every day experiences of ordinary people (Brand & Thomas, 2005). All of these impressions assert the need to reconsider the normative and cultural assumptions that underlie sustainability practices. In this regard, cultures of nature could provide new spaces for community members' hopes, fears, concerns, and sense of place, facilitating the reinvention of meaning and value that has been lost in modernity (Brand & Thomas, 2005; Macnaghten & Urry, 1998). These discussions also clarify environmental values as subjective phenomena are constructed within the cultural and natural contexts of communities and under such circumstances, these values transfer to the environmentally sustainable built environment and sustainable behaviour. It is important to remember that problems such as climate change represent both cultural and behavioural issues (Herman, 2016). Thus, in addition to nature's universal rules, which can inspire similar values among cultures, there are also many specific environmental values for different communities .The salient question is how environmental values can be known because the scientific knowledge that has been used by planners has apparently not been successful. Thus, the question remains as to which knowledge is appropriate to identify environmental values and transfer them to the built environment and behaviour. Could be there a new way to consider cultural pathways and reconsider scientific techniques towards the ultimate goal of environmental sustainability? The next section argues for a probable answer.

2.3 Traditional and Scientific Knowledge Integration to Identify Environmental Values

The disjuncture between science, culture and traditional knowledge has been considered to be at the heart of many ongoing environmental problems (Herman, 2016) because Western thinking conceptually separates people from nature. In this regard, traditional ecological knowledge as an inherently integrative social and biophysical process is considered to be capable of offering an alternative to the dominant materialist worldview to focus on understanding and managing the relationship between land and people for mutual benefit. This declaration reinforces that what ordinary people know is at least as relevant to the health of the environment as what can be found through systematic professional inquiries. Much of the important knowledge that can be obtained from ordinary people is communicated through stories, myths, and the implicit understandings that are shared in a community (De Neufville & Barton, 1987; Innes, 1995; Mandelbaum, 1991). Therefore, how can we bring culture, science and traditional knowledge together into a new discourse of wisdom for life on this planet? Although Herman (2016) suggests a multi-epistemic literacy that people use as scientific tools to produce their culture, he emphasizes that the wisdom to appropriately use such tools comes from traditional knowledge. He further presents the five values of the voyaging canoe, which is based on a story from his field studies of an oceanic voyaging canoe and culture, values and conservation in Hawaiian and Micronesian traditional knowledge from 2000 to 2005. In short, the voyaging canoe value system suggests that we all must take care of the world by doing the right thing in any situation through our excellent management of our excellent knowledge, tools and technology, with our greatest responsibility lying within our territories (Herman, 2016). Framing these values in terms of nature's universal values, we can consider many other similar values, along with many specific others, and we can learn from each other. These values may be referred to as a deep structure of the communities that are significant in any culture and can be considered the engine of the development and survival of ancient cities (Faryadi, 2004a). Thus, we must bring about a new cultural discourse to help reshape human behaviours and the cities in a more sustainable direction. That is where indigenous wisdom has a key role to play (Herman, 2016). As Kimmerer (2012) claims, scientists and policy makers all

over the world are calling to incorporate the wisdom of traditional ecological knowledge into natural resource planning and environmental policy. The role of communication and storytelling as a mode of learning from traditional knowledge is significant in this regard (Herman, 2016; Ganley, 2010). The benefits of storytelling for planning practice have previously been the subject of many organized discussions. Thus a brief review will be presented in the next section to address why storytelling can be an appropriate tool for planning in its capacity to reveal environmental values.

2.4 Storytelling for Planning the Built Environment

The early 21st century dramatic challenges hover over humankind, requires a fundamentally change in how planners plan and design communities, landscapes, cities, and regions in which the ability of people to link knowledge to action is considered as one of the frontiers to affect positive change (Steiner, 2014). There is also suggesting to shift in both planning systems and plans away from a confirmative model based on regulative certainty and move towards a more performative model with improved strategic flexibility in the quest for improved sustainability (Steele, 2011). One way to address these proposed directions is that public agencies could open up opportunities for citizens to join together within influential arenas. This possibility—which has been referred to as communicative rationality—is intended to facilitate the expression of argumentation and debate, locally and nationally, in ways that will enable ordinary citizens to regain greater control over their lives (Selman, 2000; Steele, 2011). Accordingly, planning also should attempt to link scientific and technical knowledge to processes of social transformation (Friedmann, 1987). In this regard, literature, theology, philosophy, arts, cinema, handcrafts and storytelling are social mediums that might both reveal norms and be considered as normative planning tools (Innes, 1995). Among these mediums storytelling is a true and meaningful way in which people share their heart and soul and exchange their hopes, aspirations and ideas (Ganley, 2010). Society's past narratives provide a sense of what is good and what needs to change. Public communications add values to a society's narrative because it both carves out meaning and encourages others to adopt that meaning. In this respect, Kent (2015) claims that telling, developing, and reinforcing the stories and public images of clients and organizations, public relations professionals and scholars as well as urban planners have an obligation to understand the range of possibilities. Thus he considers storytelling in an assortment of rhetorical techniques. Interest in stories and storytelling in the context of planning has also grown over the last two decades, and has been seen as an important "tool" in planning practices (Hulst, 2012). Throgmorton (2003) considers planning to be a type of constitutive and persuasive storytelling about the future. He explains that the power of good planning stories is that they are about or inspired by powerful emotions. Such stories shape meaning and values about what is important and what is not, what is possible and what is desirable. As Throgmorton states, good planning stories may enable people to envision desirable transformations in their cities and environment, long for the transformations, feel them inspired to behave actively, and believe that their actions will actually have an effect (Throgmorton, 2003). In that respect, this paper also claims that if communities reconsider their environmental values through their shared place stories, they will clearly gain a sense of what is important and what is not in their environment. Reconsidering the environmental values can motivate people to pro-environmental behaviours. It is proposed here that if planning processes were to be formed based on community stories, then storytelling might be seen as the lost circle of the planning process to join planners to people, scientific knowledge to traditional knowledge, theory to action, problem to plan, and in short, planning to communities and their values. The result of such integration would be the creation of a common language of people and planners in local communities that might interconnect their visions towards creating or improving their ideal texts as sustainable cities and environments. Thus, based on Forester (2012), just as students and faculty must read and listen critically in the classroom, community planners and organizers must listen critically to people's stories. In this way they will reach their meanings and values beyond mere words when they work with others in complex, ambiguous settings (Forester, 2012) as their built environments. The next section explains how storytelling might explore environmental values.

