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Prioritizing tourist type in Nepal: Application of the Saaty
Method (MCDM)

Bachelor Thesis

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Thesis title

Prioritizing tourist type in Nepal: Application of the Saaty Method (MCDM)

Objectives of thesis

Main objective of the thesis is to prioritize the types of tourists using Multi-criteria decision making approach (Saaty Method) by analysing major selected opportunity for the development of Nepal through tourism sector.

Partial goals of the thesis are as follows:

- to make literature review of tourism in Nepal,
- to make literature review of Multi-criteria decision making,
- to understand the role and potential of tourism in Nepal through swot analysis,
- to describe the role of tourist type and respective opportunities ,
- and to calculate the weights for respective tourist types.

Methodology

First part of the thesis will be carrying information on tourism in Nepal and Saaty method. Second part of the thesis will be focused on selecting alternatives and criteria for the tourist types and opportunity respectively.

The practical part will consist of questionnaire survey both online and face to face interview. Saaty method will be used to interpret the data to calculate the respective weights. Conclusion will be made based on the synthesis of theoretical knowledge and results of practical part.

The proposed extent of the thesis

Approx 40-50 pages

Keywords

Nepal, tourism sector, Saaty method, pairwise comparison, normalization.

Recommended information sources

- A Study On the Effectiveness Of Investment In Tourism Infrastructure Development Project (Final report), Central department of economics at Tribhuvan University, Kathmandu (at: http://www.npc.gov.np/new/uploadedFiles/allFiles/A_Study_On_the_Effectiveness_Of_Investment_In_Tourism_Infrastructure_Development_Project.pdf)
- NEPAL TOURISM STATISTICS 2012, Ministry of Culture, Tourism & Civil Aviation, Kathmandu (at <http://www.tourism.gov.np/uploaded/TourismStat2012.pdf>)
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- Saaty, T. L. (1977). "A scaling method for priorities in hierarchical structures". 234-281.

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Declaration

I declare that I have worked on my bachelor thesis titled “Prioritizing tourist type in Nepal: Application of the Saaty Method (MCDM)” by myself and I have used only the sources that are mentioned on the references of this thesis.

In Prague 11/24/2015

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Prioritizing tourist type in Nepal: Application of the
Saaty Method (MCDM)

Určení prioritních skupin turistů v Nepálu, za použití
Saaty metody (MCDM)

Abstract

The purpose of this thesis is to prioritize the types of tourists using Multi-criteria decision making approach (Saaty Method) by analysing major selected opportunity for the development of Nepal through tourism sector. This thesis provides all general information for using Analytic Hierarchy Process (AHP) for making a decision on unidimensional scale.

Multiple pairwise comparison has been made between the criteria and alternatives. The scale of ranking to prioritize and a degree of consistency for handling the error terms has been measured for each pairwise comparison as proposed by Thomas L. Saaty on 1970s. After calculating the average of all utility from the comparisons, the total weights for all alternative were calculated. Among the four alternatives, adventure tourist got the highest priority whereas religious tourist got the lowest priority.

Keywords: Nepal, tourism sector, Saaty method, pairwise comparison, normalization.

Abstrakt

Tato práce má za úkol určit prioritní skupiny turistů a jejich přínos pro rozvoj Nepálu prostřednictvím cestovního ruchu. Přínos turistů se určuje na základě analýzy více kritérií za pomoci srovnávací metody (Saaty). V této práci jsou uvedeny veškeré obecné informace pro použití Analytic Hierarchy Process (AHP) pro určení jednotného měřítka.

Mezi všemi možnostmi a kritérii bylo provedeno několik párových srovnání. Pro stanovení pořadí důležitosti daných priorit a stupně jednotnosti pro zpracování chybových podmínek byla použita metoda srovnání podle Thomas L. Saatyho z let 1970. Po vypočítání průměrného přínosu bylo vypočteno pořadí všech zvolených alternativ. Na první pozici se tak dostal turista cestující za dobrodružstvím, zatímco turista cestující za náboženstvím je nejmenším přínosem pro cestovní ruch.

Klíčová slova: Nepál, turistický ruch, metoda Saaty, párové srovnávání, normalizace.

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1 Introduction

After a decade of civil war (1996 to 2006), led by Maoist took more than 15000 lives and many other casualties, was ended to draft a constitution to be written by representatives of the people. On September 20, 2015, Nepal got the new constitution addressed by the elected political representatives through people of Nepal demolishing the centuries of autocratic rule. Now the Nepal government does have even bigger challenges and serious scenario in terms of economic growth. GNI per capita as of 2014 of Nepal is only 750\$ which is half as of India (1500 \$) (World Development Indicators, The World Bank, 2015).

The economy of Nepal has already become a catastrophe after the powerful earthquake stroked Nepal on April 20th 2015 and furthermore the economic blockade from the southern border of Nepal to India has put obstacles in the growth of economy already. The Nepal government must find a better solution and make a better decision on the behalf of ongoing crisis and problems that has been the root problems for the failure in economic growth. The new government formed after the constitutional assembly are heading towards finding a solution that will perhaps give all people of Nepal a hope to be happy and look after the opportunities of growth and development of Nepal.

Nepal needs to wake up now if not it will be too late. Nepal government must allocate all the funds and resources for the economic growth of Nepal. However, being a least developed country, Nepal mightn't have enough resources and budget to promote every sector of the country. In this case, there might be in need of some decision making process to prioritize the most important aspects of Nepal. In this situation, Nepal government must give more priority in the tourism sector for being one of the major economic sector of Nepal.

