Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

Impacts of Buildings Form on Efficient Energy Sussicient.
Case Study:Doroud Residental Complex

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ABSTRACT

It is obviouced that architectural buildings forms would be affective on the amount of energy acheivement and other energy efficiency criteria.. It is neccesary to consider the increased use of fossil fuels's influences, and environmental conditions because we are faced with the risk of fossil fuels consumption in the same way during the future forty years which is visible in the advanced studies. These studies is so important because the most effective and priority disitinctive option which has influence on residential opportunities is energy consumption way which is depending on climate and energy sources. In this study, we are going to promote level of consideration about the regional climate. In the Review of the literature part has tried to show that buildings form is one of the decisive factors in achieving energy in efficient buildings. Research findings indicate that stretch of the building forms to the south would be a significant position of power. The results of the dissertation show that south-east orientation could be more suitable for acheiveing more energy.

Keywords: Energy acheivement ,Building Forms,Residental complex, Energy Efficiency

Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

1. INTRODUCTION

Nowadays, the desirable or suitable dwelling is one of the subject which is related to the human being society because the house is a place where the humen being have relation with and they are affected by.So,dwelling and living space should be effective for 2 reasons:1-the physical aspect 2-the aspect of virtual needs. Nowadays, due to uncontrolled use of fossil energy in building especially residential land use with pay attention of random increasing of population. the crisis lack of energy will probably predict in the future which is not far away. The most use of oil products had been related to the transportation system, then in the construction section .(domestic - commercial - pubic) .While Iran has several houndred years implemented history, the Iranian architecturers has been gained valuable experience in the aspect of symmetry and harmony to nature. Nowadays, the the commands which had been used in the term of energy saveng by natural way as climate which named as domestic architecture, during past decades in Iran can be used in the same way under term of sustainable architecture in modern residential structure. In domestic architecture has to be used by indigenous people in each region and prapare facilities such as heating,cooling and natural energy.Inactive solar systems,designing based on using of southern light,the control of disturbing regions wids ,the site of the house have more close relation with traditional concepts of harmony with the climate. Today is tried to grow green architecture in Doroud city to through construct integrated design system which is compatibility with thte climatet to save energy for acheiveing sustainable architecture. The designer has to consider design these construction or complexes according to the functional needs and physical aspects (temperature,pressure,light). lighting are provided by recyclable or renewable and physical aspects also.

2. REVIEW OF LITERATURE

Review of literature is very important to understand the subject under study. This is accomplished by studying available related works done on the particular subject, which is intended to be studied .

Beatly (2005) said Sustainable development is “meets the needs of the present without compromising the ability of future generations to meet their own needs. **Brundtland** Commission (**2011)** said Sustainable development is the achievement of continued

Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

economic development without detriment to the environmental and natural resources. **Transportation Research Board** (**2012)** said **sustainability** is not about threat analysis; sustainability is about systems analysis. Specifically, it is about how environmental, economic, and social systems interact to their mutual advantage or disadvantage at various space-based scales of operation.

OBJECTIVES

1. the form of block designing how extent could be effective on sufficient and optimal usage of solar energy and prevent from annoying wind?

2. Is the difference between active and passive buildings in this region is impressive significantly?

3. The process of building design in providing and presentation of this city different building forms, how much can be effective in optimizing energy consumption?

4. How many block design form is enough seemly

5. The effects of active structure on the region

Hypothesis

1. Is by considering design standards for controlling energy consumption in housing complex and the climate of the region could be hopeful to reduce fossil fuel consumption in construct?

2. Does rotate of the blocks in each floor can be effective in energy efficiency?

3. is eastern and western blocks elongation on each floor can have a positive impact on saving building energy

3. RESEARCH METHODOLOGY

First I start to collect primary data for library. Secondly following research is analyzing-describely.in design using of constructing standards has done which has considered difference between energy consumption amount in before and after design (in comparing between one building and advanced building which cause to decreasing energy consumption) through eco tech software and etc.

In this research energy is consider as independent variable because of energy discussion, consumption and saving of that has effection on housing complex directly' so housing complex would be effected under design effection and would be consider as dependet variable. Finally by comparing before and afte design the amount of decreasing energy consumption amount would be calculated?