2.5 Storytelling as A Way to Explore Environmental Values

"Storytelling has been integral to humanity for thousands of years, through spoken and written words, but also through a prodigious variety of genres" (Barthes, 1977) in which a central genre is the built environment (Filep et al., 2014). Sandercock (2003) believes that the role of the story remains central for many professional planners and designers, even though they may use it unconsciously. In this regard Bulkens et al. (2015) have reviewed the advantages and disadvantages of storytelling in spatial planning, showing that the ways in which people may capitalize upon storytelling as a means of either achieving their own objectives or exposing the limits of participatory planning has been less considered within the literature. Their narrative analysis of the residents of Wageningse Eng in the Netherlands shows the tension that is inherent in how participatory planning is implemented. Hence, they seek to understand storytelling not only as a way of describing the planning process or as a prescriptive tool of participatory planning but also as a strategy to allow the individuals affected by a spatial planning project to voice their concerns and positions. They consider storytelling to be a useful way to obtain the visceral perspectives of landscapes and as Cameron (2012, p. 575) states, it is a return to the living, feeling, experiential, and relational dimensions of being (Bulkens et al., 2015). Furthermore the use of storytelling sheds light on our understanding of urban and social change and

its moral consequences not only in local but also in a global context (Arkaraprasertkul, 2012). Considering those experiences, this research aims to depict a theoretical framework that encompasses storytelling to obtain an understanding of the environmental values of communities and to bring such values into the built environment. The framework aims not only to elicit and understand the environmental values of communities that are layered in the deep structures of their built environments but also to identify both the urban forms and functions and the behaviours that denote them. In this regard, if a community's environmental values could be significantly known, acknowledged and interpreted into an urban environmental language, then planners would have the wisdom to create sustainable environmental plans (Faryadi, 2008). One of the most challenging debates in the planning process is the question of how and who can interpret and prioritize communities' multiple interests as their environmental values. Based on Dobrucká (2014), there is no single correct process that will guarantee good results and successful development in all possible circumstances. However, Dobrucká asserts both that the use of suitable processes can facilitate the establishment of negotiated goals and that these goals can then be implemented by suitable means. In this regard, a narrative inquiry that shares place-based stories provides an opportunity to achieve the synergy of a community story circle[1] and identify local capacity with a depth and diversity that might not emerge with individualistic narrative methods (Curthoys, Cuthbertson, & Clark, 2012; Ganley, 2010). Accordingly, planning through a story circle may be assumed to be a type of soft planning used to identify and interpret a community's environmental values.

Keeping this in mind, the framework requires a method by which to analyse people's stories and document them as they are. In this respect, Forester (2012) shares the method of conducted interviews with planning practitioners across the fields of land-use and environmental planning, historic preservation, community and economic development, along with participatory action research, which was performed by his students. The aim was to explore how practitioners manage specific projects. Accordingly they simply approached their research by choosing an interviewee, doing the interview, transcribing, and writing it up (Forester, 2012). As Forester explains, they explored the challenges and opportunities that the interviewees drew upon from their local knowledge to identify what they found to be daunting, difficult, complex, and politically challenging. At the same time, they found that they could locate possibilities for change, spaces in which practitioners believed that they could make a difference in the world that they knew intimately, the domains in which they found opportunities where others might not. He refers to their method as a critical naturalistic discourse analysis. The method is critical because they attempted to listen closely through the embedded perceptions and critical insights, framings and descriptions of their interviewees as they did in their own critical discourse analyses in their ongoing work. It is naturalistic because they attempted to use their method to probe, not to merely discover rationalizing justifications or to find the reasoning why, but to uncover the deceptively simple, more ordinary storytelling practice of their engaged interviewees (Forester, 2012). This goal is expected to be uncovered through the suggested framework of this research. Learning from Forester's experience and considering people's stories as simple and more ordinary practical stories, his particular method could be adjusted in a framework to uncover people's stories to draw upon their local knowledge, their environment, their challenges and opportunities in facing environmental problems. Furthermore, it could identify the ways they and past generations manage these issues to explore their environmental values and the solutions they employ to meet environmental challenges.

