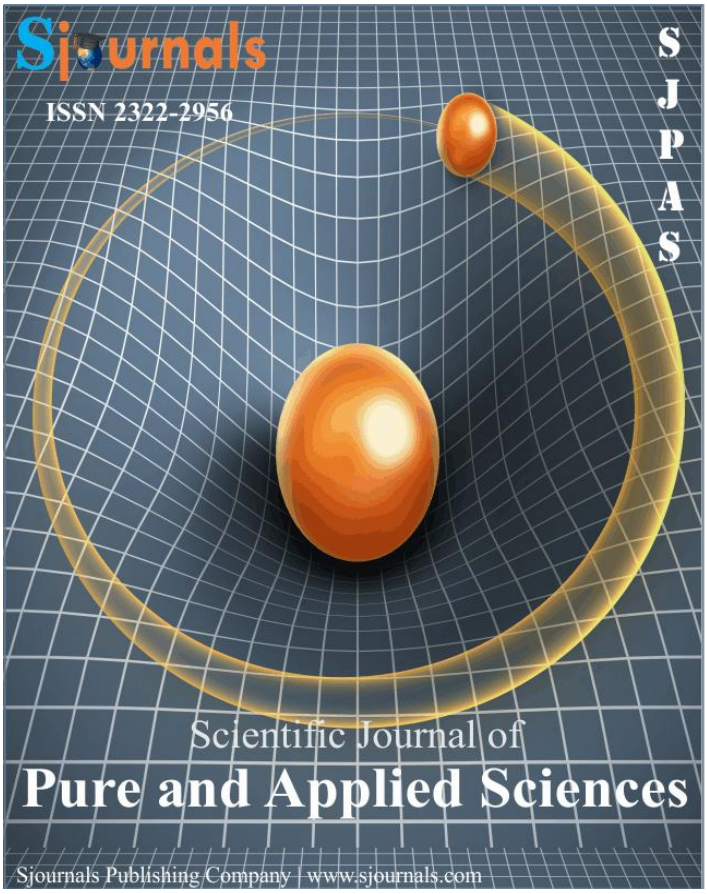
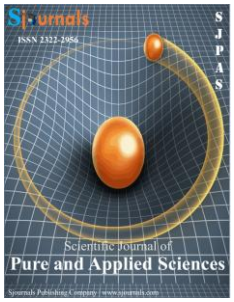


Scientific Journal of Pure and Applied Sciences (2017) 6(5) 572-580
ISSN 2322-2956
doi: 10.14196/sjpas.v6i5.2395



Contents lists available at Sjournals
Scientific Journal of **Pure and Appiled Sciences**
Journal homepage: www.Sjournals.com

Review article

Black tent housing nomads in compliance with sustainable development (Identification and investigation criteria)

Mahdi Eskandari[a], **Fatemeh Mehdipour Rabori**[b,*]
[a]*M.A Student of Architecture, Kerman Branch, Islamic Azad University, Kerman, Iran.*
[b]*M.A Student of Urban Design, Kerman Branch, Islamic Azad University, Kerman, Iran.*

*Corresponding author; fateme.mehdipour72@gmail.com

ARTICLE INFO

Article history,
Received 15 April 2017
Accepted 13 May 2017
Available online 20 May 2017
iThenticate screening 17 April 2017
English editing 11 May 2017
Quality control 18 May 2017

Keywords,
Natural environment
Human environment
Vernacular architecture
Sustainable development
Housing nomads (black tent)

ABSTRACT

Architecture is not static position of shape or location; it is living phenomenon only through human activity meaning. The machine age and subsequent change in thoughts and insights toward life and art has caused the valuable place of vernacular architecture like other arts lowered and its values be ignored; however, today, architecture technology development on the one hand and the value and importance of sustainable development on the other hand has caused using sustainable architecture and its exploitation in compliance with contemporary architecture and architectural principles of permanent and temporary human settlements between engineers and architects become a great competition. Common vernacular architecture among nomad's tribes, such as Eskimos architecture and residents of coldest and warmest parts of the Amazon rainforest in the world is considered an example of architecture and environmental compatibility in the warm and desert Iranian habitats that is in full compliance with what we today refer to as sustainable architecture. This article begins with summarizing definitions expanding with principles and the diverse opinions on the issue of sustainable development and vernacular architecture of nomadic settlements (black tent).