Received 17/04/2018
Approved 10/06/2018

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Foundamental Options

The factors which affect on the regional climate

the factors which affect on the climate of regions are sunangles,or near latitude away from,the equator and the intensity of seasonal winds.Earth has fixed rotation axis which has deviation nearly 23.5 degrees as compared with the horizontal line to the plane of earths orbitation around the sun.Since,this deviation axis put the different parts of earth infront of the sun,in different seasons, water, climate and temperature of earth will be different in every region of planet based on the angle of sun radiation. Almost,vertical onhle of the sunshines at noon is more in summer but the angle of sunshines is less in winter. The angle of radiation is nearly vertical at noon but in the winter the sunshines with lower angle.this property can be used on the south side of building. In the summer ,by putting a canopy over the side, windows can be prevented from the arrival of sun radiation and warming. but for the heat in the winter,because the sunangle is less and sulight penetrates in the room.Putting the openings and large windows the south side of the building for protecting of these kinds of windows against the sun the summer by canopy or porch are the features of modern Iranians buildings. The attention to the southern wall of building and the use of sun energy in building are the base of building which is called solar building (Gonzáles Llontop anf Otero Gonzáles, 2017). In this kind of building,the best way for placement in this building against of the sun is in the east-west direction.So,the lengh of the building should be in this direction and the width of building should be in the north-sourthern axis.because the southern wall gain the most energy in the winter,and this wall could be protected by a canopy in the summer.Since during day,the temperature of environment rises for sun radiation, and the air and the temperature are warmer at noon than in the morning therefore, its better the direction of building is turned into the east rather the sunshines directly to the west of the building in the summer.(vahid Ghobadian. traditional Iranaian buildings)

Case Study

Doroud is one of the lorestans convinces.This town is located in the north-east of lorestan convince and is located near the silakhor moor and near the two

Received 17/04/2018
Approved 10/06/2018

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rivers: dark and marboreh.Actually,the name of dorud is bahrein. Based on periodic review over 30 years was determind that the average of rainfall in several years has been more than 800ml.It causes that two rivers include mid-moisture climate with hot summer and cold winter.Doroud is located in 49degree in east lengh and 33degree in north width and 1522/25degree lenght.The most important feature about it,is it,s temperature(5/7).

The architecture of this area

This area covers huge mountaining area.with continously winter season,while humidity alaso would be visible during the day. Sometimes less humidity and so intense radiation would be observed.fozts and permanent freezing are the characteristic of this area. Winds in this area are often associate with cold breeze.

Proposal Document

This residential building are designed in Doroud city that has cold climate with the approach of taking efficient energy.We have tried to investigate all the climate and domestic option such as the direction of sunshining, conquering wind of region , the herbal covering of region, the environment temperature and humidity. This complex are constructed through 3 seperated blocks wth sustainable green architecture. Each block has 18 level with tip plan. Each floor ahs 100 square meter. It's structure is based on an ontral core which blocks are gathered to getehr around that one. It's central core is stretching to southwards to receive more energy. Each three different blocks has ability for angle rotation in two direction west and east.we could be able to determine the best angles for placing blocks, then they would be compare blocks to each other depend on angle rotation and rate of energy absorbtion to introduce the best of block. Influence of steep elevation which is designed in the height of building from the east for protecting blocks of light nuisance is important

4. DATE ANALYSIS

Block 1

we got to these results in the analysis of the first block in different season of the year with respect to computational and simulation Ecotect software and plus energy software which has been done.We examine blocks In different angles with respect to the seasons. Between june to auguest blocks needs more cool weather to make them comfortable for living. we consider the blocks in different angles in order to

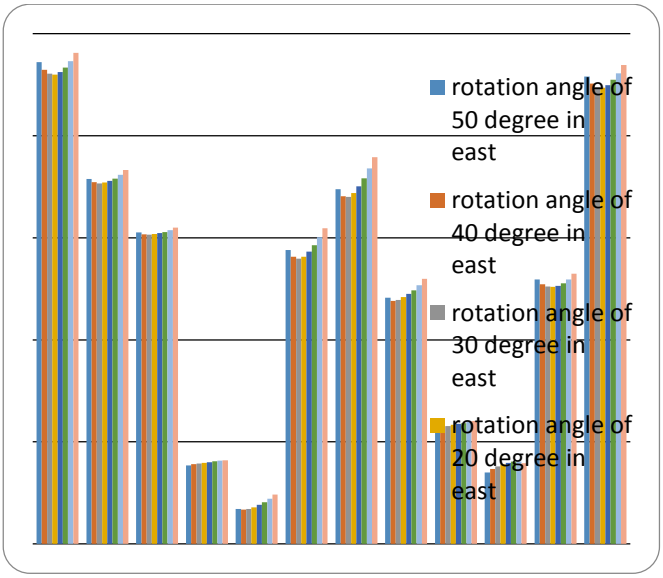
Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