In another attempt, Filep et al. (2014) aim to re-imagine the twenty-first century city within a narrative context, which is including recommendations for future research and practice. According to them, both places and the people who shape them are parts of stories and actually tell stories. They highlight narrative as a conceptual link between people, their socio-cultural identities and their cities. The recognition and understanding of a narrative's content as environmental values through built forms informs design decisions and can bring the cities into better harmony with nature and community values, along with environmental sustainability goals. They argue that without acknowledging those stories, meaning /value can be lost and hollow decisions might be made. Thus, they suggest to those who are involved in shaping urban space together with local communities to learn to read the stories of the past, articulate the stories of our own time, and envisage how those stories might yet develop with new characters and plots (Filep et al., 2014).

Using these experiences, the next section is an attempt to integrate planning and storytelling towards a soft and applicable planning process that can be established and conducted based on exploring a community's values.

3. Method: Integrating Storytelling and the Planning Process

The previous sections clarified that environmental values are subjective phenomena that can be conceptualized within natural and cultural contexts and psychological circumstances as follows:

- Self environmental concepts
- Primitive beliefs about nature and humanity's relationship with it
- Everyday experiences of nature, especially in neighbourhoods
- Social capital
- The process of providing for real-life needs
- Value systems and the normative assumptions of individuals
- Communities' cultural pathways towards environmental behaviour

Considering these conditions, environmental values could neither be formed nor discovered through a rational

planning system. In other words, despite all of the progress of planning theory and practice, most plans still emphasize rationalism, which is criticized for being incompatible with public values and concerns (Berke et al., 2006). For this reason, combining communicative and analytic approaches with the planning process has been highlighted, whereas the more careful conceptualization of the concepts of knowledge including traditional knowledge and planning support is considered a key to success (Pelzer, Geertman, & van der Heijden, 2015). In this situation community storytelling can build relationships as it compiles information, knowledge, values and know-how (Ganley, 2010). Additionally, the relationship between a particular situation and the aptitudes, attitudes and motives of the actors involved in a plan, especially leaders, should be reflected in the debates on planning theory and practice (Dobrucká, 2014). So as Ganley suggests it is the time to weave community storytelling approaches into planning processes and to try it out in the expert-dominated world of land-use planning (Ganley, 2010). These considerations, along with the theoretical basis of research—which in short, emphasizes the interconnection of social communication and discursive knowledge to explore environmental values—has lead us to combine storytelling and the planning process towards a normative-rational process of storytelling to cultivate an understanding of community environmental values and lead them towards a sustainable built environment and behaviour. In this regard, Friedmann (2008) also calls upon planners to translate the concepts and knowledge generated in other fields for example, storytelling into the planning domain and to render them both accessible and useful for planning and its practices. To develop the framework, Davidoff and Reiner's (1962) choice theory of planning as a profound, clear rational process that has special concerns about values has been selected as the basis for this research. Three avenues of investigation for urban planners and designers to build narratives, as suggested by Filep et al. (2014), correspond with and have been developed with the three main levels of Davidoff and Reiner's (1962) choice theory of planning, value formulation, means of identification and effectuation. Consequently, the combined framework also contains three main stages that can function in the governance of social circles (Ganley, 2010; Macias & Williams, 2016). The first stage aims to answer the question of what must be done to explore and understand community stories and to conceptualize their environmental values and norms. Forester's (2012) guidance has then been suggested to provide the early steps of a critical naturalistic discourse of story analysis. Using the findings set forth above, the second stage explains how values can be translated into sustainable urban forms, activities and behaviours through a desired spatial plan. The third stage presents explanations to answer the question of how a plan can be effectuated by presenting a participatory local organization and appropriate actions (Faryadi, 2004_b). As Dobrucká (2014) states, no single process will guarantee successful development under all possible circumstances, so the suggested procedure will not be irreversible. It represents the general steps of a storytelling-planning process that can be modified in more details based on the diverse social structure of communities in practice.

