Analytic network process model to analyze and identify the risks associated with green building projects

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Abstract: The issue of green buildings ensures physical and mental health of human beings. Green buildings can destroy the future of the earth, which seems to be saved. Risk management is the systematic application of management policies, procedures and processes related to the activities of analysis, assessment and control of risks. Risk management is the process of documenting the final decision and identifies and implements measures that can be used to bring the risk to an acceptable level. In this study, our main objective is to assess and identify risks and effective and provide an analytic network process model for ranking risks of green construction projects. The purpose of this method is to focus the attention of management in achieving the project objectives. In this research, the study of literature review has identified risks using statistical analysis to identify the effectiveness of the process using network analysis to prioritize them as possible. According to the graph, and the final weight was obtained using standard software SUPER DECISION unpredictable delays, weighing 0.353 followed by the financial and macroeconomic problems weighing 0.260 and 0.141 weight has a high internal chaos and the main risks are the respective weights.

[Yaser Farajiasl. **Analytic network process model to analyze and identify the risks associated with green building projects.** *Researcher* 2015;7(2):12-15]. (ISSN: 1553-9865). http://www.sciencepub.net/researcher. 3

Key words: risk management, green building, analytic network process

1. Introduction

In today's tumultuous world where every minute on the number and size of residential and office buildings and structures is increased, according to the website of urbanism and architecture for more than a quarter of cultivated lands and forests are damaged and dry, according to the house of the factory, two-thirds of the building materials used in building various causes destruction and loss of energy and groundwater resources have been unthinkable.

If you want to see the same rate that we have to continue to move, the next few years' humanity will not tolerate any other land, because of its limited resources to complete all the work will not remain beautiful forests and oceans. Green building is the most important issue is to ensure the physical and mental health of human beings.

Green buildings can destroy the future of the earth, which seems to be save and to future generations the opportunity to live with comfort and relaxation.

Green buildings are buildings that certain principles of design, energy efficiency, strength, etc. are defined in the standard. Green building is the building with the least pollution and intervention in the environment. However, only one of the four walls of the building, but must pay attention to all the details to be both efficient and beautiful. For green building projects are the risks that have been identified as priority and if necessary take them down.

Our overall goals green building project risk identification, risk rating, and determine which are most effective. The results of this research can be conducted in a green building project risks reduced and it eventually leads to structures that are more durable and more robust, higher reliability and lower costs for manufacturers and those who exploit them are imposed. Prepare a checklist of risk factors and prioritization of these factors is the main advantage, the primary focus of the study due to limited time and resources to focus on the risks that have the most influence on the success and prevents the loss of resources and to reduce the likelihood of successful green building projects. Special attention to the climatic conditions of our practical purposes and to the use of green building materials market in the most important features plan, In addition, the use of ambient temperature and the use of natural light in the design, the findings of this project are distinct from other studies.

It was said that the aim of the research is to identify risks affecting green building projects and with regard to the identification of risks in the first step is to meet and surmount them, is important. Another objective of prioritizing the identified risks on the basis of effectiveness, as was the ANP method was proposed for the evaluation.

This paper describes the standards for risk management and risk management why the project is important. And then to examine the risk factors discussed in construction projects and theoretical research and research background in the field

provided.

The buildings have a serious impact on the environment if they are not under the control and supervision, irreversible damage to human life will be. Green buildings are not only beneficial and pure natural resource consumption, but also significant changes in climate will create. The need for green building projects over the past felt.

