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## An Pathology of Mehr Housing Projects of Jajarm County in Terms of Architecture, Climate and Urbanism Criteria

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### ABSTRACT

Observing the Climate, architecture and urbanism principles cause to construct the buildings with a great quality for living; besides it saves the energy and reduces waste it. Jajarm County is located in the dry and hot climate zoning. Designing of the structures and buildings in this region is subject to certain conditions. It's been tried to State the main factors causing the climate crisis, so (cold, heat, humidity, rainfall, etc.) and the ways to deal with it, and providing specific criteria for the construction in terms of architecture and urbanism in this area of the country and Mehr housing construction, which is currently one of the government's the major policies. In this study, we deal with the "the amount of Mehr housing projects compatibility in Jajarm county with the present regulations in terms of climatic, architecture and urbanism criteria". The objective of the study was to determine the extent compliance of done designs with architecture, urbanism and climate Criteria and standards and the present relationship between two studied variables; it means the climate and urbanism architecture in projects. Type of the present study is applied-scientific research and its method is descriptive- analytic. It's been applied two methods to collect the data: library method and field method. Finally, it's specified the amount and percentage of each criterion.

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## INTRODUCTION

Mehr housing project has been the largest project of the urban housing production and delivery in the country from 2010 to 2013. One of the most important aspects of the project is concentrating of government's investment in this sector, which includes facilities and to donate the land. As well as the huge amount of underway construction in the framework of the project make it much more important the significance of scientific and creative approach. On the other hand, more than 70 percent of the cities located in cities with populations of less than 25,000 (based on 2006), and the Special features of these cities make it very serious the requirement of special attention to project management, especially at the design phase.

Architecture has been over thousands of years and authenticity of quality values have shaped over the centuries and now these values are investigated. These values are very various. If we consider architecture as a phenomenon rooted in human and a means to meet his needs, then it appears to have one of the best ways to achieve this objective is observing the factor that time had no significant effect on the changing of need to it and Changes in human life and has not caused make in changes the form of this need.

As many other significant factors shaping the architecture in each generation has its own definitions, changing social, culture, history conditions, had a great influence on them.

People regardless of their geographic location and because they have almost the same physical properties, have comfortable conditions and feel comfortable in specific range of temperature and moisture. It also confirmed that original climate design compared with other elements of architecture, less influenced by environment and spatial beliefs. However the methods and tools to access it are different from one place to another due to the possibilities and circumstances. In Architecture of our country, Iran, considering to the climate and weather conditions and the architecture is fundamental element for the formation of living environments.

Despite of the advances in technology and invention of new software in the way human fight with naturally unfavorable factors it's still obviate the climate ruling in many parts of the earth. Generally the weather or climate has a significant role like geomorphology in the development and creation of human settlements; develop them or their different functions. As the early human was looking for food, water and shelter, where the

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climate was appropriate, basic living communities have created. According to natural conditions such as climate, in some cases, the human have experienced solidarity and prosperity of the great civilizations. One of the main causes of human life on the planet earth is the air, especially the weather, that's why the geographer consistently consider the climate as one of the basic elements of landscape and geographical. Today the weather as one of the most important subset of natural geography try to meet human needs or solve problems related to the weather and its effects. It has the special place in the plan, particularly in urban planning and this is the main focus of our discussion.

#### *Problem Statement:*

Development of modern city development and migration to cities and the need to accommodate surge crowds and organize the overflowing population in recent decades, even before the Islamic Revolution has attracted many statesmen thought, in this regard, many programs and projects, including the construction of new cities or urban land by the government in the form of land transfer has been performed. Mehr housing project is the largest project currently in production and supply of housing in the country. One very important aspect of this project is focusing on the bulk of public investment in this sector including loans and grants of land. On the other hand, 70% of cities in the country are located in towns with fewer than 25,000 (2006) shows the importance of them.

Among the striking point in this project is the family's privacy obligation, regard to the rules of architecture and urban and regional climate and widening passages. Unfortunately, this project is neglected deliberately or inadvertently, due to rapidly develop in most cases. Small spaces and massive built apartments and a great population, who are predominantly rural migrators, without education have the bad consequences. In this complex, the climate, architectural and urban details housing project in Jajarm County was investigated and how to take advantage of natural factors such as wind, raining, temperature, sunlight, and considering to them in climate architecture will be considered.

