

HUMAN DIMENSIONS IN ONE-HORNED RHINOCEROS CONSERVATION IN ROYAL CHITWAN NATIONAL PARK NEPAL

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submitted by

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ABSTRACT

An empirical survey research was conducted in buffer zone of Royal Chitwan National Park, Nepal. The overall aim of the research was to identify people's acceptance of Rhinoceros (*Rhinoceros unicornis*) and its conservation in Royal Chitwan National Park. Six groups of respondent based on their professions were selected and interviewed along with semi-structured questionnaires. People's knowledge on and attitudes towards rhino and personal affectedness based on damage and benefit was measured. Attempts were made to ascertain the acceptance of rhino conservation programs and the intention for future Rhino population. People of the buffer zone demonstrated middle level of knowledge on and hold positive attitude towards rhino and its conservation issues. Degree of affectedness was reported as moderate. However, knowledge, attitude and degree of personal affectedness vary across the demographic characteristics such as age, sex, education, profession and the distance of individual residence to the National Park boundary. People with increasing levels of knowledge showed positive attitude towards rhino and its conservation, however, it decreased with the increasing degree of personal affectedness. The study demonstrated a high level of public acceptance for rhino conservation at present and positive intentions to increase rhino population in future. Therefore, it is important to understand and monitor public attitudes, increase knowledge levels and decrease degree of affectedness to ensure the long-term conservation of rhino.

KURZFASSUNG

Die Nashorn-Population in Nepal hat im Royal Chitwan National Park gegenwärtig Ihr stärkstes Vorkommen und wirft insofern auch die größten Probleme für die ländliche Bevölkerung im Park-Umfeld auf. Um hier für menschliche wie Artenschutz-Interessen eine höhere Verträglichkeit zu erreichen, wurden eine Pufferzone, ein Wildereibekämpfungsprogramm und die Verfrachtung von Nashörnern in andere Parks ein- und durchgeführt. Die vorgelegte Studie versuchte, über strukturierte Befragungen verschiedener Zielgruppen (Bauern, Lehrer/Studenten, Parkpersonal, Pufferzonen-Vertreter, Lokalpolitiker, Zivilverwaltung) bessere Erfahrungen und Daten über die allgemeine Nashorn-Kenntnis (Biologie, Verteilung, Schäden, Wilderei, Unfälle u.dgl.) sowie die Einstellung und Akzeptanz der dem Nashorn-Schutzdienenden Maßnahmen wie auch des dadurch beeinflussten Tourismus und der Nutznießung zu sammeln. Wie sich zeigte, spielten dabei Alter, Erziehung, Entfernung zum Nationalpark und persönliche Betroffenheit eine wichtige Rolle, sodaß sich daraus gewisse Schlußfolgerungen und weiterführende Empfehlungen ableiten ließen.

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ABBREVIATIONS

AAI	:Afro Asiatic Institute
ACAP	:Annapurna Conservation Area Project
APU	:Anti Poaching Unit
BZ	:Buffer Zone
BZDC	: Buffer Zone Development Council
BZCF	:Buffer Zone Community Forest
CBS	:Central Bureau of Statistics
CF	:Community Forest
DDC	:District Development Committee
DFO	:District Forest Office
DG	:Director General
DNPWC	:Department of National Park and Wildlife Conservation
HMG	:His Majesty's Government of Nepal
HQ	:Headquarter
ITNC	:International Trust for Nature Conservation
IUCN	:International Union for Conservation of Nature and Natural Resources
KMTNC	:King Mahendra Trust for Nature Conservation
MFSC	:Ministry of Forest and Soil Conservation (Nepal)
NGO	:Non-governmental Organization
NTB	:Nepal Tourism Board
NP	:National Park
NPM	:National Program Manager
NPC	:National Planning Commission
PPP	:Park People Program
PCP	:Participatory Conservation Program
RCNP	:Royal Chitwan National Park
RBNP	:Royal Bardia National Park
SPSS	:Statistical Package for Social Survey
SLC	:School Leaving Certificate
SW	:South-west
TU	:Tribhuvan University (Nepal)
TV	:Television
UC	:User Committee
UG	:User Group
UNDP	:United Nations Development Program
UNESCO	:United Nations Educational, Scientific and Cultural Organization
VDC	:Village Development Committee
WWF	:World Wildlife Fund

1. INTRODUCTION

1.1 Background

Since the ideas and the understanding of environment and ecosystems have become popular to many people, the appreciation of wildlife and National Parks has also increased. More and more people begin to understand that an intact nature, on the one hand, is necessary for the people themselves (i.e. water supply), and on the other hand, it can also be a base for a tourism economy with employment opportunity and additional income for the people. But all needs acceptance of the local people and a good management by the local or government authorities. The management of wildlife is not only the management of their populations and habitats; it also involves management of people. Public perceptions, attitudes, opinions, values, knowledge etc. and their linkages with wildlife management are of central importance in the wildlife management equation and therefore contemporary definitions of the science and art of wildlife management include a human dimension (Decker and Purdy, 1988).

The concept of human dimensions is one of the newest areas of emphasis in the evolving field of wildlife management (Manfredo et al., 1996). Various definitions of human dimensions are evident in literature. Bath (1996) stated that human dimension research is the understanding and documenting public attitudes with the purpose to help wildlife managers better market their decisions, minimize public controversy and minimize delay in implementation of management plans, programs and policies. It is noted in Manfredo *et al.* (1996), more generalized, that managing wildlife is 10% biology and 90% managing people. The traditional approaches to wildlife management rely heavily on the biological basis for decision making, therefore it is necessary to replace them with a model that contains both biological and human dimensions information (Bright and Manfredo 1995; Bath 1996; Manfredo *et al.* 1996; Manfredo et al. 1995). As given by Manfredo *et al.* (1996), the human dimension research includes the following four elements: I) to encounter the involved publics on an intensive basis, II) to organize public involvement activities, III) to conduct inventories of participation and harvest, and IV) to produce and distribute pamphlets and brochures to influence the thought and the behaviour of the public. One preliminary element of this approach is to form accurate impressions about public attitudes, which would help wildlife managers to address new challenges in wildlife management.

Management of Nepal's wildlife is currently challenged with addressing the diverse range of public interests and concerns together with the strengthening of new model 'community based conservation'. Nepal started the modern era of wildlife conservation with the enactment of National Parks and Wildlife Conservation Act in 1973 and has created networks of protected areas that now cover more than 18% of the total surface area of the country with a total number of 16 protected areas (Budhathoki, 2001). Royal Chitwan National Park (RCNP) was the country's first national park, which is inhabited by various endangered wild animals and serves as the original habitat for one-horned rhinoceros (*Rhinoceros unicornis*) since its history (RCNP, 2000). Existence of the rhinoceros in RCNP is considered as primary reason to attract huge numbers of tourists to the park every year generating huge amount of revenue for the park.

Three of the world's five rhino species are found in Asia, and one out of three is the one-horned rhinoceros. Once the rhinoceros were found across the entire northern part of the Indian sub-continent, now it is restricted only to Nepal and India with the endangered species status. The primary reason for rhinos being endangered is hunting and poaching. In the past they were hunted for trophy by big game hunters, now the belief in medicinal power of the horn increased the value in the international black market (Adhikari, 2002). People's modification of the rhino's habitat for cultivation and grazing was the secondary reason for rhinos being endangered in Nepal. Many people in the surrounding villages of RCNP depend on the agricultural activities together with their livestock to support the agriculture. Not only rhinos, but also human populations residing adjacent to the park are threatened to lose life and property due to animal attack. It is estimated that rhinos and tigers kill eight to ten people annually and about 50% of the crops are damaged by wild animal in some of the adjoining fields in the buffer zone of RCNP (RCNP, 2000). This has created conflicts with human interests, and made the rhino more accessible to poachers.

To cope with the animal-human conflict situation, His Majesty's Government of Nepal (HMG/N) has initiated collaborative approach for conservation through buffer zone management regulations by which 30 to 50% of park revenue can be recycled in the development of BZ areas (HMG, 1996). RCNP is the first park to start practicing a community based conservation program in the country (Budhathoki, 2000). However,

challenges still remain for the sustainable conservation of biodiversity including various endangered wildlife species. The case is severe in survival of the one-horned rhinoceros in its original habitat, which lead to a risk for long-term conservation of the rhinoceros in Nepal.

This situation leads the researcher to find out the factors playing a role behind such challenges. Studying the human dimensions, specifically, knowledge, attitude and behaviour of the local people towards rhino and its conservation issues are the major questions to be answered by this study. The study aims to identify acceptance of rhino conservation by local people living in the BZ of RCNP based on empirical research methodology.

1.2 Research Questions

- I. What are people's opinions on the impact of rhino on local residents?
- II. What do people know about the behaviour of rhino?
- III. What are people's attitudes towards rhino?
- IV. What are people's perceptions on the need of stakeholders' participation in rhino conservation?
- V. What are people's views on rhino conservation programs and activities?
- VI. What are people's opinions for the future population of rhino?
- VII. What is the relation between attitudes and knowledge?
- VIII. What is the relation between level of impact and attitude?
- IX. Are there relations between attitude of an individual toward rhino and his/her intention for rhino population?

1.3 Research Objective

The overall objective of this study is to find out people's acceptance of rhinoceros and its conservation in Royal Chitwan National Park – Nepal. However, the specific objectives can be stated as below:

- I. To find out the knowledge level of people on rhino and its conservation program.
- II. To explore people's opinion on the impact (degree of damage and benefit from tourism) from rhino on local people.

- III. To evaluate and document people's attitudes toward the rhino and its conservation program in Nepal.
- IV. To find out people's level of acceptance of the rhino conservation program in RCNP.

1.4 Justification of the Study

This study is acquainted with the importance of the human dimension component in wildlife management in Nepal. Sound wildlife management requires an adequate understanding of the human dimension in addition to knowledge about wild animal biology. Several studies have been carried out in the field of wildlife ecology and behaviour and some have been done about the park peoples' relations or conflicts. However, there is limited knowledge of human attitudes towards the rhinoceros.

The buffer zone development program was introduced in Nepal in 1996, to reduce park people's conflict and to promote citizen participation in wildlife conservation through community development. The institutional framework of the buffer zone covers a wide range of arrangements up to the settlement level to ensure equitable participation of every household in wildlife conservation. However, conflicts still exist in various forms and scales, which indicate that the role of public on conservation remains unsolved. It also points out the lack of study on the public belief, opinions and behaviour regarding wildlife. This study is an attempt to provide information regarding how the BZ residents, including private sectors and political leaders, perceived present conservation programs in relation to rhino conservation and accept or tolerate the rhino population.

Wildlife is Nepal's valuable natural resource, which is the backbone of country's tourism industry. RCNP is one of the most popular tourist destinations in the country. Existence of one-horned rhinoceros in RCNP is considered a primary reason to attract huge numbers of tourists to the park every year and add major share in the park revenue. The sharing of park revenue to the local development is a kind of compensation to the community. This study tries to assess people's feeling of access on the benefit, which will be helpful to apply an equitable benefit sharing system. In addition to this, the study tries to explore people's understanding of the benefit in relation to the existence of rhino.

It is common that Nepalese people interact with the wildlife, in general, in a variety of complex cultural, economic and social contexts, but not much has been done to document this. The argument of this study is that past investigations in the human dimensions component of wildlife management are inadequate. The researcher further argues that the human dimension research is rather lacking on rhino, specifically. The current study is an attempt to fulfil this research gap.

2. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 The Attitude Concept

An attitude is an individual's disposition to react with a certain degree of favour or disfavour to an object, behaviour, person, institutions, and event or to any other discriminable aspect of the individual's world (Krebs et al. 1993). Although many definitions of attitudes have been proposed, most investigators would agree that a person's attitude represents his evaluation of the entities in question. This study adopts the definition of attitude used by Eagly and Chaiken (1993), who defined attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour".

Attitude studies have been invaluable to wildlife managers as they provide insight knowledge of public feelings towards wildlife management matters and so help the managers evaluating policy alternatives to achieve their desired wildlife management goals.

Eagly and Chaiken have emphasized that attitudes are manifested in cognitive, affective and behavioural responses and are formed on the basis of cognitive, affective and behavioural processes (Eagly and Chaiken 1993). Despite of this, attitudes can be formed primarily or exclusively on the basis of any of the three types of processes. It is also generally recognized that an attitude is a hypothetical construct (Eagly and Chaiken, 1993).

Social scientists often have assumed that responses that express evaluation and therefore reveal people's attitudes can be or should be divided into three classes: cognition, affect and behaviour. Ajzen and Fishbein (1980), however, made a further distinction for the term behaviour in conation (behavioural intention) and behaviour (observed overt acts). The three components of an attitude phenomenon can be listed as follows:

- The cognitive component is concerned with opinions or evaluative beliefs. An example based on this study is "Rhinos are cruel, ugly, and aggressive".
- The effective component is comprised with feelings or emotions. The example based on this study is "I feel sadness or fear when seeing a rhino".
- The conative component comprises behavioural tendencies. The example in the study can be "I want to see the rhino population decreases."

Understanding the differences between these components can help a wildlife manager determine where conflicts exist in a specific wildlife management issue. In addition, these components help to direct the future for management of the specific species.

Social psychologists have described attitudes in three major variables. According to Wilson (1976), an attitude has three major variables: I) the object, II) the direction and III) the intensity (variance). The *object* of an attitude is that which it relates to; in other words the topic, target or content. In the present study Rhino in RCNP is the object. The second variable, *direction* involves direction or sign (negative or positive) of evaluation, which may also be represented as "agreement" or "disagreement" and "neutral" or "indifferent". The third variable of an attitude, *intensity*, indicates the level of extremism, degree, or variance of an attitude.

2.1.2 Attitude-Behaviour Relations

"One reason why it is important to evaluate attitudes in society is that they are argued to predict human behaviour" (Eysenck, 1954; Kiesler *et al*, 1969; Wilson 1973; Morgan *et al*, 1986). An individual with positive attitude toward an object exhibits favourable responses toward that object whereas individuals with negative attitudes towards an object exhibits unfavourable responses toward the object. We generally associate with people we like and avoid people we dislike, we tend to eat food we consider tasty and nutritious, we watch television programs we enjoy, and so on (Ajzen, 1993). As viewing day-to-day practice it can be seen that an individual's action or behaviour is the result of his/her attitude. But many related literatures do not support the consistency of behaviour with attitudes.

Recently social psychologists have been viewing a reinforcement of interest in the relationship between attitude and action (Ajzen and Fishbein, 1977). The emerging position seems to be that attitude is only one of many factors determining behaviour. Although this position reaffirms the importance of attitudes, it leads to the expectation that attitudes will often be unrelated to the observed behaviour (Ajzen, 1993).

For a long time, the relationship between human attitude and behaviour has been judged controversially. A number of studies have shown that a one-to-one relationship between attitude and behaviour does not exist and hence the inconsistency between people's attitudes and their behaviour (Kassilly, 2000). Ajzen and Fishbein (1980) however, report that with careful conceptualisation and implementation, attitudes are consistent with behaviour. A person's attitudes towards an object influence the overall pattern of his/her response to the object but it need not predict any given action. A single behaviour is determined by intention to perform the behaviour in question. A person's intention is a function of his/her attitude towards performing the behaviour and of his subjective norms. It follows that a single act is predictable from the

attitude towards that act, provided that there is a high correlation between intention and behaviour (Ajzen and Fishbein 1977).

2.1.3 Relevant Models

Here it is relevant to look at some related models developed from empirical research. Vogel (1994) developed a model for environmental attitudes and behaviour in Austrian agriculture. A coherent model incorporating environmental attitudes and behaviour in agriculture was developed based on theoretical considerations of the attitude construct and available empirical studies, which has derived a strong relationship between attitude and behaviour.

According to the author attitudes are individual-dependent, whereby "attitude" is emphasized as a salient feature or characteristic. This characteristic, feature or component of attitude derives from knowledge, feelings or behaviour. These attitudinal components were combined into a so-called "three-component approach" (Rosenberg, 1960). According to this approach, attitude of an individual is composed of the following components: The cognitive components include attitudinal elements derived from knowledge and perception. Knowledge and perception also lead to the development of an opinion or judgment. The affective components concern emotion, feelings, or the emotional-subjective valuation of a social object or group of objects by the individual. The action component or "disposition to act in a specified manner" corresponds to a common viewpoint that identifies "attitude" with a "consistency of reaction to a specified class of stimuli" (Green, 1974), or a "state of readiness" (Allport, 1967 as cited in Vogel, 1994). The author concludes that these components do not depend on actual behaviour, but rather that "one develops certain specific behavioural tendencies in relation to the attitudinal object" i.e. a "readiness to act" (Vogel, 1994).

Another model given by Pregernig (1999) can also be viewed in terms of attitude-behavioural relation. The model precedes on the assumption that a person's behaviour or his/her behavioural intention is the dependent variable, which is influenced by a number of independent and intervening variables. The intervening variables try to depict a person's internal psychological structures, i.e. his/her knowledge, values and attitudes, and the perceived characteristics of an object. The intervening variables are based on independent variables of two categories: variables describing the 'objective' environment and variables describing the media of selection. The environment variables represent a person's social, economic, ecological, personal and institutional environment. Under "media of selection", a person's social interactions (either in direct or in indirect social interactions) are described. The model given by the author has been presented in figure 1 below:

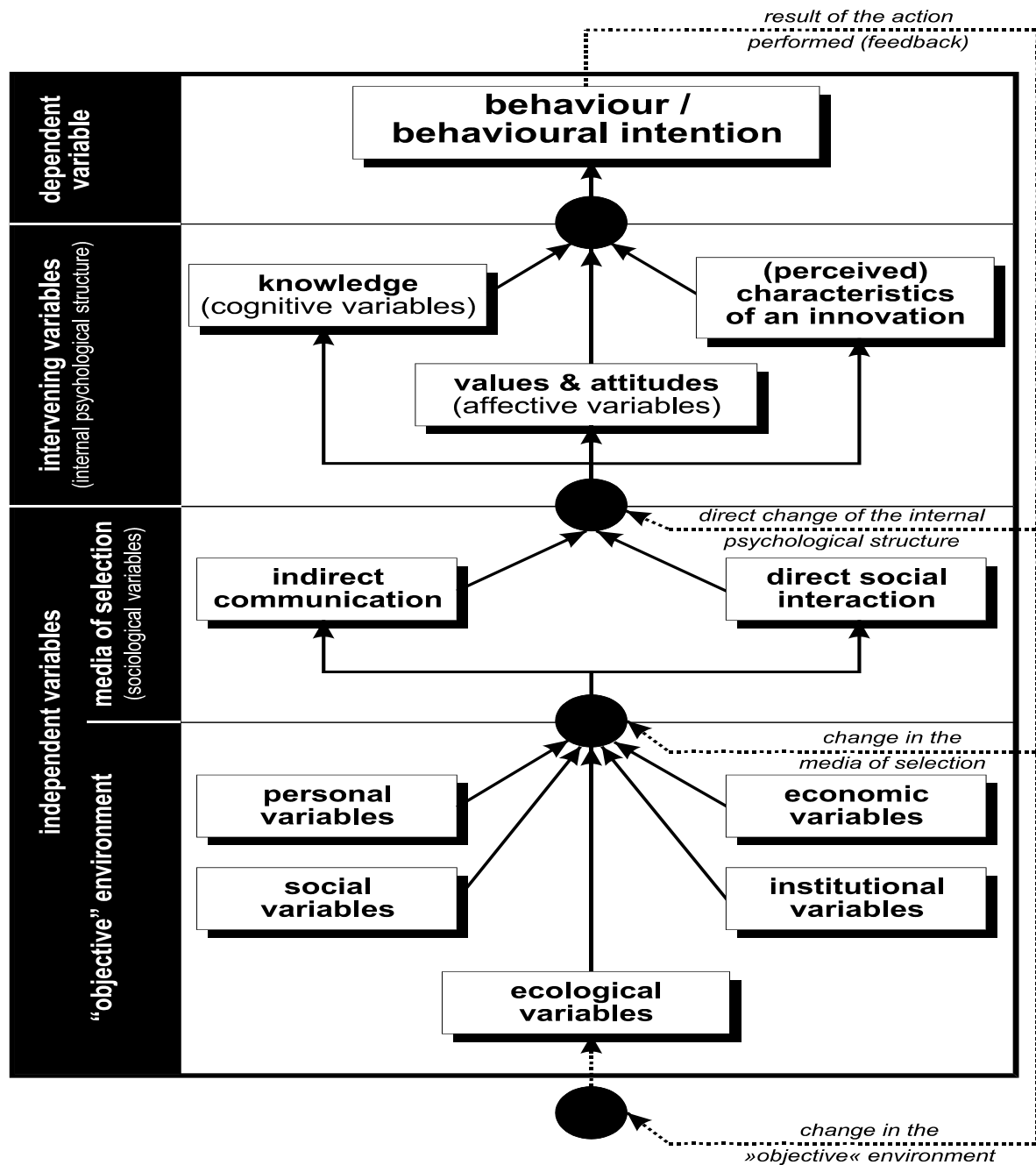


Figure. 1: Behavioral model (after Pregernig 1999)

2.1.4 Conceptual Framework of the Present Study:

It is argued by human dimensions specialists that wildlife management is largely a matter of human management. Aldo Leopold, the father of wildlife management, recognized this in 1933 when he stated, "The problem of game management is not how we shall handle the deer...the real problem is one of human management" (Kassily, 2000). The wildlife management profession has now recognized that a key to its ability to manage wildlife effectively is an understanding of the public's relationship to this resource. Because the public perceptions, attitudes, opinion, values, knowledge et cetera and their linkages with

wildlife management are of central importance in wildlife management (Decker and Purdy, 1988). Managing people here imply influencing people's behaviour. Many factors determine an individual's behaviour: knowledge, attitude and affectedness are the major ones. These factors are further interrelated with values, beliefs, past experiences, environment, religion, education, emotion, benefit, cost and many others. These interact to influence how a person reacts towards wildlife management issues.

In a broad view, this research aims to explore the public acceptance of rhinoceros and its conservation. The acceptance level indicates the *behavioural intention*, which will be examined on the basis of three components: *attitude*, *knowledge* and *personal affectedness* (Figure 2). The basis of the concept is derived from the idea that attitudes are manifested in cognitive, affective and behavioural responses and attitudes are predictable variables to the behavioural intention. In addition, author believes that the behaviour of an individual is not only a function of attitudes but there are also many other factors to influence his/her behaviour. The personal affectedness of the individual due to the rhino is important factor, which is derived from the benefit and damage that rhino costs for him or her. The knowledge of the rhino is another factor, which can be based on the education level, age, and experiences of the individual as well his/her access on information.

Operationalisation of major components in the frameworks is an essential task to illustrate the concept. So it will be attained through following ways: The level of *knowledge* in this study will be obtained from the responses from 4 knowledge-questions about rhino: food, behaviour, present population, and legal provision to protect rhino from poaching. Then knowledge scores with a range of 0 to 4 will be formed according to correct answers, where a knowledge score of 0 indicates that none of the question is answered correctly, and a score of 4 indicate that all the questions are answered correctly.

The level of *personal affectedness* will be constructed employing level of damage and benefit. Frequency of rhino arrival to an individual's agricultural field will be considered as extent of damage, and an advantage from tourism to an individual will be considered as benefit. Both damage and benefit will be calculated through 5-point Likert scales, where 1 refers no damage/benefit, 3 refer neutral and 5 refer high damage/benefit. Thus, the level of affectedness will be calculated by combining both in one with the following formula:

$$\text{Affectedness} = (\text{Damage} + 6) - \text{Benefit}$$

When there is lowest level of damage and highest level of benefit that means $((1+6) - 5)$, and it gives value of 2, which means the person is less affected from the rhino. Likewise, when there is highest level of

damage and lowest level of benefit, which means $((5+6) - 1)$ and which gives a value of 10, it means the person is much more affected.

This study implies only cognitive (opinion or belief) and affective (feeling or emotion) components to explore individual's attitude toward rhino. The *attitudes* will be obtained using 6 questions that deal about feeling or emotion (affective) and belief or opinion (cognitive) toward rhino. Mean attitude will be attained using 5-point Likert scales, from 1 to 5 level, where 1 refers strongly negative, 3 refer neutral and 5 refer strongly positive. The final component, *behavioural intention* will be achieved using the questions that ask about individual's intention for future population of rhino. To correlate *behavioural intention* with three components: *knowledge*, *attitude* and *affectedness* will be the final step and that will prove the concept on the whole.

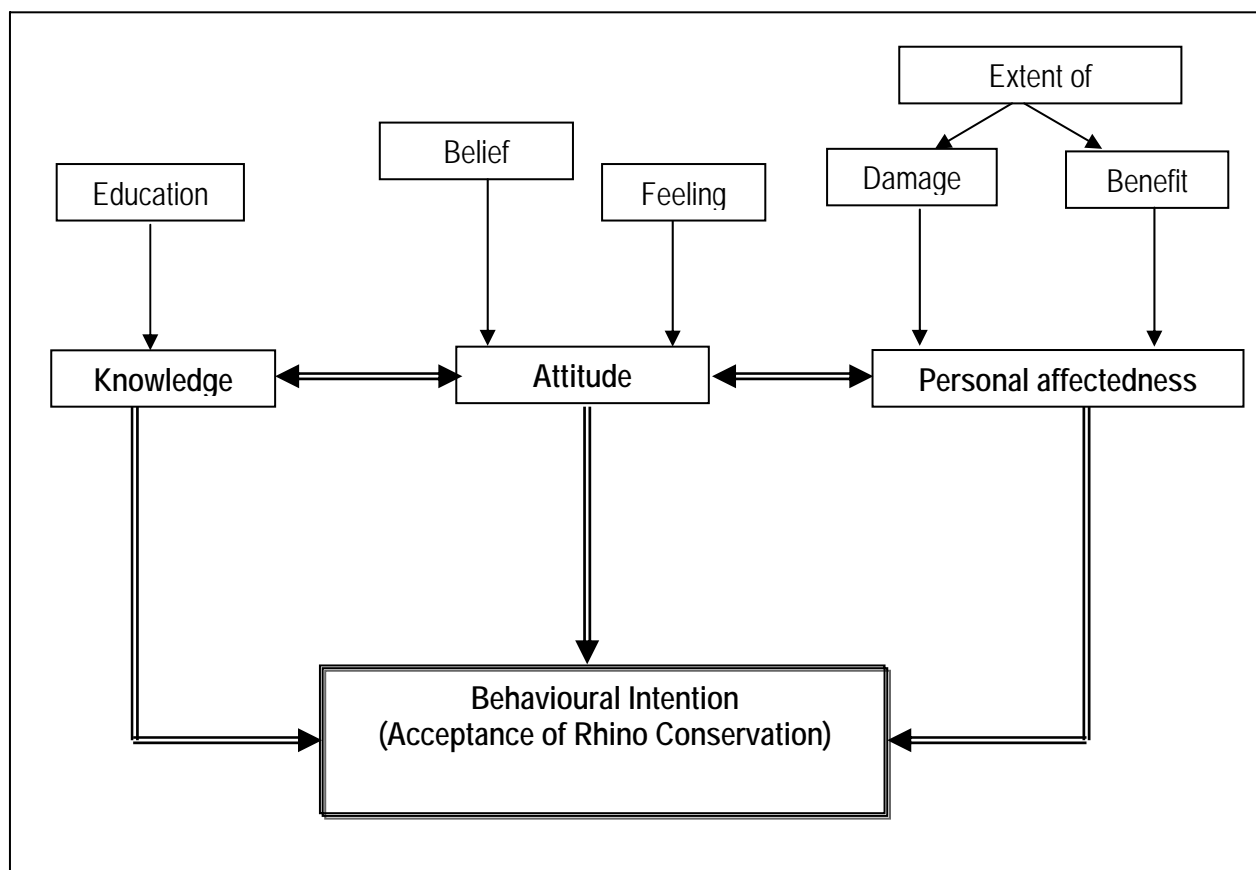


Figure. 2: Conceptual framework for the present study (individual's knowledge level on rhino and its conservation issues, his/her attitude toward rhino and personal affectedness due to the rhino are the major three components, which will shape the intention of him/her for acceptance of rhino population)

2.2. Human Attitude Towards Wildlife

2.2.1 General Context

This chapter deals with results and findings of previous studies as regards human attitudes toward wildlife especially, large mammals, and wildlife conservation. A number of studies can be found in the area of human attitude towards large predators and wildlife conservation in general, in European as well as North American context.