4. Results and Discussion: A Storytelling Planning Process

4.1 First Stage: Value Formulation

Davidoff and Reiner (1962, p.103) define planning as the "process of determining appropriate future actions". They state that because choice permeates the entire planning sequence, it must lie at the heart of the planner's task. At the first level of their choice theory of planning, value formulation, they suggest that a planner as the agent of his clients is vitally involved with values, but they also clarify that the planner cannot impose his own ideas of what is right or wrong. They assert that the planner's "role is to identify distribution of values among people, and how values are weighted against each other" (Davidoff & Reiner, 1962, p. 108). Therefore, neither the planner's technical competence nor his wisdom entitles him to accept or reject goals for the public and make the final decision in the transformation of values into policy (Davidoff & Reiner, 1962). Forester (2012, p. 24) also warns, "Planners' own assumptions and frames may ironically wall them in, limiting their prospects to work effectively with others". However, according to Bulkens et al. (2015) the final decision is usually made by the immediate clients, planners and even those who do not live in the community, not by the ultimate clients who actually live in the area. In such circumstances, the merit of a decision that can only be appraised by values is not verifiable (Davidoff & Reiner, 1962). Here, it is important to open the doors of rational decision making to the heart of community stories. In this respect, Filep et al. (2014) suggest that a community-led research should clarify the stories which are important to particular communities, and feed into processes that discern whether or not those stories are or should be reflected in the built environment. The detailed steps of their suggestion are also considered incompatible with the choice theory of planning's (Davidoff & Reiner, 1962) value-formulation level. Furthermore, the practical lessons from Forester's (2012) critical naturalistic discourse analysis has been developed in this stage to establish the gradual steps of the exploration of community stories, recognizing their subjectivities, how they act well together inter-subjectively, and how the community and planners might learn together, grow together and build relationships. These competences and combinations generate value formation as the first stage of a new storytelling and/or planning process through the following general steps:

4.1.1 Sharing place-based stories thorough story circles

- Asking people to share stories of their interactions with their environment
- Discovering the past and present stories of people who have shaped the place.

4.1.2 A critical naturalistic discourse analysis of stories

- Listening to the stories of people closely through their perceptions and descriptions,
- Letting people to do their own critical analysis to uncover their interactions with their environment,
- Creating a space in which storytellers can learn and inquire together about the issues and events that affect them as a community.

4.1.3 Exploring "challenges" and "opportunities" that story tellers have traditionally addressed

- Extracting patterns, structures, and ambiguities in people's stories,
- Asking how they have acted in challenging situations,
- Asking about spaces where they believe they can make a difference ,
- Asking domains where they find opportunities that others might not,
- Having the community establish its own issues,
- Uncovering stories that transfer through the built environment as a medium,
- Discovering new stories of the built environment,
- Understanding how those stories provide the context for socio-cultural identities,
- Clarifying which stories are important to the community,
- Discerning whether those stories are or should be reflected in the built environment,
- Learning about their real ethics through listening to the stories.

4.1.4 The exploration and analysis of environmental values

- Encouraging storytellers to negotiate their concerns, interests, aspirations and fears related to their environment,
- Encouraging people to collectively reach decisions about their priorities in rising to their challenges and finding opportunities in the built environment,
- Encouraging people to extract their environmental values from the narratives and the stories of the built environment,
- Prioritizing of community values through their social capital.

4.1.5 Writing the stories

- Writing about how people analyse their built environment and how their transcribed choices shape their resulting environment,
- Building upon or revising those stories in ways that prioritize the wellbeing of the community based on their explanations and narratives,
- Generating regulations of their priorities (through a model of social evaluation and criteria),
- Extracting and organizing people's prioritized environmental values in a systematic planning process.

4.2 Second Stage: Identification of Means

Friedmann (2008) introduces adaptation as another task for planners with the aim of adapting planning practices to real-world constraints with regard to scale, complexity, and time. In this respect, planners should note the constraints and opportunities presented by the constant flux of the world, along with the growing complexity and scale of the urban environment and the importance of the identified differences (Friedmann, 2008). This task is compatible with the identification of means in the second articulation of Davidoff and Reiner's (1962) theory and speaks to the process of moving from general objectivities to a rational, specific plan. Their aim is to develop optimal alternatives that are consistent with the presented values, not to use arbitrary planning techniques. Next, they suggest the use of the criteria that were developed at the value-formulation stage in the process of weighting the considered alternatives. They further assert that adopting criteria for evaluation during the value formulation stage and the final determination of the appropriate alternative is not the planner's task because of the inherent limitations of the planner's role in the identification of means (Davidoff & Reiner, 1962). Once more, it seems that these limitations can be captured through a suggestive storytelling planning process, if understanding and prioritizing values has been successfully achieved in the last stage. In a way that is similar to the aims of Filep et al. (2014) as set forth in their second suggestion, at this stage schemes with meanings/values that might resonate with particular communities are proposed. To achieve this aim, they suggest that how stories are manifested in the built environment and how these symbols are currently interpreted should be investigated, for example, through visual symbols buildings, land use, activities and behaviours. The approach to time differences should also be considered important because each generation not only interprets its own meanings but they also create new symbols by using, modifying and transforming those of the past through storytelling (Filep et al., 2014; Wittkower, 1977). Finally, these symbols help to form design decisions that are better harmonized with nature and community values into the future, as Filep, Thompson-Fawcett, and Rae set forth in their second suggestion. The focus of their third suggestion is still on decision making about new, preserved or re-used built forms in lieu of new development, whereas Davidoff and Reiner's (1962) third stage as an effectuation is concerned with the action level of planning. Accordingly, the former is considered to be a complement to the means identification stage, which is led by the planner in the second stage. With the above suggestions in mind and reconsidering the results of the critical naturalistic discourse analysis (Forester, 2012) from the previous

stage, some general steps of the means identification in the storytelling planning process are formed according to the following steps:

4.2.1 Participatory processes

- Practicing social learning and social capital to encourage the future transformation of the built environment and behaviours (to reflect both the community's environmental identity and their new values).