#### *The Importance and Necessity of Research:*

Construction of safety building which provide welfare for the public is very important. This building has the features, regulations and standards that should be observed during the design and construction. This study seems necessary to evaluate the design principles of the project (Mehr Housing of Jajarm County) in terms of climate, architecture, and urbanism.

#### *The General Objective:*

- Pathology of Mehr housing project in Jajarm County in terms of climate, architecture and urbanism criteria

#### *The Research Question:*

- How much in Mehr housing projects of Jajarm County it's been observed the architecture, climate, and urbanism criteria?

#### *The Research Method:*

In this study, the type of research is scientific-applied and analytical-descriptive method is used to analyze the data. To collect the necessary information and relationships two ways are applied: A - Library b – field. After collecting data by using the statistical methods to analyze the data are discussed.

#### *The Research Population:*

Our study population has the homogeneous and measurable characteristics.

#### *The Sample Size:*

According to Morgan table, our sample size is calculated as follows: The general size of statistical population N (units built in Mehr Housing Plan in Jajarm County): 1500 units

The sample size based on Morgan table S: 306 Units

#### *The Sampling Method:*

In this study, random, deliberate method or judgment from built units is used.

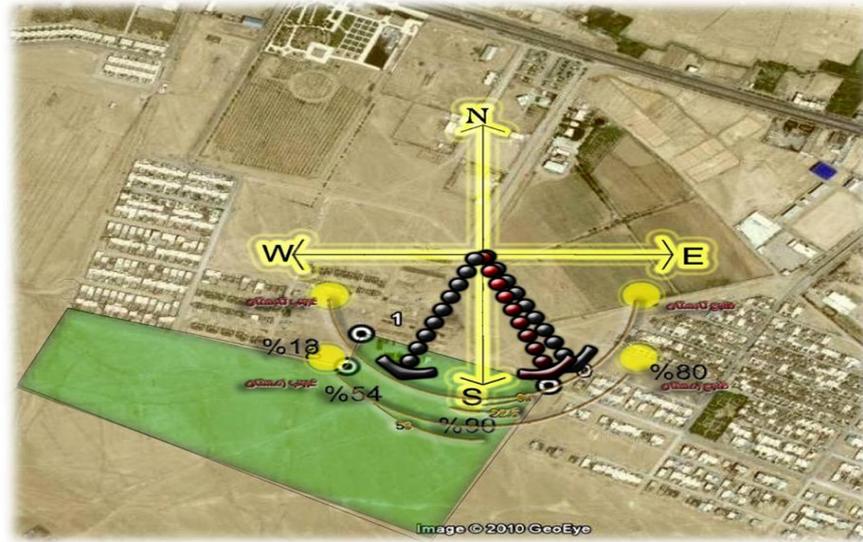
#### *Data Collection Tools:*

The first method of data collection in the research is applying the evidence of library and documentation and plans that are provided to the project consultants. The second method of data collection in the research is field visiting from Mehr housing project that one benefits of this approach is the accuracy and being measurable of the collected information.

*The Research Range:**Geographic position of the county:*

Jajarm County is located in south-western districts of Northern Khorasan and between 36 degrees and 57 minutes latitude (north) and 56 degrees, 23 minutes longitude (east). The county is restricted to Mane Smlqan County from north, Bojonrd from the North East and Sabzevar from the South East and Semnan from the south. The county has an area of 5955 square kilometers, equivalent to 4/2 the area of the province. It's located in 150 km southwest of BOJNURD and six kilometers of Garme County.

Research range is 22-hectare site on the suburb of Jajarm county with a population under 25,000 of North Khorasan Province.

*The Climate Studies:*

Weather conditions along with other environmental factors, are the most important factors in shaping urban contexts. Any human manipulation in the environment is subject to the climate too much. Considering the weather conditions in the preparation of urban plans is important in two respects: First, it can be evaluated the characteristics of climatic adaptation capabilities of humans in the environment and on the other hand, it can be created conditions favorable forms of spatial structures suit to climatic and with appropriate tools.