Several studies have been conducted in European countries on large predators, especially, bears, lynx and wolves to record the public attitude towards those animals (Bjerke and Reitan 1994, Dahle, 1987; Gossow, 2000; Kaczensky *et al*/2003; Szinovatz 1997; Szinovatz and Bath, 1997). Similarly, a rather large amount of studies are available in North America and Canada due to the longer history of the human dimension research. Studies which deal with the developing, testing and applying of different methods, such as "wildlife acceptance capacity (Decker and Purdy 1988), "wildlife attitudes and values scales" (Purdy and Decker 1989), typology of attitudes toward animals (Kellert 1976), attitudinal formation models (Bright and Manfredi 1996) can be found. Studies on public attitude toward and knowledge of bears and wolves have been done by Bath, (1996a); Bath (1994); Bath and Buchanan (1989).

The perception of people towards wildlife conservation varies greatly from one individual to another. Some may have a positive attitude whereas others may have a negative and still others may be indifferent to the conservation values (Kellert, 1985). Numerous factors have been recorded in previous researches, which influence attitudes of the public toward wild lives. Socio-demographic characteristics (such as age, sex, professions, education, distance to the National park or protected area), the residence of the respondent, perception of the predators' population size, personal importance of the whole issue or specific species are the major.

Studies conducted in large predators, bear and lynx, revealed mostly positive attitudes of publics. One of the initial studies conducted by Asgard (1975) as cited in Szinovatz (1997), identified actual public attitudes toward bear as positive, in which 81% of the respondents support a protection of the bears. An early study, conducted by Norling *et al.* (1981), showed quite positive attitudes toward wildlife in general and the big predators. Dahle (1987) conducted and documented Norwegian general public's willingness to pay for and their attitudes toward the predators' bear, lynx, and wolf. Dahle (1987) found similar appealing results compared to Norling *et al.*, (1981) and Asgard (1975). Approximately half the respondents (51%) of the 1000 people sampled, supported the maintaining of the current bear population size, 15% support an increasing of the population, whereas 21 % were in favour of a general reduction. Socio-demographic

characteristics, such as age, gender, education, income and nature interests were found to influence the attitudinal levels. Positive attitudes were held by people with high education or men and negative attitudes were mostly held by women, older people and low educated respondents.

People holding most positive attitude towards bears will most likely: (I) support actions favourable to bears; (II) tolerate bear's damage and (III) maintain their position in case of conflict (Ajzen, 1993; Bright and Manfredi, 1995). Usually one expects more positive attitude with increasing knowledge (Bath and Buchanan, 1989). But, in the case of highly controversial large carnivore species, a negative relation between knowledge level and acceptance can be found (Bath, 1994; Bright and Manfredi, 1995; Kellert *et al.*, 1996; Szinovatz, 1997, Kaczensky *et al.*, 2003)

An inverse relationship between age and attitude was often found (Dahle 1987, Bath 1989, Stevens *et al.* 1994, Bjerke and Reitan 1994; Szinovatz, 1997; Kaczensky *et al.*, 2003). The older the respondents, the more negative attitude towards the animals were recorded. There was often a direct relationship between educational level and attitude of the species (Stevens *et al.* 1994, Bjerke and Reitan 1994, Szinovatz, 1997; Wechselberger, 2002). Often a tendency for those with positive attitudes to come from urban rather than rural areas was documented (Bath 1989, Stevens *et al.* 1994, Kaczensky *et al.*, 2003).

The level of education and standard of living (Nepal and Weber 1993) seem to be some major determinants of a positive attitude towards nature conservation. The positive attitude in the community tended to intensify with the level of education (Infield, 1988). A study carried out in Natal, South Africa, showed positive correlation between attitude and affluence of the households. More of those household heads who had to laid any importance on allowing local people access to wildlife resources and building a mechanism to integrate conservation areas into local economies (Jacobson, 1991).

Public attitudes are generally believed to be most positive in areas where carnivores are absent or in areas with an unbroken carnivore-human co-existence (Kellert *et al.*, 1996; Zimmerman *et al.*, 2001; Bath and Majic, 2001; Kaczensky *et al.*, 2003). More recent research in North America suggests that attitude towards large predators are changing and that most of public today support large carnivores recovery (Bath, 1989; Kellert, 1996). Unlikely, another study conducted in Austria 'attitude of hunters and residents of Vienna towards bear and lynx' have revealed the negative attitude towards bear and lynx (Zeiler *et al.*, 1999). Attitude level also depends on the distance of the residents' to the protected areas or national parks or wildlife habitat. In Yellowstone National Park, USA attitudes of residents from counties surrounding the park were more negative toward wolves than those of residents from further away from the park (Bath 1989; Bright and Manfredi 1996). Szinovatz and Bath (1997) also found that Norwegian attitudes toward

bears varied according to distance from the core area, where bears are returning. Those residents in the core area were more negative toward bears than those from non-core areas (Zeiler *et al.*, 1999 as quoted in Szinovatz, 1997).

The farmer's attitudes towards national parks in the Prespa National Park, Greece were found to be aggressive, as a result of exacerbating conflicts over land use (Pyrovetsi & Gerakis, 1987). On the other hand, villagers showed strong support for wildlife preservation in Mt. Kinabalu, mainly due to the improvement of transportation and development of new scheme associated with the establishment of the park (Jacobson, 1991).

Different attitudes were held on the basis of profession and interests of the people (Bath 1989; Bath and Buchanen 1989). Interest groups such as stock growers or nature protection organizations tend to hold the extreme attitudes toward species and the general public lying more in the middle with a moderate attitude (Bath 1989). Attitudinal and knowledge levels were directly related to different professions. Stock growers (Bath and Buchanen 1989) tend to have a more negative attitude toward wolf restoration, regardless of distance from the park or educational level. The general public mostly holds a more moderate view of the issues than people closer in distance to the issue (Bath and Buchanen 1989).

Wildlife damage can alter a person's perceptions about wildlife, especially when damage exceeds his/her tolerance. For example, farmers who had experienced deer damage were more likely to believe that deer populations were increasing and to want a reduction in the deer population than other farmers (Decker and Brown 1982; Decker *et al.*, 1983). Conover (1998) found similar result in a national survey of agricultural producers. In his survey 53% of respondents reported that the amount of wildlife damage they experienced exceeded their level of tolerance. In the same survey 40% of all agricultural producers reported that wildlife damage on their farm or ranch was so severe that they would oppose the creation of a wildlife sanctuary near them; 26% said wildlife damage reduced their willingness to provide wildlife habitat on their property.

In developing countries, the creation of a nature preserve often is opposed by local residents, who are most impacted by it. These people fear restrictions on their historic use of resources within the preserve, crop damage from herbivores venturing out of the preserve, and loss of livestock and human lives due to an increase in local predator populations. In fact, crop damage is often cited as the main reason why neighbours dislike nature reserve (Parry and Campbell 1992; Heinen 1993; Newmark *et al.*, 1993).

2.2.2 Nepalese Context

Because virtually no studies have been found on the public attitude towards one horned-rhinoceros, in specific, an attempt has been made to review some relevant studies, which are conducted from a rather broad view. Various researchers in Nepalese context have noticed diverse forms of conflicts between parks and people as well as people's attitudes towards wildlife conservation, in general (Parry & Campbell 1992; Nepal and Weber, 1993; Sharma and Shaw, 1993; Heinen 1993; Martin and Vigne 1995; Budhothoki, 2001, and Acharya, 2002).

The initiations of protected areas have not only positive impact on the biodiversity conservation in Nepal, but also negative impact on the socio-economic conditions of the people (Budhothoki, 2001). Imposing of strict park regulations and denying easy access to park resources resulted in survival threat to many poor communities. The strict protection, on the other hand, supported the increasing numbers of animals including the rhinoceros, which ultimately affected the surrounding people (Sharma and Shaw, 1993; Nepal and Weber 1993).

Thus, a major source of park–people conflict is wildlife leaving protected areas and entering human settlements to extract resources, such as crops and livestock. Where this problem exists, people living adjacent to protected areas often have negative attitudes toward wildlife and or the protected area (Nepal & Weber 1993). In Nepal studies have shown that some people living adjacent to national parks feel that the government considers the wildlife more valuable than local people (Nepal and Weber 1993; Kharel 1997).

A positive attitude on the part of local people toward natural resources management is essential to achieve long-term conservation and sustainable development of natural resources. A study conducted in Nepal (Struggle for Existence) by Nepal and Weber (1993) revealed that the conservation attitudes of the local people could be explained in relation to various aspects of their socio-economic conditions. The land holding size, frequency of visits and distance to the park were significant in explaining a positive conservation attitude, which was due to bigger land size, lower frequency of visits and increasing distance to the park (Nepal and Weber 1993). Nepal and Weber found that the proportion of indifferent attitude declined as the distance increase from the park.

People's perceptions of different species within the same protected area can vary greatly. Oli *et al.*, (1994) reported that in the Annapurna Conservation Area, the majority of people had strongly positive attitudes toward blue sheep (*Pseudois nayur*) because they are beautiful and harmless and they enjoyed seeing

them, whereas they had strongly negative attitudes toward snow leopards (*Uncia uncia*) because they kill livestock.

Attitude of villagers toward rhinos around RCNP as recorded by Ganga Thapa of King Mahendra Trust for Nature Conservation (KMTNC) was found to be negative (Martin and Vigne, 1996). With an increasing human population around the park, and increasing rhino numbers, negative feelings toward rhinos have risen; about 75% of the local villagers now dislike the animals because 7% of the rhino populations live outside the Park disturbing the people and their livelihood. More than 60% of the paddy lost to wild animals is by rhinos, which often trample the paddy at night (Martin and Vigne, 1996). Wild animals especially rhinos (*Rhinoceros unicornis*), boars (*Sus scrofa*) and spotted deer (*Axis axis*), destroy 1/8 of the crops around the park each year (Nepal & Weber, 1993). Similarly, another study conducted in Budongo Forest Reserve in Uganda (Hill 1988) found that residents living around the reserve had a variety of utilitarian and aesthetic reasons for feeling that elephants (*Elephas maximus*) should be protected; although most people also felt elephants are dangerous.

Peoples' attitudes toward wildlife are not only based on species to species but also place-to-place. A study on "Local Resident's Perceptions of Protected Areas in Nepal" by Allendorf (1999) reveals that people's attitude towards wildlife species found to be different in three protected areas. The most commonly mentioned species in Kaakri Bihar protected area accounting for 80% of all responses were sambar (*Cervus unicolor*), tiger (*Panthera tigris*) and leopard (*Panthera pardus*) and jackal (*Canis aureus*), whereas the most frequently mentioned species in Royal Bardia National Park (RBNP) accounting for 58% were elephant, rhino, spotted deer and tiger and leopard). In Lumbini area 64% of all responses mentioned blue bull (*Boselaphus tragocamelus*), hyena (*Hyaena hyaena*) jackal and hare (*Lepus nigricollis*) (Allendorf, 1999).

The differences in attitude may be explained by extent and severity of crop damage and livestock depredation by wildlife (Allendorf, 1999). People dislike species if they eat crops or livestock or generally "do damage." People also say they dislike some species because they are afraid of them and because they hurt people. However, a different result can be found from the same study that the attitude towards animals differs on the basis of their values like cultural and aesthetic ones. Even species that have the most negative effects, are liked by some people in two protected areas (RBNP and Lumbini) For example, although elephants cause a great deal of crop damage, 26% of the people like elephants (Allendorf, 1999). The most common reasons for liking elephants as reported by Allendorf (1999) were that people liked to

see them and felt that preserving them was good and they are believed to be created by god's and visually appealing as well.

The status of wildlife conservation depends on the forest coverage. One study reveals that public attitude towards forest conservation depends on the perceived need. In case of Nepalese situation, the increase of forest products is highly acceptable with the increasing demand of people. The perceived shortage of tree and forest products has changed the attitude of farmers toward tree plantation, which increase forest cover in many parts of Nepal (Koirala *et al.* 2001).

2.3. Conservation History of Nepal

2.3.1 Wildlife Conservation History of Chitwan Valley

The history of wildlife conservation had started since the Rana regime (1846-1950) in the Chitwan valley as hunting ground for the privileged class. Prior to the malaria eradication program in Chitwan valley, the ruling Rana of Nepal had protected the habitat and utilized Chitwan valley as a hunting reserve (Müller-Böker, 1999; Gurung and Guragain, 2000). From 1846 to 1951 Chitwan became the site of huge big game hunts, to which the Maharaja invited a big part of the world's nobility. In 1911 during the visit of King George-V, of England the record book of 39 tigers, 18 rhinos, 2 bears, several leopards were shoot within the period of 11 days. Moreover, all the previous records were broken. A major hunt, in which lord Linlithgow, the Viceroy of India, took part back comprise 120 tigers, 38 rhinos, 27 leopards and 15 bears (Gurung, 1983).

After the fall of Rana rule and the launching of malaria eradication program, the valley had to bear double threats from the human population. On the one hand, the massive population migration into this area resulted in large-scale devastation of wildlife habitat by opening it up for agricultural land while subsequent intensification of poaching was there on the other hand. In 1927, out of the total area of Chitwan district (148062.5 ha), 126621.5 ha or 86% were under forest cover, which in 1977 was reduced to 64964 ha or 44% of the total area (Gurung, 1983; Müller-Böker, 1999).

Similarly, the wildlife habitat was destroyed extensively, which resulted in the rapid decline of wildlife population, especially one-horned rhinoceros and Royal Bengal Tiger. Wildlife species such as water buffalo and swamp deer became extinct. During the period of the 1950s, no conservation concept of wildlife could be found in the valley from the government (Müller-Böker, 1999).

The earliest wildlife management step in Chitwan was taken by establishing a "rhino sanctuary" in 1957. The wildlife protection Act 2015 (1957 AD) provided legal basis for the protection of wildlife. Then

Mahendra Mriga Kunja (Mahendra Deer Park) with an area of 175 sq km was declared in 1959. In order to make wild animals protection measures more effective, the Mahendra Mriga Kunja was renamed as Royal Chitwan National Park in 1972 with an area of 544 sq km. Later in 1975, the Royal Nepal Army joined the park with a responsibility of park protection. The park was then extended from 544 sq km to 932 sq km in 1977 (Gurung and Guragain 2000; RCNP, 2000; Pradhan, 2001). DNPWC brought forth the buffer zone policy in 1993 under the fourth amendment of the National Parks and Wildlife Conservation Act 1973 (Paudyal, 2001; RCNP, 2000).

2.3.2 Rhino Conservation in Nepal

Rhinoceroses are large herbivores that occur in tropical Asia and Africa. The greater one-horned rhinoceros (*Rhinoceros unicornis*), (family: Rhinocerotidae) is one of five living species of rhinoceros in the world. They were once found across the entire northern part of the Indian sub-continent. It once was known to have been extremely common and widespread in the Indo-Gangetic plains of the north, east and central parts of India up to the Pakistan border Indus valley, and along the southern part in Nepal Terai. By the end of the 19th century it had completely disappeared from much of the range. Today only about 2200 one-horned rhinoceros survive in the wild in Nepal and India (Pradhan, 2001; Adhikari, 2002). In Nepal, Chitwan valley of flood plain is the prime habitat for the second largest one-horned rhino population in the world. Rhinos occurred in highest densities along the flood plain grasslands and riverine forests bordering the Rapti, Narayani, Reu and Dhungre rivers suggesting riverine grasslands as the single most critical habitat dominated by 4-6 m tall *Saccharum spontaneum* (Pradhan, 2001).

The overall trend of rhino population in Nepal seems increasing with the increment rate of 3.88% from the population census 1994 to 2000 (Adhikari, 2002; Kandel, 2003). However, several up and downs can be seen in its history within the period of 1950 to present. Nepalese rhino populations were relatively well protected in the nineteen and early twentieth century (Laurie, 1978). The rhinoceros population was estimated at about 800 in 1950 in Chitwan Valley, which fell to 300 in 1959, and only 100 remained in 1966 (William, 1994; Gee, 1959; Adhikari, 2002).

The reason for declining of rhino population was massive destruction of forest and grasslands in Chitwan Valley (Caughley, 1969; Müller-Böker, 1999) due to agricultural expansion and rampant resettlement for migrants from mid-hill of Nepal (Adhikari, 2002; Pradhan, 2001). The traditional religious value of its blood, hooves, piece of skin and even the horn (*Khag* in Nepalese language) were another supportive reason in the past (Martin, 1985). The greatest threat to rhinos is the demand for rhino horn, used in traditional Asian medicine to treat a variety of ailments (Martin and Vigne, 1996; Adhikari, 2002). However, the major causes of declining of its population in Asia as well as in Africa stems in the illegal exploitations of rhino (Gurung

and Guragain, 2000; Martin, 2001; Leader-Williams et al. 1990). The study by Leader Williams *et al.* 1990 concluded that declining of rhino numbers results from problems, which come from outside the protected areas, such as increasing rhino horn demand in the international market and a decline in other economic opportunities for local people living in and around the protected areas.

Realizing the rapid decline of rhino population, the HMG/N started to give priority to its conservation. After the establishment of RCNP with strict conservation efforts the rhino population increased from 147 individual in 1972 to 358 in 1988 (Dinerstein and Price, 1991) and 544 in 2000 (Rijal, 2000; Adhikari, 2002). Moreover, to protect the rhinoceros from being extinct the government of Nepal has implemented many other activities.

2.3.3 Rhino Translocation Program

One of the major rhino conservation strategies of the Nepal Government is translocation of rhinoceros to other suitable habitats. The main objective of the translocation of the endangered rhino is to establish a new viable population in new home range, RBNP and to minimize the human-rhino interactions in Chitwan as well as to save the species from any natural or other disasters (Jyanwali, 1995; and Pradhan, 2001). The translocation of rhinos was started in 1986 with the help of Non-Governmental organizations (World Wildlife Fund (WWF) and KMTNC). A total of 87 rhino have been translocated from RCNP to RBNP including 3 in Royal Suklaphanta Wildlife Reserve (RSWR) in the period of 1986 to 2003. Considering the historical range of rhinos (all through the Gangetic plains) the translocation of rhino populations to RBNP and RSWR seems to be quite suitable (DNPWC, 2002). According to WWF Nepal Program the western Terai (RBNP) is one of the priority sites for the Greater one-horned rhino selected for the South Asia bioregion. The wide area with 968 square km is provided by Babai Valley of RBNP, which is said to be a good rhino habitat. The sighting of baby rhinos in new area indicates a positive trend in their new habitat (DNPWC, 2002).

2.3.4 Anti Poaching Operation

One of the remarkable steps was the implementation of the anti-poaching operation. Department of National Park and Wildlife Conservation (DNPWC), with the support of International Trust for Nature Conservation (ITNC) and (WWF) Nepal program, set up an institutional program originally referred to as the Anti-Poaching Unit (APU) in 1992 in RCNP and RBNP (Gurung and Guragain, 2000). This program includes intelligence units and many guard posts erected in main strategic points of the parks. The APU patrol inside parks and gather information about poaching and trading activities in the surrounding villages. The structure of APU consists of Chief Wardens, park rangers, game scouts, elephant staff and informers.

The APU works through intelligence system in cooperation with District Forest Offices (DFO) and Royal Nepal Army Concerned.

Legal provision with a certain penalty system is another instrument, which was introduced by National Park and Wildlife Conservation Act 1975. The penalties for poaching rhinos can be a 5 to 15 years of imprisonment with a fine of rupees 50,000 (\$1= Rs.74) to 100,000 (Pradhan 2001). There is an award system as well in ITNC that provides incentives to the local people for their information leading to the arrest of poachers and dealers of wildlife species and their parts (Gurung and Guragain, 2000). The park awards the villager informants up to the amount of rupees 50,000 (Pradhan, 2001). In spite of such severe penalties and efforts, poaching of rhino is still reported. According to the official record of RCNP, 107 deaths of rhinoceros were found in the period of 2001 to mid 2003. Out of which, 64.5% (69) were killed by poachers. This indicates that strict law alone is not sufficient to decrease the poaching of endangered wildlife species. Cooperation of local people living adjacent to the protected area is the key to achieve success in such issues (Pradhan, 2001). Despite mounting efforts over the past two decades, threats to sustainable conservation of endangered wildlife species mostly, rhinos and tigers continuously existed in different forms and scale.

2.3.5 Buffer Zone Management Program

The BZ is an area designated as a zone of impact surrounding the national park in order to provide for additional habitat to wildlife and the use of forest products to the local people and community development (HMG, 2001). Realizing the growing needs of community participation in the conservation of biodiversity, the Government of Nepal has made a breakthrough in its conservation process with the initiation of Buffer Zone Management Policy in 1993 under the fourth amendment of the National Park and Wildlife Conservation Act 1973 (HMG, 1973). Subsequently, Buffer Zone Management Regulation was passed in 1996 (Budhathoki, 2001). The legal provision has authorized Park's Chief Warden (or warden) as responsible for managing forest resources in designated buffer zone areas, and the law encourages them to form User Groups (UG), User Committees (UC) and Buffer Zone Development Councils (BZDC) to promote local involvement in conservation. In addition, the Act provides that 30 to 50 percent of the funds generated from park revenues (e.g., entrance fees, hotel royalties, etc.) to be expended for local community development (HMG, 1996).

According to the Buffer Zone Management Regulation, the organizational structure of the BZ can be the following: Adjoining communities have been mobilized by forming user groups (UGs) in the settlement level. Participation of all households for mobilization and decision making process has been made

essential. The local people have been encouraged to form male and female user groups separately. These settlements-based community organizations (User Groups) will then be federated to form user committees at the sector level. As per the BZ Management Guidelines, there will be 21 such committees in each buffer zone area. The chairpersons of these committees will form Buffer Zone Development Councils (BZDC) at the park level of which the chief of the park (park warden) acts as a member secretary. This apex body is entrusted to mobilize share of the park revenue for the conservation and development activities in the Buffer Zone through users' committees and groups.

2.3.6 Stakeholders of Rhino Conservation

A person who will be affected by, or will affect, wildlife management is a stakeholder may be any citizen having an interest (a stake) that could be affected by a wildlife management decision or action (Susskind and Cruikshank 1987; Crowfoot and Wondolleck 1990; Decker et al. 1996). Their stake may take the form of a recreational, cultural, social, and economic or health and safety impact from wildlife or the management of wildlife. Any of those kinds of impacts can be the focus of wildlife management (Decker et al. 2001). Stakeholder includes both those who benefit from positive outcomes of people-wildlife interaction and those who experience problems. They also include those who influence or make decisions about how a program is managed (Weiss, 1983).

A study was conducted by Paudyal (2001) to assess policy issues for biodiversity conservation analysing stakeholders in terms of their right, responsibilities, activities, interests, and problems for buffer zone management. He categorized all stakeholders of the buffer zone management into five groups: I) primary stakeholders are user groups, user committees and Buffer Zone Development Council; II) local non-governmental organizations; III) the park authorities that has main responsibilities of conservation and management; IV) international donor and visitors, and V) resorts, inside and outside the park (Paudyal, 2001).

Since this study mainly focuses on rhino and its conservation, the stakeholders have been viewed more specifically than in other cases. All the parties or groups or individuals, who are benefited from rhino, getting trouble out of it and entitled with main responsibility of its conservation are considered as stakeholders in this study. Moreover, the parties, who are responsible for the local development along with political decisions, are also another important stakeholders. Stakeholders with six categories are described as below:

(I) Local general people, who imply for the entire male and female citizen living in the BZ and having the occupation of farmers, wage labours, teacher, students etc, (II) Private sectors, for example hotel enterprises, which are the tourism-based local hotels, restaurants and other business, which are running inside as well as outside of the park boundary, (III) Local political institutions, for example District Development Committee (DDC) and Village Development Committee (VDC), (IV) Nongovernmental Organizations (NGO), which are involved in local development, social mobilization and conservation, (V) Buffer Zone Development Council (BZDC)/UG/BZCF, which have stake in conservation and utilisation because park and buffer zone forests provide them with fodder, fuel wood and other resources, and (VI) Park authority, which has main responsibilities of conservation and management as well as generating financial resources.

Stakeholders' involvement has been considered as an important strategy to resolve the animal-human conflicts in the field of wildlife management. Researches demonstrate that conflicts over management of wildlife populations, large herbivores in particular in suburban communities have increased dramatically during the last decade and in many situations, the tolerance of stakeholders for negative impacts of wildlife has been exceeded. So, well-designed, well-executed stakeholder involvement process can help agencies and communities resolve conflicts between stakeholders and facilitate implementation of socially acceptable management actions (Chase *et al.*2002). There are several additional objectives for involving stakeholders in management and most objectives for citizen involvement in natural resources issues are classified into 4 broad groups, which include improving the management climate, providing input for decisions, helping to make decisions, and implementing actions (Bleiker and Bleiker, 1990; Lauber and Kuth, 1998 as cited in Decker *et al.*, 2001). As stakeholders play a large role in the management process, an agency may have multiple objectives for stakeholders' involvement, but the importance is to think in wider view because stakeholders' experiences, interests and preferences are just a few of the many factors to be considered in the design of a public involvement process (Chase *et al.*2002).

3. SITE AND METHOD OF THE STUDY

3.1. Rationale for the Selection of the Study Areas

This study has been conducted to understand perspective of people towards one-horned rhinoceros (*rhinoceros unicornis*). The buffer zone area of RCNP was selected for this study for various reasons. I) It is the only national park in Nepal, which is known as original habitat of greater one-horned rhinoceros. II) The DNPWC has been conducted various program in the buffer zone of RCNP and III) The researcher is well known in the area since she worked as a buffer zone development officer in the adjoining protected area called "Parsa Wildlife Reserve (PWR)". Two User Committees (Barandabhar and Meghauri) out of total 21 were selected for the questionnaire. To study the view of private sectors entrepreneurs, Souraha area was selected purposively, because Souraha is the only area where hotels and guesthouse are concentrated for the tourist service.

3.2. Setting of the Study Area

3.2.1 The Chitwan District

The Chitwan district lies about 146 km SW from Kathmandu, the country's capital city. It is located between longitudes 83°55' to 84°48' East and latitudes 27°21' to 27°53' North. Physiographically, it is divided into Terai, Siwaliks and Middle Mountain Regions. The district covers an area of 2218 sq. km with a total population of 472,048 (CBS, 2002). It is divided into 36 Village Development Committees (VDC) and two municipalities for its administrative management purpose. About three fourth of the area of the district's lands have high agricultural potential and are relatively flat. Over 75% of the annual rainfall occurs during monsoon from June through September with average annual rainfall of 2000 mm .

Forest, agricultural lands, pasture/grazing lands, settlements and wastelands constitute the major land use types in the district. The agro-climatic conditions are favourable for crops, vegetables and tropical to sub-tropical fruits. There are three cropping seasons in a year viz. monsoon (from June to September), winter (from October to February) and summer (March to May). The important crops are paddy, maize and millet in monsoon, wheat lentil, potato and buckwheat in winter, paddy and maize in summer.