Tourism plays a very vital role in Nepal as it is a largest industry in Nepal and largest source of foreign exchange and revenue. Tourism is one of the main largest sources of economic

sustenance in Nepal after agriculture. Many people depend on incoming of foreign tourist for their livelihood. Hence, the income from tourism can be utilised in different aspect to make the development of country as it can be utilized in better education, infrastructure etc. Tourism also helps in exchange of cultures. Tourism industry is seen as a way to alleviate poverty and achieve greater equity in the country. The prioritization can be further breakdown on promoting of certain types of tourist. As of today's economy of Nepal, Nepal government might not be able to allocate budget to promote all types of tourist at once. It can be done by focusing only to the main type of tourist that are most crucial for the economic development of Nepal.

This thesis mainly focus on the prioritization of tourist types in Nepal following the very famous mulita-criteria decision making tool known as Analytic Hierarchy Process(AHP) or Saaty Method. Thomas Saaty proposed AHP which is based on building hierarchy of decision categorised as alternatives and criteria using multiple comparison between each pair of alternatives or criteria represented in a matrix form (Saaty, 1980).

2 Objectives and Methodology

The main objective of the thesis is to prioritize the types of tourists using Multi-criteria decision making approach (Saaty Method) by analysing major selected opportunity for the development of Nepal through tourism sector.

Partial goals of the thesis are as follows:

- to make literature review of tourism in Nepal,
- to make literature review of Multi-criteria decision making,
- to understand the role and potential of tourism in Nepal through swot analysis,
- to describe the role of tourist type and respective opportunities,
- and to calculate the weights for respective tourist types.

First part of the thesis will be carrying information on tourism in Nepal and Saaty method. Second part of the thesis will be focused on selecting alternatives and criteria for the tourist types and opportunity respectively. The face to face interview and Survey was done to collect the data. After collection of sufficient data, the analytical hierarchical process (AHP) or Saaty method was used to get the desire goals.

For this study, online monkey survey tool and Microsoft Excel programme has been applied. Pairwise comparison of the criterion and alternatives was analysed in Microsoft excel programme and at last Saaty method (AHP) was used to interpret and calculate the respective weights from the data. Conclusion are based on the synthesis of theoretical knowledge and results of practical part.

3 Literature Review

3.1 Basic terminology

3.1.1 Alternative

It is a choice between two or more possibilities and also defined as mutually exclusive (Beavon, 2005). There might be different alternatives when there comes to make a decision, which one to choose or which one to discard is the main concern in any decision making process. In modern practices, alternatives are judged along with the related criteria using pairwise comparison, ranking method and so on.

3.1.2 Criterion

The choice of an alternative is influenced by the selection of criteria for obtaining the desired goals in a decision making process (Ishizaka A. & Nemery P., 2013). The selection of right criteria is equally important to extract the weights for choosing an alternative. Criterion is often referred as a basis on which decision may be based. At first, AHP works by formulating priorities for both alternatives and the criteria that are used to judge related alternatives. The criteria are measured on the basis of different scales for both quantitative and qualitative measures (Saaty, 1977).

3.1.3 Weight

AHP works as a unidimensional scaling problem transforming multidimensional scales into one. (Saaty) It works with both tangible and intangible scales of measurement. To make a certain priorities, each alternative and criterion is give a certain scale of weight regarding their importance and is based on pairwise assessments using judgments. The alternative with the highest weight means the most important one in the decision making process (Saaty T.L & vargas L.G, 2000).

3.1.4 Multi Criteria Decision Making

The decision making process is concerned of making quality decision based on the qualitative and quantitative analysis of given attributes for a desired goals. What makes MCDM complex is the plurality of the criteria involved in the problem (Tabucanon, 1988). While making of decision using this method normally depends on the procedures for scoring alternatives, discovering relevant criteria, weighting the criteria and not the least, for structuring the criteria trees (Bruga, 2004).

Many decision making process is a conflicting ones. Some alternatives are better in some criteria and other alternatives may be better in other criteria. It's a personal choice according to the preferences (Haines, 2000). Dealing with Multiple Criteria deciding (MCDM) issues involves following key steps (Malczewcki, 1999).

Setting up Goals: Each decision making process is required to have its goals to be fulfilled.

Identification of the downside/issue: Decision-makers ought to determine the character of the analysis problem. They need to confirm specifically those criteria to be thought-about and that decision-making ways needs to be adopted.

Problem structuring: Experts in decision making helps to determine the goals, values, constraints, external setting, key issues, uncertainties and stakeholders of this enterprise. During this step, we want to gather the acceptable information or info in order that the preferences of decision-makers will be properly known and regarded.

Model building: Experts then specify the alternatives, construct criteria and the model for the preferences. This method permits them to compile a group of doable alternatives or ways so as to ensure that the goals are going to be achieved.

Using the model to test and challenge established thinking: Experts collect and synthesize info, challenge people's intuition and recommend their decision for a new alternative and study the strength and effectiveness of model.

Developing associated action plan: At last, an associated action plan is set up and a decision is made on what alternative is to be prioritized.

3.2 Introduction to Saaty Method

3.3 Analytical Hierarchy Process

The Analytical Hierarchy Process (AHP) is a method proposed by Thomas L. Saaty in the 1970s for solving decision making when having multiple attributes or criteria. The AHP is a decision making process which provides the objective mathematics to process multidimensional scaled elements into a unidimensional scale to select the best alternative with the preferences of an individual or a group of decision makers. Golden et al. (1989) describes AHP as

“a method of breaking down a complex, unstructured situation into its component parts; arranging these parts, or variables, into a hierarchic order; assigning numerical values to subjective judgments on the relative importance of each variable; and synthesizing the judgments to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation” (Golden et al., 1989).