*The Elements of Climate:*

Factors that influence on the climate condition or on a region are called climate factors. Factors influencing on the Earth's climate, such as intensity of solar radiation at the Earth's surface, the Earth's axis tilt angle, air flow and geographic location (In terms of height above sea level) specifies the type and quality of weather in every region of the planet. In smaller scale, the factors include temperature (temperature), humidity, sun radiation, air flow (wind) in each region. As well as other factors influencing on the quality of the climate or local weather can be noted to geographical location in terms of ups and downs, physical location and type of land cover types in terms of the kind of construction of building (Fesharaki, 1995, 12).

*The Climate Plan:*

The climate plan a plan that will create as far as possible the natural environment suitable for users to as well as coordination with the surrounding natural environment and greater utilization of natural resources in place (Kasmaee 1990,38).

The term of implement climate design is a special construction method that its objective is to reduce heating and cooling costs by using natural energy flows for buildings (Ghobadiyan and Feiz-Mahdavi 2001, 46).

To fulfill this objective, the building should be investigated according to the climatic characteristics of the region. It should be over in two stages.

Investigating of the local weather conditions in terms of the human comfort Structural design of buildings (purpose of building structure is such things as dimensions of building and its size, type of windows, the size of window, etc.) (Alijani 1997, 40-45).

The climate designing has gone beyond of building design. The Important point to understand the architecture of each region is getting informed how the building complies with the specific climate of the region. How the building applies from the sun, wind and green space and how the architect creates micro weather climate. All this are for a sign of climate design.

*The Major Objectives of Climate Designing:*

For all different climates of the country can determine 12 major total objectives as follows:

- Reducing heat wasting of the building
- Reducing the Wind effects on heat wasting of the building
- Utilization of solar energy for heating buildings
- Hot air out of the building
- Protection of the building against to sun exposure
- Utilization of the daily fluctuations temperature
- Utilization of the outside appropriate condition
- Curran created the interior spaces
- Increasing of humidity
- To avoid the increasing of humidity
- Building protection against to raining
- Reducing the effect of dusty winds on the building (Kasmaee, 1992, 262).

*Features of Dry and Hot Climate Area (studied area):*

Category 3 includes group 5 zonation and contains a central desert area of land and Zagros and Alborz Mountains. This area include East Esfehan province, a major part of Yazd province, central part of the Fars province, parts of the Kerman province, and north parts of Semnan province and some parts of Khorasan Razavi and South Khorasan and Northern Khorasan (Jajarm county) provinces. This area has relatively cold winters and hot dry summers. Table 2-15 shows the climate Designing Criteria in this area. Also this area is presented in Figure 2-29. General schema of Figure 2-30 shows the most important for the climate criteria in this area.

**Table 2-8:** climate Designing criteria in regional (hot and dry desert)

resource	action	prior ity	regulations	category
308-1	The building stretches from east to west	1	Utilization of solar energy for heating the buildings	Hot, dry desert
308-1	Application of vertical windows on the south side			
308-1	The application of building materials with high thermal capacity			
308-1	Deployment of the building in direction of the maximum solar radiation			
305-1	Intensive and concentrated plan	1	Reduction of heat wasting of the building	
305-1	Prediction of less important spaces - Parking and warehouse -in the wall			
305-1	The application of connected walls (contiguous context)			
305-1	The application of heat insulation in external wall and roofing			
305-1	Application of two layers window			
305-1	Avoid creating large windows on the northern side			
309-1	Application of trees around the building	1	Building protection against sun exposure	
309-1	The building stretches from east to west			
309-1	Application of awning appropriate external			
309-1	Prediction of less important spaces - Parking and warehouse - in West			
311-1	The construction a part of the building into the ground (preferably Services)	2	Utilization of the daily fluctuations in air temperature	
311-1	The applying of building materials with high thermal capacity			
311-1	Applying of integrated Heaters external surfaces			
307-1	To build the entrance back to building to the wind above the ground			
307-1	To seem all opening			
309-1	Applying of heat insulation in roof			
309-1	applying a small double layer windows	3	Protection against the heat of air out	
314-1	Observing to north wind direction when constructing the building			
313-1	To create foundation and green space around the building	4	Increasing of humidity	