3.2.2 Royal Chitwan National Park (RCNP)

Location and Area

RCNP is located between 83° 87' to 84° 74' East Longitude and 27° 34' to 27° 68' North Latitude in the southern part of Chitwan District. The park covers a total area of 932 sq. km and is bordered by the PWR in the east and international boundary with India in the southwest. Valmiki Tiger Sanctuary and Udaipur Sanctuary lie across the Indian boarder in Bihar, India. The Rapti River forms the natural boundary in the

north, while the Narayani River, with the parts of Nawalparasi district, forms the western boundary of park (Figure 3). The area was gazetted as the country's first national park in 1973. Recognizing its unique ecosystems of international significance, UNESCO declared RCNP as a World Heritage Site in 1984 (RCNP, 2002).

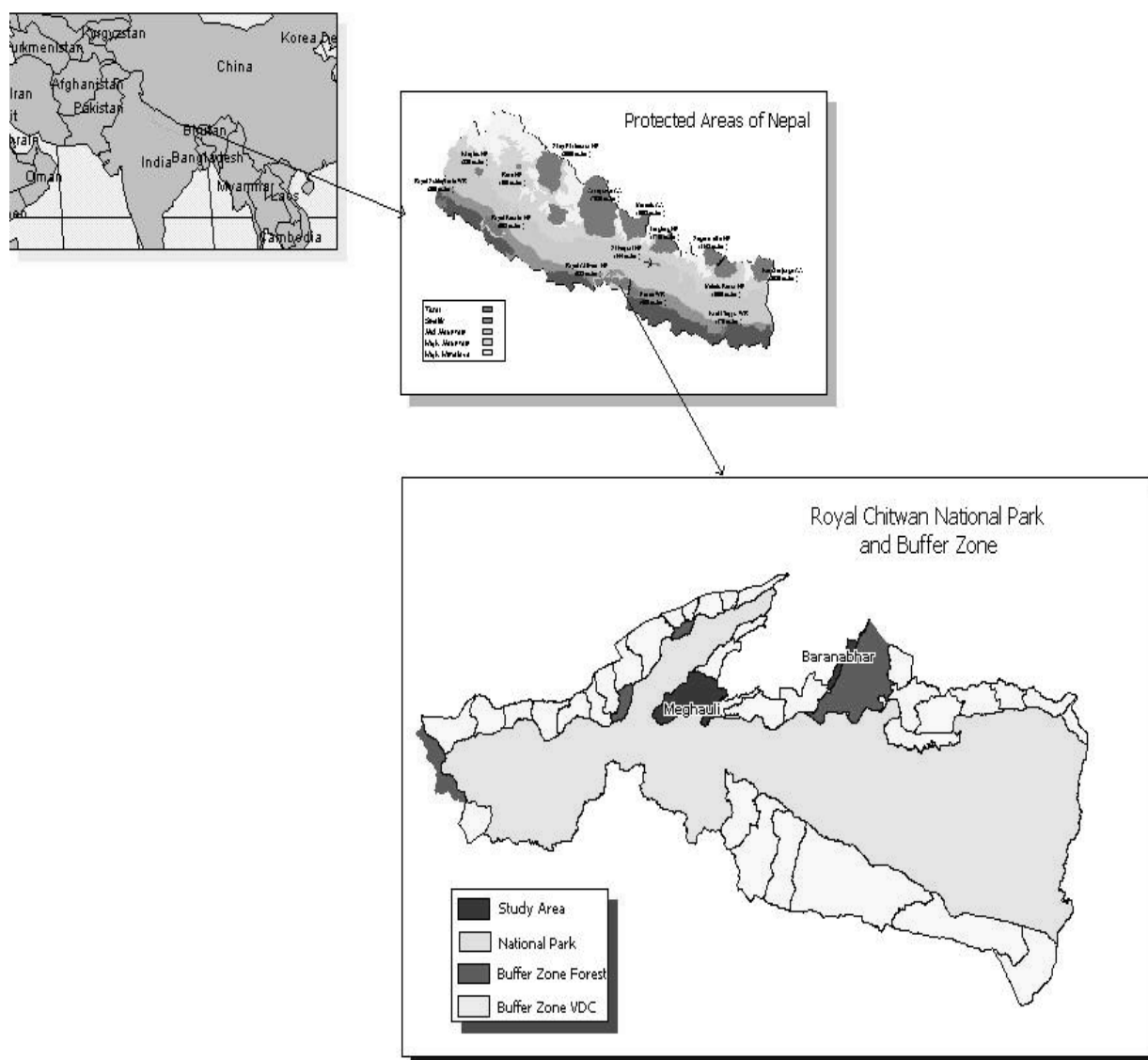


Figure 3: Royal Chitwan National Park (Confer Annex for large scale map)

Topography and Geology

Chitwan lies in the region of the Siwalik Range. These youngest formations from the Himalaya consist of erosion debris from the Pliocene and early Pleistocene that were caught up in the final phases of folding and rising. The range runs in a strike direction parallel to the Himalayas. The so-called Siwalik strata have built up the mountain chain called Churiya. The Churiya Range, which borders the Rapti valley on the south, and attains heights of up to 800 m s l, consists of conglomerates of the upper Siwalik strata in the east while formations from the lower Siwaliks predominate in the west. North of the Churiya chain is the

Rapti valley, which steadily widens from east to west (Pradhan, 1989). The park has a diversified landscape and river system, which has served as habitat for hundreds of wild animals, birds, and reptiles. The park encompasses parts of the flood plains of three major rivers, namely Narayani, Rapti, and Reu. The variations in width, length, and depth of these three rivers and numerous other streams have greatly modified the physiography of the valley.

The Climate

The park has a range of climatic seasons, each offering a unique experience. It is situated at an elevation of 142 m above sea level. The climate of Chitwan is subtropical with a summer monsoon from mid June to late September and a relatively dry winter. The mean temperature in summer is 33°C and in winter is 17°C. The mean air temperature rises during the pre-monsoon period (February to May) and declines during the post-season (October to June), with the lowest in January (Pradhan, 1989). Humidity is high all-year round. Dry, cool northerly winds blow from the Himalayas during winter. Rainfall, temperature and humidity vary considerably over short distances within the valley.

The Vegetation

The salient features of the park embrace its unique ecosystem of significant values. The vegetation of Chitwan valley is tropical to sub-tropical. About 70 percent of the vegetation is predominately sal (*Shorea robusta*) forest. The remaining vegetation types include grassland (20 percent), riverine forest (7 percent) and sal (*Shorea robusta*) with chir pine (*Pinus roxburghii*) (3 percent) (RCNP, 2002). The riverine forest consists of Khair (*Acacia catechu*) Sissoo (*Dalbergia sissoo*), and Simal (*Bombax ceiba*). The riverine vegetation is surrounded along the Rapti River and other large streams in the north. Most of Chitwan Valley was cleared for cultivation, so these parts were transformed from natural to man-made landscape. The grasslands form a complex community with over 50 species. The tall Elephant grass (*Saccharum spp.*) and the shorter thatch grasses (*Imperata spp.*) are the major species forming the grasslands. This kind of vegetation provides the habitats for wildlife, especially one-horned rhinoceros, and preserves a unique ecosystem.

The Wildlife

The biological richness of the park is outstanding with 8 ecosystem types, which include 7 forest types, 6 grassland types, 5 wetland and 3 main river system habitats. The faunal diversity consists of 50 species of mammals, over 525 species of birds, 49 species of reptiles and amphibians and 120 species of fish (NTB, 2001). Among ungulates, hog deer (*Axis porcinus*) are the most abundant, followed by chital (*Axis axis*), which frequently graze in the tall grasslands, occasionally on short grasses at forest edges and on open riverbanks. The sambar (*Cervus unicolor*) is the largest of the deer species in Chitwan (Laurie, 1978). Gaur

(*Bos gaurus*) is also common in the park. The great one-horned Indian rhinoceros constitutes the bulk of the biomass of the park (Laurie, 1978); the current population is estimated to be 544 individuals (DNPWC/HMGN, 2000). The park is famous for the Royal Bengal Tiger (*Panthera tigris*). Other Carnivorous includes the leopard (*Panthera pardus*), wild dog (*Cuon alpinus*), jackal (*Canis hipus*) and red fox (*Vulpus bengalensis*). Beside these, wild pigs (*Sus scrofa*), sloth bear (*Melursus ursinus*), wild elephant (*Elaphas maximus*), the gangetic dolphin (*Platanista gangetica*), marsh crocodile (*Crocodylus palustris*) and gharial (*Gavialis gangeticus*) are also found in this park.

3.2.3 The Buffer Zone of RCNP

The BZ area of the RCNP was legally declared in 1996 following the buffer zone management regulation 1996. Table 1 presents some facts and figures about buffer zone and study area. The buffer zone area of RCNP includes 2 municipalities and parts of 35 VDC from four districts: Chitwan, Nawalparasi, Parsa and Makawanpur. The buffer zone is divided into 4 sectors and 21 unit committees for its administrative management following the buffer zone management guidelines 1999. One user committee in each UC is formed comprising 13 members (including one third female) following buffer zone management regulation. The BZ covers an area of 74676.2 ha and comprises total numbers of 510 settlements, covering 36193 households with the total population of 223260 (111,143 male and 112,117 female) (RCNP/PPP, 2001).

Table 1: Details about buffer zone and study area

Description	Entire BZ	Megghauli UC	Barandabhar UC
Number of districts	4	1	1
Number of VDCs + Municipality	35+2	1	1+1
Area (ha)	74676.2	3067.2	785.6
Number of wards included in BZ	232	9	7
Number of settlements	510	27	9
Number of households	36193	2331	969
Population,	223260	17495	5401
Male	111143	8759	2762
Female	112117	8736	2639

Source: RCNP BZ Profile

Figure 4 illustrates the main study area, which covers two UC namely Megghauli and Barandabhar. Megghauli UC covers all the parts of Megghauli VDC, which lies at the western border of Chitwan district covering an area of 3067.2 ha. It is about 28 kilometers far from Bharatpur, the district headquarter of Chitwan. The UC comprises 2331 household with total population of 17495 (RCNP/PPP, 2001). The UC

sites. The most prominent land use is cultivated agricultural land in both sites followed by forestland in Barandabhar and by grassland in Megghauli (Table2).

Table 2 Major land use types in the study area

SN	Land use types	BZ	Megghauli	Barandabhar
1	Cultivate land	46.6%	90.4%	59.8%
2	Forest land	40.2%	3.9%	40.2%
3	Grass land	1.0%	5.7%	-
4	Shrub land	1.6%	-	-
5	Others	9.6%	-	-

Source: RCNP BZ profile

The economy of both study sites is based on agriculture. Agriculture is practiced as means of subsistence as well as for cash income. There are some agro-based enterprises like vegetable farming, horticulture, fisheries, etc. Other enterprises that are prevalent in the area are shop keeping, tailoring, poultry farming etc. The land is fertile to bear three crop rotations in a year. The major crops cultivated in the area are paddy, maize and wheat. The most common cash crops include oil seeds; primarily mustard, soybean, lentils and some cultivate jute. The education status of study area can be viewed in table 3 below. A large portion of the population in the study areas is illiterate. The majority of the population falls in the middle class of education i.e. under school leaving certificate (SLC) in both the sites as well as in the entire BZ. The Barandabhar has higher percentage (18.5) of population from SLC and above SLC education than Megghauli and even than BZ average, which has only 5.9% (RCNP/PPP, 2001).

Table 3 Educational status of the study area

SN	Education Status	BZ	Megghauli	Barandabhar
1	Illiterate	41.0%	42.9%	35.0%
2	Under SLC	53.0%	52.8%	46.5%
3	SLC and above	5.9%	4.2%	18.5%

Source: RCNP BZ profile

The average travelling distance from the park boundary to the settlements of the BZ area is about 3.12 km. Only 71 settlements lie within a distance of less than 1 km. Similarly, 320 settlements are located within a range of 1 to 5 km, 57 settlements in between 5 to 10 km and 13 are situated in a distance of 10 km or more from the park boundary. (Dhakal, 2000)

3.3 The Research Method

Since limited research work has been done in specific to public attitudes toward rhinoceros in Nepal, this study deals with the empirical survey research, in which data are gained directly from the target groups. In any empirical research project strict attention must be made to methodical issues of data collection. This study is based on explorative and descriptive design, which has focused on qualitative aspect of phenomena to collect information.

3.3.1 Survey Research

The social science approach has been applied in this study. Data collection was accomplished through survey research. "Survey research is probably the best method available to the social scientist interested in collecting original data for describing a population too large to observe directly "(Babbie, 1995). The major goal of a survey research is to learn about the ideas, knowledge, feeling, opinions, attitudes and self-reported behaviours of a defined population by asking them directly. It is more complex than the "status survey", as it seeks not only the current status of population's characteristics, but also tries to discover relationships among variables (Szinovatz, 1997).

To examine people's knowledge of and attitude towards rhino and it's conservation issue, conducting a survey was the most appropriate method. There are several survey techniques available in social survey. The questionnaire survey is the most widely used method in social studies (Fillon, 1978; Fillion, 1980; Chambers, 1983; Bath, 1993). Russell (1988) outlines the 3 methods of collecting questionnaires data (personal interviews, self-administered questionnaires and telephone interviews). Babbie, (1995) has named it "interview survey". The interview is an alternative method of collecting survey data, in which research asks the questions orally and record respondent's answer (Babbie, 1995).

This study employed the personal interviews or interview survey with semi-structured questionnaires considering the local situation, where many people are poor in reading and writing. There was direct involvement of researcher during the course of survey, which was the strongest part of this study. Babbie, (1995) explained numbers of advantages in doing interview survey; they are: I) Interview surveys typically attain higher response rates than mail surveys, II) Respondents seem more reluctant to turn down an interviewer standing on their doorstep than they are to throw away mail questionnaire, III) Presence of interviewer generally decreases the number of "don't know" and "no answer", and IV) The interviewer can be instructed to probe for answers, and the interviewers can also provide a guard against confusing questionnaire item, if the respondents misunderstand the questions.

3.3.2 Questionnaire Design Procedures

"The term questionnaire suggests a collection of questions, but an examination of typical questionnaire will probably reveal as many statements as questions. That is not without reason often; the researcher is interested in determining the extent to which respondents hold a particular attitude or perspective. If you are able to summarize the attitude in a fairly brief statement, you will often present that statement and ask respondents whether they agree or disagree with it" (Babbie, 1995). This study followed the questionnaire design used by the University of Chicago's National Opinion Research Center stated by Earl Babbie (1995). The questionnaire were formulated with the five-point Likert scale format, in which respondents are asked to strongly agree, agree, disagree or strongly disagree, or perhaps strongly approve, approve, and so forth. Most of the questions were designed with the matrix to make it easy to answer. Earl Babbie (1995) pointed out that this format has a number of advantages. First, it uses space efficiently. Second, respondents will probably find it faster to complete as set of questions presented in this fashion. In addition, this format may increase the comparability of responses given to different questions for the respondent as well as for the researcher, and also to correlate various answers to others.

In this study the research problem was defined and refined as much as possible. With the lists of tables for the final report in mind, questions were revised several times and formatted to meet research objectives. The questionnaire was drafted in winter semester 2002 and contents were reviewed first by Prof. Gosow H., Institute for Wildlife Biology and Game Management and Dr. Pregernig M, Institute of Socio Politics, University of Natural Resources and Applied Life Sciences, Vienna. Experts in wildlife conservation and social science in Nepal did the second review. A pre-test was conducted with ten persons in the summer 2003 before starting the survey. This procedure resulted in modifying some questions to make them simpler using local words, and even a dropping of some questions.

3.3.3 Questionnaire Contents

Considerable attention was paid to the simplicity of the questions so with which they would be answered in representing the true attitude, opinion and knowledge of the respondents. The wording of questionnaires used in this study borrowed heavily from expert advice sourced from available literature. Babbie (1995) advises that the questionnaire title should be clearly define the subject, make short items as much as possible, avoid negative terms and items, which make respondents confuse. In order to encourage respondents to answer all the questions easily, close-ended questions with fixed clear-cut choices to choose from were used. However, a few open-ended items were also included to explore the view of respondents spontaneously. Russell (1988) stresses that close-ended questions have the advantage of being efficient on ambiguous for purpose of analysis, and adds that including open-ended items is good as

it breaks the monotony for respondents. The questionnaire consists a total of 20 with some sub questions, which were organized in five sections including respondent's demographic characteristics (Confer annex 1).

3.3.4 Sampling Frame and Sample Procedure

A representative sample reflects the actual characteristics of the population accurately and without bias. The quality of statistical problem solving depends on correct samples. It is necessary to develop a sampling procedure that reduces sampling error to a tolerable and acceptable level. Most possible sources of error can be reduced substantially (and may be even avoided or eliminated), if all steps of the sampling procedure are carefully planned and evaluated before the full set of sample data is collected and analysed (McGrew and Monroe, 1993). An attempt was made to follow all the steps and sampling procedure carefully in this study.

The people living in buffer zone area of RCNP are the target population for this research work. A total of 280 individuals of over 16 years old from different profession were the sample population in this study. The study followed the stratified sampling method. The first step was to divide all the target population into 6 groups on the basis of professional background, which include: 1) general farmer, 2) school teachers and college students, 3) local political leader (VDC/DDC representative), 4) buffer zone leaders, 5) private sector, specifically, tourism based hotel entrepreneurs, and 6) National park staff. The sample size was decided in the second step. The former 4 target sample groups were attained from two randomly selected areas from inside the buffer zone. The 5th group was obtained from a purposively selected area, where tourism based hotels are concentrated inside the buffer zone, and the 6th group was done from the national park staff. Figure 5 and table 4 (page 44) illustrates the sample size of the study. Farmers represents 52% of the sample population, teachers/students represents 16%, hotels entrepreneurs, buffer zone leaders and park staff represent 9% each and local political leaders represents 5% of the total population.

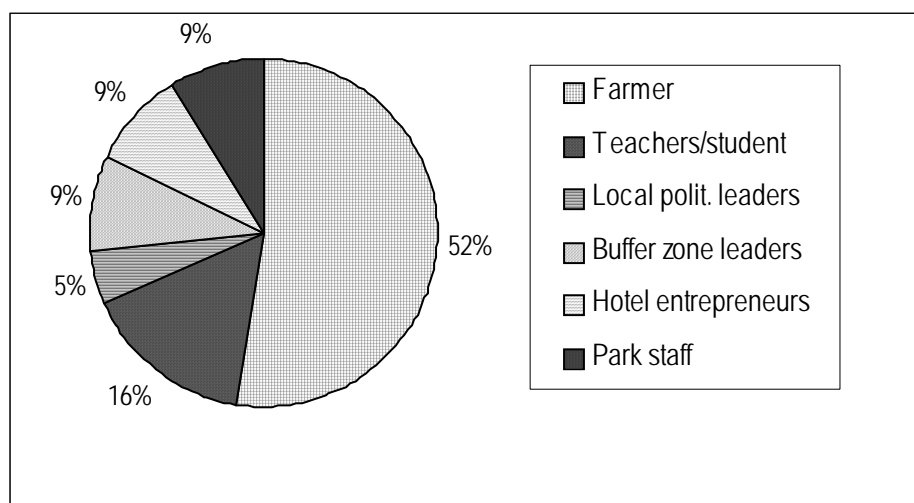


Figure 5: Sample frame and sample size

After selecting the sample size, the simple random sampling method was applied to select the interviewee from each group. The random selection procedures were selected on the basis of practical situation. To select the respondents from farmer groups, walking in the streets in every settlement was applied. One in every 12 to 15 household was selected and any adult available in the house was interviewed. To incorporate perspectives from both genders, it was tried to interview with male and female adult in every alternate household.

Respondents from all the other groups were selected with similar procedures. A simple lottery system was applied from the name lists of target group people. The teachers and students were interviewed only from secondary and higher secondary schools in the study site. 44 teachers and students from 5 secondary schools and one higher secondary school were interviewed. The village development committee representatives and DDC members from the concerned sector were considered as local political leaders in this study. So, 14 members out of 86 elected political leaders were interviewed in total. The UC members are considered as BZ leaders. There is one user committee with 13 members in each site. A total of 25 buffer zone leaders were interviewed from two user committees. There are about 61 hotels run permanently in Souraha area, out of which 25 hotel owners were selected for the interview. Similarly, out of 129 total staff members working in the park, 25 were selected for the interview. To obtain additional information, secondary data were also utilized in this study. Relevant documents such as other research reports, annual progress reports as well as periodic progress reports were collected from different official sources i.e. RCNP, DNPWC, KMTNC, WWF, DDC/VDC and BZ offices. Information's were also collected from some key informants from the BZ area. Old persons from aboriginal people were identified and discussed with the help of checklists of questionnaire contents.

3.3.5 Use of Semantic Differential Method

The psychologist and communication scholar Charles E. Osgood (1957) devised a method to plot the differences between individuals' connotations for words, which is called Osgood's method and known as 'Semantic differential'. He worked with the semantics of words and ideas involved in scaling opinions and created a method to plot a psychological distance between words by mapping a subject's connotations of the words. This study employed semantic differential method to measure attitude toward rhino using words, which gives meanings on the subject of "Rhino". In this method, meaning of the words are taken as subjective responses and meaning are defined in terms of their position on a continuum between polar adjectives, such as "good-bad" or "kind – cruel" and so on. Osgood's method is a development of the Likert scale to that Osgood adds three major factors or dimension of judgment:

- Evaluative factor (e.g. Good/Bad, Kind/Unkind, Beautiful/Ugly, Happy/Sad)
- Potency factor (e.g. Strong/weak, Large/Small, Heavy/Light, Deep/Shallow)
- Activity factor (e.g. Active/Passive, Fast/Slow, Hot/Cold, Noisy/Quiet)

Only the first category, i.e. the 'evaluative factor', was used in this study to measure public's attitudes toward rhinoceros. Though the method is, most commonly, based on a seven-point rating scale with bipolar word-pairs placed at opposite ends of the scale, this study employed only five point-rating scales. Different words or adjectives, which are considered to deal the feeling and belief on 'rhino', were provided with 5 rating scales from negative to positive.

3.3.6 Statistical Analyses

After gathering the data from the field, the data entry process was done using a more appropriate computer program, namely "Statistical Package for Social Sciences (SPSS)", which facilitates the process of data analysis in more precise and appropriate way (SPSS, 1999). Descriptive statistics was used to outline all results obtained in the study. Frequency data among all five groups were analysed using cross tabulations and Chi-square statistics. Means of responses for each sample group were compared. Knowledge scales were calculated following Bath (1989). Each correct answer received a score of 1, while incorrect answers and "*I do not know*" responses indicating lack of accurate information held by the respondents received a score of 0. Since this study dealt with total four knowledge questions, hence, 1 was the lowest knowledge score and 4 was highest scores. Attitude scores were calculated as follows: strongly Disagree/Not important at all received a score of 1, Disagree/Not important received a score of 2, Neutral opinion received a score of 3, Agree/Important received a score of 4 and Strongly Agree/Very important received of 5. So, a mean score of 1 indicated a strong negative feeling, a score of 3 indicated a neutral stand and a score of 5 indicated a strong positive feeling

4. RESULTS

This chapter deals with major results of the study. The results are separately outlined for different groups of respondents on the basis of their profession, age, education, and - sometimes – their sex and locations, which are assumed to be important factors in understanding the objectives of the study. The respondent's socio- demographic factors have been described in the first step and the results by items and sample groups from different characteristics of the respondents have been presented in the second step.

4.1. Profile of the Respondents

Table 4 presents the respondent's profile. Results discussed in this study were obtained from information collected mainly from six categories of respondents that based on the profession, which are farmers, teacher/students, hotel entrepreneurs, local political leaders, buffer zone leaders and national park staff. The farmers group was the major respondent and constituted 52.5%. This was followed by teacher/student and so on (Table 4). However, other demographic characteristics such as age, sex, education, location (two study sites) and distance to the national park boundary were also equally considered important to explore people's knowledge and attitudes toward rhino and accepting its conservation.

The dominant age bracket for both locations was 20-40 years, which accounted for 48.9% of the responses. The age group of 41 to 60 years was second. More than 15 % of the respondents were from the below 20 age group. The least number of respondents were from the age group of 61 and older (10.8%). In regards to the gender of the respondents, this study was not able to achieve the balance. Males constituted a higher percentage of respondents (68.6%) than females (31.4%). In the education of respondents, the middle level (literate to SLC) dominates with 47% followed by illiterate group. Only 6.9% constituted the education level of SLC and above.

The respondents were requested to write their approximate distance to the NP boundary from their home. The majority in both locations (Meghauli and Barandabhar) are at a distance of 1-3. Out of the total, 43 respondents were at a distance of less than 1 km; 86 were at a distance of 1-3 km; 43 at a distance of 3-6 km, 16 were at 6-9 km; and 42 were at a distance of more than 9 km.

Table 4: Respondents characteristics

	Frequency	Percentage
Profession		
Farmers	147	52,5
Teacher/students	44	15,7
Private Sectors (hotel entrepreneurs)	25	8,9
Local Political (LP) leaders	14	5,1
Buffer zone (BZ) leaders	25	8,9
National Park (NP) staff	25	8,9
Sex		
Male	192	68,6
Female	88	31,4
Age		
< 20	30	10,7
20 - 40	137	48,9
41 - 60	87	31,1
> 61	26	9,3
Education		
Illiterate	121	43,3
Literate to SLC	132	47,1
College & above	27	9,6
Location		
Meghauli	161	70,0
Barandabhar	69	30,0
Distance to NP boundary		
< 1 km	43	18,7
1 - 3 km	86	37,3
3 - 6 km	43	18,7
6 - 9 km	16	7,0
> 9 km	42	18,3

Source: Field survey 2003

4.2. Basic Findings by Items and Sample Groups

Public's knowledge and attitudes towards the rhino and their acceptance of rhino conservation program are described with the help of tabulation, diagrams, charts. Some statistical tools were employed to analyse the results. In general, each item was identified and documented with the help of descriptive statistics. The frequency distributions of the responses to each item by types of respondents are presented to illustrate differences in response among the groups. The findings of the study have been presented in major four headings below:

1. Knowledge about rhino and it's conservation
2. Perception on the impact of rhino
3. Attitudes and preference of wild animals

4. Acceptance of rhino conservation

4.1 Perception on present conservation programs

4.2 Opinion on legal provision for the protection of rhino

4.3 View on stakeholders' participation for rhino conservation

4.4 Acceptance of rhino population

4.2.1 Knowledge about Rhino and its Conservation

The findings from only four groups of respondents (farmers, teachers/students, local political leaders and BZ leaders) have been discussed here, because this study tried to find out the level of knowledge of the local residents about rhino and its conservation program in RCNP. Knowledge on rhino's food and behaviour, the present population and legal provisions for its conservation have all been considered as major knowledge (Confer annex 1).

4.2.1.1 Knowledge of Rhino Behaviour

The study sought to acquire an understanding of the local residents' general knowledge about rhino behaviour. Knowledge of behaviour implies when and how does rhino walks, what does it looks like and how does it defend when it feels threatened etc. Figure 6 presents the overall knowledge on the rhino behaviour. It shows that most of the local residents are familiar with the general behaviour of rhino. More than 79% claimed that they know and only 21% said they do not know about the above-mentioned behaviour of rhino.

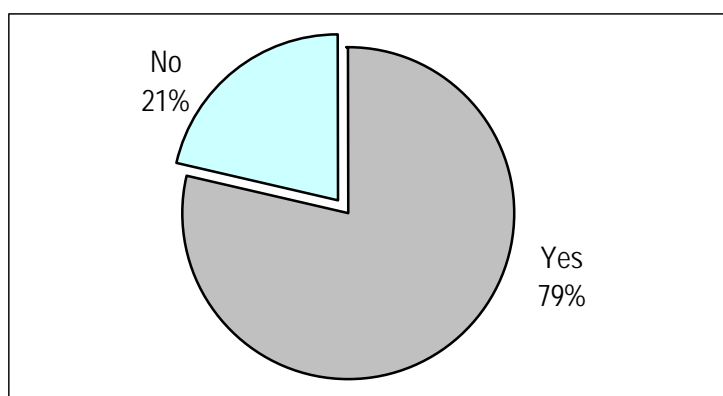


Figure 6: Percentage of respondents concerning knowledge on rhino behaviour

There are few differences on the level of knowledge by profession of the respondent's group. BZ leaders seemed the most knowledgeable, constituting 88.0% of the "yes" answer for the question, "do you know about rhino behaviour?" Farmers seemed the

least knowledgeable, constituting about 75% of the “yes”. 85% of local political (LP) leaders and 84% of teacher/students constituted of “yes” answers (Table 5).