1. Introduction

Nomadic phenomenon refers to a group of people that has long been considered one of the first human gatherings. The structure of nomadic life which always under the direct influence of surrounding environment formed has caused people migrate from place to place during the year and take advantage from favorable conditions of places and different seasons (Golabzadeh, 1995). Therefore, investigation nomadic life indicates that nomad's settlement system as a dynamic and flexible system is compatible with the geographical conditions and the environment around it which, according to their need for space usually use tent allows them setting up and dismantling in any place and under any circumstances, they want (Moshiri, 2001). Some certain economic and social relations with the natural environment and subtly cultural symbols in the development of vernacular architecture reflected in the way that simplicity and makeup is manifest in them (Alyakono et al., 2004). Review architecture of the temporary nomads settlements (Black tent) in the past suggested the greatest productivity of the system from renewable, cheap and clean energy, but the lowest use of renewable energy (fossil). This would also while preventing damage to the natural environment and create maximum economic efficiency is the logical answer to the important principles of sustainable development (Zareie and Madadi, 2013).

2. Geography science: Concepts and history

Geography: "The word represents Geography (Geo and Grafya) for description the land." (Safinezhad, 1987). The start date refers to the second half of the eighteenth century with two most significant co-founder including Humboldt and Ritter. Alexander Humboldt was the father of general and natural geography in this era, because his studies focused more on natural geography with less attention to human factors. Contrary to Humboldt**,** Ritter is the father of human geography, because he considered the natural environment for human study. Ritter makes the differences between history and geography and state history places human in time and geography places human in place (Safinezhad, 1987). In the second half of the 19th century Humboldt and Ritter views develop and geography science is divided into two main branches of natural geography and human geography. Natural geography studies nature factors in relation to each other, such as relationship between the rain and destruction earth's surface roughness; while, human geography studies the natural environment and the human response to these factors examined in different environments.

Important components in the study of human geography: 1) geographical environment. This requires study natural sciences 2) human life. This requires study social sciences. Natural sciences are collection of climatology, oceanography, geology, botany, etc., which human is not involved in changes and other variations of those, but the results have impact on human geography. Social sciences also discuss the relationship between humans; however, human geography is not, because one side is nature and the other side is human, and human geography forms the link between the two issues.

Geographical environment and its relation with architectural form: In Human Geography, Geographical nature refers to the natural environment may be started from small environment encompasses the region, country or continent. Hence, in human geography, the local geography (region) is considered which examining it cause understanding the relationship between man and his living space (Safinezhad, 1987). Geographical environment and natural conditions prevailing in that is one of the main factors influencing the architecture and construction principles in each region; so, Residents of the area due to the current climate and examining the best possible solutions shape architectural form and their residence space (Moshiri, 2001).

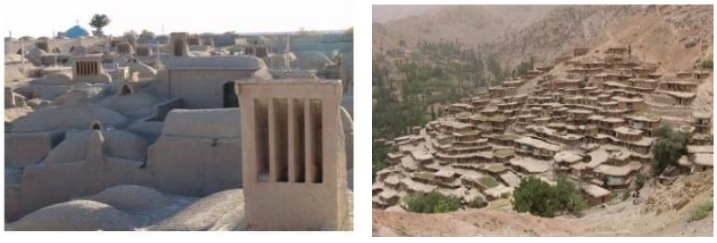


Fig. 1. The environment and climate effect on architecture form (Typology or iconic architecture) (Akrami, 2010).

Building performance and its relation with architectural form: Climatic characteristics make people fruitful and highly qualified in choosing how to deal with the specific problems of each country, using elements of the land, construction means and methods tailored to their needs in interaction with nature (Alyakono et al., 2005). For example, in the coldest regions of the world, Eskimos in full compliance with the natural environment and circumstances build ice huts called Igloo; while, tribes living in the deserts of Tibet know desirable some circular shelter as shed for their life which temporary and rapid performance of each of these settlements on the basis of basic needs having a significant role in the creation of architectural form (Safinezhad, 1987).

Fig. 2. (Right) Igloo- (Left) Mongol tribe's settlements in Tibet: A shelter on basic needs. (Performance oriented architecture) (Alyakono et al., 2005) (2) (Akrami, 2010).