Requirements	
Observing the National regulations issues	General criteria
Conformity of north direction of the preparation map with architectural map	
Compliance architecture design with preparation plan (dimensions, availability ...)	
Offer full architectural plans with complete specifications of phase 1	
The observance of minimum size (50 square meters)	
Select the type of structure (rather than the construction of new structures)	Layer and viewing
The lack to install the air conditioner, heater and exposed pipes on the exterior	
The lack of implementation of projection on the transition	Parking and external access
Providing the required number of parking per unit area	
Observing to parking criteria (ramp slope, the minimum height of a ramp ...)	
the remaining outdoor parking in terms of parking deployment (according to regulations)	
Dimensions of parking and circulation space predict	
Compliance minimum width of stairs room (2.30 m)	
Observing the number of stairs to access to the floors	
Observing lack of ...of stairs	
Prediction of the elevator (if needed)	
Observe the appropriate size of the hole and a cabin (according to capacity requirements)	
Observing the minimum width of the entrance door (1.10 m)	
Observing of the minimum entrance hallway width (proportional to the number of units)	
To Create at least 2 sets of stairs in complex over 5 floors with 4 units per floor	
Providing the Disabled access to the ground floor facilities	
Observing to Qable direction in furniture services	Spatial quality
The existence of radiation in climate categories 1,2,3	Sky lighting
Compliance of appropriate dimensions of sky lightings	
Observing the confidentiality of in skylight (distance / location of the skylight, and ...)	
Possibility of living room air conditioning (opening to outdoor)	
Observing to structural limitation of openings	
Diagraph shape of room and prediction of seam	

*Urban Criteria Considered in This Study:*

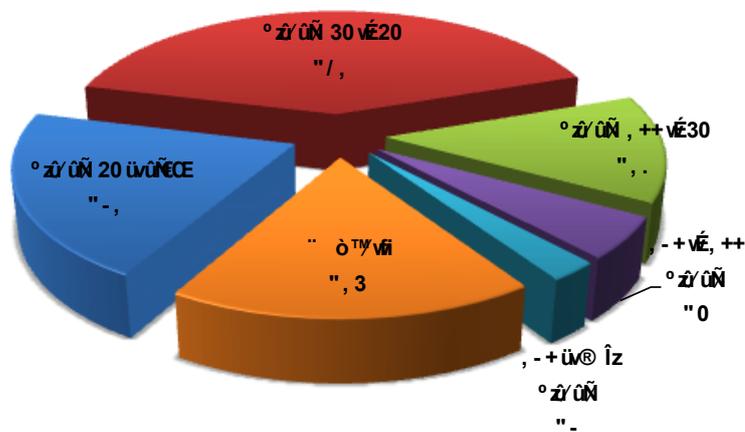
- Internal urban roads
- Structural characteristics of passages
- The role of slop in urban planning
- Providing the service applications
- Observing the network hierarchy
- Observing to the Iranian-Islamic Architectural and urbanism patterns - in terms of urbanism criteria
- Observing the landscapes
- Observing to create a sense of belonging to the place

*The General Investigating of Samples Size:*

According to the provided information of complete check lists for each unit (our sample size is 306 based on Morgan table) our statistical population is 1500 Mehr housing units in Jajarm County.

*Quantitative Features of the Investigated Projects:*

Generally, the investigated projects include about 22 acres of land. Maximum the designed lands is 200 square meters



*Evaluated Criteria in Architecture and Urbanism Climatic:*

Criteria of urbanism part and the related weighting coefficients

Approximately 45 criteria have been investigated in the urban sector. Investigated criteria is considered with a weighting Coefficient and presented in Table 3-1.

*The Criteria of Climate Architecture Part and Corresponding Weighting Coefficients*

In the climate architecture part, much greater number of criteria and consequently the classification is done in more categories. Criteria of architecture sections, which are about 110 projects, have been evaluated in terms of these criteria. In Table 4-2, the criteria of architecture sector along with the corresponding classification and weighting coefficients for each criterion are presented. It is also necessary to note that one of the issues considered in the determination of weighting coefficients has been ignoring some of the issues and design principles. In other words, sometimes the lack of consideration of a measure designing on the part of many designers, can cause hot spots and the increasing the importance of the criteria. That's why the failure to observe some certain standards among the designing population, cause the increasing the weighting coefficient of that measure in assessments.

*General Assessment of Projects:*

*The general result of the projects assessments in the urbanism sector:*

According to the General assessments, and considering that the Jajarm County is located in category 3, the final project rating in terms of criteria of the Urban Development Department has been calculated equal to 49.1 percent. Also, in the urbanism sub-sections, the points of access to the city is equal with 16.7 percent, 59.8 percent and score points of urban application is equal to urban space system , equal to 71.2 per cent. In Table 4-3 in each the main groups is provided.