Table 5: Knowledge of rhino behaviour subject to profession of the respondents

Types of respondents	n	Yes (%)	No (%)	No answer (%)
Farmers	147	74.8	25.2	0.0
Teachers/students.	44	84.1	15.9	0.0
Local political leaders	14	85.7	14.3	0.0
BZ leaders	25	88.0	12.0	0.0
Total	230	78.7	21.3	0.0

Source: Field survey 2003

There are only minor differences of knowledge level by sex and age. The male respondents showed a bit more knowledgeable than female respondents. The middle-aged groups, especially from 20 to 60 years of age hold more knowledge than other groups of age. However, the education level of the respondents has been found a bit more of an influential factor on the knowledge of the rhino in general. It shows that the knowledge level increases with the increase of the education level of the respondents (Confer annex 2.1.1).

4.2.1.2 Knowledge of Rhino Food

The results show that the food source of rhino is nothing new for local residents. Figure 7 illustrates the respondent’s knowledge on rhino food. Almost all respondents (97%) were able to say that the rhino eats grass and fodder. 3 % said cereal crops were the food for the rhino, and least of all one person said “others” was the food source. Nobody said that the rhino is a meat-eating animal.

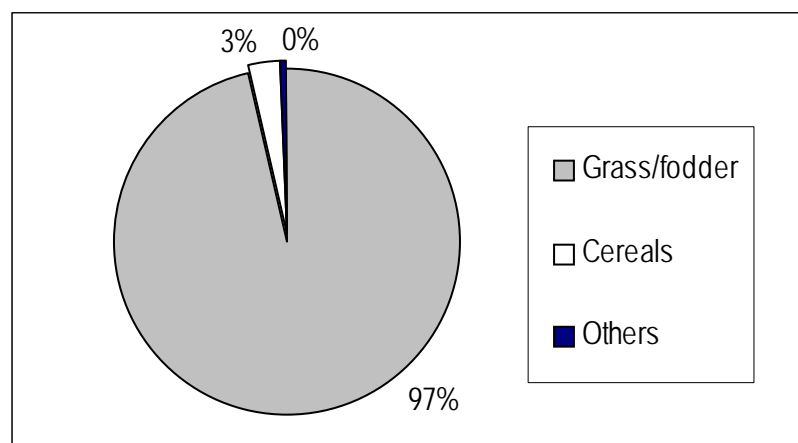


Figure 7: Percentage of respondents concerning knowledge on rhino food

There are very little differences by profession, age, sex and education of the respondents on knowledge of the rhino's food. Political leaders seemed the most knowledgeable, followed by farmers among the professional groups. Likewise, the middle aged-group appeared a little more knowledgeable than other ages. Male seemed slightly more knowledgeable than females. The illiterate groups have shown more knowledge than higher educated groups (Confer annex 2.1.2).

4.2.1.3 Knowledge of Present Rhino Population

Total rhino population was estimated as 544 in RCNP in 2000 (DNPWC, 2000). Thus, the estimation of 400-800 has been considered the correct answer for the population size of the rhino presently. Figure 8 presents the respondent's perception on rhino population size in RCNP. 31% of the respondents assessed the correct range of 400-800 individuals, 5% overestimated, and a majority about 34% underestimated the population size. A large portion of the respondents said 'don't know'.

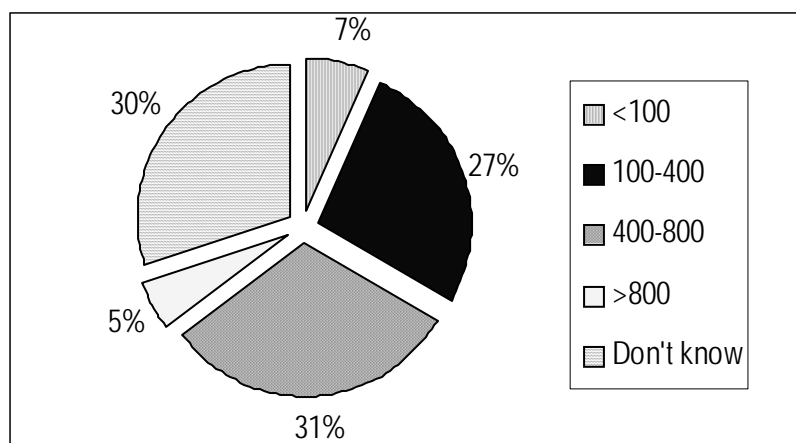


Figure 8: People's knowledge about rhino population in RCNP

However, the difference on the knowledge level was recorded in accordance with the profession, sex, and education level of the respondents. Table 6 below shows the knowledge differences by profession. Respondents of teachers/students groups seemed more knowledgeable than other groups. Out of 147 total respondents from farmers, only 31.3% estimated correctly the rhino population size, whereas among the teachers/students and BZ leaders, about 59% and 52% respectively estimated the population size correctly.

Table 6: Knowledge of rhino population subject to profession of respondents

Respondents	n	< 100 (%)	100-400 (%)	400-800 (%)	> 800 (%)	Don't know (%)

Farmers	147	6.8	26.5	31.3	5.4	29.9
Teachers/students	44	4.5	25.0	59.1	4.5	6.8
Local p. leaders	14	21.4	28.6	42.9	7.1	0.0
BZ leaders	25	0.0	44.0	52.0	0.0	4.0
Total	230	6.5	28.3	39.6	4.8	20.9

Source: Field survey 2003

Figure 9 below shows the knowledge differences by education and sex of the respondents on the rhino population size. Regarding the education, the majority of the respondents from illiterate groups underestimated the existing rhino population. Only 21.7% of this group stated acceptable rhino numbers. A very high percentage (56.5%) from the middle class of the educated group stated right answers. From the highest education class, though, only 43.8% estimated the proper population range of the rhino. Thirty-four percent of the respondents from the illiterate group and about eleven percent from literate to SLC group gave a “don’t know” answer. Results show that a much higher percentage of the male respondents than the female respondents estimated the rhino population correctly. More than 47% of the female respondents but only about 15% of the male respondents stay behind “don’t know” answer

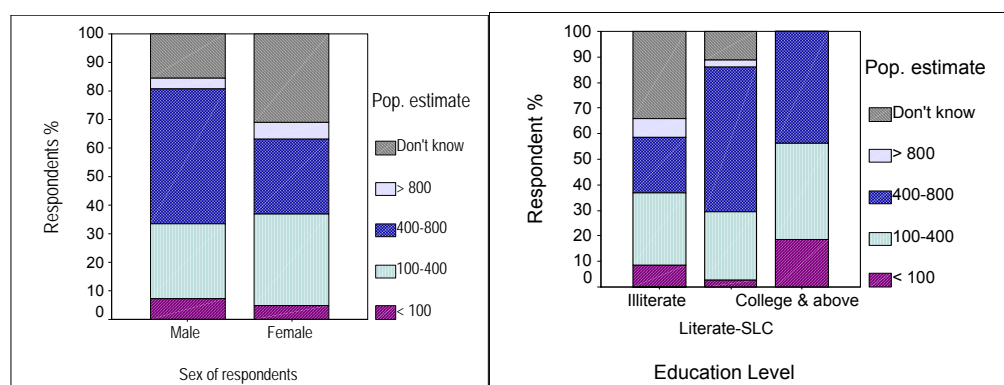


Figure 9: Knowledge of rhino population subject to sex and education

4.2.1.4 Knowledge of Legal Provision

The National Park and Wildlife Conservation Act-1973 has given legal provision to protect the rhino from poaching in Nepal. It includes punishment for poachers as well as rewards for informants. There is a penalty of 15 years in jail and a fine of rupees 100,000 (\$1= 74 rupees) for a poacher and also for anyone who encourages poaching. There is also an award of rupees 50,000 for anyone who informs concerned authorities about poaching.

Respondents were asked to tell about the above-mentioned three provisions for reward and punishment. Answers were categorized on a scale of 1 to 3. Here 1 refers to a full

knowledge of all three provisions, 2 refers to little knowledge, meaning they could tell about the provision of a reward and punishment but could not quantify the reward or punishment. And 3 refers to no knowledge at all, meaning they don't know about any provision. Figure 10 offers an impression about the percentage of local residents who know of the legal provision for rhino protection in Nepal. The overall results show that very few respondents (13%) have full knowledge on the subject, 59% knew nothing at all, and 28% have little knowledge on the subject.

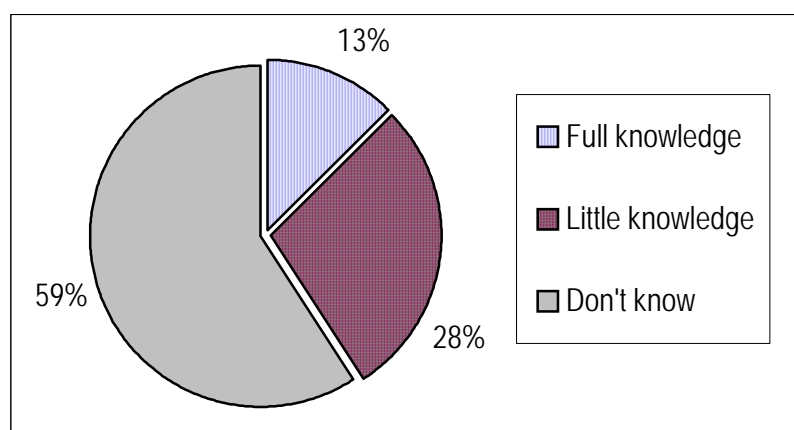


Figure 10: People's knowledge of legal provision for rhino protection

The level of knowledge is subject to profession, age and education of the respondents. A much higher percentage (64.5%) from the farmer's group had no knowledge at all, and only about 10% of the farmers had a full knowledge about the rhino's legal provision. The political leaders seemed to have a higher knowledge (21.4%) among the groups, followed by the teacher/student group and the BZ leaders (Table 7).

Table 7: Knowledge of legal provision subject to profession of respondents

Respondents	n	Full knowledge (%)	Little knowledge (%)	None (%)
Farmers	147	9.5	25.9	64.6
Teacher/student	44	18.2	22.7	59.1
Local political leaders	14	21.4	71.4	7.1
BZ leaders	25	16.0	28.0	56.0
Total	230	12.6	28.3	59.1

Source: Field survey 2003

Comparing the knowledge level with age and education of the respondents, the knowledge increases with decreasing age and increasing education level. Figure 11 demonstrates that only about 7% of the 46 illiterate people answered with a full knowledge of the legal provision. That contrasts with about 17% of the literate to SLC level group that answered with a full knowledge and with about 25% from the SLC and above level group that answered with a full knowledge. Similarly, the second figure below illustrates that about 17% out of 30 from the age group 15-20, held a full knowledge of the legal provision for the rhino. The percentage to express full knowledge decreased with the increasing of age class. Only 8% of the respondents out of a total of 25 from the age group above 60 answered all the provisions (Confer annex 2.1.4).

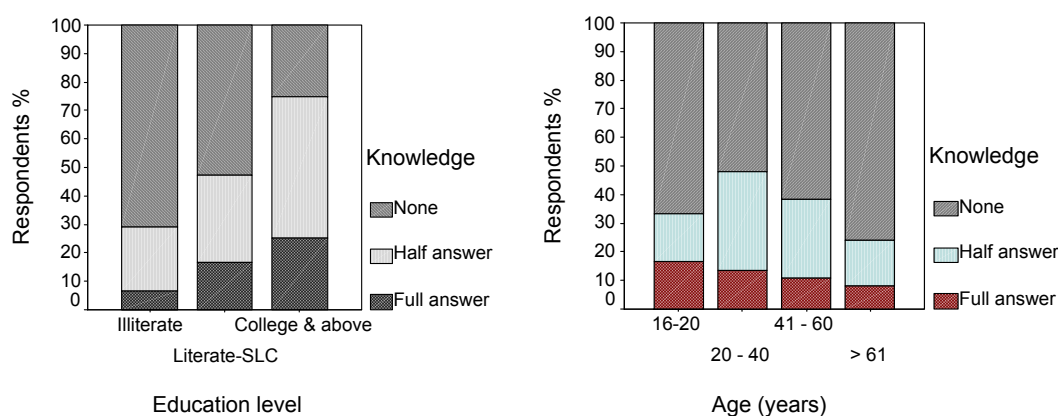


Figure 11: Knowledge of the legal provision subject to age and education

4.2.1.5 Sources of information

The sources of information and dissemination mechanisms are one of the basic factors for an individual to acquire knowledge. With an objective of finding out the sources of information about rhino behaviours and its conservation status the following question was administered with multiple choices: '*From where do you know about rhino behaviour?*' (Confer annex 1).

The overall result revealed that the majority of the people relied on the direct and verbal means of information and communication. A very high percentage (i.e. 63%) of the respondents said that they came to know about rhino behaviour by directly seeing them and from their relatives and friends. 10% said that they knew through the news media (radio television and journals); 4% said through trainings/workshops; and only 2% said

that they learned from schools or formal education. Many people (21%) had no response (Confer annex 2.1.5).

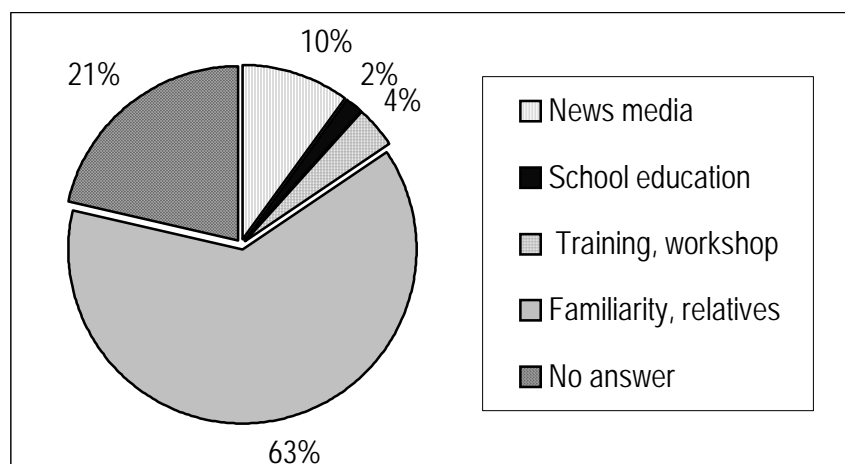


Figure 12: Source of information to learn about rhino

4.2.2 Impact of Rhino

Impact can be either negative or positive. The crop damage from rhinos is considered as a negative, and the benefit that people get from RCNP due to the existence of rhino has been considered as a positive impact in this study. Results under this subheading are based on only four groups of respondents, who come mainly from an agricultural background, viz. farmer, local political leaders, BZ leaders, and teachers/students.

4.2.2.1 Level of Damage

The frequency of the rhino's arrival in the individual's agricultural field was mainly considered as the damage level in this study. Three questions were used for measuring the damage level by the rhino on the local people. First, the respondents were asked about their perception towards the most trouble-giving animal to them (Which animal of RCNP do you think gives the most trouble to the local people of BZ?). Secondly, they were asked the places where they have seen the most rhino movements (*Where have you seen rhino most frequently?*). At last they were asked how often rhinos destroy their crop each year (*How often comes the rhino to your field during a year?*)

The overall results show that rhinos are the most trouble-giving animals among the given options. They arrive to agricultural fields frequently and damage crops by eating, walking, and meshing on them. They also sometimes kill humans on farms and in the forests. The findings from items and different sample groups are presented below.

Perception of Most Trouble-making Animals

Figure 13 presents an overall public perception on the most trouble-giving animal found in RCNP. A majority of the respondents (about 74%) stated that the rhino - among the given list (tiger, rhino, bear, elephant, and others) - gives the most trouble to the local people. About 14% stated tiger; about 1% stated elephant, and about 11% said other animals give trouble to them. It is interesting that nobody reported the bear as a trouble-giving animal in the study area.

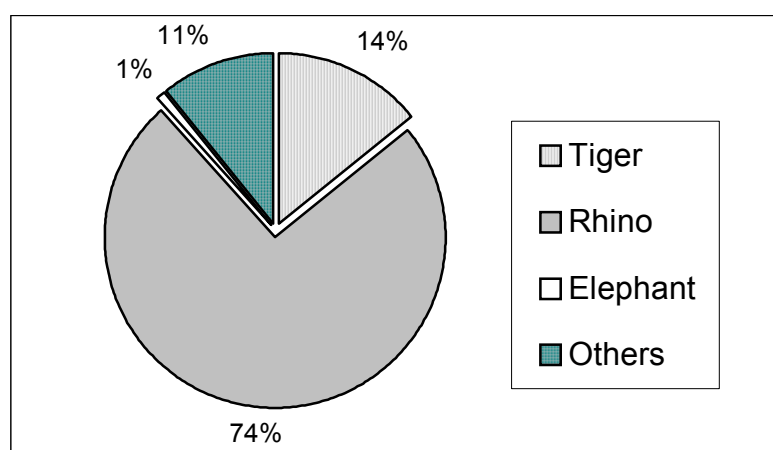


Figure 13: Public perception of the most trouble making animal

Specifically, respondents have been found to have different views about the animal, which gives them the most trouble. Their profession, distance from their home to the park boundary, and their location (two study sites) influence the perceived differences of the respondents.

Table 8 describes the perception of respondents by their profession on the most trouble-giving animal among the given lists of animals existing in RCNP. Out of four professional groups, BZ leaders have quite different views than other groups. 40% of the BZ leaders stated that the tiger was the most trouble-giving animal to them, while 48% of them stated that the rhino was the most trouble-giving animal. A very high majority of all other groups stated that the rhino was the most trouble-giving animal. 95.5% from the teacher/student group, 85.7% from local political groups, and 70.7% from farmers think the rhino is the most seditious animal to them.

Table 8: Perception of most trouble giving animal subject to profession of the respondents

Respondents types	n.	Tiger (%)	Rhino (%)	Elephant (%)	Others (%)

Farmers	147	15.0	70.7	1.4	13.6
Teachers/students	44	2.3	95.5	0.0	2.3
Local p. leaders	14	0.0	85.7	0.0	14.3
BZ leaders	25	40.0	48.0	0.0	12.0
Total	230	14.3	73.5	0.9	11.3

Source: field survey 2003

Table 9 describes the perception of the respondents on the basis of their home distance to the NP boundary. The number of respondents to view the rhino as the most troubling animal decreases as the distance between their home and the park boundary increases. The results show that the rhino seems to be the most annoying animal up to 6 km from the park boundary; whereas, the tiger is the most troubling animal at distances greater than 9 km.

A high majority of the respondents from a distance up to 6 km reported that rhinos are the greatest nuisances to them. 86% from a distance of less than 1 km reported so. 91.9% of the respondents living from 1 to 3 km from the park boundary reported that rhinos were the greatest nuisances, and from 3 to 6 km it was 74.4%. However, only 28.6% from the distance above 9 km stated that the rhino gives them trouble. For this group living at a distance farther than 9 km, about 43% reported that tigers were the most problematic animal. 29% stated that “other” animals were the most trouble to them. Other animals imply wild boars and deer species (Table 9).

Table 9: Perception of most trouble making animals subject to distances

Approx distance	n.	Tiger (%)	Rhino (%)	Elephant (%)	Others (%)
< 1 km	43	4.7	86.0	4.7	4.7
1 - 3 km	86	4.7	91.9	0.0	3.5
3 - 6 km	43	11.6	74.4	0.0	14.0
6 - 9 km	16	25.0	56.3	0.0	18.8
> 9 km	42	42.9	28.6	0.0	28.6
Total	230	14.3	73.5	0.9	11.3

Source: field survey 2003

People reported differently on the most nuisance animals in two study sites. A much higher percentage of respondents (88%) out of total 161 total respondents from Meghauli reported rhinos as the most trouble-making animals whereas only about 41% of respondents from Barandabhar, out of total 69, said that rhinos give more trouble to them, but about 32% respondents from Barandabhar said tigers are the most trouble-making to them (Confer annex 2.2.1).

Presence of Rhino in Agriculture Fields

Assuming that the presence of rhinos in the agricultural field is a measure of the damage to it, the question, “*Where have they seen the rhino?*” was constructed. Figure 14 presents the overall result on the rhino’s movement outside the national park boundary. The majority of the respondents (42%) claimed that they had seen the rhino mostly in agricultural fields; 30% said they have seen it in the community forest (CF) and other governmental forests; 25% stated inside the national park; and 3% said in the other areas.

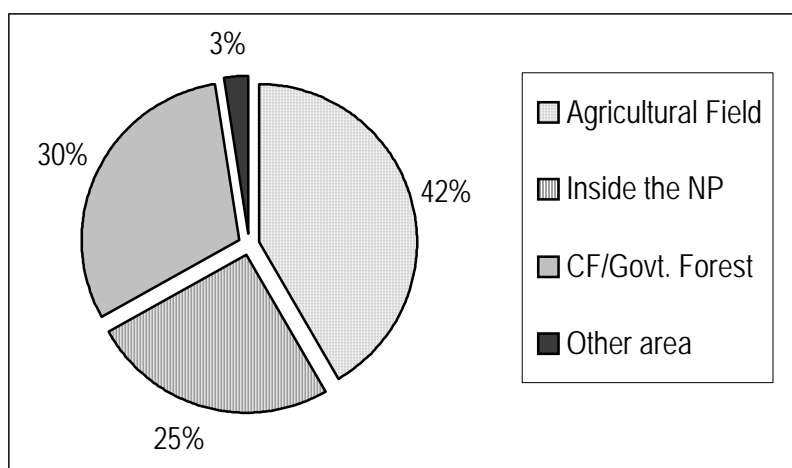


Figure 14: Rhino movement outside the NP area as sighted by people.

Table 10 presents the areas where the rhino was seen the most by the different groups of respondents. Out of a total of 147 farmers, 46.3% said they have seen the rhino in agricultural fields; 31.3% of the farmers stated that they had seen it in the community forest and government forests; 19.7% had seen it inside the national park; and 2.7% had seen it in other areas. Similarly, the highest percent of respondents (43.2%) from the second group (i.e. teachers/students/ service holders) also stated that they saw the rhino mostly in agricultural fields. However, the majority of the local political leaders (64.3%) claimed that they had seen the rhino mostly inside the national park. Only 14.3% of the political leaders stated that they had seen it in the agricultural fields.

Table 10: Rhino movement outside the national park

Respondents	n	Inside NP (%)	CF/BZ. Forests (%)	Ag. Field (%)	Others (%)
Farmers	147	19.7	31.3	46.3	2.7
Teachers/students	44	29.5	25.0	43.2	2.3
Local political leaders	14	64.3	21.4	14.3	0.0
BZ leaders	25	28.0	40.0	28.0	4.0
Total	230	25.2	30.4	41.7	2.6

Source: field survey 2003

Extent of Damage Caused by Rhino

To understand the people's perception of the extent of the damage that rhinos cause, five choices were provided to measure how often or frequently the rhino arrived in their agriculture crops per year. Those choices were: *Never, < 5 times, 5 to 25 times, 25 to 50 times, and more than 50 times* per year. In this case, "more than 50 times" is considered to be most frequently; "25 to 50 times" is frequently; "5 to 25 times" is sometimes; "> 5 times" is occasional.

Figure 15 gives a general impression of how often the rhinos come into the farmer's agricultural fields in the study area. The results demonstrated that the rhino causes a high extent of damage to the farmers who live in the vicinity of the national park. Only 14% of 230 respondents answered that the rhino never comes to their agricultural field. 21% reported that the rhino came most frequently; 10% reported frequently; 34% reported sometimes; and 21% reported occasional.

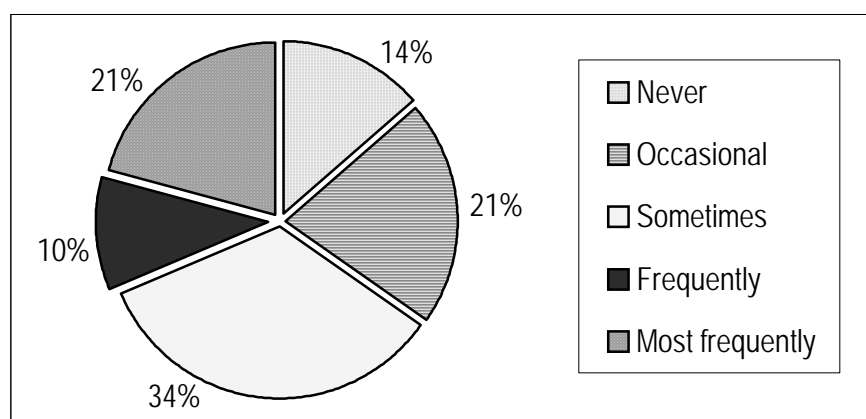


Figure 15: Frequency of rhino arrival in the agricultural land

Different professions of the respondents reported the frequency of rhino arrival to the agricultural field differently. Most of the farmers have reported that rhinos come to their fields all round the year. More than 20% and about 12% of them reported most frequently and frequently, about 39% and 20% of the respondents reported sometimes and occasional arrivals of rhinos in their fields. A large number of respondents (43%) of the local political leaders, on the other hand, reported that they had never come to their fields. The group of teachers/students and BZ leaders were recorded as having nearly similar experiences as the farmers with the frequency of the rhino's arrival (Table 11).

Table 11: Frequency of rhino arrival in the agricultural field

Respondents	n	Never (%)	<5 times (%)	5 - 25 times (%)	< 26 - 50 times (%)	> 50 times (%)
Farmers	147	8.8	20.4	38.8	11.6	20.4
Teacher/students	44	15.9	22.7	27.3	9.1	25.0
Local Political Leaders	14	42.9	21.4	14.3	7.1	14.3
BZ leaders	25	20.0	24.0	28.0	8.0	20.0
Total	230	13.5	21.3	33.9	10.4	20.9

Source: Field survey 2003

Figure 16 shows the number of rhino arrivals in the fields subject to the distance of respondent's home to the national park boundary and two study locations. The results show that the incidence of rhino influx increases with the decreasing distance of the respondent's home to the national park. About 51% of the respondents (N=43) from a distance of less than 1 km stated of a frequent and most frequent raiding by the rhino in their agricultural crops. Similarly, more than 46% of the respondents who lived at a distance of 1 to 3 km (N=86) reported of the rhino most frequently or frequently coming into their crops. For those who lived at a distance of 3 to 6 km (N=43) the percentage dropped to about 12%. For those living at a distance of 6 to 9 km from the park's boundary, the incidence of most frequent or frequent rhino arrivals in crops was only about 6%. Lastly, the percentage was about 9% for those living more than 9 km.

The results show that perceptions on the degree of rhino damage clearly differ by location. People from Megghauli are found to be more affected than people from Barandabhar. A much higher percentage of respondents from Megghauli (28%) reported rhino come to their fields most frequently. Only about 4% from Barandabhar, reported the frequent visits of rhinos to their fields (Figure 16).