The nomad's tribes know black tent as the most desirable residential building in compliance with the Iranian desert habitats which temporary nature and movable nomadic life in the final consolidation form and its main structure is effective. Among the other advantages of this type of housing is its compliance with sustainable development objectives which first Sustainable Development then its relation with black tent (Housing nomads) will be discussed.

3. Sustainable development: History, concepts, components

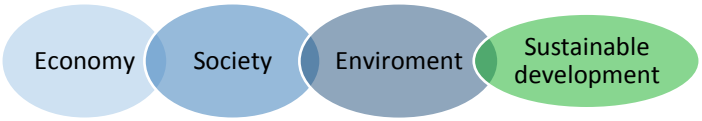
3.1. History

After the first United Nations Conference on Environment, held in Stockholm in June 1972, a 26 article plan which the content of this program agreed by 113 countries. The most important statement of this collaboration document was serious attention of the member states to the correct and rational utilization of natural resources, reducing environmental pollution, comprehensive training to protect the environment and create environmental organizations and international institutions (Dabiry et al., 2009). As a result, the output of the above-mentioned conference, followed by the world scientific community awareness about global human environmental issues was called the emergence of new term such as sustainable development. In 1987, a man named Brondland based on two important principles of Environment and Development in the report named (Our common future) introduced the term sustainable development for the first year (Anjomshoa and Dai Allah, 2011).

3.2. The concept of sustainability

Stability meaning in Dehkhoda dictionary: Durability.
Sustainability meaning related to the desired subject: What can be developed and continued in the future.
Stability meaning in Latin words and phrases:
-Sustain: Support-strengthen-keep alive.
-Sustenance: Sustainability-life maintenance process.
-Sustainable: Tolerable-sustainability.

Sustainable development: Is a concept that according to the natural, economic, social resources, and using technology and technical facilities, its main purpose is to provide a correct and efficient pattern in order to meet the needs of present and future generations (Zandieh and Parvardinejad, 2010).



Diag. 1. Functional diagram for sustainable development.

3.3. Sustainable development indicators

Diagram 1): Functional diagram for sustainable development (Anjomshoa and Dai Allah, 2011).

3.4. Environmental indicators based on sustainable development objectives

Environment is the set of natural factors such as soil, water, light, air, etc., which besides having a mutual relationship with each other provide better living conditions and basic needs of living organisms, including humans (Anjomshoa and Dai Allah, 2011).

3.5. Social indicators based on sustainable development objectives

Providing appropriate solutions for development a society according the intellectual, social and cultural characteristics of the society; because, the principle of development revolves around human capital. The most important social indicators of sustainable development are: 1) environmental resources 2) social values 3) design skills.

3.6. Economic indicators based on sustainable development objectives

Rational management and proper utilization of funds to the benefit of society people for overcome economic difficulties and achieve sustainable economy (Dabiri et al., 2009).

4. Sustainable design and three design principles of Vitruvius: 1) Strength 2) Beauty 3) Benefit

Every day a deeper implication of Vitruvius three principles is achieved during years. Each one of these principles at different times considered as the basis of architects working that sustainable design is also aimed at honoring the three principles. The first principle of strength: As stated before, the goal of stability is durability, so durability does not make sense when there is not necessary resistance and strength in a building against forces such as earthquakes. The stability and strength of materials is also considered the characteristics mentioned in sustainable design. Thus, every building material should be recycled after destruction and dismantling.

The second principle of beauty: This principle in sustainable design trying provide psychological comfort which in the process of sustainable design can be provided in the course of a closer relationship between man and nature and mankind together, because one of the dangers of modern industrial societies is distancing people from each other endangers the welfare of human psyche. The third principle of benefit and useful productivity: sustainable design which considered a kind of flexible design should maintain its efficiency in the long run and be helpful by taking advantage of flexibility and adaptability in different conditions (Mahmoudi, 2003).

5. Sustainable architecture according to the vernacular architectural characteristic

The most important issues in sustainable design, according to the vernacular architectural characteristics should be considered, including: 1) Attention to the environment potential in the preparation of sustainable architecture substrate 2) Attention to the replicable values of vernacular architecture in the formation of sustainable architecture (Hosseini et al., 2008).