At first, AHP works by setting the priorities for alternatives and the criteria that are used to choose the respective alternative based on desired goals (Saaty, 1977). During this process, relevant criteria are used by giving certain ranking scales on them whereas irrelevant criteria are eliminated from the process by the decision makers. After getting the required alternatives and criteria, pairwise comparison is made on them by putting them in a matrix form and scaling them or weighting them on a given ratio form 1-9 (Saaty, 1977). The fundamental scale of absolute numbers is given below:

Table 1: The fundamental scale of absolute numbers (Saaty, 1977)

Intensity of Importance	Definitions
1	Equal Importance
3	Moderated importance
5	Strong importance
7	Very strong or demonstrated importance
9	Extreme importance
2,4,6,8	Intermediate values between to adjust judgments
Reciprocals of Above	If activity i has one of the above non-zero numbers assigned to it then activity j at adjacent diagonal will have reciprocals value when compared with i.

For a given set of alternatives that needs to be weighted can be given as:

$$X = (x_1, x_2, \dots, x_n) \dots \dots \dots (1.1)$$

After alternatives are provided with a weight vector by decision makers, it can be expressed as:

$$w = (w_1, w_2, \dots, w_n)^T \dots \dots \dots (1.2)$$

Where w_i represents a value which gives a direct proportional to the score of alternative x_i . That means, greater the value of w_i , better will be the i^{th} alternative. An alternative is preferred over another, if w_i is greater than the other (Saaty, 1977).

3.4 Pairwise Comparison Reciprocal Matrix

Comparing a large number of alternatives might be a complicated one and a decision maker often do have a problem in solving the decision making task. So, use of pairwise comparison has been used to overcome the problem and to make the decision making process more

effective and efficient. Hence, the aim of the method is to decompose the problem into smaller sub problems and solve these latter ones.

At first, the pairwise comparisons of both alternatives and criteria are made into a pairwise comparison matrix, $A = (a_{ij})_{n \times n}$, expressed as given

$$A = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{pmatrix} \dots\dots\dots (1.3)$$

With $a_{ij} > 0$ which denotes the degree of preference of x_i to x_j . More in general, from Saaty's theory (Saaty, 1977), each entry is supposed to approximate the ratio between two weights.

$$A \approx \frac{w_i}{w_j} \quad \forall i, j \dots\dots\dots (1.4)$$

If the entries exactly represents ratio between weights, then the matrix A can be written as

$$A = \left(\frac{w_i}{w_j} \right)_{n \times n} = \begin{pmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \dots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \dots & \frac{w_2}{w_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \dots & \frac{w_n}{w_n} \end{pmatrix} \dots\dots\dots (1.5)$$

When taking both (1.4) and (1.5) equations, applying a condition of multiplicative reciprocity $a_{ij} = \frac{1}{a_{ji}}$ $\forall i, j$ holds and A can be expressed as

$$A = \begin{pmatrix} 1 & a_{12} & \dots & a_{1n} \\ \frac{1}{a_{12}} & 1 & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \dots & 1 \end{pmatrix} \dots\dots\dots (1.6)$$

Note that, this form of matrix follows the assumption that x_1 is 3 times better than x_2 , then we can deduce that x_2 is 1/3 as good as x_1 .

After multiplying this matrix A by the vector $\omega = (\omega_1, \dots, \omega_n)^T$, we get

$$Aw = nw \dots\dots\dots (1.7)$$

Where n is an eigenvalue of matrix 'A' in correspondence with eigenvector w. After solving $(A-nI)w = 0$

This implies a system of homogeneous linear equation and has a non-trivial solution if and only if the determinant of $(A-nI)$ vanishes. Since every row is a constant multiple of the 1st row, matrix A has unit rank making all of its eigenvalues except one are zero. Since the eigenvalues are perturbed by a small perturbation of the coefficients, the equation becomes

$$A'w' = \lambda_{max}w' \dots\dots\dots (1.8)$$

Where λ_{max} is the largest eigenvalue of A'. To simplify the notation, equation (3) is expressed in the form

$$Aw = \lambda_{max}w \dots\dots\dots (1.9)$$

Where A is Saaty's matrix of pairwise comparisons (Saaty, 1977).

3.5 Consistency Measures

Consistency measures is an important term whenever a decision is being taken regarding the weights calculated. This measures the error in the result. So, to solve this inconsistency problem, consistency criterion was introduced. The theory of consistence holds that $\lambda_{max} \geq n$ always and A is consistent if and only if $\lambda_{max} = n$. The consistency index formula (C.I.) form of a matrix of size $n * n$ is as follows:

$$C.I. = \frac{\lambda_{max} - n}{n - 1} \dots\dots\dots (2.1)$$

Similarly, the consistency ratio (C.R.) is expressed as:

$$C.R. = \frac{C.I.}{R.I.} \dots\dots\dots (2.2)$$

Where R.I. is given by average random consistency index and is obtained from randomly generated reciprocal matrices for relevant scale proposed by Saaty. In 90s, Saaty has suggested thresholds of 5% and 8% for 3*3 and 4*4 matrices respectively (Saaty, 1994). For the nth order of matrices, Saaty proposed the following R.I. and is given below in a table.

Table 2: R.I table as proposed by Thomas L. Saaty (Saaty, 1994).

n	1	2	3	4	5	6	7	8	9	10
R.I.	0	0	0.52	0.89	1.11	1.25	1.35	1.40	1.45	1.49

4 Background

4.1 Tourism

Tourism is one of the growing industries in the world. The growth of tourism industry to promote the economic growth and to progress the modern society has become a common strategy worldwide. Tourism industry mainly consists of sightseeing, traveling, accommodation, food, shopping and entertainment. Strong comprehensiveness, high industrial relevance and large pull function Lickorish and Kershaw (1958) states that

“Tourism embraces all movements of people outside their community for all purpose except migration or regular daily work. The most frequent reason for this is for holiday, but it will also include for example, attendance at conference and movement on sporadic or infrequent business purposes” (Agarwal M.K. & Upadhyay R. P., 2006).