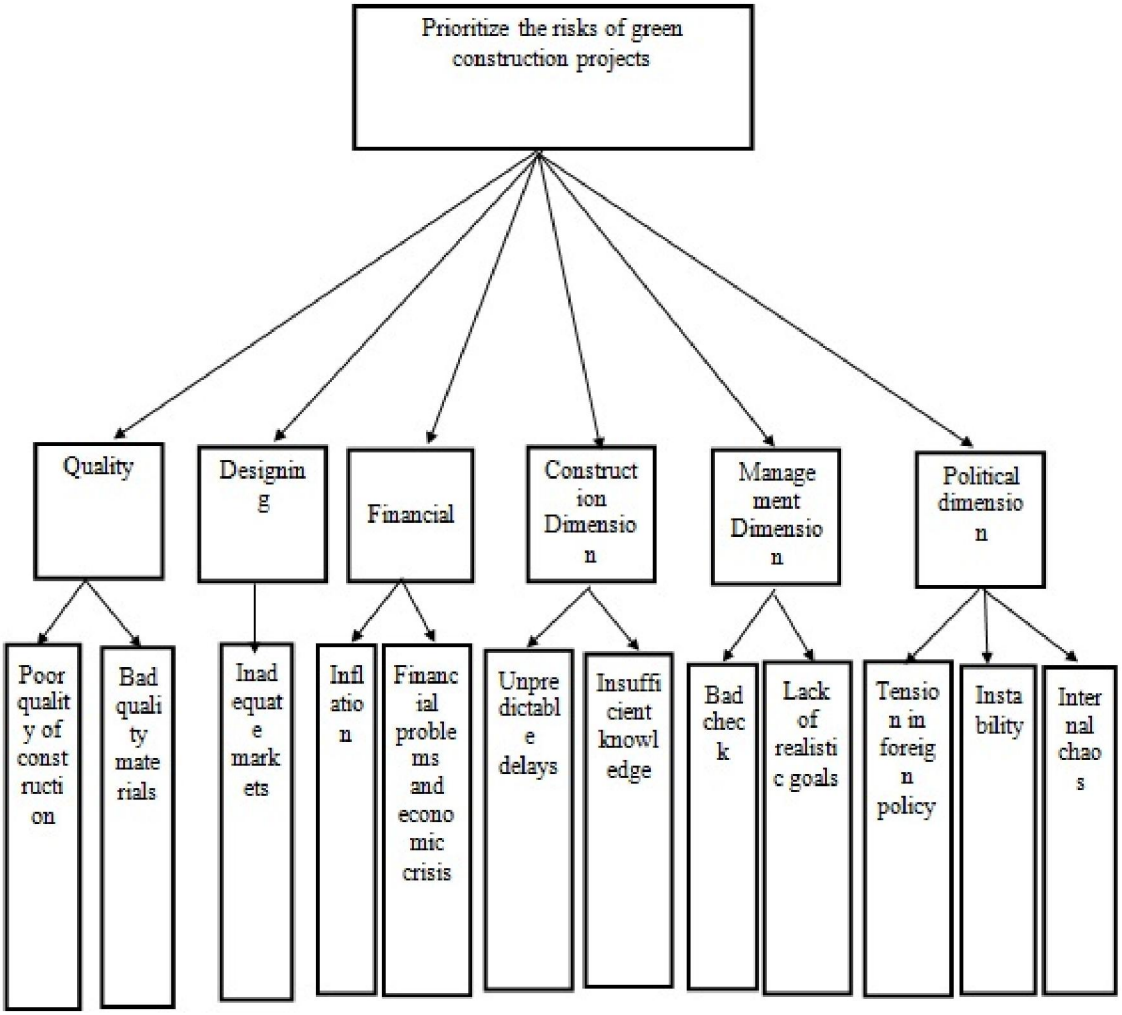
Benefits of green buildings include:

- Reducing energy consumption and related fuels
- Reduce greenhouse gas emissions
- Reducing energy consumption per unit building
- Clean and beneficial use of natural resources
- The use of non-industrial water
- Use of recycled materials

Risk management is the systematic application of management policies, procedures and processes related to the activities of analysis, assessment and control of risks. Risk management is the process of documenting the final decision and identifies and implements measures that can be used to bring the risk to an acceptable level.

Risk Project, a non-deterministic event is likely to occur if the project outcomes and goals, positive impacts (opportunities) or negative (threats). Identify project risks can have a huge impact on the success of the project. Identified risks and the risk analysis used. While there are several methods to analyze the risk of project managers, using a variety of other approaches to decision-making process based on matrix prefer. Successful project managers in relation to their needs, with open lines of communication throughout their organization are so important.