6. Migration and nomadic: Concepts, history and the most important poles of Iranian nomadic, housing

The term migration: In Persian valid dictionaries has different interpretation including: death, migrate, go from one home to another home, transfer, exile, immigration and so on (Touba, 2007). Laverson Kerdar: knows nomadic related to the time before Christ (BC) that in the dry and low fodder land has begun (2007). Migration is a mass and seasonal movement to compromise with nature, not conflict with it in order to sustain and adapt life to the natural environment changing; and nomadic is a group of people have the ability to confront the nature in an interrupted movement and provide facilities, according to the nature and the main reason is lack of necessary technique and technology to adapt life in the area of main production (livestock) with environment (Touba, 2007). The most important of these are life, freedom of movement and ease of transport (Pardigar, 1987). Three factors that always impact kind of life, insight and art of nomads including 1) Environment, 2) Economic, 3) Migration.

(Hematali Kaykhah and Naghi Zadeh, 2012). The most important nomadic poles in Iran can be considered in two main parts: 1) The west of Iran. 2) Asia and the fringes of desert (Touba, 2007).

Housing nomads (Black tent) and sustainable development: Transient and vulnerable nature with words of black and tent combined to obscure the fact that such structures are safer and more reliable from many of other systems; because they are very light in weight with a waterproof integrated and flexible shell (Moore, 2013). Black tent is a lightweight, fast binding, functional house with two main components of structure and shell which the original and main material of it (wood and goat hair) are natural materials. This type of material in addition to being natural and having sufficient strength to withstand the different climatic conditions in terms of economic and environmental alternative are fully optimized. (Hematali Kaykhah and Naghi Zadeh, 2012).

7. Black tent and social indicators of sustainable development

How to set up black tent consistent with social components of sustainable development: Act of setting up and dismantling black tent is perfectly synchronized with social networks and principles of nomadic life; so during construction and dismantle, all family members, including men and women, young and old in the form of a group shall play their role in each turn. As a result, each of the members of this small community by having a sense of responsibility and group collaboration in order to achieve a common goal, each responsible for part of the work that benefits all members of the group. Finally, this kind of cooperation and group activities will lead to unity which ultimately results in survival and social sustainability of small nomadic society (Anjomshoa and Dai Allah, 2011).

How do you separate and organize the space inside black tent consistent with social components of sustainable development: The way of dividing black tent inner space, layout and placement of equipment inside it among nomadic families is different and usually related to homeowners social status and ethnic and cultural characteristics of each tribe. For example, in some tents organizing interior space is according two areas or the main part for men and women that men section to Lamardon and women to Keivanoo are known. The Keivanoo part attributed to women and children and everyday tasks like cooking and knitting is done permanently. Lamardon part is for men, which is sometimes used as a reception space for guests and when guests are not using it as a cozy atmosphere for family to relax and gather is used. Of course, this type of organization in the interior space of the tent into two main sections for men and women has been not planned before and sometimes can also be changed (Pardigar, 1987). Therefore, age, gender, type of activity and social communication in the way of dividing and organizing is effective which finally, this type of peaceful coexistence with minimal interference and conflict led to the continuation of resident social and peaceful life and social relation stability will be determined (Anjomshoa and Dai Allah, 2011, 1973).

Fig. 3. Inside view of black tent and spatial organization of it (Hematali Kaykhah and Naghizadeh, 2012).

8. Black tent and economic indicators of sustainable development

The ability to reproduce and replace black tent parts: Each tent is built from different parts together named Lat, each of them has a width of 40 to 60 cm and length of 6 to 15 m and based on tent wearing and household wealth were replaced by a new piece every 1 or 2 years (Filberg, 1993). Recyclability of replacement parts: Usually replacement parts purchased by poorer households and re-used. Natural materials: The shells from goats' hair and skeletons of tents are made from foliage trees and economically, materials will be no charge on nomadic families.

Resistance and more durable than canvas tents: Compared with canvas tents, black tents have useful life about 12 to 15 years, while the maximum useful life of canvas tents is 4 years and against weather and climate change condition have lower durability and resistance compared to black tents (Anjomshoa and Dai Allah, 2012).

Easy transportation without any cost: The weight of every Lat is about 11 to 17.5 kg, which they wrap it around a wooden pole and normally animals such as horses, mules or bull used to carry it. Thus, the lightness and ease of dismantling and carrying black tent cause additional costs to carry it from one place to another is not imposed on tribal families and economically be beneficial for families (Pardigar, 1987).