Tourism sector plays a direct relation in increasing the revenue and helps to build a strong economic situation of a country. The direct and indirect expenditure of tourist in a visit country imposes the development process significantly and efficiently. Tourism also plays role in building industrial infrastructure, transportation, civil aviation, highways, international business, accommodation and so on. It also increase the quality of service and promotes services in the field of customer service or care, conferences and exhibitions consultation, food and housing etc. nowadays, tourism is also conscious in preserving culture, ecosystem or environment etc. which is also a huge bonus for that country.

4.2 History of Nepalese Tourism

Nepal is a landlocked country with diverse physical characteristics having Himalayan regions with clear stream of water flowing through mountains to the plain region. Nepal is also known as peaceful country for its natural environment and surrounding. Nepal is famous all over the world as a country of temples, mountains, cultural heritage etc. There are lots of

Himalayas, green forest, lakes, deep gorges, ancient antiques and artistic temples that attract many tourists to visit Nepal. Nepal did not allow tourist before 1950 AD. During the autocratic Rana rulers, Foreigners were hardly permitted to Nepal. With the establishment of democracy, Nepal opened the door to all. During 1950, Nepal built a first road system that is connected from Kathmandu to Indian borders, after that Nepal welcomed many international tourists to explore rich culture, regions and Himalayas. According to the previous study about tourism development, during 1962 AD the approximate arrival number of tourist had been more than 60,000. There is also a great role of government and Nepal tourism board to promote tourism industry in Nepal organizing various programs and providing facilities. According to the Encyclopaedia of tourism, in 1983, tourism of Nepal peaks as the country's leading economic sector by marketing Hindu- Buddhist culture and Himalayan landscape. During 1996, about 400,000 tourist visited Nepal and during 1997, Nepal tourism committee was established and tourism got in its peak. After that government of Nepal declared a program 'visit Nepal 1998' by financing much more in advertising about the tourist destination all over the world. In 1998 government of Nepal expected 500,000 international tourists out of which only 463,684 tourists arrived. In the same year by 41,827 number of tourist increased than in 1997 because of the program 'visit Nepal 1998'. Two years later master plan of Nepal tourism was prepared followed by government of Nepal in the establishment of ministry of tourist in 1973. Nepal has its own culture and tradition so Nepal welcome the visitors as their guest and 'guest is an incarnation of god'. After the development of trade industry in 20th century, year 2000/2001 AD, there was decrease in arrival of tourist than in the year 1998/1999 because of the bad events in Nepal occurred like moist problem and massacre of royal family on 1 June 2001. In the year 2011, the government of Nepal declared it as a tourism year and expected a million foreign tourists coming to the country in that year. (Khaniya et al., 2011)

5 SWOT Analysis of Tourism role in Nepal

Table 3: Normalization and Pairwise Comparison between the Criteria (own source)

Strength	Weakness
<ol style="list-style-type: none"> 1. Natural and Cultural Diversity 2. Favourable Weather 3. Affordable Cost 4. Hospitality 	<ol style="list-style-type: none"> 1. Poor Infrastructures 2. Quality of Services and Food 3. Lack of Skilled Human Resource 4. Marketing
Opportunities	Threats
<ol style="list-style-type: none"> 1. Export Market 2. Economic Growth 3. Employment 4. Conservation of Environment 	<ol style="list-style-type: none"> 1. Political Instability 2. Natural Calamities 3. Environmental and Wildlife Problems

5.1 Strength

5.1.1 Natural and Cultural diversity

Nepal is a very rich country in terms of nature and culture. Every year Nepal attracts huge number of tourist for its pristine nature, wild life, temples and monuments, festivals etc. Nepal is one of the most favourite destinations for the foreigners when it comes to mountaineering. The picture of world's tallest mountain Mount Everest comes first to their mind. Tourist loves to do the adventurous things like rafting in raging rivers, jungle safari in wilderness, trekking through undulating landscape. Distinct varieties of flora and fauna are found here.

5.1.2 Favourable weather

There are four season in Nepal autumn (September-November) 15-24 degree Celsius, winter (December-February) 19-12 degree Celsius, spring (march-may) 16-23 degree Celsius, summer (June-august) 23-30 degree Celsius. Every season tourist can visit Nepal according to the preference and the act of activities decided. The most favourable time to visit the main tourist destination like Kathmandu from November to march, Chitwan national park

from October to march, Pokhara from November to February. For trekkers most favourable time to trek is mid-June, July, august, mid-September.

5.1.3 Affordable cost

Travel cost in Nepal may be the lowest in the world. Even an individual having less budget also can afford to visit Nepal from lodging to bag carrier, you will be surprised paying little penny. In comparison to Czech Republic, the differences in different types of expenses in a daily basis are as follow:

Table 4: Difference in expenses in two different countries (Numbeo, n.d.)

Czech Republic	Amount(\$)	Nepal	Amount(\$)
Accommodation	41.7	Accommodation	13.17
Food	20.08	Food	7.99
Water	2.8	Water	0.28
Entertainment	11.60	Entertainment	6.82
Local Transportation	5.99	Local Transportation	1.56
Alcohol	7.99	Alcohol	6.32
Souvenirs	16.58	Souvenirs	3.81

5.1.4 Hospitality

Nature of people in Nepal is very welcoming and always a smiling face towards their guest. Here people are so helpful and kind nature to the guest. It is also a saying here in Nepal that guest are like god and have to treat and comfort them well. So then when you see the good behaviour towards you in a foreign country then definitely anyone would like to visit the country for the next time as well.