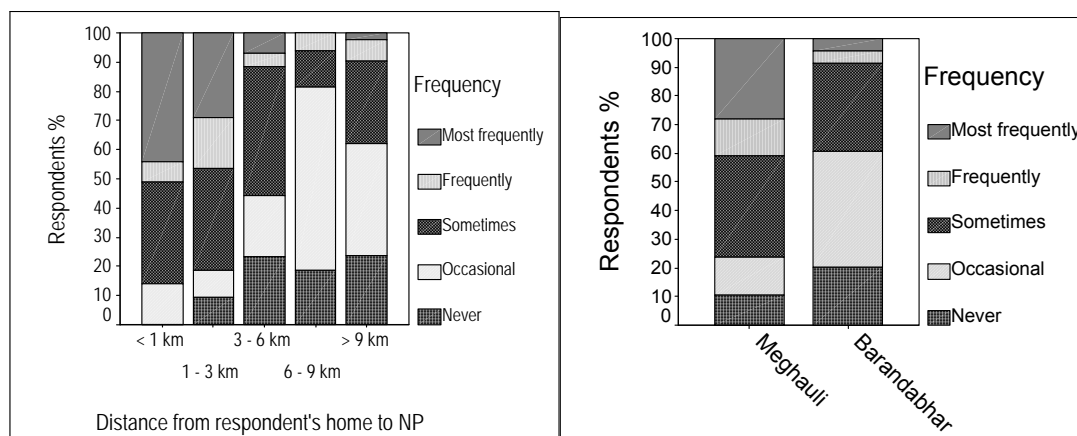


Figure 16: Frequency of rhino in the agricultural fields subject to respondent's home distance to NP boundary and two study locations.

Season and Time of Crop Damage

An open-ended question “Which crop do they mostly damage and in which season and at what time?” was helpful to know the damage intensity by season, to which crop, and the people's experience with rhino behaviour. A majority of the respondents claimed that crop damage is frequently very high during August to December. It is reported that rhinos prefer more paddy, wheat, and lentil than other crops. The majority think that rhinos come out from the national park due the attraction of the agricultural crops. Some of the respondents think the rhino is intelligent enough to stay away from humans, since they enter the agriculture fields mostly at night.

Threat to Human Life

An attempt was made to find out the threat of the rhino to human life with the help of open-ended questions and through the official records as well. It was reported that rhinos cause many incidents in the study area every year. An official record of RCNP shows that rhino in the buffer zone of RCNP attacked a total of 65 people during the period of 1998 to mid of 2003 and 12 of them were dead. In the single case of Meghauji two were dead and 7 were injured. In the Barandabhar area three people were injured in the same period (Table 12).

Table 12: Human casualties from Rhinoceros

Year	Barandabhar		Meghauji		Rest of the UC		Entire BZ	
	Injured	Death	Injured	Death	Injured	Death	Injured	Death
1998	0	0	0	0	2	1	2	1
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	4	1	4	1

2001	0	0	3	1	13	2	16	3
2002	2	0	2	1	14	4	18	5
2003	2	0	2	0	9	2	13	2
Total	4	0	7	2	42	10	53	12

Source: RCNP official record, 2003

4.2.2.2 Benefit to the People

Since tourism is a major source of revenue generation in RCNP, an attempt was made to explore people's perception on the benefit they got from tourism. There are three ways the local people can benefit from tourism. First, they get revenue through the BZ management regulation for their community development (Confer chapter 2). Second, local people can run tourism based business activities, and third, they get employment out of it. Two questions: 'Do you think that presence of rhino is an important source of tourism in Chitwan?'; 'Do you benefit from the tourism?', were asked to find out what do they think about the benefit they get due to the existence of rhino in RCNP. It is found that the local people think the rhino is an important source of tourism in RCNP, and the majority of them think that they are benefiting from tourism. However, many people think there is more negative impact from the rhino to local residences.

Presence of Rhino as a Source of Tourism

Public perception on the presence of rhino in RCNP as a source of tourism in Chitwan is presented in figure 17. The results revealed that tourism in Chitwan appears supported much by the rhinoceros. A high majority of the respondents (93%), out of total 280 respondents, accepted that the presence of rhino in Royal Chitwan national park is a major source of tourism. Only 3% did not accept, and 4% seems unsure on the issue.

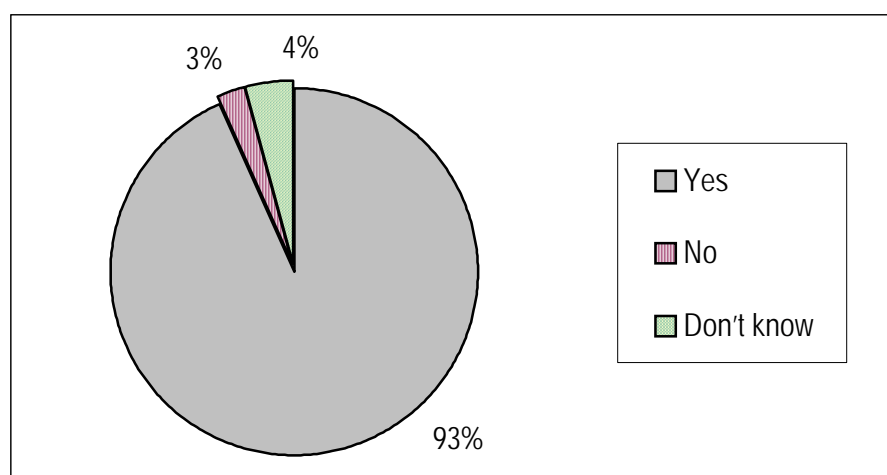


Figure 17: Perception of 'rhino' as a source of tourism

There are only little differences in the perceptions of respondents by their age, sex and other dimensions. Very few differences of the perceptions were found in regards to the profession of respondents and educational level. Table 13 presents the perceptions of the respondents according to their profession and education respectively. All respondents (100%) of the groups of national park staff, local political leaders and private sectors (hotel entrepreneurs) stated that rhino is the major source of tourism in RCNP. But 2.7% of the farmers group and 12% of BZ leaders group did not agree and 7.5% of the farmers and 2.3% of teachers/students groups seemed doubtful on it.

Table 13: Presence of rhino as important source of tourism

Respondents	n.	Yes (%)	No (%)	Don't know (%)
Farmers	147	89.8	2.7	7.5
Teachers/students	44	97.7	0.0	2.3
Private sec.: hotels	25	100.0	0.0	0.0
Local p. leaders	14	100.0	0.0	0.0
BZ leaders	25	88.0	12.0	0.0
National Park Staff	25	100.0	0.0	0.0
Total	280	93.2	2.5	4.3

The comparison of perceptions by the educational level of the respondents shows that the positive feeling increases with the increasing level of education. For example, 89.3% of the total respondents from illiterate group (N=121) said that tourism in Chitwan is supported due to the rhinoceros in RCNP, only 3.3% of this group did not agree and 7.4% remained with “don't know”. Yet, about 96% of the middle education group and 100% of the highest educated group gave a positive view towards the rhinoceros supporting tourism (Confer annex. 2.2.4).

Benefit from Tourism

RCNP is renowned as a tourist attraction in Nepal. According to official record of RCNP, tourism supports about 90% of the annual revenue in the park. The local communities get a share of 30-50% of the total revenue every year through the buffer zone development council (Confer chapter 3). Moreover, there are many hotels and tourism based businesses run inside the BZ. These businesses have generated employment for the local people. The question, “Do you benefit from tourism?” refers to whether or not local residents realize a benefit to them.

Results from only four groups of respondents: farmers, teachers/students, BZ leaders and local political leaders are presented under this subheading. Figure 18 explains

overall view of respondents on the degree of benefit that they get from the tourism activities. The greater parts of the respondents have a positive feeling about it for 29% and 28% of the total respondents out of 230 stated to have more benefited and benefited from the tourism. About 29% said that they did not benefit from it and 14% had a neutral view (Figure 18).

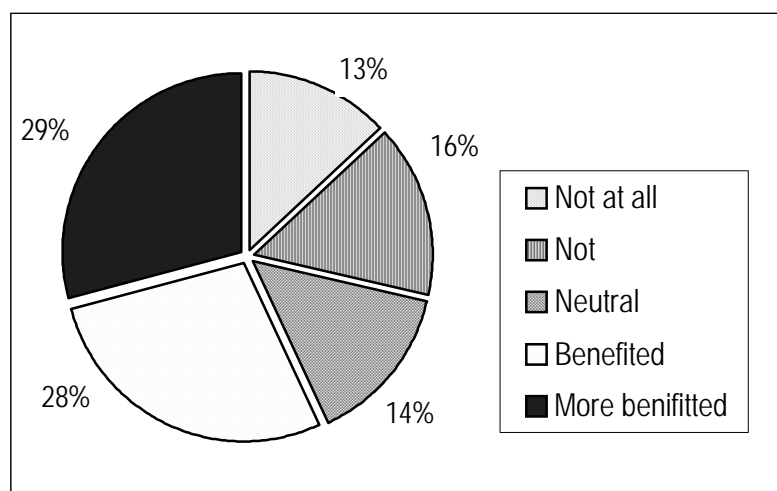


Figure 18: People's feeling of benefit from tourism

The degree of feeling is different in the different groups of respondents. Farmers and local political leaders feel that they have less benefited from tourism in comparison to other groups. More than 38% of the farmers out of 147 think that they have not been benefited from tourism whereas only about 11% of teachers and student's groups, about 14% of local political leaders and 8% of the BZ leaders have negative responses on it (Table 14).

Table 14: Perception of benefit from tourism subject to profession of the respondents

Respondents	n	Not at all (%)	Not (%)	Neutral (%)	Benefited (%)	More benefited (%)
Farmers	147	18.4	20.4	14.3	23.8	23.1
Teachers/students	44	0.0	11.4	13.6	38.6	36.4
Local leaders	14	14.3	0.0	21.4	28.6	35.7
BZ leaders	25	4.0	4.0	12.0	32.0	48.0
Total	230	13.0	15.7	14.3	27.8	29.1

Source: field survey 2003

It is also found that the degree of feeling on benefit differs by the level of education of the respondents. Figure 19 gives an impression that people's feeling of getting benefit

increases with their education level. About 80% respondents of the highest education level and more than 65% of the middle educated group said that they have benefited, while only about 43% of the illiterate group stated that they have benefited (Confer annex 2.2.5).

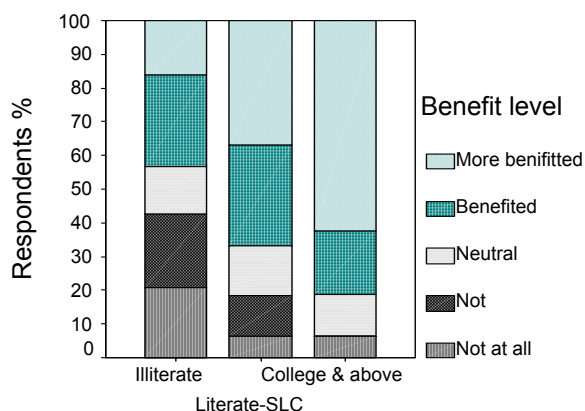


Figure 19: People's feeling of benefit from tourism subject to education level

4.2.3 Attitudes and Preference of Wild Animal

It was tried to comprehend people's preference of wild animals species (large mammals), which exist in RCNP. The following four questions were used for this purpose. The first question '*Do you like wild animals?*' was used as an entry question. The second question, '*When you think of wild animals (large mammals) of RCNP, which one do you recall first?*' was asked to find out people's affection and interaction with rhino. Third question, '*How do you feel when you think of the word "rhino"?*' And fourth questions '*What do you think when you remember "rhino"?*' were used to measure the attitudes toward rhino in specific (Confer annex 1).

A '5 - point Likert scale' with 'strongly dislike to strongly liking' was used to find out the preferences of wildlife species. Attitudes toward rhino was measured employing 'semantic differential' method (Confer chapter 3). The results of separate items by different sample groups have been presented in the following subheadings.

4.2.3.1 Attitudes towards Wild Animal

The figure 20 gives public's preferences of wild animals in general. The result revealed that most of the respondents like wild animals. 59% and 27% of the total respondents, out of total 280, stated: strongly like and like wild animals. 7% remained with neutral view, 4% and 3% stated dislike and strongly dislike.

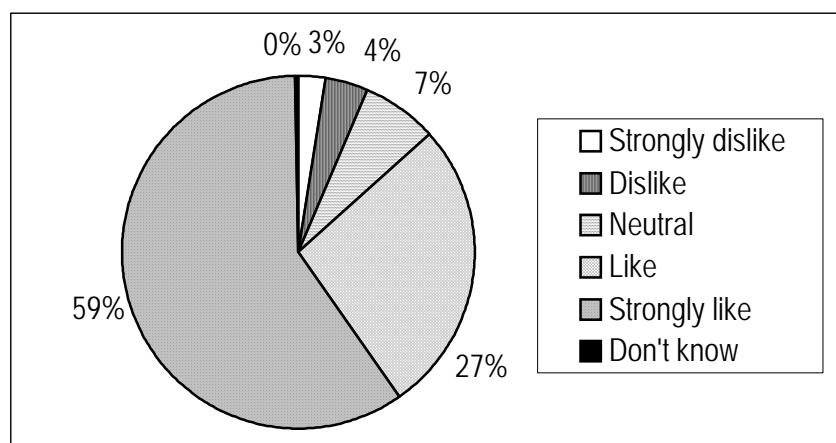


Figure 20: Peoples' preference of wild animal

Analysing the results by profession, only few percentages of farmers and hotel entrepreneurs stated the view of 'Strongly dislike' and 'dislike', some from farmers and teacher/student's group showed the neutral view and all the respondents from the rest of the groups said 'like' and 'strongly like' of the wild animal (Table 15).

Table 15: Preference of wildlife by profession of the respondents

Respondents	n.	Strongly dislike (%)	Dislike (%)	Neutral (%)	Like (%)	Strongly like (%)	Don't know (%)
Farmer	147	4.1	7.5	11.6	32.0	44.9	0.0
Teachers/students	44	0.0	0.0	4.5	29.5	63.6	2.3
Hotel entrepreneurs	25	4.0	0.0	0.0	16.0	80.0	0.0
Local p. Leaders	14	0.0	0.0	0.0	21.4	78.6	0.0
BZ leaders	25	0.0	0.0	0.0	32.0	68.0	0.0
NP staff	25	0.0	0.0	0.0	4.0	96.0	0.0
Total	280	2.5	3.9	6.8	27.1	59.3	0.4

Source: field survey 2003

The results show that the age of the respondents was an important factor to indicate affection towards the animal. A very high majority (33.3%, and 56.7%) of the younger aged (16–20) people liked and strongly liked wild animals. Only 46.2% and 34.6% of the old-aged people (above 60 years of age) said they like and strongly like. No one of young aged people (16-20 years) said 'strongly dislike' and 'dislike' (Figure 21).

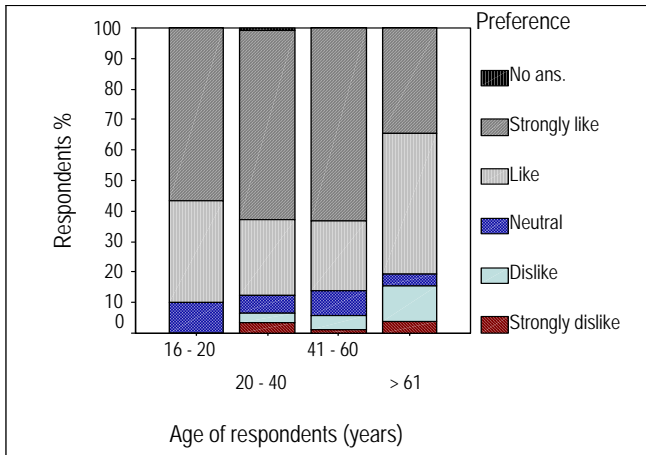


Figure 21: People's preference of wild animal subject to age class

4.2.3.2 Preference of Animal

The result revealed rhinos are the most preferred animals among large mammals that found in RCNP. In total respondents, 88% stated that they recalled rhino. Only 7% stated they recalled tiger and 4% stated elephant. It was interesting that, again nobody said that they recalled bear (Figure 22).

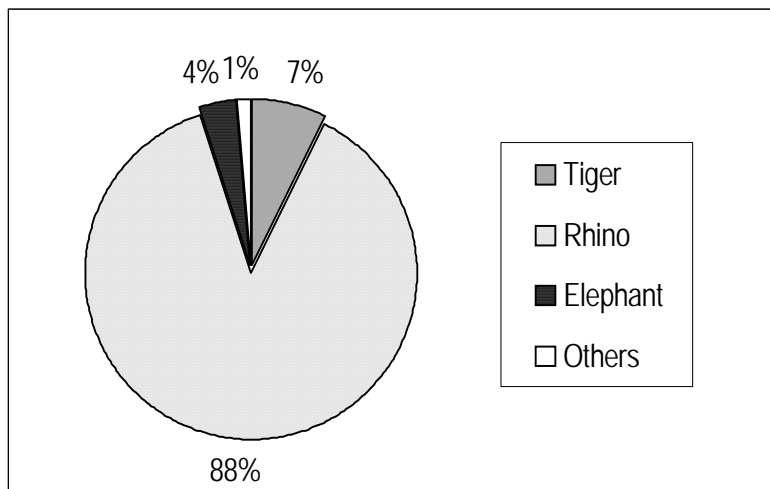


Figure 22: Percentage of first recalled animal by respondents

The public affection for rhino seems very high in any respect. Table 16 presents the results by professional background. The results show that the differences are not so high among the groups. However, in comparison to other groups, a smaller percentage of farmers preferred rhino. About 84% of farmers and 96% of park staff stated rhino out of given list of animals (Table 16).

Table 16: The most recalled animal subject to professions

Respondents	n.	Tiger (%)	Rhino (%)	Elephant (%)	Others (%)
Farmers	147	9.5	84.4	3.4	2.7
Teachers/students	44	6.8	90.9	2.3	0.0
Private sectors, hotels	25	4.0	88.0	8.0	0.0
Local p. leaders	14	7.1	92.9	0.0	0.0
BZDC leaders	14	4.0	92.0	4.0	0.0
Park staff	25	0.0	96.0	4.0	0.0
Total	280	7.1	87.9	3.6	1.4

Source: field survey 2003

4.2.3.2 Attitude towards Rhino

The attitude toward rhino in this study has been dealt with two concepts: feeling and belief. Each one was characterized with three attributes. Each attribute was characterized with negative and positive words and divided into two segments. The three attributes to express feeling were 'sad versus happy'; 'hate versus love' and 'fear versus entertainment'. Similarly the second three attributes to describe the belief were 'cruel versus kind', 'ugly versus beauty'; and 'aggressive versus peace'. Respondents were requested to rate one among from five scales to express their opinion.

It can be seen from figure 23 that lines, which represent the mean attitudes, occurred on the positive section in the range from 3.5 to 4.5. Only one line runs below 3 and one line runs above 4.5. The results, in general, show that all groups of people have positive feeling and belief towards rhino. However, the mean attitude differs by the profession of respondents. The park staffs have most positive attitudes in all six variables followed by BZ leaders. Farmers, on the other hand, showed less positive attitudes toward some attributes and even negative ones to some attributes; for example, farmers are afraid of rhino, or think it is cruel and aggressive. There is a comparatively big gap in the mean attitude between farmers and park staffs. In summary, it can be said that every group of respondents loves rhino, feels happy by seeing it and thinks it is beautiful.

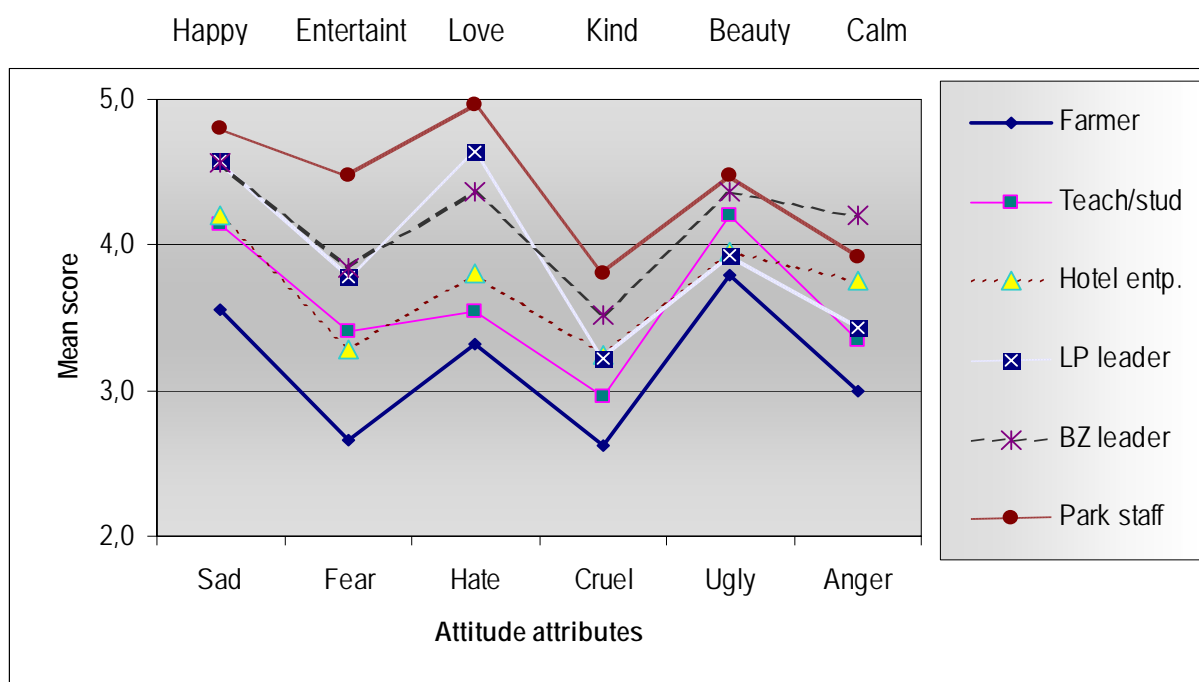


Figure 23. Attitudes towards the 'rhino' subject to professions (1=negative attributes: sad, fear, hate, cruel, ugly and anger; 3=middle or neutral; 5=positive attributes: happy, entertain, love, kind, beautiful and calm)

Exploring results in respect to the sex of the respondents, a distinct feeling and belief was found between male and female respondents. Women group shows more negative feeling than male in all six attributes. The mean feeling of female respondents is found to be neutral regarding the attribute "afraid of rhino", whereas the mean feeling of men respondents is more towards the entertainment. It is interesting that both male and female groups love equally the rhino (Confer annex 2.3.2).

4.2.4 Acceptance of the Rhino Conservation

To explore people's acceptance of the rhino conservation program is one important task for this study. The degree of acceptance was measured in three major ways: I) Identifying people's opinion on existing rhino conservation programs/activities, II) Exploring people's view on stakeholders' participation for rhino conservation and III) Assessing people's intention for future conservation of rhino. All questions were provided with 5 levels of ranking. The responses recorded from all target groups of respondents were documented separately in each item.

4.2.4.1 Opinion on Rhino Conservation Programs

To explore people pinions on conservation programs run by DNPWC, the following four questions/statements were evaluated: '*Implementation of BZ management program*';

'Rhinos translocation activities to other parks', 'conduction of a anti-poaching unit' and 'the sufficiency of existing legal provisions for rhino conservation' (Confer Annex 1). Responses to every question were measured with 5-scale negative to positive scales. Mean score for every group for each item was calculated. The mean score 1 represents *'not important at all'*, 3 represents *'neutral'* and 5 represents *'very important'*.

The responses from all target groups in all three items have been presented in figure 24 below. The overall result reveals that the BZ and anti-poaching programs are viewed positively by every group of respondents with the mean scores above 4. Whereas the mean score for rhino translocation program for each group, except NP staff were observed below 4. It indicates that BZ management and anti-poaching program are more accepted by all profession groups than translocation program. The hotel entrepreneurs showed neutral view with the mean score of 3 on the rhino translocation program (Confer annex 2.4).

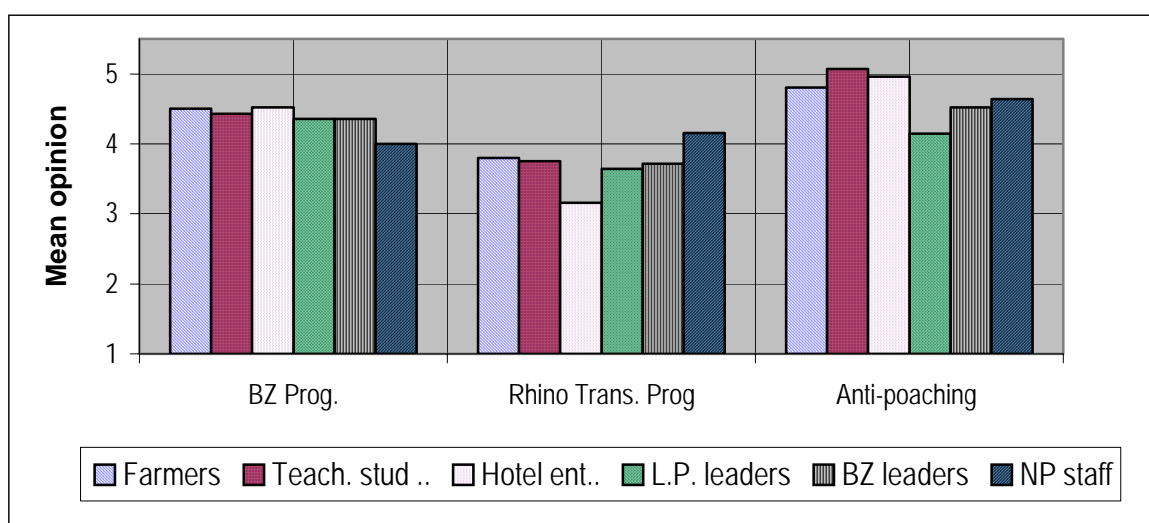


Figure 24: Opinion of different professional groups of the rhino conservation programs

Buffer Zone Management Program

The government of Nepal, Department of national park and Wildlife Conservation (DNPWC), has implemented a buffer zone development program for the last 7 years in the buffer zone of RCNP (Confer chapter 2). The results show that a majority of the respondents has a positive view on the buffer zone management program. 25% and 57% of the total respondents expressed that the BZ program is important and very important for rhino conservation in RCNP (Figure 25).

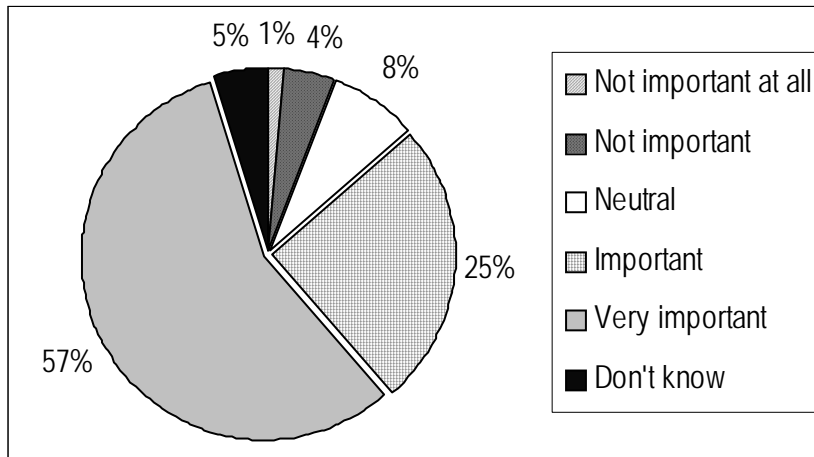


Figure 25: Percentage of people's opinions of BZ management program

Rhino Translocation Program

The rhino translocation programs have been organizing by DNPWC since 1986 with the help of WWF Nepal. Result shows that respondents are less positive towards rhino translocation program. Eighteen percent of the respondents said the program very important and 33% of the respondents said it is important. About 19% said the program is not important and 19% showed the 'Neutral' view (Figure 26). During the informal discussion, many respondents expressed that the management of rhino in RCNP with habitat improvement would be better option than translocation to the other national parks, which is just wastage of time and money. Viewing by profession, hotel entrepreneurs have fewer acceptances than the others for the program. Majority of this groups (about 56%) said neutral and negative view (Annex 2.4.2).