determine the best angles in term of the lowest cooling .Thus the rotation angles of the block in 0,10,20,30,40,50 degrees in East , we reached the conclusion that as the blocks angle change from o to 30 degree to East , we have the lowest cooling in building , then coolings need being increased by the angle of 40 to 50 degree , while rotation of block with 10 , 20 degree in West , cooling quantity is increasing . In respect to some calculations this block needs more heating in the coldest seasons of the year , because of this , we situated the block in distinguished angles according to our expriement .While, block in rotation angles of 10, 20 , 30 degrees decates the lowest heating in January, February , march , with rotation angles of 40 , 50 in East , rises the need of heating and these angles have the most heating energy to keep building warm sufficiently. (fig1, table 1)

Fig 1.block1

TABLE1.Total(cooling , heating)



Thus , we reached the conclusion that rotation angles of the block in 20 , 30 degrees has the lowest heating in the coldest seasons of year December , January , February , March However in june , july, Agust we need the lowest cooling for building in angle of 30 degree.

Block 2

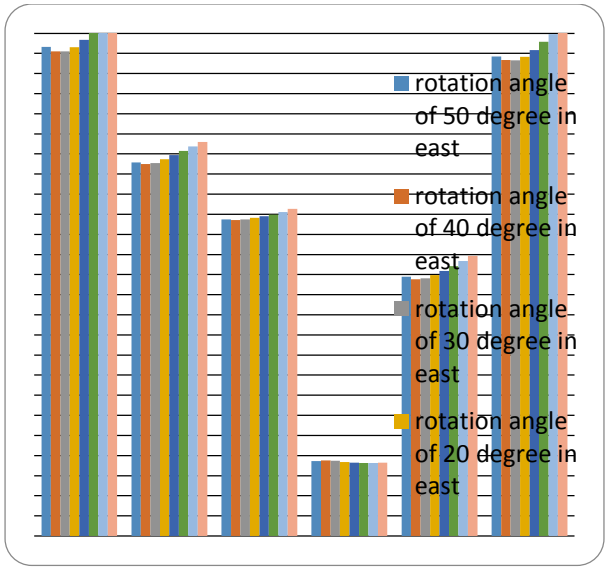
Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

Due attention to calculations which are done for block 2 , in June,July,Agust that we need more heating energy to heat building, with the rotation angles of the block in 0,10,20,30,40,50 in East and 10,20 in west,we find out that we need less cooling energy in rotation angles of the block in 10,to 40 degrees.And then with rotation of angles of 10,20 the most quantity of cooling is expressed. It means that block face with extreme heat.Thus for these reasons ,with rotation of angles 10,20 degree in west. And actually we should ase mechanical equipment for cooling block that this title is against the topic of this article. According to calcusions which are done, we examined block in different angles in the coldest seasons of year. So block 2,in angle of 30,40 degree in East needs the lowest heating December,January, February, March.Thus, we got from analysing block 2,that building needs the lowest heating in rotation of angles of 30,40 degree in East in December,January,February,March while in rotation of 40 degree in ,It needs the lowest cooling.

Fig 2 .block2

TABLE:2Total(cooling , heating)



Block 3

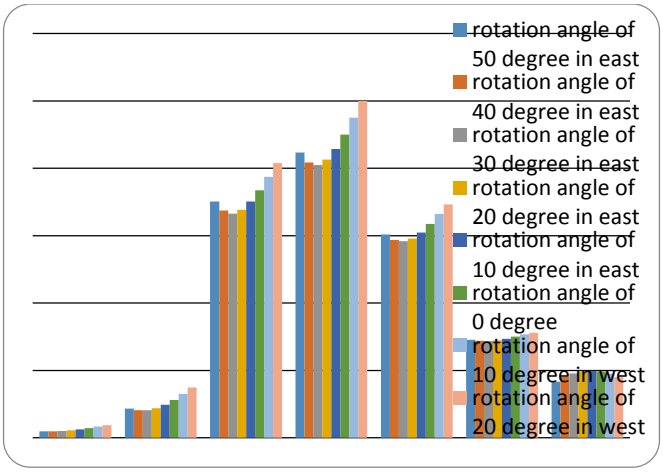
Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