5.2 Weakness

5.2.1 Poor infrastructure

Nepal being a country with huge and tallest mountains, it creates a huge barrier for the development process. The Himalayan range lies in the north of the country present huge physical obstacles. Nepal being in a difficult geographical region as well as least developed country, building of roads and infrastructure is very expensive and a slow process (Highways, 2014). Whereas, there are others aspects where it is lack in like electricity, poor supply of water etc.

5.2.2 Quality of services and food

One of the reasons to increase the number of visitor in a country is by giving quality services and a good food to eat. This is where Nepal lacks in terms of it, either due to illiteracy or lack of budget and needs immediate change in the system. When there is no sufficient budget for maintaining quality food and services any foreigner would not like it. Due to the lack of proper trainings and education, quality of services are often found not to be of high quality. So considering the quality of food and services, it plays a vital role in attracting tourist in any country. Based on the money spend, its right of any person to get corresponding quality and healthy food or services.

5.2.3 Lack of skilled human resources

Skilled and trained human resources is a key for any business. People working in tourism field in Nepal, most of them are not skilled. Mostly it is seen in Nepal that most of workers are uneducated and unaware of his/her responsibilities. The selection of workers are directly nominated through relatives cause or more over failure is due to high corruption.

5.2.4 Marketing

Nepal is a richest country in source of everything that a tourist wants to have or desires. However, this country lacks in exploring its beauty and values through marketing. A better managed and versatile marketing campaigns is in need to show what the country has.

5.3 Opportunities

5.3.1 Export market

Inflows of tourist have positive effects on exports of traditional products, and then efforts to attract tourism are of interest not only to agents directly related to the tourism industry, but also to current or potential exporters. This means that there is high possibility to be realized from cooperation between tourism and export promotion agencies. For example promoting local product by using local product in a hotel at a high end of the market. “Chyangra Pashmina” logo which is introduced by the Association of Pashmina Exporters of Nepal is used only by Nepal’s exporters. However, if tourist consumption of products in Nepal also promotes exports, building the brand domestically can also help to build it internationally. The London-based council said in its annual report that Nepal received 796,000 visitors in 2013 and generated US\$ 0.42 billion) in revenue which is 21.1% of total exports (Prasain, 2014).

5.3.2 Economic growth

Maximum number of tourist visiting a country has a direct contribution in an economic growth of a country i.e. in GDP, employment and so on. It also depends on the spending nature of tourist as well as making of international market. The expenses made by the tourist while purchasing handicrafts, visiting recreational place, monuments, temples, mountains, etc., attending seminars and business visits in an international hotels, exploring adventures places and doing sports activities etc. are all the way of collecting certain amount of money.

It increases the flow of money in a country and increases the purchasing power of that country. The value of money will be strong and leads to an economic growth.

5.3.3 Employment

Employment is said to be a backbone of a country. It does have diverse effects in the economic growth of a country. In 2013, it contributed 504,000 jobs according to world travel and tourism council (WTTC) where, the figure indicates the 3.2 % of the total employment of the country. Tourism supports a job like travel agent, employment by hotels, airlines, transportation service, restaurants, leisure industries directly supported by tourist (Prasain, 2014).

5.3.4 Conservation of environment

A country with a peaceful and clean environment is always in the eye of tourist. People love to visit places where there is adequate amount of greenery, less or zero pollution, conserved wildlife and habitats. Conservation programs or projects based on it must be done time to time to increase the flow of tourist in Nepal. This might lead to increase the opportunity for tourism sector.

5.4 Threat

5.4.1 Political instability

Political instability is a serious problem to the country and tourism industry. On 20th September 2015, Nepal constitution came to an effect after a long period of time, almost a decade finding a better solution. However, Nepal constitution has not been approved by some political parties resulting in strikes, demonstration and so on. Due to this situation there is an on-going informal economic blockade from all northern border point to India. While being more than 90% of trade closed there is a shortage in fuels, gas, food and other things (Gupta, 2015). Most nations have warned their citizens to be careful while visiting

Nepal. This could decrease the flow of tourist in Nepal. So, political instability has always been a crucial factor.

5.4.2 Natural calamities

Nepal lies on the boundary of two massive tectonic plates that collided to build the Himalayas. In April 25 2015 Nepal was hit by an earthquake of 7.8 magnitude scale and frequent powerful aftershocks. It destroyed lots a cultural heritage sites and monuments and left them into rubble. On the same day avalanche set off by the quake on Mount Everest killing 17 people and leaving many traveller trapped in the mountains (Mangla, 2015). Also landslides occur in Nepal from time to time which effects in tourism. So because of this natural calamities there is fear in peoples mind not only for the short term but can be for the long term, which is not really good for the tourist visiting Nepal and tourism industry.

5.4.3 Environmental and wildlife problems

When the number of tourist arriving to the country is more than that a country's environment to cope with, then there will be much more problem in the environment. Environmental conservation programs and other pollution controlling activities in time can be helpful otherwise it will lead to potential threats of losing natural wildlife or habitats, deforestation, pollutions etc. The increase in smuggling of valuable ivory, skins, tusk etc. are the major problems that leads to the extinction of endangered animals.

5.5 Selection of Alternatives and Criteria

5.6 Tourist

A person who is travelling, who is supposed to leave his/her hometown to visit a place with the purpose of pleasure, shopping, entertainment, cultural, religious and historical attraction. On a condition that he or she should return back to his or her hometown with no longer than 12 months. Tourist can be categorized based on their desired or needs and their

reasons to travel different places in the world. In the context of Nepal we can categorize tourist into following five broad categories.