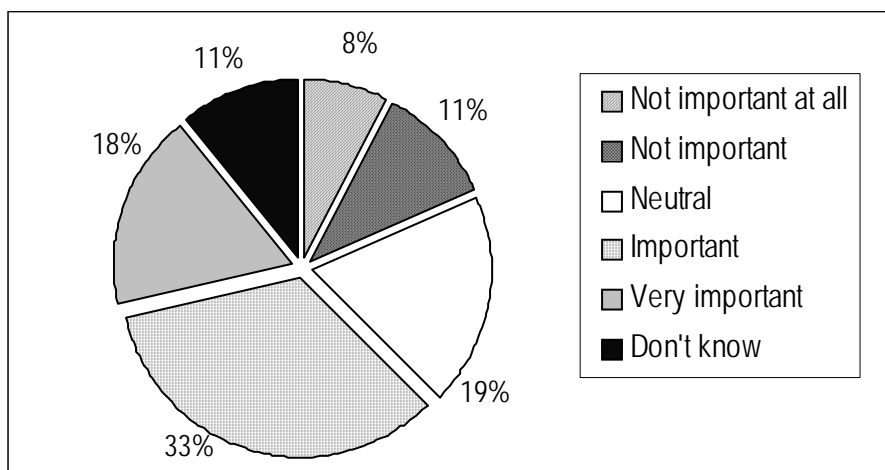


Figure 26: People's opinion of rhino translocation program

Opinion on Anti-poaching Program

DNPWC has set up an institutional program designated as the Anti-Poaching Unit (APU) in RCNP and RBNP in order to safeguard the endangered animal species, particularly the rhinos and tigers (Confer chapter 2). The results show in general that people do not give a big importance to the anti-poaching program for rhino conservation. Only about 40% expressed positive view on it. Many (42%) remained with 'Don't know' answer and 11% with 'Neutral' (Figure 27). Analysing the results according to professional background, farmers gave much less importance to the program than other groups, about 17% and 8% of which said 'important' and 'very important'. The NP staffs, on the other hand, are more positive and about 84% of which stated positive view (Annex 2.4.3).

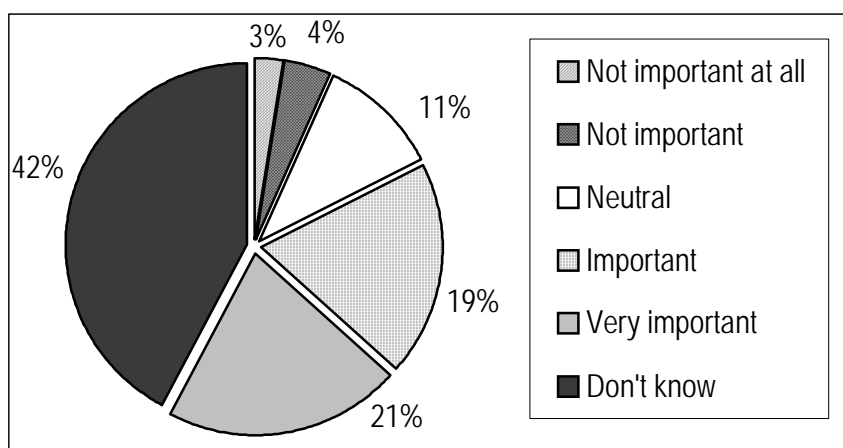


Figure 27: People's opinions of anti poaching program

Opinion on Existing Legal Provision

The illegal hunting of rhino is a common problem that has affected the RCNP since starting of the national park. Respondents were asked directly that what do they think of the sufficiency of present provision of awards and punishments for rhino poachers (Confer chapter 4.2.1.4). The overall result revealed that the legal provision is not sufficient to control the rhino poaching. Out of total 280 respondents, only 14% said the existing legal provision is 'highly sufficient' and 18% said 'sufficient'. 11% said 'not sufficient at all' and 20% said 'not sufficient'. Many of the respondents (20%) showed 'neutral' view and 17% said 'don't know' view (Figure 28).

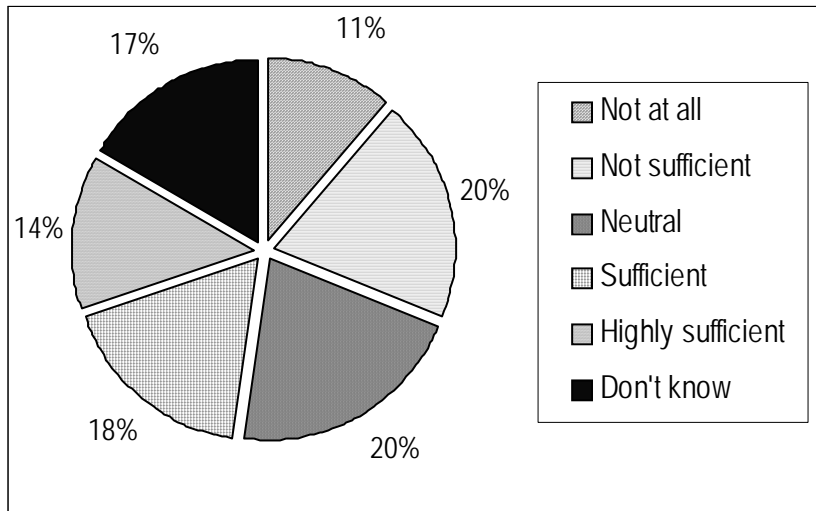


Figure 28: People's opinion on sufficiency of legal provision

Like to the other items, the opinion on legal provision was also measured using 5-point Likert scale. Here, mean score of 1 refers not sufficient at all, 3 refers neutral and 5 refers highly sufficient. The mean value of opinion for every group of respondents remained below the neutral value –3. It indicates that all the respondents think the present legal provision is not sufficient for the control of rhino poaching. A significant difference among the professional group was observed ($X^2=10.65$ and $p < 0.05$). Opinion of local political leaders appeared bit different from others. The mean opinion for this group was observed below the value-2 (Figure 29).

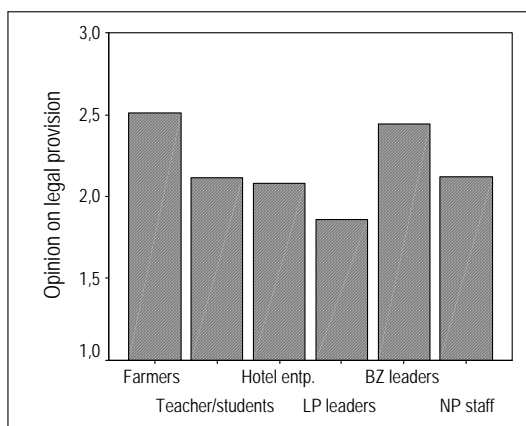


Figure 29: Opinion on existing legal provision subject to profession (1=not sufficient at all, 3=neutral, 5=highly sufficient)

4.2.4.2 View on the Stakeholders' Participation

This sub chapter deals about public view on the stakeholders' participation for rhino conservation in RCNP. In this study, all the parties or groups, who are benefited from

rhino, getting trouble out of it and entitled with main responsibility of its conservation are considered as stakeholders (Confer chapter 2.2.2). The study tried to explore public view on the level of participation in terms of rhino conservation. The respondents were provided with two major questions with six sub questions (Confer annex 1, question no 17 and 18).

Results of all items were measured with '5-point Likert' scales from 'not active to very active' and presented in the figure and table below. The table 17 and the figure 30 show the comparison of present and expected level of participation from the different stakeholders. In overall, the result reveals that the expected level of participation for every group is higher than their present level of participation. The mean expected and existing value for BZDC is highest with 4.77 and 4.33 respectively. The mean value for existing participation of private sector is 3.18 and expected mean value is 3.71 followed by NGO and local political institutions (Confer annex 2.4.5). It indicates that respondents, in general, expect a more active role of three stakeholders (BZDC, park authority and local people). Similarly, regarding the present, the respondents have evaluated that above three stakeholders are playing a more active role than the rest three (private sectors, NGOs and political institutions). The respondents have given least importance for private sector (hotel entrepreneurs).

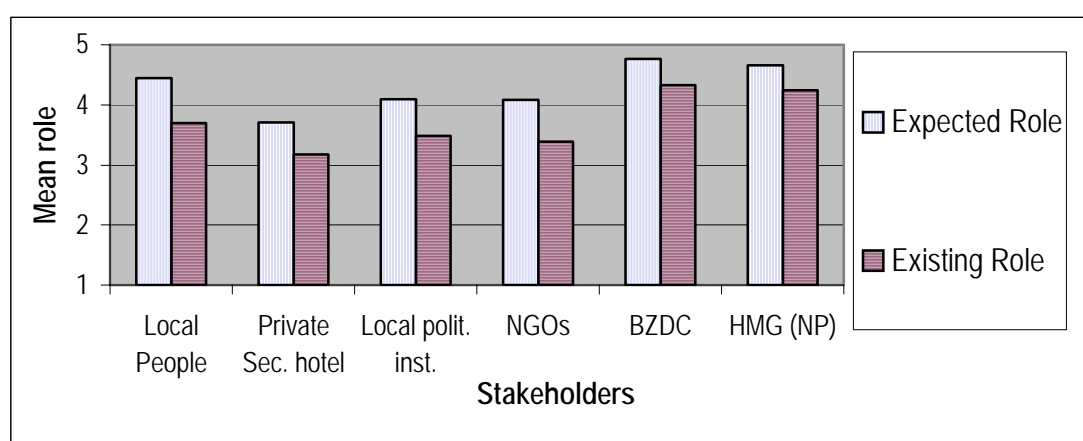


Figure 30: People's perception of stakeholders' participation on the rhino conservation (1=not at all, 3=neutral, 5=very active)

4.2.4.3 View on Future Conservation of Rhino

In order to explore public's view on the level of accepted population of rhino in the future, respondents were asked: "How do you like to see rhino population in RCNP in the future?" along with five choices- 'nil', 'less than now', 'same as now', 'more than

now' and 'don't know'. Though this enquiry was not sufficient to measure accepted population size, some information on the future of the population acceptance level has been obtained. The results can also be seen in relation to *behavioural intention* of the respondents in terms of future of rhino.

The overall result revealed that a high majority of total respondents (80%) wanted to see rhino population more than now. 14 % wanted to see same as now and only 6% wanted to see less than now. No respondent wanted rhino population nil in RCNP and no one said 'don't know' (Figure 31).

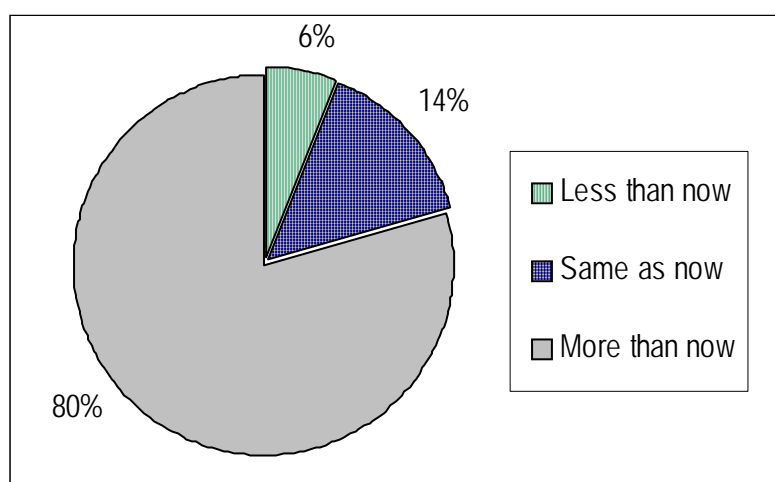


Figure 31: Public intention for the future rhino population

However, the opinion differed by different professions of the respondents. The intention of political leaders can be a bit more emotional: 100% of this group stated that they liked to see a greater rhino population in future. Among the all other groups, least percentage of farmers said that they want to see more rhino population in future. However, still a high percentage of this group (75%) stated that they wanted to see more rhino in the future (Table 17).

Table 17: Intention for the future population of rhino subject to profession of respondents

Respondents	n.	Less than now (%)	Same as now (%)	More than now (%)
Farmers	147	6.8	17.7	75.5
Teacher/students	44	4.5	13.6	81.8
Local political leaders	14	0.0	0.0	100.0
BZ leaders	25	8.0	4.0	88.0

Total	230	6.1	14.3	79.6
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Source: Field survey 2003

Little differences in the results were obtained when it was analysed by level of education and closeness of the respondents to the NP. About 14% of respondents, living at a distance of less than one km from the NP boundary, preferred the decreasing of rhino population. Respondents living at a distance of 6 to 9 km made no suggestion to reduce the population. It is interesting that about 7% of the respondents living at a distance of more than 9 km have stated that they wanted to decrease rhino population. Considering results regarding education level, respondents with lower education level wanted to reduce rhino population size and all the respondents having college level of education or university degrees wanted a bigger population in the future (Figure 32).

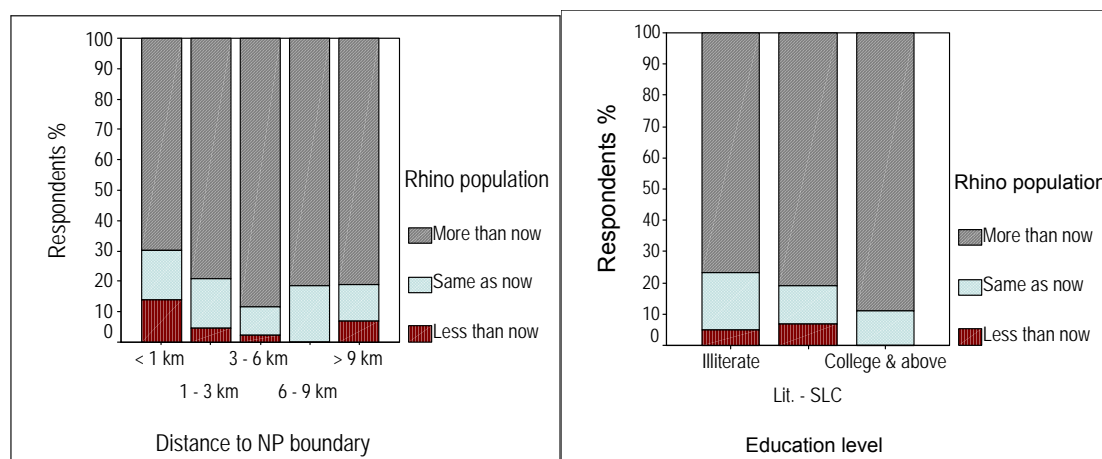


Figure 32: Public intention for future population of rhino: subject to distance to NP boundary and education level of respondents)

Small differences in the view of sex and age of the respondents were also observed. Respondents of middle-age group (41-60 years) did not express any view to reduce rhino population. Comparatively higher percentage (12%) of old-age groups (>60 years) said that they wanted to see rhino population decreasing. Similarly the views of male and female respondents also differed slightly. More males than females said, they wanted to see future population of rhino 'more than now' (Confer annex 2.4.6).

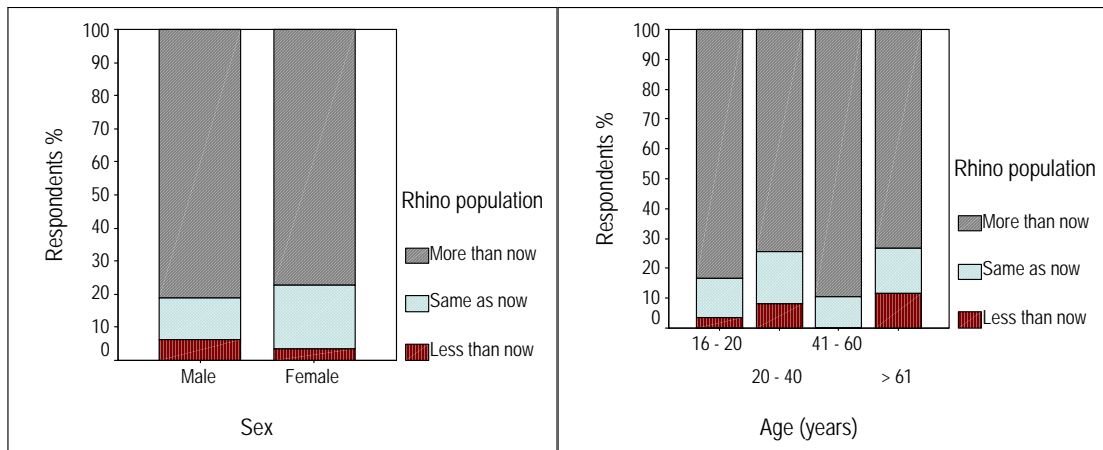


Figure 33: Intention for future population of rhino: subject age and sex of the respondents

5. DISCUSSION

5.1 Knowledge Level

Wildlife management issues are often complex and require an understanding of both the human and biological components of the management equation. A major factor of human component is the knowledge; people have about wildlife and matters of management. Knowledge is considered as key factor in shaping people's attitude about an item or an issue (Kassilly, 2000).

This study tries to explore people's knowledge level on rhino and its conservation issues. All the results related to knowledge items have been summarised and discussed in this subchapter. The knowledge scores are formed from the four items as presented in chapter 4.2.1. A knowledge score of 0.0 indicated that none of the questions obtained the correct answers. A score of 4.0 indicates that all the questions were answered correctly. High knowledge scores obtained, in this study, imply that residents of buffer zone area of RCNP are quite knowledgeable about general behaviour of rhino and its conservation status. K-independent samples for non-parametric test (Kruskal-Wallis H) are used to reveal the significant differences.

Study confirmed that knowledge level is dependent on profession, age, sex and education of the respondents. In respect to profession of the respondents, farmers are less knowledgeable than all the other groups and BZ leaders are more knowledgeable among the all. However no significant differences among the different professional groups with regard to knowledge have been observed. The statistical test confirmed that a highly significant difference was observed in the knowledge with the different educational level ($X^2=15.68$ and $p<001$). The higher the educational level of the respondents was, the better was their knowledge of rhino (Figure 34).

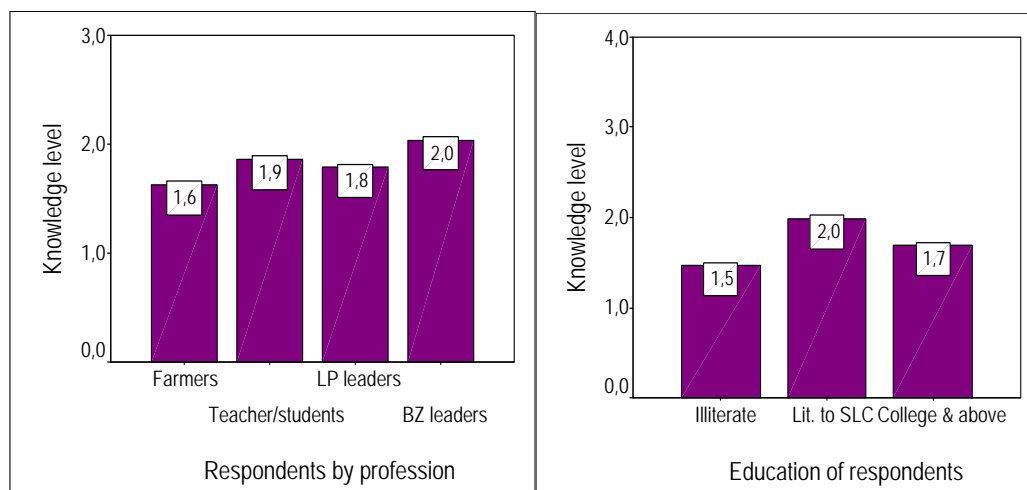


Figure 34: Knowledge level by respondents' profession and education (Mean knowledge score 0.0 = no questions was answered correctly, 4= all questions were answered correctly)

Similarly, the results revealed significant differences between the sex ($\chi^2 = 17.11$; $p < 0.001$) and age of the respondents ($\chi^2 = 8.15$ and $p < 0.05$). Women and old aged respondents tend to have less knowledge about the rhino than males and younger aged respondents. Such differences in knowledge levels were also noted by earlier studies (Bjerke and Reitan 1987; Szinovatz, 1997) (Figure 35).

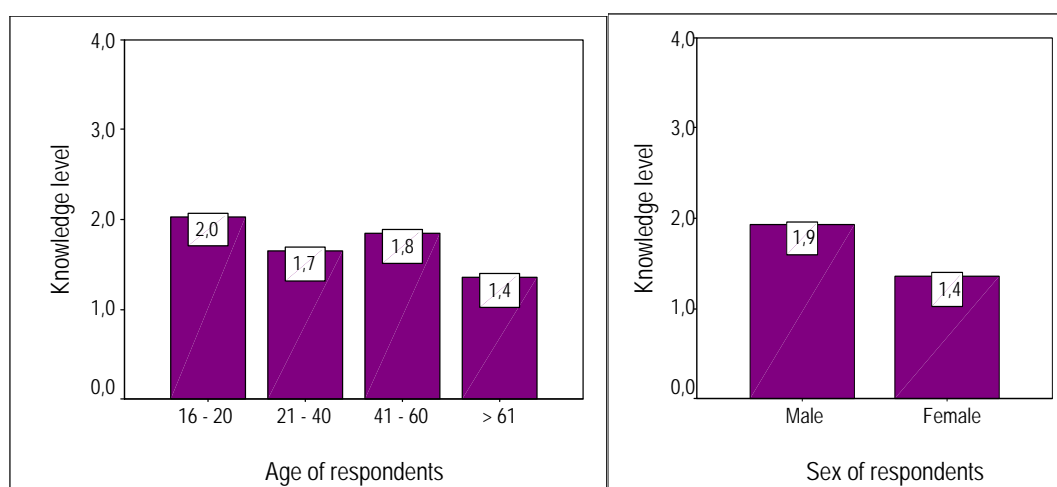


Figure 35: Knowledge level by age sex of respondents (Mean knowledge score 0.0 = no questions was answered correctly, 4= all questions were answered correctly)

The level of knowledge on the different items by different characteristics of the respondents can be discussed differently as below:

5.1.1 Knowledge of food and behaviour

The results show that residents of the BZ and of RCNP are familiar with the general behaviour of rhino. The knowledge of what they eat, at which time and where they walk,

what they look like, and how they defend when they feel danger, is not new for the majority of the respondents.

There is a slight difference in the knowledge level by profession, age, sex and education of the respondents. Unlike the others, illiterate groups have shown more knowledge than higher educated groups in general behaviour of the rhino. It can be true, because most of the illiterate groups are farmers, and a majority of them (46,3%) said that they saw it in their fields. Most of the farmers noticed that rhinos often move during the time of morning and evening, graze in the grasslands and spend a lot of time in the wetlands.

5.1.2 Knowledge of Rhino Population

A high difference was found between the professional groups in the level of knowledge in relation to existing rhino population. The higher percentage of leader's groups (BZ leaders as well as political leader) underestimated the population of rhino in comparison to the other groups. Teachers/student's group gave more correct answers in comparison to other groups. A high percentage of farmers groups remained with the 'don't know' view. The high amount of 'don't know' indicates either a bad design of question asked in an open form, or a kind of mistrust to the detail given by researchers (Szinovatz, 1997).

Analysing the education and sex of the respondents, a higher percentage of male and educated people estimated more correctly than female and non-educated groups. The percentage of respondents estimating more than acceptable level is higher in farmers groups, illiterate groups, female and people living close to the park. The discrepancy between belief and knowledge cannot be measured through these questions. People might be aware of the current estimation of the rhino population done by the national park, but might not agree and therefore give a higher or lower estimation.

Considering the context of high damage level from the rhino, it is more obvious that people living close to the park, illiterate people and farmers, tend to indicate higher population estimates. It is noticeable that about 90% of the respondents from illiterate groups are farmers. The educated groups, people living in the greatest distance to the park and political as well as conservation leaders (BZ leaders) on the other hand, would

likely have higher numbers of rhinos and so they estimated less than actual population size.

5.1.3 Knowledge of Legal Provision

People's knowledge of legal provision, particularly reward to informant and punishment for poacher, in general, is very low. Only 13% were able to tell all the provisions, and a high majority of the respondents, i.e. 59% of them, were not able to answer any.

Viewing from the professional background, the local political leaders (LP leaders) are more knowledgeable in comparison to the other groups. Almost one fourth of the farmers and two thirds of the BZ leaders had no idea about provision. While analysing education and age of the respondents, knowledge level increases with the increasing education and decreasing age. The higher educated groups were able to explain legal matters more than illiterate groups and the people of younger age (16-20) are more knowledgeable than people of old aged (above 60 years). Though many respondents could say that the law in Nepal prohibits the killing of rhinos, they were not able to explain the legal provision. This might be due either to lack of knowledge of the conservation education programs and activities or not appropriate mechanisms of communication and information. Having less knowledge in non-literate groups indicates that the media of information is not in favour of the majority of the people, who are illiterate.

While talking about the source of information, a majority of the respondents (more than 63%) claimed that they learned through the family (parents) by directly seeing them during their work in the farm and forests. It indicates that most of the people rely on direct and verbal information and communication in the study area. Pradhan (2001) had also realized already this, and therefore he stressed the need of conservation education and awareness programs and recommended mass medias like radio, TV, Audio-visuals and local level posters. The awareness of Convention on the International Trade of Endangered Species (CITES), status of rhino, fines and punishments, rewards to the informers, and other relevant information should be furnished simultaneously to the local people (Pradhan, 2001).

5.2 Impact of Rhino on Local People

This study tried to find out the impact of rhino on local residents. The impact from one to another can be either negative or positive. In this study, crop damage from rhinos and

human casualties are considered as negative impact. On the other hand, benefit from tourism is considered as positive impact on the local residents. In the case of the buffer zone, there is a link between rhino and tourism benefit. One of the reasons to promote tourism activities in Chitwan is due to the presence of rhino in the RCNP, which ultimately benefit to the local people through the revenue sharing mechanism (Confer chapter 2.2.2). The tourism activities can also benefit the locals through increasing business and generating employment.

The negative impact from rhino has been considered as *affectedness* in this study, which is a consequence of negative and positive impact or damage and benefit from rhinos to a person. Considering the idea that the higher the frequency of rhino in the agricultural crop, the more damage it costs, the level of damage was measured with the intensity of frequency in the crop. It was measured in five levels with 1 to 5 scales, where 1 is no damage, 3 moderate and 5 is severe damage. Similarly, the benefit from tourism was also measured with five scales from 1 to 5, where 1 refers no benefit at all, 3 neutral and 5 high benefits. The level of damage and benefit has been combined to calculate degree of affectedness (Confer chapter 2.1.4).

Analysing the level of *affectedness* by profession, the farmers groups are more affected than any of the other groups followed by teachers/students. The result shows that political leaders feel least affected from rhino (Figure 36). The statistical test shows that there is significant difference ($X^2=13.75$ and $p < 0.01$) between the farmers and other professional groups with respect to *affectedness*.