The last Point of Urbanism Department	Total score of urban space system	Total score of urban application system	Total score of urban access system
49.1	71.2	59.8	16.7

Among the criteria examined, the lowest score is related to the fit (in fact, mismatch) medical and administrative application. However, there is this case with a slightly less intense for business and sports application. Other criteria with lowest rating are given to the stretches of visual cues, according to the urban area in terms of population and application area, observing to dead-end streets and long passages.

On the other hand, the best condition in urbanism sector in connection with the observance of standards and uncertainty radius winter shading, general observing of the minimum area of service functions, Applicability of the piece direction with land range is visible.

The important point in this context is that at low points in the urbanism sector projects, it seems that the qualitative aspects have been little under attention. This can be seen in the absence of spatial planning and analysis capabilities within the bulk of professionals of urbanism planning and restriction of the urban design professionals in the preparation of plans, and urban development plans.

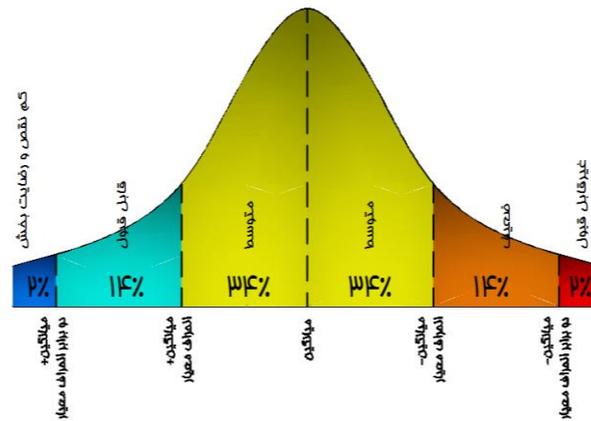
*The General Result of the Projects Assessments in Architecture Sector:*

The final score of the projects in terms of the criteria of architectural projects is equal to 76.3 percent based on the assessment of all projects. Also in Architecture sub-sections, score of the public affairs is 100%, 80.8 percentage points for parking and building access, internal circulation score 84.3%, the score of dimensions and proportions Spaces 69.4%, 95.9 percentage points for sky lighting system, 50%, for architectural issues in other aspects and the score of structure and facilities aspects, equal to 65.9% has been calculated. Table 4-4 it's been presented the score of each sub-sectors of main architecture group.

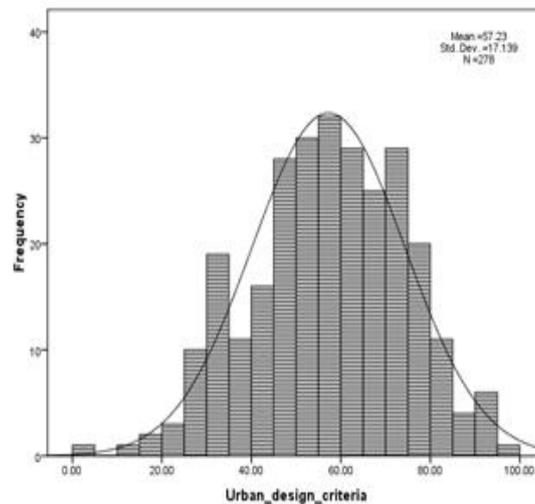
The final architecture score	Structural and installation aspects of architecture	Other architectural issues	The sky lighting system	The dimensions and proportions of an architectural space	Internal circulation	Parking and access to the building	General issues of Architecture
76.3	65.9	50	95.9	69.4	84.3	80.8	100

*Conclusion:*

One of the criteria of sample population assessment is investigation of the distribution of scores in the statistical population compared to the normal population. In fact, the normal population is assumed distribution of members including a bell shape (Figure No. 5-1). In such society, if the scores are divided by the standard deviation to the mean, about 2% are located in sector "the average + twice the standard deviation". Also, 14 percent in the next section and 68 percent are located in the middle part of the diagram.