5.7 Types of tourist as an Alternative

5.7.1 Leisure and holiday tourist

These types of tourist are those who want to take a leave from their busy schedule to relax and freshen up their mind. While some of tourist might like to relax in nature peacefully and make their mind fresh so again, Nepal would be one of the best choice for those tourist as it is very rich in natural resources. These tourists can plan a trip from Kathmandu, Pokhara to Chitwan. It is one of the best choices. Where in Kathmandu they can look after monuments and temples religious side of Nepal. In Pokhara they can view mountains and other activities like boating, paragliding etc. whereas, in Chitwan they can experience jungle safari, view wildlife etc. Normally tourist will spend around \$80-\$280 for the package (Ltd., 2015).

5.7.2 Adventure tourist

These types of tourist wants an unusual and exciting experience which is dangerous like mountaineering, rock climbing, bungee jumping etc. So, Nepal would be one of the perfect destination for these kind of tourist. Here they can experience a different kind of activities like white water rafting, mountaineering, paragliding, kayaking, mountain biking, trekking etc. These kinds of tourists can choose a destination like Pokhara, Manang, Mustang, Kathmandu etc.

5.7.3 Business and professional tourist

These types of tourist travel related to business, meeting, conference, exhibitions and special events. In context to Nepal business tourist visit here for different business opportunities. Whereas Nepal is open for the foreign investment, adopting the most liberal economic policies. Nepal has made the administrative procedure easy and simple. There are

lots of opportunities for foreigners in the fields that they can make an investment on like handicraft, tourism, hydro-electricity, tea, pashmina and silk product, readymade garments, leather(raw and finished), handmade paper, carpet and woollen product etc.

5.7.4 Religious tourist

These tourists want to know and gain knowledge of religion. Importance of the religion. Nepal is also rich in religious importance. The famous religious places in Nepal are Pashupatinath, Boudhanath, Swayambhunath in Kathmandu, Manakamana in Gorkha, Janaki temple in Janakpur, Lumbini which is also the birth place of Gautam Buddha, Krishna Mandir in Patan and so on. However 86.51% of Nepalese follow Hinduism, 7.78% of Nepalese follow Buddhism, 3.53% of people follow Islam, and 2.17% of people follow Christianity, Tantrism and others (Tourism, 2009). Talking about the famous Kailash Manasarovar, many tourists like to make this place a destination to visit. It is in Tibet though; people have to pass through the Nepal. Whereas, in the case of Hindu people go there after visiting Pashupatinath, one of the biggest temples for Hindu which is in Kathmandu after than make a trip to Kailash Manasarovar (Prabin, 2010).

5.7.5 Backpackers and gap year travellers

These tourists take a long break from their work either to travel around or for some volunteering work and working abroad. These kinds of tourists travel for longer period of time than in comparison to other tourist. Backpacker tourist are those tourist who leave their home car and other things to travel around just with one back pack with the necessary stuffs like clothes which has a multiple use, first aid box, water etc. . And twice the money along with laminated copies of passport, plane tickets and contact numbers. Backpacking can be explained as an independent, often international, low-budget way of travelling. Individual who back packs is called backpacker (ATEC et al., 2011).

5.8 Criteria

Considering the SWOT analysis made as of table no.3 and analysing with the opportunity that types of tourist are creating or may create in future, 7 important criteria were chosen. They are as follows:

5.8.1 Employment

Higher the rate of employment, greater will be the economic growth of a country. In this section, experts were asked to give a rating for the pairwise comparison based on the employment opportunities provided by the tourists. The scaling given will directly impact its importance for the desire goals.

5.8.2 Education and Trainings

In every sector, the need and importance of education and training is equally beneficial for the growth of a country. This criteria comes in the top most priority when taking about economic development. Vocational training or projects based on general information on health, science, environment etc. are very important for a country like Nepal. When tourist visits to Nepal, they are bringing some knowledge or experience to share with the Nepalese people. So, while making decision, this criteria is very important to include while choosing best alternative.

5.8.3 Infrastructure Development

In this modern era, tourist are mostly looking for an easy and convenient place where they can visit the place in short time with quality services and in secured way. However, we also need to think that for what propose tourist visits and where. The necessity for the infrastructure development may depend on the type of location in Nepal. In this criteria, the discussion was made on which alternative do need or plays role in building infrastructure.

5.8.4 Cultural Preservation

Any nation's culture and tradition is worth to be preserved for ever. Tourists flowing for the unique culture is a tremendous source of revenue for the least developed country like Nepal. However, the incoming of tourist also does have negative impact on the cultural and tradition of that place. Culture is like living source that keeps on changing as the condition and resources changes due to the impact of high density population. The pros and cons made by tourist in Nepal were kept in mind before ranking the alternative and criteria.

5.8.5 Eco-friendly

Apart from global warming and climatic change, natural ecosystem have been destroyed day by day just for seek of pleasure and in search of habitat for the human beings. The ongoing deforestation for the urbanisation has created a diverse effect in the natural habitat and as well as natural sources like water shades, lakes, rivers etc. When a tourist travels to any country, it is very important to have them as eco-friendly. Based on these factors, types of tourist were ranked and analysed.

5.8.6 Spending nature of Tourist

How much does a tourist spend in a country like Nepal? How much revenue is collected from the tourism sectors? These are questions that are directly related with the economic growth of a country. The price rate for the hotels, transportation, luxury and gaming, sports, adventurous activities, basic day to day need and so on were taken into note while scaling the criteria and alternatives.