4.2.2 Analysis of the manifestations of the built environment and behaviours

- How have they been interpreted in the past?
- How are they interpreted today?
- Have new symbols emerged from the use, modification and transformation of symbols of the past?
- Do traditional symbols survive, emptied of their content?
- Proposing schemes whose values might resonate with particular communities,
- Considering how to encourage the modification or transformation of meaning by recipient communities,
- Asking people to identify the buildings, land uses, activities and behaviours that need to be improved and those that need to be created,
- Crafting practical future steps through proposals for actions that can actually address people's real concerns and interests, their aspirations and fears.

4.2.3 Reconfirming evaluation criteria

- Continuing the first stage and reconfirming the common values and/or meanings of forms, functions and activities for the evaluation of design proposals,
- Proposing multiple built forms and behaviours that have the potential to achieve similar socio-cultural outcomes,
- Social appraisal of proposed schemes related to planning decisions,
- Justifying new preserved or re-used existing built forms and behaviours in lieu of new development by reading and engaging with the unique and plural embedded narratives.

4.3 Third Stage: Effectuation

Effectuation is related to the management of programmes and with control, which, as Davidoff and Reiner stated, has been explained at a great length and from various points of view in administration theories (Davidoff & Reiner, 1962). Similarly, this research is also limited to those aspects of effectuation, so it is essential to involve the storytelling in the planning process. The process must also include the criteria that are necessary to exercise control of administrative discretion. In this regard, Davidoff and Reiner (1962) again refer to community values as the basis for the controls and the criteria that are formulated in the earlier stages of planning process. They then suggest that planners should establish the set of criteria for their clients in reference to controls that might pertain to both the location and the characteristics of such controls and of the planning function (Davidoff & Reiner, 1962). Considering that the storytelling planning process—as discussed in the first stage—begins primarily with the establishment of the social circle, which includes the local planners, and that the controlling criteria should address this inclusion, there is an opportunity to form a participatory local organization to conduct the third stage. This group could be an independent local organization that consists of a variety of resident interests groups and their stories, resident planners, specialists, representative of local authorities and even developers in any particular neighbourhood or site. Their general policy might be to guide a whole variety of actions and activities that will have some impacts on the urban environment towards the avoidance of any environmental pollution and deterioration while improving environmental sustainable behaviours (Faryadi, 2004b). This proposed organization would be an operational organization that applies the prioritized environmental values (the results of the value formulation stage) and their preserved, modified or new manifestations as buildings, land use, activities and behaviours (the results of the means identifications step) to create environmental action plans. It would also be responsible for creating the controlling criteria to conduct the operational phases in accordance with the social circle's visions.

Based on these suggestions, some stories of everyday life in Iran are introduced in the next section to demonstrate how we can communicate with and learn from the inherent environmental values of people's past stories and move towards the formation of sustainable future urban forms, functions and behaviours.

4.4 Exploring Environmental Values in Exemplified Stories

In a study of storytelling's capabilities, Faryadi and Redaie (2018) recalled the memories, stories, and environmental narratives of residents of some villages located in Yazd Province of Iran. Through some informal meetings, interviews and field observations they re explored the underlying environmental values of interviewees with the aid of themselves. The results showed that the residents of villages have been addressing the most compatibility and less disruptions' of the environment due to their strong system of values. This has been led them to create some innovative developments during the centuries to capture their hard climate conditions; from some well known as central court houses, Ghanaat [2] and Windcather [3] (Baad Gir) to some everyday behaviour as nonchemical fertilising. The latter is the use of sewing scraps from local textile plants as a fertilizer which enriches the soil while keeping the moisture on the ground for a long time. These signs commonly denote to the strong traditional knowledge of region's folks and explore a main environmental value as

recognizing and coordinating to the nature's powers to live and survive. The research revealed that storytelling is capable to join communities' values with urban planning choices but it needs to be set within organizational planning process in contemporary complex situations (Faryadi & Redaie, 2018). Below, are retelling some other people's simple, ordinary stories—which might be familiar to many others—to note how those stories depict their environments and lifestyles, which are simply transcribed and written up.

In Khoy, a city in Azerbaijan (an Iranian province where the weather is cold), there are stories drawn from the traditional knowledge of previous generations, who made holes in their snowy yards that they used as a natural freezer to preserve spoilable food in the winter. Addressing the former discussions, people had obtained practical knowledge of how to sustainably benefit from natural laws based on everyday needs that might be considered a universal value, such as the five values of the voyaging canoe (Herman, 2016).

In Tafresh, a city in Markazi Province, there are stories about all of the women in the neighbourhood gathered in each house on a weekly basis, participating in making and sharing dairy products. This story explores people's clear knowledge of the power of participating in processing quickly corruptible materials, which also had the benefit of preserving their time and health. In this case the environmental values might be interpreted as saving raw materials, producing organic dairy products and making social capital in the terms described by Macias and Williams (2016). The manifestation of those values into the contemporary built environment would improve neighbourhood social programmes based on everyday needs and rehabilitate traditional neighbourhood participation through urban villages.