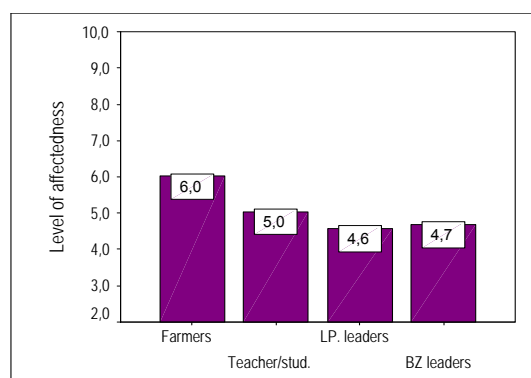


Figure 36: Perception of level of affectedness by respondents' profession (Mean score 2 = less affected and 10= highly affected)

Though mean level of *affectedness* is not so high, some degree of differences can be observed in the different distances to the NP boundary and two study locations. The significant difference among the distances ($X^2 = 16.64$, $p < 0,01$) and between two

locations ($X^2 = 12.05$, $p < 0,01$) with regard to the affectedness from rhino was obtained. The mean degree of affectedness with a value of 6.3 was observed to the respondents living at a distance of less than one km. This mean value was found 5.9 to the respondents living at a distance of 1-3 km from the NP boundary. This rate is decreasing with the increasing distance and only 4.7 mean value was observed above the distance of more than 9 km (Figure 37).

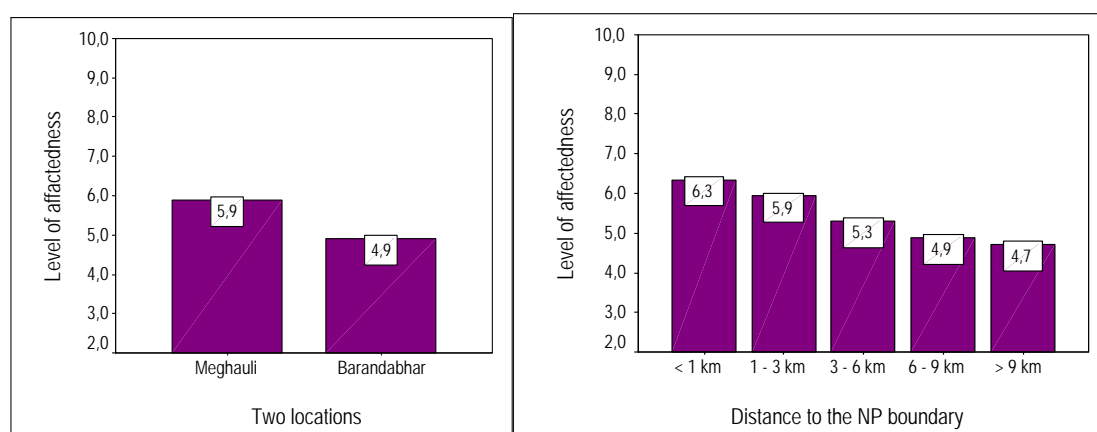


Figure 37: Perception of degree of affectedness: subject to study location and distance to the NP boundary (Mean score 2 = less affected and 10= highly affected)

To understand the base of the personal affectedness, or impact in other word, a detailed discussion has been made corresponding results in specific. So the item wise discussion are presented in the following sub headings:

5.2.1 Damage by Rhino

As has been described above, rhinos proved to be one of the animals causing most damages to the agriculture crop in the nearby area of RCNP. Though other animals are also reported, a very high majority of respondents stated that they get trouble mostly by rhino in terms of damaging the crops. They further reported that rhinos are seen most of the time in the agriculture fields, outside the national park boundary and the frequency of rhino arrivals is very high too.

The respondents of different professions and different home distance to the national park boundary reported the degree of damage differently. Farmers groups reported more damage than any other groups. Many of the respondents living close to the park mentioned that they gave up to cultivate lentils, because of the damage by rhinos. Similar results were recorded in previous studies as well. Nepal and Weber (1993)

mentioned that rhinos were the most feared animals in terms of crop raiding. They not only damage crops by feeding, but considerable damage occurred due to trampling, particularly, when the farmers chase them from the fields. Paddy and wheat are their preferred crops and they also like maize and oilseeds. The loss of crops through rhino was reported almost two times higher than through wild pig and spotted deer (Struggle for Existence, pp 58, Nepal and Weber, 1993).

Degree of damages caused by rhino seemed different in two study sites. The frequency of rhino in the crop fields was recorded higher in Megghauli than in the Barandabhar area. Respondents stated that the less movements of rhino in the fields of Barandabhar was the effect of infrastructure, barbed wire fencing constructed along the boarder of human settlements. The respondents from Megghauli complained that the barbed wire fencing in their area was not effective to control the rhino coming out from the national park. The infrastructure (barbed wire fencing) in Megghauli was reported to be destroyed by flood during the monsoons.

It has been found that the distance to the park boarder is an indicator for the wildlife disturbances. Respondents living close the park boundary had reported more frequency of rhino arrival in the crop than people living in the further distance. Nepal and Weber (1993) also recorded a higher intensity of crop damage in areas, which were closer to the park. Another study to assess crop damage and human harassment by rhinoceros in Souraha area was conducted in 1989 by Jnawali. The extent of crop damage was assessed in three zones of different distance from the park boundary: zone I (0.5 km from the boundary), zone II (1 km from the park boundary) and zone III (1.5 km from the boundary). It was reported that the zone I was severely attacked with highest economic loss than in zone II and III (Jnawali, 1989).

5.2.1.1 Threat to Human Life

Encounters with wild animals around the park were another reason for negative impact to the human being. It creates threat to human life. The villagers often discussed the incidence with rhinoceros in the study area. There were several cases of rhino attacks in Megghauli VDC. Most of the respondents reported that such fatal incidents took place outside the park usually in the fields. An official record of RCNP shows that rhino attacked a total of 65 people during the period of 1998 to mid of 2003 in the buffer zone

of RCNP, 12 of them died. In case of Megghauli, a total of 9 incidences (7 injured and 2 killed) were reported and three injure cases were reported from Barandabhar within the same period.

The threat of rhino to human life was rather high in the past. A total of 78 accidents were recorded during the years 1978-88, out of which 23 were killed and 55 were injured (Jnanwali, 1989). Most of the accidents occurred outside the park while guarding the crops, grazing cattle, collecting fuel wood/fodder and fence materials, walking around in the village in the evening, fishing in rivers and using local bush toilets. Most of these accidents occur due to poor knowledge of rhino's behaviour. Martin and Vigne, (1996) stated that "Rhinos are also dangerous to people".

5.2.2 Benefit due to the Rhino

Rhino is not only considered as a trouble-giving animal but also a major source of economic benefit to the residents of the buffer zone. A very high majority (90%) of the respondents estimated that tourism in RCNP is promoted due to the presence of rhinos. Interview result of hotel entrepreneurs and park staff showed that more than 75% of the total tourists visit the RCNP every year because of the rhinos. Though there might be numbers of other reasons, the increasing population of rhinos and its familiarity can be the one.

The correlation between increasing trend of rhino population and visitors in RCNP has given an impression of influence of rhino on the tourism in Chitwan. Though several ups and downs can be seen in rhino population history within the period of 1950 to present, the overall trend of rhino population seems increasing (DNPWC, 2000; Adhikari, 2002). The population was estimated 147 individuals of rhino in 1972 (Pelinck & Upreti, 1972), 376 in 1988 (Dinerstein & Price, 1991), and 544 in 2000 (DNPWC, 2000). Likewise, a smooth increasing trend of tourist visits in the park can also be observed. An official record of RCNP shows that the number of tourist visits in the park was 836 in the initial period of park establishment (1974/75), 96,062 in 1996/97, and 117,512 in the years 1999/02 (RCNP/official record 2003).

A direct relationship between rhino and tourism promotion can be seen from BZ community forests of RCNP as well. Various forest patches located near human

settlements along riverbanks are good rhino habitats due to protection by BZ community forest user groups. Such forests are now becoming good example of eco-tourism since tourists visit the area to watch rhinos. Bagmara BZ-Community Forest (BZCF), which is located near to Souraha, is a good example: the forest inhabits more than 20 individual rhinos round the year. The forest makes good income every year from the entrance fee; alone in the years 1996/97 it was \$15,000 (Martin, 1998).

Various studies show that RCNP is a major tourist destination in Nepal. Tourism in RCNP can be seen as a benefit to the local residents directly and indirectly. Up to 50% revenue of the park will be invested every year in the BZ development programs (Confer chapter 2.2.2). The official record of RCNP show that an average of NRs 40 millions of the revenue is generated by the park every year and about 90% is shared by tourism alone (DNPWC/official Record, 2003).

Our study also revealed that a majority percentage (57%) of the respondents felt they have benefited from tourism activities. The benefit can be either through BZ development program or tourism related business and employment. A socio-economic survey conducted by Dhakal (2000) shows that the local people's involvement in the tourism business in recent years has been increased. The survey report shows that there is a considerable number of households in the buffer zone involved in tourism related activities such as hotels, restaurants, teashops, workers in hotels and tourist guides.

Analysing the profession and education level, respondents with higher education and respondents with leaders (BZ as well as political) groups accepted that they have been benefited from tourism. Very few respondents of farmer profession and illiterate group said that they have benefited from the tourism. This might be due to less involvement of such groups in tourism activities as well as in the buffer zone development program of the policy and implementation level.

5.3 Attitudes and Preference of Wild Animal

5.3.1 Attitudes Towards Wild Animal

Result revealed that most of the people in the study area like wild animals, particularly, large mammals, which found in RCNP. A very high majority of the respondents (86%)

showed the positive attitudes towards the animals. However, the percentage of respondents to admire wildlife varied among the professions. A significant difference was observed among the professional groups with regard to attitude towards wildlife ($\chi^2 = 27.67$ and $p < 0.001$). People with farmer professions are less positive than others. The park staff and hotel entrepreneurs, on the other hand, are highly positive. BZ leaders and local political leaders are comparatively more positive than farmers but still less positive than park staff. It can be possible, because the livelihood-base of the leaders group is also dependent on the agriculture in the study area. This result can be supported by earlier studies as well. Different attitudes were held on the basis of profession and interests of the people (Bath 1989; Bath and Buchanan 1989).

The education and age of the respondents are other factors, found in this study, which influenced the attitude of people towards wildlife. The illiterate group of people has shown less positive view than people with higher education. Similar results were found in previous studies as well (Dahle 1987, Bath 1989, Stevens *et al.* 1994, Bjerke and Reitan 1994; Szinovatz, 1997; Kaczensky *et al.* 2003).

Some researchers contend that the foundation of attitudes toward the environment is laid during early childhood (Miller, 1975) and that attitudes, preferences, beliefs and values, developed during youth govern human behaviour throughout adult life (More, 1977). Other studies suggest that early childhood is a critical period in the development of cognitive abilities for environmental knowledge and their exposure and interactions with environment, which is helpful to construct the positive attitude (Chemers and Altman, 1977 as cited by Gray, 1993).

The significant difference among the education level was observed ($\chi^2 = 14.85$, $p < 0.01$), but no significant difference among the age in relation to attitude was found. As has been stated before, most of the illiterate people in this study live on farming; it may be possible that they keep the attitude as farmers' do, due to the bigger damage they get from wild lives. This can be supported by previous studies conducted in Nepal by Allendorf (1999), who stated that the differences in attitude might be explained by extent and severity of crop damage and livestock depredation by wildlife. People dislike species if they eat crops or livestock or generally "do damage."

Regarding the results about most memorable animals of RCNP, rhino was first-rated by the respondents of the study area. The study indicates that rhinos are the best-known animals due to their impact to the local people, which could be either negative or positive. In this study, it is reported (by 74%) that rhinos are more trouble-making animals than others. It is also reported (by 93%) that rhinos are the main source of tourism. 57% of the respondents stated that they benefited from tourism.

5.3.2 Attitude towards Rhino

The results illustrate that the mean attitude for the entire professional groups, except farmers, was positive towards rhino. A more or less similar pattern of the mean attitude (in the figure-23) indicates that most of the respondents like rhinos, they feel happy seeing it and think it is beautiful. All other groups think that this animal is kind and calm and entertain seeing it. Most of the respondents from farmers group think that rhino is cruel and aggressive and majority of them feel afraid of this animal. However, the differences can be seen among the other groups as well. The park authorities love more, entertain more and feel happier than any other groups seeing the rhinos. The nature of the graph for political leaders is seen as a freak, which increase sharply towards love and falls sharply towards the cruel (Figure 23).

The attitude towards an object can be seen as benefit and damage that it makes to an individual. The farmers group was the one, who experienced more frequent rhino arrival to their crop, and much less percentage of political leaders stated the incidence of rhinos in their fields. Obviously, farmers are the most sufferer group in terms of crop damage and human casualties from the rhino. But there is neither damage nor benefit from rhino to the park staff. Though, the BZ leaders and political leaders are also based on agriculture, these groups are supposed to be more aware of the benefits sharing provision through the "BZ development" mechanism. The results indicate a possibility that farmers might have been guided with their practical knowledge of rhino's behaviour. One can easily imagine that rhino will be converted to an aggressive and cruel nature when farmers chase them away from the crop. The possible reason that farmers are afraid of rhinos can be the accident and death casualties due to rhinos during their work. We cannot ignore the fact that the majority of the incidences and death casualties due to rhino in the study area have happened to farmers.

Previous studies have also found that villagers do not admire rhinos because of their damages to them. As stated by Martin and Vigne (1996), attitude of villagers towards rhinos around RCNP was found to be negative. "With an increasing human population around the park, and increasing rhino numbers, negative feelings towards rhinos arose; by about 75% of the local villagers disliked the animals because 7% of the rhino populations live outside the Park disturbing the people and their livelihood. They stated that more than 60% of the paddy lost due to wild animals is by rhinos, which often trample the paddy at night" (Martin and Vigne, 1996).

Another study conducted by Oli *et al.* (1994) in the Annapurna Conservation Area reported that the majority of people had strongly positive attitudes toward blue sheep because they are beautiful and harmless and they enjoyed seeing them, whereas they had strongly negative attitudes towards snow leopards because they kill livestock. However, a different result can be found from a study conducted by Allendorf (1999), which reveals that the attitude towards animals differs on the basis of their values. Even species that have the most negative effects are liked by some people because those animals have aesthetic and religious as well as cultural value.

Besides the professional, the level of attitude varied across other demographic characteristics: age, sex, study locations and education of respondents as well as distance of the respondents' home to the NP boundary. There is a highly significant difference among the respondents of different level of education ($X^2 = 28.58$; $p < 001$) in relation to the attitude towards rhino. A positive relation was observed with the education level of the respondents. The higher education level of the respondents hold more positive attitude than people with illiterate of lower education level (Figure 38). Similar results can be found in earlier studies as well. Often a direct relationship between educational level and attitude to the species was found (Stevens *et al.* 1994, Bjerke and Reitan, 1994).

In respect to the relationship between age and attitude, significant difference was observed among the different level of age groups with regard to attitude ($X^2 = 9.91$ and $p < 05$). The present study revealed highest level of positive attitude hold by middle-aged people. However, older groups of people (> 60) hold more negative than younger age groups (16 - 20 years) (Figure 38). Therefore, it can be said that this result corresponds to previous studies. An inverse relationship between age and attitude was

often found (Dahle 1987, Bath 1989, Stevens et al. 1994, Bjerke and Reitan 1994). The older the respondent, the more negative attitude towards the animals was recorded.

Analysing from the sex of the respondents, a significant difference in attitude towards rhino was observed between male and female ($X^2 = 10.21$ and $p < 0.01$). Women are less positive than men towards the species. This result coincides with the findings from key informants' interview. It was recorded that women are more vulnerable than men from the rhino because of their more pronounced role in collecting fuel wood, fodder from forest as well as in agricultural activities, where rhinos usually arrive. Some respondents stated that it is more frightening for women and children than for men, when rhinos pass by in front of their house and surrounding in the night. A similar study result revealed that people dislike elephants and some other species because they are afraid of them and because they hurt people (Allendorf, 1999).

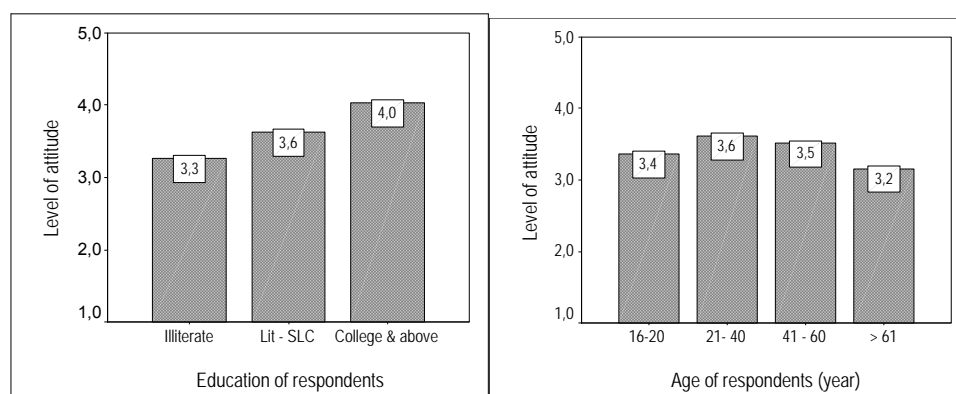


Figure 38: Mean attitude towards rhino: subject to respondents' age and education (mean attitude score 1 = strongly negative, 3 = neutral and 5 = strongly positive)

The attitude towards the rhino differed also by distance of the respondents to the core area and two study locations. There was a significant difference between two locations ($X^2 = 5.12$ and $p < 0.05$) and a highly significant difference was recorded among the different distances ($X^2 = 26.77$ and $p < 0.001$). Respondents from further distance and less remote area hold more positive attitude than those of close to the park boundary and remote from the market area (Figure 39). Often a tendency for those with positive attitudes come from urban rather than rural areas was documented (Bath 1989, Stevens et al. 1994). Between the two locations, Megghauli is more remote place and lies closer to the park than Barandabhar. Similar results were obtained from previous studies in America, Austria and Norway about wolves', bears' and lynx acceptance' (Bath, 1989; Bright and Manfredo, 1996; Szinovatz and Bath, 1997; Zeiler *et al.* 1995).

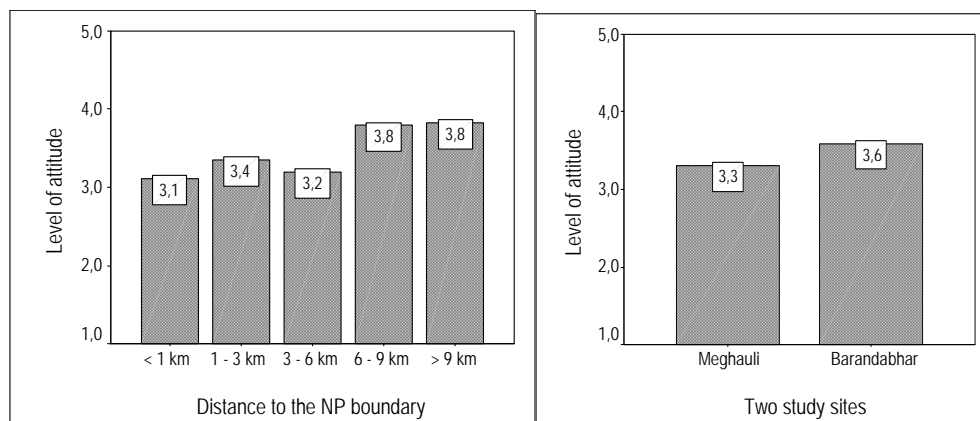


Figure 39: Mean attitude toward rhino: subject to study sites and distance to the NP boundary (Mean attitude score 1 = strongly negative, 3 = neutral and 5 = strongly positive)

5.3.3 Relation of Attitude with Knowledge and Personal affectedness

It is found that the level of *attitude* towards rhino is positively correlated with level of *knowledge* and negatively correlated with the degree of affectedness. People with more knowledge performed relatively more positive attitude than people with less knowledge. Respondents who are able to reply all four knowledge-questions correctly have demonstrated slightly higher positive attitude towards rhino and the respondents who are not able to reply any answer correctly, have shown neutral attitude but still not negative. However, the statistical analysis confer that there is no significant difference between knowledge on and attitude towards rhino but little consistence in the attitude with the knowledge level (Table 18).

Table 18: correlation between knowledge on and attitude towards rhino

			Knowledge on rhino	Mean attitude
Spearman's rho	Knowledge on rhino	Correlation Coefficient	1,000	,092
		Sig. (2-tailed)	,	,166
		N	230	230
Mean attitude	Mean attitude	Correlation Coefficient	,092	1,000
		Sig. (2-tailed)	,166	,
		N	230	230

Table 19 illustrates the correlation between attitude and degree of affectedness. A significant difference among the level of personal affectedness with regard to attitude towards rhino ($X^2 = 45.89$; $p < 0.001$) was observed. Person, who was least affected by rhino shown more positive attitude and who was more affected by rhino shown neutral

and negative attitude (Figure 40). Here, an individual who has been affected negatively by rhino is more likely to say rhino are ugly, aggressive cruel and feeling of fear and sad.

Table 19: correlation between mean attitude and level of personal affectedness

			Mean attitude	Level of affectedness
Spearman's rho	Mean attitude	Correlation Coefficient	1,000	-,398**
		Sig. (2-tailed)	,	,000
		N	230	230
	Level of affectedness	Correlation Coefficient	-,398**	1,000
		Sig. (2-tailed)	,000	,
		N	230	230

** . Correlation is significant at the .01 level (2-tailed).

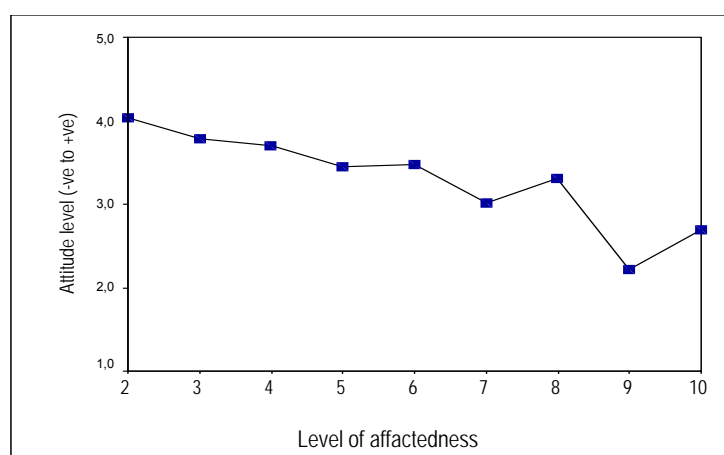


Figure 40: Relationship between level of affectedness and attitude towards rhino (mean attitude score 1 = strongly negative, 3 = neutral and 5 = strongly positive and Level of affectedness 2 = least affected, 10 = highly affected).

5.4 Acceptance of Rhino Conservation

5.4.1 Opinion on Rhino Conservation Program

One component of exploring people's acceptance of rhino conservation is to understand their opinion regarding existing program and activities. The result reveals that the overall opinion of the local residents is positive towards all the programs and activities. However, more positive responses were found on the buffer zone management program than rest two (rhino translocation and anti poaching). More than 80% of the respondents stated the implementation of BZ programs is important for rhino conservation. A study conducted prior to the implementation of the BZ program in RCNP (Nepal and Weber, 1993) found that only about 10% of the respondents had prioritised the BZ programs among the eight given options. It indicates that the implementation of BZ program has positive impact on the local residents. In another

study in Malaysia, found that villagers have strongly supported for wildlife preservation in Mt. Kinabalu, mainly due to the improvement of transportation and development of new scheme associated with the establishment of the park (Jacobson, 1991).

While analysing a single item from the different professional groups, the *BZ program* was accepted, more or less equally by all groups. No significant difference was obtained among the different professional groups. In comparison to other groups, only a smaller percentage of farmers groups have viewed the program important for the rhino conservation. All the other groups, except NP staff, have stated more or less similar, positive view towards the importance of the program. As a comparatively smaller percentage of NP staff has given positive response, it can be said that the NP staff does not give major importance of the BZ program in terms of rhino conservation. This indicates that park authorities might not have been fully satisfied with the BZ program, especially for the rhino conservation. The continuation of rhino poaching even after the implementation of BZ program, the rhinos death in the BZ area and local people's involvement in the rhinos poaching activities might be the reasons behind this opinion. A study conducted by Adhikari (2002) revealed that almost all poaching arrests were made in the vicinity of the park.

Concerning the *rhino translocation program*, the majority of the respondents have a positive response and significant differences among the professional groups were not observed with regard to the importance of the program. Hotel entrepreneurs and NP staff have different views from other groups. A majority of the NP staff has positive views on the program, whereas a comparatively higher percentage of hotel entrepreneurs have a negative view on the rhino translocation to other parks followed by farmers. The comparatively less positive responses from hotel entrepreneurs towards the translocation program can be viewed relating with the finding that almost all the hotel enterprises are based on tourism, and tourism is supported by presence of rhinos in RCNP. It is obvious that the more rhinos exist in the RCNP, the more benefit they can make with their tourism business.

The farmer's groups, on the other hand, might have been affected with the continuous damage from rhinos of their agricultural crop. A finding from key informants interview also indicates that there is no decrease of damage by rhino, since government has conducted rhinos translocation program. The park authorities have their own view that

the translocation program is not only to reduce rhino-human conflict in Chitwan, but also to save the population of rhino, and they think that it should be continued until there is a viable population in the second or third home area.

As regards to people's perception of the *anti-poaching program*, though generally positive responses are obtained, a significant difference in the views can be observed among the different professional groups ($X^2 = 12.09$ and $p < 0.05$). Only a small percentage of farmers and teachers/students think the program is important to protect rhinos. Many of the farmers and teachers/students (about 50%) groups remained with 'Don't know' view. The NP staffs, on the other hand, are most positive towards the program. No one from the NP staff has negative views towards the program; however, few percentages remained with neutral view. Getting less positive or 'Don't know' views from farmers can either indicate that the program is unsatisfactory or that the respondents have less knowledge of the program. A study report on 'assessment of anti-poaching operation' conducted by Gurung and Guragain (2000), stated that villagers complained to be unsatisfied with anti-poaching unit in Bardiya National Park. 'Anti poaching unit cannot arrest poachers and punish them. This has developed negative impressions among local people. National Park authorities arrest and punish only the poor people who are forced to enter into park forests to collect fodder and firewood' (Gurung and Guragain, 2000).

5.4.2 Opinion on Existing Legal Provision

Poaching of rhinos and penalty for poaching are not new in Nepal. Long before 1950, there was a death penalty for poaching of the rhino (Adhikari, 2002). The punishment for the rhino poacher was increased in April 1993 from 5 years in jail and/or a 15000 rupees fine to maximum 15 years in jail and 100000 rupees (\$1= 74 rupees) fine, a further deterrent to poacher (Martin and Vigne, 1996). The finding of this study suggests that the existing legal regulation is not sufficient to save the rhino from poaching. More than 31% of the respondents are not satisfied with the present penalty and majority percentages of the respondents remained with 'Neutral' and 'Don't know' view. This can indicate that either people don't want to speak about policy matters or they are really lack of knowledge. Some might have been guided with the view that the penalty is not a final solution to control the poaching. Majority of the respondents expressed that the reason to poach rhino is smuggling, rather than the poverty, when they were asked an open question, 'what could be the reason that people poach rhino?'

Analysing the different professional groups, some degree of differences can be observed among the different professions ($X^2 = 10.65$ and $p < 05$) in respect to opinion on sufficiency of existing legal provision. Farmers and BZ leaders expressed comparatively higher opinion on the sufficiency of existing legal provision than others. Teachers/students, hotel entrepreneurs and national park staff have similar views; all are not satisfied with the present provision. The discussions with key informants also suggest that the penalties (rupees 100,000 as fine and 15-years sentence case) are not a sufficient for a rhino poacher in comparison to its ecological and economical value. The price of one kg rhino horn is \$ 12000 to 14000 in the local black market and up to \$ 30000 in the international market (Gurung and Guragain, 2000).

5.4.3 Stakeholders' Participation in Rhino Conservation

The success of wildlife conservation depends on the public relation. Active participation of stakeholders is the sign of good public relation. "Positive public relations foster the civic support that is essential to the success of their conservation and management missions" (Gilbert, 1975). Equal participation of different stakeholders is a sign for a sustainable conservation. This study tried to analyse the level of stakeholders' participation of rhino conservation, which can indicate the degree of acceptance by local people. The participation in this study implies both decision-making as well as protection activities.