Fig. 4. Black tent transportation method (Pardigar, 1987).

Setting up and dismantling operations without any need to the specialized force: Setting up and dismantling operation doesn't need any specialized force and usually residents of each house with minimal cost and without the need for external force shall establish their residence space (Anjomshoa and Dai Allah, 2012).

Fig. 5. Setup black tent by family members (Pardigar, 1987).

Setting up speed and saving time: Maximum force and maximum time necessary to establish black tent is 3 people and 2 hours. In addition, due to the lightness and separate parts from each other at any time and under any circumstances can be held in the fastest time possible (Golabzadeh, 1995).

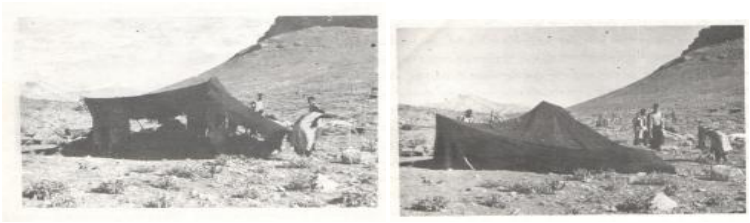


Fig. 6. Setup black tent in the shortest possible time (Pardigar, 1987).

9. Black tent and environmental sustainable development indicators

Set up black tent with different forms, according to environmental conditions and different seasons (Summer and winter tent). Climate solutions of winter tent consistent with the environment components (Steeped roof black tent): To drain rainwater from the roof to the side walls and prevent entering to the interior.

Fig. 7. Roof form of black tent consistent with climate change (Baghaie, 2009).

Using stone in the bottom of black tent: Using stone under side walls to a height of about 60 to 80 cm, a way to counter the influence of atmospheric factors, especially cold air into the interior space in the role of windbreaker (Zarei and Madadi, 2014).

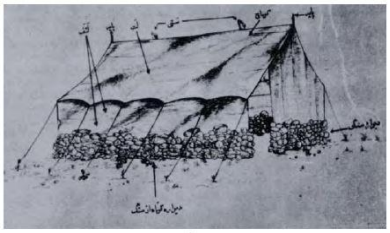


Fig. 8. Using stone in the bottom of black tent (Anjomshoa and Dai Allah, 2012).

Black tent orientation principles: When setting up black tent, the main entrance should be facing the sun against annoying wind as far as possible. In this way, the sun will penetrate deeper into it; this practice both in terms of health and adjusting internal temperature is effective.

Select the desired site to establish building: The most important thing in choosing the desired site is considering water flooding and river path as well as attention to the prevailing and annoying wind direction to prevent tent overthrow (Hematali Kaykhah and Naghi Zadeh, 2012).

Providing thermal energy: Dark colors absorb more energy in winter are efficient in providing thermal energy in interiors space. Earth ovens in the form of a hole on the ground and in the interior space are dug in the way that there is the flow of everyday life in the winter and gain necessary heat (Zarei and Madadi, 2013).

Fig. 9. Example of earth ovens (Pardigar, 1987).

Climate solutions in summer tent consistent with the environment components: Flat roof black tent: in the summer due to favorable weather and lack of rainfall, roof of the tents are usually flat and a set of measures and care is taken not used for winter tents.

Fig. 10. Change in the form of building consistent with climate (Hematali Kaykhah and Naghizadeh, 2012).

Natural ventilation and light by the pores in the shell: According to the physiological characteristics of goat hair and its expansion and contraction during warm and cold seasons, this operation makes the tent black shell contracted in the summer and holes in the fabric texture have been thinner; in this way, air easily through the available pores replaced and a soft light enters into the interior space (Zarei and Madadi, 2013).

Black tent orientation principle: Unlike winter tents, tents are usually held behind the sun facing the favorable winds in the summer to take greatest benefit from the shade and coolness.

Select desired site to establish building: In the summer usually choosing a land to establish a home is easier and in deserts, grasslands, mountains and sometimes in the vicinity of the trees establish their home enjoying the shade and air conditioning (Hematali Kaykhah and Naghizadeh, 2012).