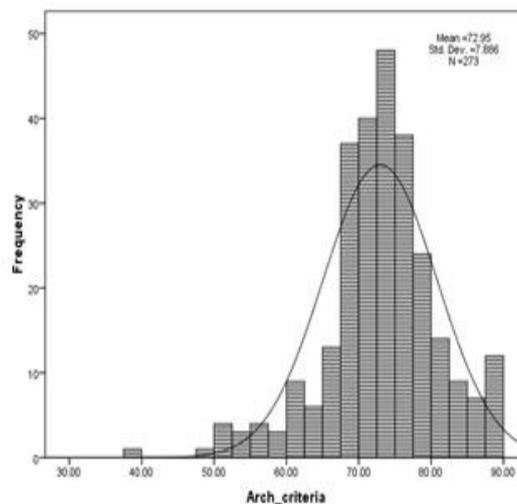


By Askalvgram charting the distribution of the final scores of projects in the urban sector, as well as by testing Kvlmvgvrvf - Smirnov (on the software environment SPSS) it's observed that this sector with the significant coefficient of 2/0, is normally distributed. Askalvgram diagram in Figure 5-2 illustrates the distribution of the projects scores in Urbanism Department.



On the other hand, it can be seen that the distribution is close to normal distribution by examining the distribution of the project points that. Then, in the urban sector, regardless of the level and quality of the whole project a balanced distribution of weak, medium and strong projects is studied.

Contrary to the urban sector, the distribution of points in the architecture sector is not normal at all. And also it's observed by chart review that frequency rates are also out of normal.



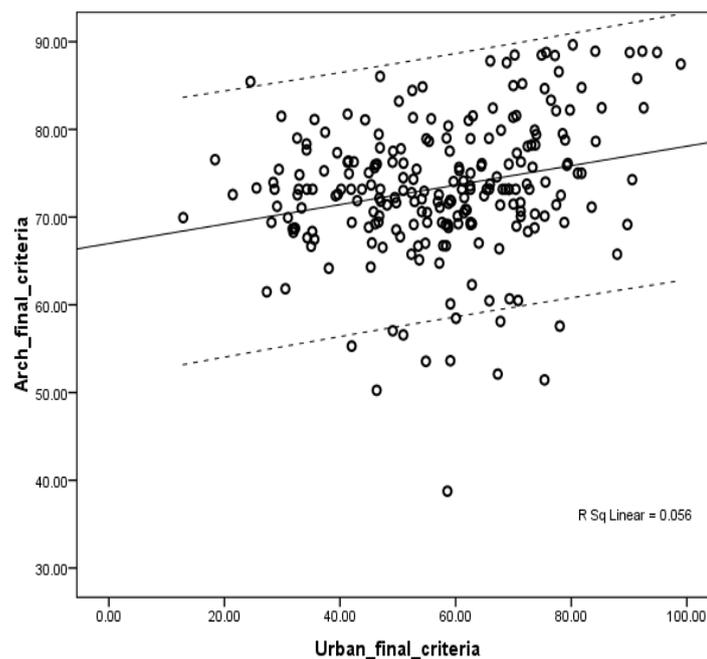
Then it can be concluded that the abnormal distribution of the architecture sector scores among the project that at first the number average of designers in architecture sector is significant. It should be noted that this should be viewed as an opportunity. Since the increasing of educational resources, including editing and publishing of the design criteria and courses and learning workshops, especially this volume can be advanced among experts.

The second point in the analysis of non-normal distribution of architecture sector is that the very weak contribution is also higher than normal. In this context it is necessary by identification of the critical points it's been investigated very poorly, enhancing the quality of expert designers. Then, the second hypothesis is confirmed.

#### *The Relationship between Architecture and Urbanism Score:*

Another problem of the statistical information is comparing the final score of projects in two urban and architectural sectors.

By analyzing the correlation between the two variables, the final score and final score of urbanism and final score of reviewed projects architecture it's observed that there is a significant relationship. However, the correlation coefficient ( $r$ ) and coefficient of determination ( $r^2$ ) in this relationship is very limited and is based on the Pearson correlation are respectively 0.238 and 0.056.



#### *Collecting and Conclusions of the Studies and to Identify Proposed Policy and Packages:*

Regular and targeted training courses at relatively intensive courses (design workshops in different parts with different classes) in order to strengthen the technical knowledge of experts

Applying of management services of the project in the selection of consultants, leading the consultant in providing of the design and delivery of project documentations

To create management structure within Iso quality patterns and relied on the check lists based on the regulations of plans preparation In order to structure the process (selection of consultants, preparation of plans, delivery of documents, designs, project management, etc.)

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