5.8.7 International Business

International business tourist spends the money in luxury hotels as well as open a great chance to create employment and trade opportunity in a country. From both point of view, it is very significant for the development of the country. Experts in decision making or

decision makers were asked to rate the tourist types on positive aspects of business and chances that are created from this criterion.

5.9 Questionnaire and Survey

For the practical part, questionnaire and survey was generated online and was given to participants for the feedback in tourism sector in Nepal. First task was to set up criteria and alternatives to make a hierarchical problem structure for achieving the goals. During this process, out of 5 alternatives only 4 of them were chosen as the best alternative for further selection. After having the real sets of alternatives and criteria, some employee in Nepal who are experts in the tourism of Nepal were asked to give a certain scale based on their importance. The following decision tree as in figure no. 1 shows the selected criteria and alternatives.

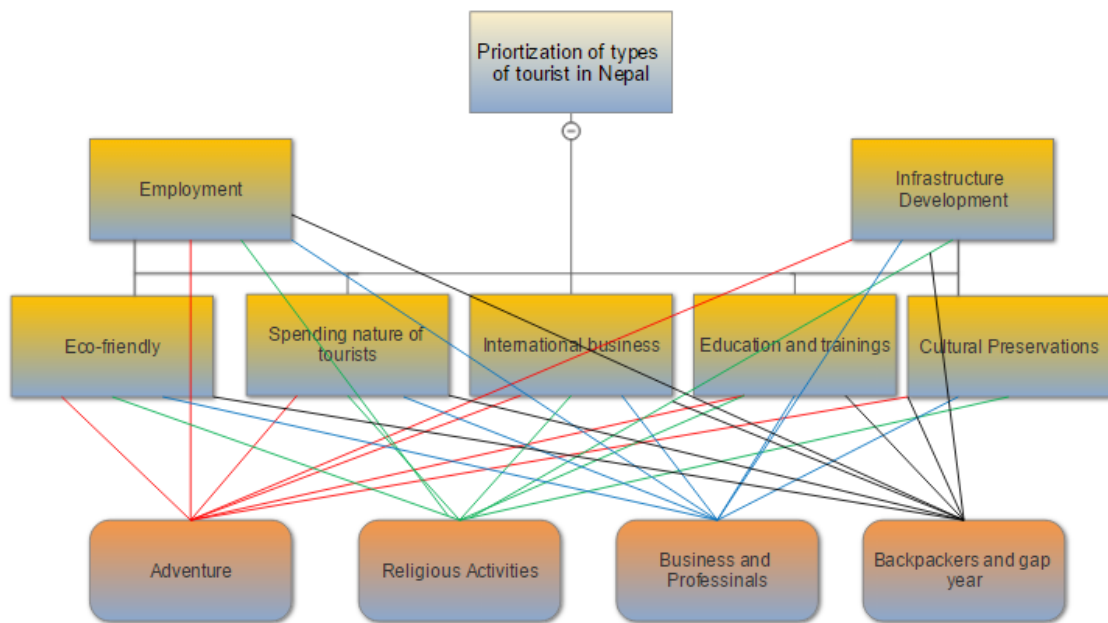


Figure 1: Hierarchical problem structure for the prioritization of types of tourist (Saaty T.L & Vargas L.G, 2012).

In a decision making process for the prioritization of types of tourist using AHP method, it is necessary to set the criteria for which an alternative holds most suitable reasons for being decisive. To fulfil the desire goal, the survey result was analysed that were collected from the feedback from travel agents and some expert personal in these fields. According to the interpretation of data that were collected, significant criteria were chosen best on their weights. These criteria includes: C1 as employment, C2 as infrastructure development, C3 as education and trainings, C4 as cultural preservation, C5 as eco-friendly C6 as spending nature of tourist and C7 as international business.

Table 5: Normalization and Pairwise Comparison between the Criteria (own source)

Factor	C1	C2	C3	C4	C5	C6	C7	GM	Normalized GM
C1	1.00	7.00	3.00	5.00	2.00	9.00	7.00	3.88	0.39
C2	0.14	1.00	3.00	3.00	3.00	7.00	9.00	2.19	0.22
C3	0.33	0.33	1.00	3.00	3.00	3.00	3.00	1.37	0.14
C4	0.20	0.33	0.33	1.00	1.00	5.00	3.00	0.85	0.09
C5	0.50	0.33	0.33	1.00	1.00	3.00	3.00	0.91	0.09
C6	0.11	0.14	0.33	0.20	0.33	1.00	1.00	0.32	0.03
C7	0.14	0.11	0.33	0.33	0.33	1.00	1.00	0.35	0.04
Total								9.87	

5.10 Pairwise Comparison and Normalisation

Table 6: Pairwise Comparison and Normalization based on employment (own source)

Employment	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	3.00	5.00	9.00	3.41	0.59	0.23
Business	0.33	1.00	5.00	3.00	1.50	0.26	0.10
Religious	0.20	0.20	1.00	3.00	0.59	0.10	0.04
backpacker	0.11	0.33	0.33	1.00	0.33	0.06	0.02
					5.83		

Table 7: Pairwise Comparison and Normalization based on infrastructure development (own source)

Inf. Development	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	1.00	5.00	7.00	2.43	0.40	0.09
Business	1.00	1.00	7.00	9.00	2.82	0.46	0.10
Religious	0.20	0.14	1.00	5.00	0.61	0.10	0.02
backpacker	0.14	0.11	0.20	1.00	0.24	0.04	0.01
					6.10		

Table 8: Pairwise Comparison and Normalization based on education and trainings (own source)

Edu. & training	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	3.00	0.33	0.14	0.61	0.10	0.01
Business	0.33	1.00	0.33	0.14	0.35	0.06	0.01
Religious	3.00	3.00	1.00	0.20	1.16	0.19	0.03
backpacker	7.00	7.00	5.00	1.00	3.96	0.65	0.09
					6.08		