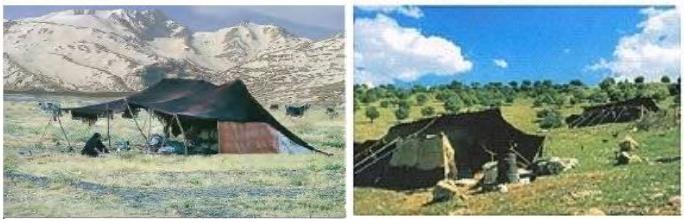


Fig. 11. Setup black tent in different sites (Khosravivand and Faezy, 2013).

Structure and method of cooling black tent: In the summer, black tents are usually like a sunshade or outdoor space and are opened from three sides and just closed from furniture side. This has the role of a roof sunshade that protects the building from direct sunlight and reduces heat absorption and improves the cooling space. Also in warm seasons, earth ovens are placed outside the black tent and in its vicinity to be disposed of its heat easily (Zarei and Madadi, 2013).

Fig. 12. Black tent structure in the summer (http://www.ashayer.ir).

10. Conclusion

What was said in detail about sustainable design represents a view of architecture that refers to some fundamental points: 1) Quality orientation, attention to the future, 3) Attention to the environment. Therefore, sustainable design is not a formal style from transient conditions and momentary excitements, but at its core has profound concepts linking man, nature and architecture. To extract values that should be considered in the development of architecture, attention the repeating values of vernacular architecture is very important, because this type of architecture relying on its traditional policies express explanations embedded over the millennia in raised questions of sustainable development. Vernacular architecture of nomadic settlements (Black tent) is also not exempt from this rule carries within itself the environmental, social and economic values and are repeated vernacular architecture in the process of sustainable design.

References

Akrami, G., 2010. Mysteries of rural architecture. Hous. Rural. Enviro., No, 131.

Alyakono, Adriano, 2005. Vernacular architecture. Tehran, scientific and cultural institute of Faza.

Anjomshoa, A., Dai Allah, M., 2011. Nomadic black tent, settlement in accordance with sustainable development in the Iranian desert habitats. Proceedings of the National Conference of desert habitats, tourism and environmental arts.

Bagahie, A., 2009. Structure role in the aesthetics of contemporary architecture. City identity. No, 4.

Dabiri, F., Poorhashemi, S.A., Rosta, F., 2009. Investigation environmental international principles and concepts. Environ. Sci. Technol., 11(3).

Filberg, S.C., 1993. Black tent, nomads and semi-nomads housing of world in the history. Translation of Asghar Karimi. Mashhad: culture deputy of Astan Quds Razavi.

Georgian Mahlabani, J., 2010. Sustainable architecture and review it in the environment field. Sci. Res. J. Iran. Architect. Urban. Soc., No 1.

Gholabzadeh, M.A., 1995. Proceedings of the Second Seminar and decades of Kerman studies. Tehran: Meraj.
Hosseini, S.B., Mofidi Shemirani, S.M., Madadi, H., 2008. Education sustainable architecture in Iran, barriers and trends. Technol. Train., 2(3).
Khosravivand, F., Faezy, S.F., 2013. Black tent, archetypal of tent structures and its application in modern industry. First National Conference on Building Materials and new technologies in the construction industry.
Mahmoudi, M., 2003. Sustainable design principles consistent with the objectives of sustainable design.
Moore, F., 2013. Understanding structurs behavior. Translation of Mahmoud Golabchi. Tehran: Institute of Tehran University Press.
Moshiri, R., 2001. Nomadic geography. Tehran: Lily.
Pardigar, J.P., 1987. Bakhtiari nomad's techniques. Translation of Asghar Karimi. Mashhad: culture deputy of Astan Quds Razavi.
Safinezhad, J., 1987. Principles of Human Geography. Tehran: Publishing and Printing institute of Tehran University.
Touba, A.A., 2007. Introduction to migrate and settlement. Eslamshahr: Islamic Azad University, Eslamshahr branch.
Zandieh, M., Parvardinejad, S., 2010. Sustainable development and its implications in Iranian residential architecture. Hous. Rural. Environ.
Zarei, M., Madadi, H., 2013. Evaluation of climatic comfort in Iranian nomadic dwellings (with a particular approach to black tent). First National Conference on Geography, Urban Planning and Sustainable Development. No 1.

How to cite this article: Eskandari, M., Mehdipour Rabori, F., 2017. Black tent housing nomads in compliance with sustainable development (Identification and investigation criteria). Scientific Journal of Pure and Applied Sciences, 6(5), 572-580.