In this study, the main objective is to assess and identify risks related to the effective and provide an analytic network process model for ranking risks of construction projects. The purpose of this focus is the attention of management in achieving the objectives of the project.



Basic and applied research can be based on objective. The aim of our research is a descriptive-survey research.

In this study, we designed a questionnaire with Likert range of 5 options. And 50 experts from construction projects, including contractors, consultants, employers and distributed according to the size of the population and the uncertainty of the simple random sampling method was used and the number of 50 experts, the sample was selected.

And experts are asked about the impact of relevant criteria. The majority of respondents were 54 to 58 years. 40% have a Bachelor's degree and 80% of respondents were male. The questionnaire safety standards, social, political, administrative, manufacturing, finance, equipment, design, quality and external factors are vital. Each of the risks associated with the sub total of the questionnaire with 37 questions. In order to identify the most important risk existing data into Excel using SPSS software we've done a statistical analysis. Since the validity of the questionnaire was confirmed by experts, the reliability was assessed by Cronbach's alpha, and as the data obtained Cronbach's alpha value for each factor of 0.7 and 0.92 for the total scale and since Cronbach's alpha values greater than 0.7 indicate the reliability of the questionnaire is obtained. The questionnaire should be valid. Then determined for normal and non-normal data (normal and abnormal criteria of the criteria) Kolmogorov-Smirnov test (KS) test is important. Since these tests were conducted at the 0.05 level, if the sig value or the p-value for this test is less than 0.05, data normality assumption is rejected. Since the P-value of all variables (criteria) is higher than 0.05, therefore, all variables are normally distributed and the effectiveness of their given that these variables are normally distributed, we used the t test.

And the P-value of all ancillary variables (the scales) is less than 0.05, so all sub intended not follow a normal distribution with a non-normal distribution, respectively. Therefore, we used the Wilcoxon test for the effectiveness of each of the sub. At the end of the standard 37 sub-criteria; 12 criteria and sub criteria impressive final show in Fig.

The 12 sub-criteria for analysis were selected by ANP. Matrix of interdependent criteria to each other, each sub interdependence; paired comparison based on objective criteria, the test criteria according to their interdependence with controlling each dimension of comparison for each sub-test main dimensions to compare paired sub interdependent with each of our sub form.

Name	Graphic	Ideals	Normals	Raw
BD		0.400709	0.141784	0.141784
BQ		0.029266	0.010355	0.010355
CO		0.063396	0.022432	0.022432
FN		0.736777	0.260697	0.260697
G		0.193470	0.068456	0.068456
IN		0.201548	0.071314	0.071314
IS		0.052651	0.018630	0.018630
K		0.018774	0.006643	0.006643
P		1.000000	0.353834	0.353834
SO		0.098191	0.034743	0.034743
SQ		0.004181	0.001479	0.001479
T		0.027221	0.009632	0.009632

Analyzes were performed using the software SUPER DECISION As the final of the criteria specified in the following priority:

Criteria for unpredictable delays, weighing 0.353 and 0.260 weight followed by macroeconomic and financial problem and internal disorder associated with a weight of 0.141 has the highest weight is the most important risks.

Suggestions:

• It's possible to use method of TOPSIS, ELECTRE important to prioritize risk.

• Since the expert opinion may be subject to uncertainty, fuzzy data can also be considered.

• You can use the techniques of dynamic systems to investigate the sensitivity analysis of variables influencing variables and how to use it.

• Since the measure of unpredictable delay has the highest weight is concerned, in other words, the most important known risk. Because the most important project activities are critical activities that delayed the entire project delayed. Thus, if these activities are identified and timely start and be completed on time delay to zero.

• To avoid financial problems and macroeconomics, foreign investors should be looking for, as well as through financial support through the capital market to prevent the emergence of this problem.

1/29/2015

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