Block 3 need the lowest cooling so as to make cool space in rotation the angles of 30 degree in East in June,July,Agust while we examined this block on that angles in the cohdest seasons of year.And the result was: block 3 in East decates the lowest heating in the angles of 20,30 degree in December,January,February ,March, while the rotation of angles of 0,10,20 degree in west,heating energy increases. .Thus, we reach from conclusion that in angles of 20,30 degree in East ,It needs in the lowest heating energy in December, January, February.And rotation of building in angle of 30 degree in East , conclude the lowest cooling in June,July,Agust

Fig 3 .block2

TABLE3 :Total(cooling , heating)



Identified Problems

The blocks comparison

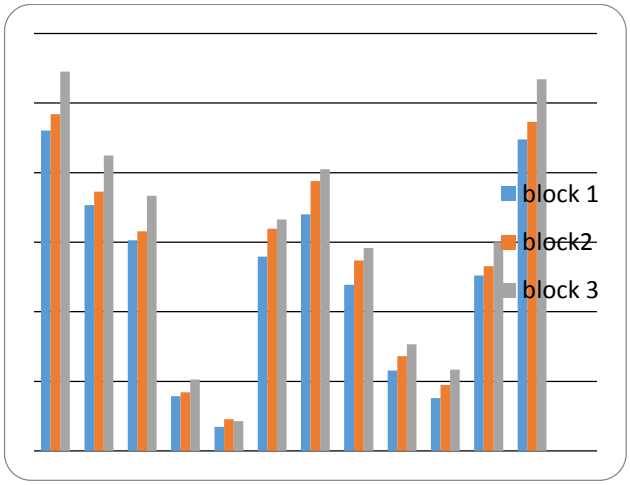
According to conclusions for this building , in comparison to blocks, we got that block 1 has the lowest and block3 has the most heating energy in all of the seasons of year especially in December ,January,February,March which need of heating energy is

Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

more.And block 1 has the lowest and block 3 has the most cooling in June,July,Agust.And finally according to investigation that based on these block,block1 has the best function interm of cooling and heating energy than two other blocks in angle of 30 degree and continue to top floors, the function of 3 block can be controlled in reciving efficient energy.

TABLE4: The blocks comparison



Steeped ecopy to west

We can determine from iran,s traditional building that un important spaces of house , which are located in some locality that are on west light . Because this light is the cause of extreme and hard heat in building .Thus they used steep level in floors in order to prevent arriving disturb lights that we will pay it next .

TABLE5:Steeped ecopy to west

Cooling energy	Heating energy	blocks
8	2092	Block2
8/04	3509	Block2
0	4449/26	Block1
0	4615	Block1
7/46	4900	Block3
10/13	526/07	Block3
0	4429	Block1
0	3428/8	Block1

Received 17/04/2018
Approved 10/06/2018

Revista Publicando, 5 No 15. (2). 2018, 953-964. ISSN 1390-9304

4/8	3626/12	Block2
3/7	3535	Block2
0	4369/1	Block1
0	2689	Block1
10/9	4719	Block2
9/7	2775/6	Block2
14/98	3971	Block3
15/8	4169	Block3
7/6	3167	Block2
5/13	5999	Block1

fig4. South elevantion

5. CONCLUSION

Uncontrolled use of fossil fuel caused disposing energy and breifly caused envirnoment pollution .Thus the designers should use passive construction ways that are very cheap but have enough output.So we can save the using of fossil fuel with more information of architecture designings methods .Some strenusous methods such as photovoltaic systems and etc…,could be used also, for instance : in plan of this building passive systems and harmony with the climate of region such as buildings rotation to the south light. On one hand disturbing winds in sport regions blows from south to south-west and on the other hand using of south light is important,thus with some buildings rotation and use of herbal covering in south and south –west that disturbing winds would be

Received 17/04/2018
Approved 10/06/2018

controlled. Tromb walls twhich are constructed to the south could play important role in saving and reflexing solar energy in to the building .The other thing is green roof :it is one of the factor in sustainable and ecological designing. This method would be effeithiol in cnstruct safe environment.Green roof has some more benefit such as decreesing heating effects, prevent from dust' s moving , sight comfort and etc. Using of this system, photovoltaic system is a creative way in aducating section of construction .Photovoltaic system is one of the direct system.for changing solar energy instead of electrical energy .In this method of design providing some places for talking and discussing are proposed. So we are try to use Ecotec program and plus energy to calcute the quantity of efficient energy which is recived from south . We hope, we have a limited role in designing these buildings which is based on saving efficient energy.

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Received 17/04/2018
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Received 17/04/2018
Approved 10/06/2018