With regard to some newer stories from the 1960s and the 1970s, it is worth telling stories about the small to medium-sized yards of most of Tehran's houses, where many children directly experienced the main elements of nature such as soil, water, air, plants and animals and learned their inherent rules in four different seasons. Planting vegetables in small spots, listening to the music of the winds among the tall poplars, discovering the rules of water in small yard pools, addressing the rows of ants marching towards their nests and discovering their life style, keeping silkworms in the spring and nurturing chickens in the summer, jumping into piles of dried leaves in autumn, watching the blue dark sky full of stars at night and looking up at Ursa Minor and Major, and many other similar activities are childhood experiences shared by many. These activities have many inherent meanings in which the main shared value might be learning natures' rules through everyday life. Expressed as a tangible environmental value of contemporary cities, this value could be translated as improving direct access to nature for all people. Regardless of the potential for this value to be actualized, it could be interpreted into certain urban forms or functions such as building more single houses than condominiums, improving facilities to develop more green roofs and balconies and creating more shared neighbourhood gardens and allotments. In addition, as a psychological interpretation, involving children in nature-related activities and/or behaviours with real experiences of plants and animal life will help construct their environmental self-identity—as a meaning-making system—and will foster their ecologically responsible behaviour (McGuire, 2015).

These stories show that storytelling can be considered as a strong social practice and developed as a normative planning tool to reinvent the environmental values of communities, especially traditional ones, in which indigenous knowledge has been continuously transferred and has helped sustain the community for centuries. These stories are also a reminder that the regeneration of community story circles would empower cultures to bring out our environmental values and their formal manifestations (Macias & Williams, 2016). In this way, people would clarify their specific buildings, land use, activities and behaviours as the formal and functional urban symbols that denote their communities' environmental values. These types of stories can be considered to be placed in a framework of a storytelling planning process. But they need to be designed through specific plans and evaluated to test its real-world efficiency, which should be completed in greater detail in research's future path.

5. Conclusion

This research argued that scientific planning systems have been less successful in effectuating sustainability concepts because of the inability of scientific knowledge to explore environmental values and social creativity and translate them into plans. It explained that environmental values are formed through the interconnections of people and their cultural contexts and in regions in which people are directly connected to the land and experience it with their own instincts and feelings. Consequently, it argued that people have learned from nature and know how to use it in mutually sustainable ways and improve upon those ways based on accumulative local or traditional knowledge. Traditional knowledge, which has been continuously transferred from heart to heart, communicated through stories and improved upon evolutionarily by generations, might be considered in the current systematic planning process. This research made an effort to incorporate the wisdom of storytelling into the capacities of the planning process towards a storytelling planning process through a "both/and" logic (Arida, 1998). To achieve this aim, the subjective and normative nature of storytelling is combined with the objective and rational procedure of the planning process, applying its conceptual commonalities and compatibilities and recognizing the value of its contrasts. Articulations of Davidoff and Reiner's (1962) planning process, value formulation, means identification and effectuation were applied as a rational framework to forge a storytelling cultural pathway in the complex cities of today. The main common concept with storytelling is the highlighting of the community's values as a significant, basic step

involved in environmental intervention. Nevertheless, their focal contrasting point primarily refers to the planners' responsibility to understand people's values and analyse them with scientific facts to establish planning goals through rational processes. In this regard, the storytelling planning process understands and prioritizes the community's environmental values and visions through people's leadership (Filep et al., 2014), social circle (Ganley, 2010), social capital (Macias & Williams, 2016), critical naturalistic discourse analysis (Forester, 2012) and independent local organization (Faryadi, 2004_b) at various stages. Considering these elements might present a framework or common language from which communicate people and planners to develop their environment based on shared values. In this regard some examples of Iran's old and new environmental stories, introduced to exemplify the ability of storytelling to reveal community environmental values and their manifestations through traditional knowledge in the new development plans. The suggested storytelling planning process is based on theoretical foundations and although might be considered a procedural planning method, it should include the potential to be completed with local content. The research's future aim is to examine, and develop the process in particular neighbourhoods and cities of Iran.