Table 9: Pairwise Comparison and Normalization between the Alternatives based on cultural preservations (own source)

Cultural Pre.	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	3.00	0.20	0.20	0.59	0.10	0.01
Business	0.33	1.00	0.14	0.20	0.31	0.05	0.00
Religious	5.00	7.00	1.00	3.00	3.20	0.55	0.05
backpacker	5.00	5.00	0.33	1.00	1.70	0.29	0.03
					5.80		

Table 10: Pairwise Comparison and Normalization based on eco-friendly (own source)

Eco-friendly	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	5.00	5.00	0.33	1.70	0.28	0.03
Business	0.20	1.00	3.00	0.14	0.54	0.09	0.01
Religious	0.20	0.33	1.00	0.14	0.31	0.05	0.00
backpacker	3.00	7.00	7.00	1.00	3.48	0.58	0.05
					6.03		

Table 11: Pairwise Comparison and Normalization based on spending nature of tourist (own source)

Spending	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	1.00	7.00	7.00	2.65	0.42	0.01
Business	1.00	1.00	7.00	9.00	2.82	0.45	0.01
Religious	0.14	0.14	1.00	3.00	0.50	0.08	0.00
backpacker	0.14	0.11	0.33	1.00	0.27	0.04	0.00
					6.23		

Table 12: Pairwise Comparison and Normalization based on international business (own source)

Int.Business	Adventure	Business	Religious	backpacker	GM	Nor. GM	Uij
Adventure	1.00	0.20	5.00	7.00	1.63	0.25	0.01
Business	5.00	1.00	7.00	9.00	4.21	0.64	0.02
Religious	0.20	0.14	1.00	1.00	0.41	0.06	0.00
backpacker	0.14	0.11	1.00	1.00	0.35	0.05	0.00
					6.61		

5.11 Consistency Analysis

Table 13: Consistency Analysis of Each Pairwise Comparison (own source)

Table No.	lamdamax	CI	RI	C.ratio
5	7.76	0.13	1.35	0.10
6	4.26	0.09	0.90	0.10
7	4.23	0.08	0.90	0.09
8	4.23	0.08	0.90	0.08
9	4.23	0.08	0.90	0.08
10	4.23	0.08	0.90	0.08
11	4.13	0.04	0.90	0.05
12	4.23	0.08	0.90	0.09

5.12 Final weights

Table 14: Calculation of Total Utility of Each Alternative (own source)

Factor	C1	C2	C3	C4	C5	C6	C7	Total
Adventure	0.23	0.09	0.01	0.01	0.03	0.01	0.01	0.39
Business	0.10	0.10	0.01	0.00	0.01	0.01	0.02	0.26
Religious	0.04	0.02	0.03	0.05	0.00	0.00	0.00	0.15
backpack	0.02	0.01	0.09	0.03	0.05	0.00	0.00	0.20

6 Case Analysis

The purpose of this thesis was to prioritize the types of tourists using Multi-criteria decision making approach (Saaty Method) by analysing major selected opportunity for the development of Nepal through tourism sector. Base on the face to face interviews and survey, types of tourist such as adventure, business, religious and backpackers and year gap were selected and were represented as alternatives to be prioritised. The criteria were set up according to the opportunity that are created by tourist in Nepal and their significance with the alternatives. The calculation was based on AHP method to get the total utility for each alternative in the following procedures:

1. At first, the decision problem was generated to a hierarchy of criteria and alternatives that would follow up with goals.
2. The AHP scale of ranking was used.
3. Pairwise comparison was made to calculate the weights for respective criteria and then for the alternatives.
4. Along with taking geometric mean, normalisation was made after averaging each row's value for getting respective scores.
5. At last, consistency of all pairwise comparisons was analysed and total weights for the alternatives were calculated.

The AHP method that was used in this thesis has shown the respective priority for the alternatives, i.e. Adventure > Business and Professionals > Backpackers and gap year travelling > Religious activities with the score of 0.39, 0.26, 0.20 and 0.15 respectively. After analysing the results, we can say that adventure tourist plays the most significant role, backpackers and gap year travelling tourist along with business and professionals plays moderate role and religious activities tourist plays least important role in the economic growth and development of Nepal. The decision makers may work on given priorities and

on doing so development process might be enhanced despite of limited resources and budget.

7 Conclusion

This thesis proposes the application of AHP method or Saaty method for the prioritization of types of tourist in Nepal. The important part of this decision making application is how the decision makers makes the hierarchy of alternatives and criteria for decision making problems in real life. To maintain the standards and under limited resources available, decisions are supposed to be logical. Each alternative does have their own strength and based on our goals, we must implement that alternative which is more effective and efficient for the success of individuals or a company.

There are various types of tools or methods that can be very helpful in decision making process. Based on the necessity of the problem or desired goals and circumstances, it is important to apply particular method of decision making. AHP method is more valid and useful when the scaling or ranking is made by the experts on that field. Pairwise comparison in general is to compare a set of items for which a decision is to be made. In practical, there are many situation where decisions are made to use more than one alternative based on the situation.

The main challenge for the government of Nepal will be to increase the number of tourist in Nepal. After already hit by powerful earthquakes and ongoing political instability and strikes, Nepal has already experienced a huge decline in the number of international tourist. There remains a great challenge to regain the better statistics of tourist visits. This thesis will be used as a base to further thesis writings. The next step will be related on how the government can implement and work on this prioritizing method. Further, the study will focus on the marketing of tourism sector in Nepal by taking most efficient type of tourist to create a regular flow of tourist in Nepal.

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