References

1) Ardebili, M. R., & Naseri, T. S. (2016). The Role of Social Capital in The Conservation of Historical Buildings. *Space Ontology International Journal* , 5(2), 31-41.
2) Arida, A. (1998). Quantum environments: Urban design in the post Cartesian paradigm. Retrieved from http://rudi.herts.ac.uk/rudiments/quantum.htm1
3) Arkaraprasertkul, N. (2012). Moral Global Storytelling: Reflections on Place and Space in Shanghai's UrbanNeighborhoods . *Storytelling, Self, Society* , 8. (3, Special Issue: Global Storytelling(SEPTEMBER-DECEMBER 2012)), 167-179. doi: 10.1080/15505340.2012.711126
4) Barthes, R. (1977). *Image music text*. London: Fontana Press.
5) Bell, S., & Morse, S. (2007). Story telling in sustainable development projects. *Sustainable Development*, *15*, 97–110. doi:10.1002/sd.305
6) Berke, P., Godschalk, D., Kaiser, E., & Rodriguez, D. (2006). *Urban land use planning* (5th ed.). Urbana and Chicago: University of Illinois Press.
7) Berkes, F. (2012). *Sacred ecology* (3rd ed.). New York, NY: Routledge.
8) Boeve, P. J., & Van Petegem, P. (2011). A cross-cultural study of environmental values and their effect on the environmental behavior of children. *Environment and Behavior*, 45, 551–583. doi:10.1177/0013916511429819
9) Brand, P., & Thomas, M. (2005). Urban environmentalism: Global change and the mediation of local conflict. London: Routledge.
10) Bulkens, M., Minca, C., & Muzaini, H. (2015). Storytelling as method in spatial planning. *European Planning Studies, 23*, 2310–2326. doi:10.1080/09654313.2014.942600
11) Cameron, E. (2012). New geographies of story and storytelling. *Progress in Human Geography*, *36*, 573–592. doi:10.1177/0309132511435000
12) Cilliers, E. J., Timmermans, W., van den Goorbergh, F., & Slijkhuis, J. S. (2015). Designing public spaces through the lively planning integrative perspective. *Environment, Development and Sustainability* , 17 (6), 1367–1380. doi: 10.1007/s10668-014-9610-1
13) Curthoys, L., Cuthbertson, B., & Clark, J. (2012). Community story circles: An opportunity to rethink the epistemological approach to heritage interpretive planning. *Canadian Journal of Environmental Education, 17*, 173–187. https://cjee-lakeheadu-ca.ezproxy.library.yorku.ca/article/view/1105
14) Davidoff, P., & Reiner, T. A. (1962). A choice theory of planning. *Journal of the American Institute of Planners, 28*, 103–115. doi: 10.1080/01944366208979427
15) Davoudi, S. (2000). Sustainability: A new vision for the British planning system. *Planning Perspectives*, *15*, 123–137. doi:10.1080/026654300364056
16) De Neufville, J. I., & Barton, S. E. (1987). Myths and the definition of policy problems: An exploration of home ownership and public-private partnerships. *Policy Sciences*, 20, 181–206. doi:10.1007/BF00156584
17) Dobrucká, L. (2014). Reframing planning theory in terms of five categories of questions. *Planning Theory*, *15*, 145–161. doi:10.1177/1473095214525392
18) Faryadi, S. (2004a). Sustainable urban design principles and rules for the cities of Iran in the process of globalization (with emphasis in biological needs). *Environmental Studies*, 30, 29–45. Retrieved from http://en.journals.sid.ir/ViewPaper.aspx?ID=5152
19) Faryadi, S. (2004b). A methodology for participatory local environmental planning. *Journal of Environmental Studies*, 31, 14–29. Retrieved from https://jes.ut.ac.ir/article_10100_188f10a66d8a5c1844aebf87979e075f.pdf
20) Faryadi, S. (2008). *Urban representation of multiculturalism in a global city: Toronto's Iranian community*. Hamilton, ON: Institute on Globalization and Human Condition, McMaster University. Retrieved from https://socialsciences.mcmaster.ca/institute-on-globalization-and-the-human-condition/documents/IGHC-WPS_08-4_Faryadi.pdf
21) Faryadi, S., & Redaie, M. (2018). Applying storytelling as a communicative planning tool for

understanding and interpretation of environmental values - Yazd province, Iran. Journal of Environmental researches, in print (in Persian).

22) Filep, C. V., Thompson-Fawcett, M., & Rae, M. (2014). Built narratives. *Journal of Urban Design*, 19, 298–316. doi:10.1080/13574809.2014.890043
23) Forester, J. (2012). Learning to improve practice: Lessons from practice stories and practitioners' own discourse analyses (or why only the loons show up). *Planning Theory & Practice, 13*, 11–26. doi:10.1080/14649357.2012.649905
24) Forman, T. (2008). *Urban regions, ecology and planning beyond the city*. Cambridge: Cambridge University Press.
25) Friedmann, J. (1987). *Planning in the public domain: From knowledge to action*. Princeton, NJ: Princeton University Press.
26) Friedmann, J. (2008). The uses of planning theory: A bibliographic essay. *Journal of Planning Education and Research, 28*, 247–257. doi:10.1177/0739456x08325220
27) Ganley, B. (2010). *Re-Weaving the Community, Creating the Future. Storytelling at the Heart and Soul of Healthy Communities.* Orton Family Foundation. https://www.orton.org/sites/default/files/resource/1611/Storytelling_Whitepaper_hotlinked.pdf
28) Gunder, M. (2006). Sustainability: Planning's saving grace or road to perdition? *Journal of Planning Education and Research*, 26, 208–221. doi:10.1177/0739456x06289359
29) Herman, R. D. K. (2016). Traditional knowledge in a time of crisis: Climate change, culture and communication. *Sustainability Science*, 11, 163–176. doi:10.1007/s11625-015-0305-9
30) Hulst, M. (2012). Storytelling, a model of and a model for planning. *Planning Theory*, 11, 299–318. doi:10.1177/1473095212440425
31) Innes, J. E. (1995). Planning theory's emerging paradigm: Communicative action and interactive practice. *Journal of Planning Education and Research, 14*, 183–189. doi:10.1177/0739456x9501400307
32) James, S. P. (2016). The trouble with environmental values. *Environmental Values*, 25, 131–144. doi:10.3197/096327116x14552114338747
33) Kent, M. L. (2015). The power of storytelling in public relations: Introducing the 20 master plots. *Public Relations Review*, 41, 480–489. doi:10.1016/j.pubrev.2015.05.011
34) Kimmerer, R. W. (2012). Searching for synergy: Integrating traditional and scientific ecological knowledge in environmental science education. *Journal of Environmental Studies and Sciences*, 2, 317–323. doi:10.1007/s13412-012-0091-y
35) Lein, K. J. (2003). *Integrated environmental planning*. Oxford: Blackwell Publishing.
36) Macias, T., & Williams, K. (2016). Know your neighbors, save the planet: Social capital and the widening wedge of pro-environmental outcomes. *Environment and Behavior*, 48, 391–420. doi:10.1177/0013916514540458
37) Macnaghten, P., & Urry, J. (1998). *Contested natures*. London: Sage.
38) Mandelbaum, S. J. (1991). Telling stories. *Journal of Planning Education and Research, 10*, 209–214. doi:10.1177/0739456x9101000308
39) McGuire, N. M. (2015). Environmental education and behavioral change: An identity-based environmental education model. *International Journal of Environmental & Science Education, 10*, 695–715. doi:10.12973/ijese.2015.261a
40) Opdam, P., Nassaue, J. I., Wang, Z., Albert, C., Bentrup, G., Castella, J.-C., et al. (2013). Science for action at the local landscape scale. *Landscape Ecol* (28), 1439–1445. doi:10.1007/s10980-013-9925-6
41) Pelzer, P., Geertman, S., & van der Heijden, R. (2015). Knowledge in communicative planning practice: A different perspective for planning support systems. *Environment and Planning B: Planning and Design, 42*, 638–651. doi:10.1068/b130040p
42) Rees, W. (1999). Scale, complexity and the conundrum of sustainability. In M. Kenny & J. Keadowcroft (Eds.), *Planning sustainability* (pp. 101–127). London and New York: Routledge.
43) Rockeach, M. (1968). *Beliefs, attitudes and values*. San Francisco, CA: Jossey-Bass.
44) Sandercock, L. (2003). *Cosmopolis II*. London: Continuum.
45) Schlosberg, D., & Coles, R. (2016). The new environmentalism of everyday life: Sustainability, material flows and movements. *Contemporary Political Theory, 15*, 160–181. doi:10.1057/cpt.2015.34
46) Seifollahi, M., & Faryadi, S. (2016). Evaluating the Quality of Tehran's Urban Environment Based on Sustainability Indicators. International Journal of Environmental Research, 5(2), 545-554. doi:10.22059/ijer.2011.339.
47) Selman, P. (2000). *Environmental planning* (2nd ed.). London: Sage.
48) Semsar, Y. A. (2010). Formulation of Expert's Experiences of Ghanaat. Tehran, Iran: Managing Water Resources of Iran Compony and the International Center of Ghanat and Historical Water Buildings(In Persian).
49) Shariatzadeh, A. (1992). Yazd Windcathers and the Method of Building them,. In A. Shariatzadeh, Yazd Nameh. Tehran: Culture of Iran landscape(In Persian).
50) Steele, W. (2011). Strategy-making for sustainability: An institutional learning approach to transformative planning practice. *Planning Theory & Practice, 12*, 205–221. doi:10.1080/14649357.2011.580158
51) Steiner, F. (2014). Frontiers in urban ecological design and planning research. *landscape and urban*

planning (123), 304-311. doi:10.1016/j.landurbplan.2014.01.023

52) Stern, C. P., Dietz, T., & Guagnano, G. A. (1995). The new environmental paradigm in social psychological perspective. *Environment and Behavior*, 27, 723–745. doi:10.1177/0013916595276001
53) Throgmorton, J. A. (2003). Planning as persuasive storytelling in a global-scale web of relationships. *Planning Theory*, 2, 125–151. doi: 10.1177/14730952030022003
54) Vickers, S. G. (1968). *Value systems and social process*. New York, NY: Basic Books.
55) Wheeler, S., & Beatly, T. (Eds.). (2004). *The sustainable urban development reader*. London and New York: Routledge.
56) Wittkower, R. (1977). *Allegory and the migration of symbols*. New York, NY: Thames and Hudson.

Acknowledgments

This paper is based on the findings of author's research during her 2016 sabbatical at York University (Toronto, Canada) supported by funding the International Association of the University of Tehran, Iran. The author is grateful to the Faculty of Education at York University and especially to Professor Sarah Barrett for her support during her research.

[1] Social circle is considered as people coming together to orally share their place-based stories, within the context of environmental and cultural interpretation Curthoys, Cuthbertson, & Clark, 2012).

[2] Ghanaat is a traditional building technology for setting the flow, save, and distribution of underground waters. Ghanaat has played an important role for forming, survival and development of arid zone settlements (Semsar, 2010).

[3] Windcather is a cooling system which conducts winds from outside into houses (Shariatzadeh, 1992)