The result of this study revealed that every stakeholders group have participated in the rhino conservation. In relation to present level of participation, almost all respondents groups stated that the more active role is being played by two stakeholder groups, (*park authorities* and *BZDC*), followed by *general people*. All other groups: *political institutions*, *NGOs* and *private sectors* are evaluated as near to neutral, which indicates a less active role. However, every group of respondents has their own valuation as stakeholders. In the opinion of park staffs, only park authorities are playing a more active role than all others. In the view of the hotel entrepreneurs, the private sectors have played an almost as active role as park authorities and BZDC.

There is no equal participation of all groups of stakeholders. It is obvious that park authorities that have major responsibilities for conservation have to play a primary role. The second group, BZDC, is not only entitled for the conservation, but also sharing

benefit. Such a role of the other stakeholders might have not been realised by any of the respondents groups. In fact, the BZDC is the second most responsible stakeholder for the conservation of the biodiversity. While general people's role has not been viewed as active as other stakeholders, it indicates that there might be less participation of that group in decision-making.

Concerning the expected role in terms of rhino conservation, almost all professional groups of respondents think that the park authorities and buffer zone development council should play the most active role. The hotel entrepreneurs think that all the stakeholders should play more or less an equally important role, whereas BZ leaders viewed quite differently: They gave least importance to private sectors and political leaders. Since the entire respondents group has expected a very active role of three stakeholders (national park authorities, BZDC and local people), it seems that they give a higher value to only these groups in terms of rhino conservation. It indicates that not all stakeholders are equally important for the rhino conservation, though they are equally important for the overall wildlife conservation. Hence the study suggests that all the stakeholders might not be seen in the similar categories, it should be rather specific to the species and related issues and challenges.

Every professional groups of respondents, in the present study, correspond the related stakeholders to some extent; for example: farmers represents for *local general people*, BZ leaders represents for *BZDC*, NP staff for *HMG (NP)* and so on. Every groups of respondents stated that their respective stakeholders should play more active role in the future than they do at present. Such high expectation of every group of respondents can be viewed as an indicator of readiness to participate more in rhino conservation. One major motivating factor behind such interest of participation might be the implementation of buffer zone development programs, which has provided provision of sharing park revenue to the communities. Though there is a high willingness of more participation by all types of respondents groups, there is lack of equal participation at present. The conflicting interest and priorities of all the stakeholders might lead to less effectiveness of the conservation efforts.

5.4.4 Acceptance of Rhino Population

The human dimension inquiries are helpful for wildlife management professionals to make management decisions. Understanding of public view on 'how do they like to see rhino population in the future' can be helpful to the wildlife managers to get future direction for the rhino conservation. It was stated by Gossow, (2000) that "bear management" is means to a large extent "people management", and suitable living space for brown bears in the Alps does not only mean suitable natural habitat, but requires to begin with the willingness in the mind of the people to coexist with bears.

The results revealed that local residents have willingness for the rhino population growing. In other words, it can be said that a high acceptance level of rhino population has been observed. The accepted level of rhino population provides a base for cultural carrying capacity for rhino, which has been recognized as an important factor in the field of wildlife management in recent decades that for instance (Decker and Purdy, 1988). The "cultural (or socio-economic or political) carrying capacity" is defined as maximum wildlife population, which society will accept within an area (Decker and Purdy 1988), or the number of animals that can compatibly coexist with the local human population interests (Minnis and Peyton, 1995). .

The result that a very high majority of the respondents (80%) want to see the rhino population growing indicates a quite high level of acceptance of rhino population by local residents. Though the study was unable to quantify the exact number of acceptance of rhino population by local residents, a rough cultural carrying capacity can be estimated from the results obtained here. Because the percentage of respondents groups to say 'same as now ' and 'less than now' can be viewed as upper limits for the rhino population, which has provided a range of population to exist in the RCNP. In this respect, the upper limit of rhino population in farmers and NP staff, followed by teachers/students, is lower than in other groups. The local political leaders, on the other hand, had no negative answers, showed quite different views than others. It indicates that the farmers groups have a lower level of tolerance than the local political leaders who might lack the negative experiences with the rhinos.

5.4. 5 Correlation of Behavioural Intentions to the other Components

As has been intended in the conceptual framework (Confer chapter 2.1.4), making correlations of behavioural intentions with three components (knowledge, attitude, and

affectedness) is the final undertaking of this study. Statistical test for correlation coefficient (Spearman's rho-test) was employed to obtain the results. In addition, K-independent samples for non-parametric test (Kruskal-Wallis H) are used to reveal the significant differences. The test confirmed that the *behavioural intention* is positively correlated with *attitude* and *knowledge*, and negatively correlated with *affectedness*.

Table 20, below, shows that there is a significant positive correlation between positive attitude and behavioural intention. A person, who hold positive attitude towards rhino wanted more rhino population in future and a person holding negative or neutral attitude towards rhino wanted rhino population lesser in future (Figure 41). It means people who think rhinos are kind, beautiful and calm, are more likely to agree with the statements "rhino population should be increased more than now". Similarly, the people who have negative attitudes are more likely to support the decreasing of rhino population.

Table 20: correlation between mean attitude and intention for rhino population

			Mean attitude	Intention for rhino population
Spearman's rho	Mean attitude	Correlation Coefficient	1,000	,243**
		Sig. (2-tailed)	,	,000
		N	230	230
	Intention for rhino population	Correlation Coefficient	,243**	1,000
		Sig. (2-tailed)	,000	,
		N	230	230

** . Correlation is significant at the .01 level (2-tailed).

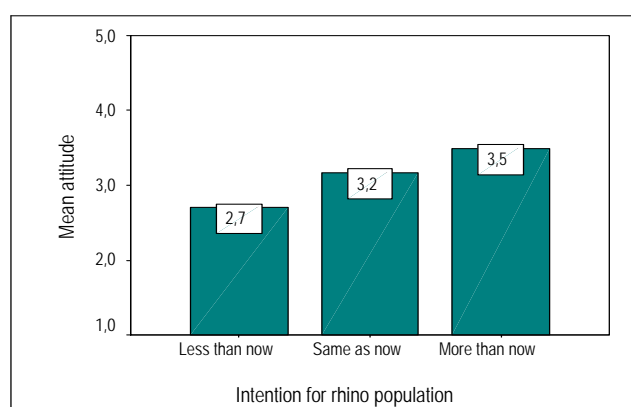


Figure 41: Relationship between people's attitude towards and intention for rhino population (mean attitude score 1 = strongly negative, 3 = neutral and 5 = strongly positive).

The test also confers that there is a significant difference ($p < 0.05$) across the groups of different knowledge level with regard to intention for rhino population. Likewise the

correlation between level of knowledge and intention for rhino conservation has also been observed significant (Table 21). An individual who knows more about rhino and its related issues is, more likely accepts rhino population growing in future (Figure 42). Hence, the study confirmed that increase of local public knowledge level would be one of the major options to increase their acceptance of rhinoceros for its sustainable management. But there exist also findings that “more knowledge about a quite ‘controversial’ wildlife species like the brown bear does not automatically mean that people more readily accept it. But it improves people’ ability to criticize and their readiness to take use of it” (Gossow, 2000). This possibility should be consciously considered in stakeholders specific education program and efforts.

Table 21: correlation between knowledge on rhino and intention for rhino population

			Knowledge on rhino	Intention for rhino population
Spearman's rho	Knowledge on rhino	Correlation Coefficient	1,000	,205**
		Sig. (2-tailed)	,	,002
		N	230	230
	Intention for rhino population	Correlation Coefficient	,205**	1,000
		Sig. (2-tailed)	,002	,
		N	230	230

** . Correlation is significant at the .01 level (2-tailed).

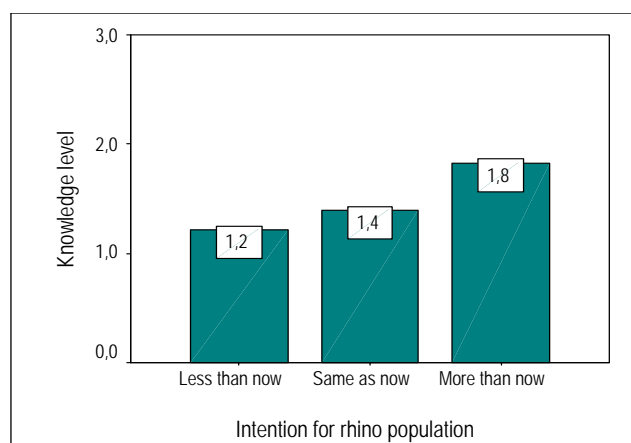


Figure 42: Relationship between knowledge about and intention for rhino population (Knowledge score 0 = no questions was answered correctly, 1 = one question was answered correctly, 3 = three questions were answered correctly) etc.

Regarding the correlation between *behavioural intention* and *personal affectedness*, a highly significant, negative correlation has been observed (Table 22). Past researches have also suggested that population preference can be used as one indicator of wildlife problem tolerance (Seimer, *et al.*, 2003). The present study shows that people desire a

wildlife population decrease when they feel that they are affected more negatively (Figure 43). These findings provide some evidence to suggest that negative affectedness has been exceeded for many of those who have experienced damages, which decrease the acceptance of rhino population. Therefore, it is important to understand and monitor public attitudes, perceptions, and acceptance or tolerance in a longitudinal framework or repeated monitoring efforts.

Table 22: correlation between mean attitude and intention for rhino population

			Level of affectedness	Intention for rhino population
Spearman's rho	Level of affectedness	Correlation Coefficient	1,000	-,172**
		Sig. (2-tailed)	,	,009
		N	230	230
	Intention for rhino population	Correlation Coefficient	-,172**	1,000
		Sig. (2-tailed)	,009	,
		N	230	230

** . Correlation is significant at the .01 level (2-tailed).

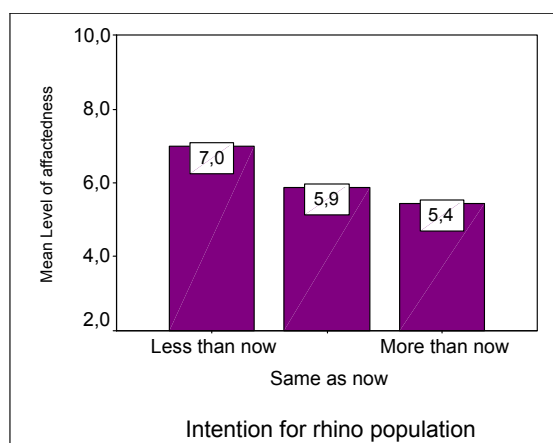


Figure 43: Relationship between level of personal affectedness and intention for rhino population (the degree of affectedness 2= less affected and 10 = highly affected).

6. SUMMARY AND CONCLUSION

The management of wildlife is not only the management of populations and habitats; it also involves management of local community by influencing people's behaviour. The wildlife management profession has now recognized that a key to its ability to manage wildlife effectively is an understanding of the public's relationship to this resource. Considering this principle the present study employed human dimension research on wildlife, specifically on one horned rhinoceros, because there is a great challenge in survival of the rhinoceros due to various human activities. The sustainable conservation of such an endangered wildlife species cannot be achieved without the positive behaviour of local people. Therefore understanding of behavioural intentions of local people through exploring their attitudes towards and knowledge about rhino, and degree of affectedness to them became essential to this study.

The findings are presented within the theoretical context of study and in relation to findings from previous studies. The overall findings show that residents of RCNP BZ hold a positive attitude towards and a moderate level of knowledge of rhino and its conservation and demonstrate positive views on the rhino conservation programs.

Regarding the knowledge level of local people on rhino and its conservation issues, a moderate level of knowledge in general was observed. The local people of the RCNP buffer zone are quite familiar to the general behaviour and food of rhino but they are less knowledgeable of the present rhino population size as well as legal provision for rhino protection. A majority of the respondents were not able to explain the legal provision of rhino protection. The knowledge level differed heavily by demographic characteristics of the respondents. The knowledge was positively related with education level and inversely with the age. Farmers and females are less knowledgeable than people with other professions and males. The study also revealed that most of the people in the study area learned about rhino according to own experience and shared their knowledge's with family and friends. It indicates that there are insufficient conservation education programs and a lack of appropriate communication mechanisms. The less knowledge of illiterate groups indicates that the media of information is not favour to the majority of the people. This study suggests that there is an urgent need of appropriate conservation education programs, which can cover all types of people in the BZ. A sustainable system of conservation education can be

maintained through regular dissemination of information and by utilizing the institutional network of BZ.

The level of impact (level of affectedness) on local people due to the presence of rhinoceros in RCNP is one of the major factors to influence behavioural intentions. The study revealed that there is a moderate to high level of affectedness to rhino to the people. It means people think that they are negatively affected by rhino although it supports the economic development through tourism. The level of affectedness varies on the basis of respondent's home distance to national park boundary, locations and professions of the respondents. Farmers and people living near the national park are more affected than people with other professions and living far from the park. Residents of Meghauli are reported to be more affected than residents of Barandabhar.

The increase of personal affectedness by an individual increases the negative attitude towards rhinoceros. Therefore, minimization of personal affectedness would be one option to change the attitude of people. It can be achieved through minimizing the level of damage by rhino and maximizing economic benefit for the people. This study suggests that minimization of damage level can be achieved through construction of effective physical barriers along the park boundary, establishment of sustainable compensation mechanisms for life and property damage, and habitat improvement inside the park. In the same way, the level of benefit can be increased through promoting tourism activities in all potential areas of buffer zones and direct involvement of local people in tourism activities. The establishment of a village tourism system would be a better option to benefit local people directly.

To explore people's attitudes toward rhinoceros was the third important question to be answered in this study. In overall people of RCNP buffer zone hold a positive attitude towards rhino and its conservation program. However, the attitude level varies across demographic characteristics of the respondents. The profession of people has been found to be one important factor to influence the attitude. People with resource related professions (agriculture) tend to have negative to neutral attitudes toward rhino. An inverse relationship between age and attitude was also observed. The older the respondent, the more negative attitude towards rhino was recorded. A positive relationship was observed with the education level of the respondents. The attitude

towards rhino differed also by distance of the respondents to the national park and sex of the respondents.

The direct relationship with level of knowledge and attitude was stated in this study. However, no significant difference was observed. Respondents who were able to reply all knowledge-questions correctly have demonstrated a slightly more positive attitude towards rhino and the respondents who were not able to reply any answer correctly, have shown neutral attitude but still not negative. On the other hand, a negative correlation between attitude and degree of affectedness was found, in which a high significant difference was observed. People, who have been less affected by rhino, have shown more positive attitudes and those who are more affected by rhino have shown neutral and negative attitudes. Therefore one should consider the options to increase knowledge level and decrease degree of negative contacts to achieve a more positive attitude.

The study indicates that there is an acceptance of rhino conservation in RCNP by local people. It is confirmed by people's opinion about the importance of rhino conservation programs (BZ management, rhino translocation and anti-poaching), their expectation for active participation by stakeholders and wishes to see a higher rhino population in future. This willingness to see more rhinos implies people's positive behavioural intention for rhino conservation, which leads to an acceptable cultural carrying and extending capacity of rhino in RCNP. It is also conformed that the level of knowledge and attitude towards rhino as well as personal affectedness due to rhino influence the behavioural intention of the people. Therefore, it is important to understand and monitor public attitudes, increase knowledge level and decrease degree of affectedness (negative impact) to ensure the long-term conservation of rhinoceros.

On the basis of present findings, it is appeared that the knowledge, attitude and affectedness are predictable variables, by which the behavioural intention of an individual is directed. However, the actual predictability of behaviour and intentions through attitude and value orientations in the field of wildlife management are much disputed. The casual relationships between attitudes, values, knowledge and behaviour are certainly not clear (Volk, 1990 as cited by Szinovatz, 1997). However, Ajzen and Fishbein, (1980) stated "Attitudes are consistent to behaviour with careful

conceptualisation and implementation". In addition, a person's behavioural intention is dependent variable that is influenced by a number of independent and intervening variables (Pregernig, 1999). The present study is not sufficient to provide evidence of linkages between behavioural intention and dependent variables (knowledge, attitude, personal affectedness). Therefore, further research is needed to monitor long-term changes of attitude and wildlife value orientation in a broad category of human dimensions.

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ANNEX 1: QUESTIONNAIR**I. Attitude towards wild animal and rhino**

1	Do you like wild animal? (Please circle one)	Strongly dislike -----Strongly like					<input type="checkbox"/> no answer
		1	2	3	4	5	

2	When you think about wild animals (large mammals) of RCNP, which one do you recall for the first in your mind? (Please circle one)				
	I. Tiger	II. Leopard	III. Bear	IV. Rhino	V. Elephant

3	How do you feel when you think of word "rhino"? (Please circle according to your feeling)					
Sad	1	2	3	4	5	Happy
Scared	1	2	3	4	5	Relax
Angry	1	2	3	4	5	lovely

4	What do you think when you remember about "rhino"? (Please circle according to your opinion)					
Cruel	1	2	3	4	5	Kind
Ugly	1	2	3	4	5	Beautiful
Anger	1	2	3	4	5	Calmness

II. Knowledge on rhino and conservation

5	Do you know about rhino's behaviour (walking , eating)?		
	I, Yes	II. No	III. No answer

6	What is the main food source of rhino?			
	I. Grass and fodder	III. Cereal crop	IV. Meat	<input type="checkbox"/> Don't know

7	How many rhino do you believe currently exist in RCNP? (Please circle one)			
	I. Less than 100	II. 100-400	III. 400 -800	IV. 800-1200
	V. 1200-2000	<input type="checkbox"/> Don't know.		

8	Could you tell what are the legal provisions to the rhino poacher? (Fine, jail and prize)

	sufficiency of existing legal provisions for rhino conservation in Nepal?	1	2	3	4	5	<input type="checkbox"/> Don't know
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17.	What is the importance of the following groups in rhino conservation in RCNP	Not important at all-----Very important					
a	Local people	1	2	3	4	5	<input type="checkbox"/> Don't know
b	Private sectors/hotel entrepreneurs	1	2	3	4	5	<input type="checkbox"/> Don't know
c	District/village Dev. Committee.	1	2	3	4	5	<input type="checkbox"/> Don't know
d	Non-Governmental Organizations	1	2	3	4	5	<input type="checkbox"/> Don't know
e	Buffer Zone Dev. Council	1	2	3	4	5	<input type="checkbox"/> Don't know
f	Concern government authority	1	2	3	4	5	<input type="checkbox"/> Don't know

18.	How do you evaluate the following group's role in rhino conservation in RCNP?	Not at all-----Very active					
a	Local people	1	2	3	4	5	<input type="checkbox"/> Don't know
b	Business circle/hotel owners	1	2	3	4	5	<input type="checkbox"/> Don't know
c	District/village Dev. Committee.	1	2	3	4	5	<input type="checkbox"/> Don't know
d	Non-Governmental Organizations	1	2	3	4	5	<input type="checkbox"/> Don't know
e	Buffer Zone Dev. Council	1	2	3	4	5	<input type="checkbox"/> Don't know
f	Concern government authority	1	2	3	4	5	<input type="checkbox"/> Don't know

19.	How do you like to see rhino population in RCNP in future?
	I. Nil. II. Less than now. III. Same as now IV. More than now. <input type="checkbox"/> Don't know

20.	Please kindly provide information about you		
	Caste/ ethnic group:	Sex:	Age:
	Education:	Occupation:	Distance to NP boarder:
	Date:		

ANNEX 2: RELATED RESULTS

2.1 Knowledge about rhino and its conservation

2.1.1 Knowledge on rhino behavior

	Knowledge on general behaviour of rhino subject to education		Total
	Yes	No	
Illiterate	76 71,7%	30 28,3%	106 100,0%
Literate - SLC	91 84,3%	17 15,7%	108 100,0%
College & above	14 87,5%	2 12,5%	16 100,0%
Total	181 78,7%	49 21,3%	230 100,0%

2.1.2 Knowledge on rhino food

Knowledge on main food of rhino subject to profession

	Main food			Total
	Grass/fodder	Cereals	Others	
Farmers	144 98,0%	2 1,4%	1 ,7%	147 100,0%
Teacher/students	41 93,2%	3 6,8%		44 100,0%
Local P. leaders	14 100,0%			14 100,0%
BZ leaders	23 92,0%	2 8,0%		25 100,0%
Total	222 96,5%	7 3,0%	1 ,4%	230 100,0%

Knowledge on main food of rhino subject to respondent's age

	Main food			Total
	Grass/fodder	Cereals	Others	
16 - 20	27 90,0%	3 10,0%		30 100,0%
21 - 40	108 98,2%	2 1,8%		110 100,0%
41 - 60	63 96,9%	1 1,5%	1 1,5%	65 100,0%
> 61	24 96,0%	1 4,0%		25 100,0%
Total	222 96,5%	7 3,0%	1 ,4%	230 100,0%

2.1.3 Knowledge on rhino population

Knowledge on rhino population subject to age of respondents

	No. of rhinos in RCNP					Total
	< 100	100-400	400-800	> 800	DK	
16 - 20		5 16,7%	20 66,7%		5 16,7%	30 100,0%
21 - 40	8 7,3%	37 33,6%	42 38,2%	7 6,4%	16 14,5%	110 100,0%
41 - 60	3 4,6%	16 24,6%	26 40,0%	3 4,6%	17 26,2%	65 100,0%
> 61	4 16,0%	7 28,0%	3 12,0%	1 4,0%	10 40,0%	25 100,0%
Total	15 6,5%	65 28,3%	91 39,6%	11 4,8%	48 20,9%	230 100,0%

Knowledge on rhino population subject to education of respondents

	No. of rhinos in RCNP					Total
	< 100	100-400	400-800	> 800	DK	
Illiterate	9 8,5%	30 28,3%	23 21,7%	8 7,5%	36 34,0%	106 100,0%
Literate - SLC	3 2,8%	29 26,9%	61 56,5%	3 2,8%	12 11,1%	108 100,0%
College & above	3 18,8%	6 37,5%	7 43,8%			16 100,0%
Total	15 6,5%	65 28,3%	91 39,6%	11 4,8%	48 20,9%	230 100,0%

2.1.4 Knowledge on legal provision related to rhino protection

Knowledge on legal provision subject to education of respondents

	Knowledge on legal provision			Total
	Full knowledge	Little knowledg	None	
Illiterate	7 6,6%	24 22,6%	75 70,8%	106 100,0%
Literate - SLC	18 16,7%	33 30,6%	57 52,8%	108 100,0%
College & above	4 25,0%	8 50,0%	4 25,0%	16 100,0%
Total	29 12,6%	65 28,3%	136 59,1%	230 100,0%

2.1.5 Sources of information to learn about rhino

Source of information to learn about rhino subject to age of the respondents

	Source of information					Total
	News media	School education	Training, workshop	Familiarity, relatives..	No answer	
illiterate	10 9,4%		4 3,8%	71 67,0%	21 19,8%	106 100,0%
Under SLC/SLC	8 7,4%	2 1,9%	3 2,8%	70 64,8%	25 23,1%	108 100,0%
College & above	1 6,3%	1 6,3%		10 62,5%	4 25,0%	16 100,0%
Total	19 8,3%	3 1,3%	7 3,0%	151 65,7%	50 21,7%	230 100,0%

2.2: Impact of rhino on local people

2.2.1 Most trouble giving animal

	The most trouble giving animal subject to two locations				Total
	Tiger	Rhino	Elephant	Othrs	
Meghauli	11 6,8%	141 87,6%	2 1,2%	7 4,3%	161 100,0%
Barandabhar	22 31,9%	28 40,6%		19 27,5%	69 100,0%
Total	33 14,3%	169 73,5%	2 ,9%	26 11,3%	230 100,0%

2.2.2 Frequency of rhino in agricultural field

	Frequency of rhino in agricultural field subject to distance to NP					Total
	Never	<5 times	5 - 25 times	< 26 - 50 times	> 50 times	
< 1 km	6	15	3	19	43	
	14,0%	34,9%	7,0%	44,2%	100,0%	
1 - 3 km	8	30	15	25	86	
	9,3%	34,9%	17,4%	29,1%	100,0%	
3 - 6 km	10	19	2	3	43	
	23,3%	44,2%	4,7%	7,0%	100,0%	
6 - 9 km	3	2	1		16	
	18,8%	12,5%	6,3%		100,0%	
> 9 km	10	12	3	1	42	
	23,8%	28,6%	7,1%	2,4%	100,0%	
Total	31	78	24	48	230	
	13,5%	33,9%	10,4%	20,9%	100,0%	

	Frequency of rhino to the agriculture field subject to localitons					Total
	Never	<5 times	5 - 25 times	< 26 - 50 times	> 50 times	
Meghauli	17 10,6%	21 13,0%	57 35,4%	21 13,0%	45 28,0%	161 100,0%
Barandabhar	14 20,3%	28 40,6%	21 30,4%	3 4,3%	3 4,3%	69 100,0%
Total	31 13,5%	49 21,3%	78 33,9%	24 10,4%	48 20,9%	230 100,0%

2.2.4 Rhino as a major source of tourism

Responses on 'rhino as a major source of tourirms in RCNP' subject to education of respondents

	Response on 'rhino as source of tourism'			Total
	Yes	No	Don't know	
Illiterate	108 89,3%	4 3,3%	9 7,4%	121 100,0%
Literate - SLC	126 95,5%	3 2,3%	3 2,3%	132 100,0%
College & above	27 100,0%			27 100,0%
Total	261 93,2%	7 2,5%	12 4,3%	280 100,0%

2.2.5 Benefit from tourism

Responses on 'benefit from tourism' subject to sex of the respondents

	Benefit from tourism					Total
	Not at all	Not	Neutral	Benefited	More benefitted	
Male	19 12,8%	19 12,8%	22 14,8%	42 28,2%	47 31,5%	149 100,0%
Female	11 13,6%	17 21,0%	11 13,6%	22 27,2%	20 24,7%	81 100,0%
Total	30 13,0%	36 15,7%	33 14,3%	64 27,8%	67 29,1%	230 100,0%

Responses on benefited from tourism subject to education level of respondents

	Benefit from tourism					Total
	Not at all	Not	Neutral	Benefited	More benefited	
Illiterate	22 20,8%	23 21,7%	15 14,2%	29 27,4%	17 16,0%	106 100,0%
Literate - SLC	7 6,5%	13 12,0%	16 14,8%	32 29,6%	40 37,0%	108 100,0%
College & above	1 6,3%		2 12,5%	3 18,8%	10 62,5%	16 100,0%
Total	30 13,0%	36 15,7%	33 14,3%	64 27,8%	67 29,1%	230 100,0%

2.3: Attitudes and Preference of Wild Animal

2.3.1 Attitudes toward wildlife

	Preference of wild animal by different age of respondents in years						Total
	Strongly dislike	Dislike	Neutral	Like	Strongly like	DK	
16 - 20			3 10,0%	10 33,3%	17 56,7%		30 100,0%
21 - 40	5 3,6%	4 2,9%	8 5,8%	34 24,8%	85 62,0%	1 ,7%	137 100,0%
41 - 60	1 1,1%	4 4,6%	7 8,0%	20 23,0%	55 63,2%		87 100,0%
> 61	1 3,8%	3 11,5%	1 3,8%	12 46,2%	9 34,6%		26 100,0%
Total	7 2,5%	11 3,9%	19 6,8%	76 27,1%	166 59,3%	1 ,4%	280 100,0%

	The most recalled animal by different profession of respondents				Total
	Tiger	Rhino	Elephant	Others	
Farmers	14 9,5%	124 84,4%	5 3,4%	4 2,7%	147 100,0%
Teacher/students	3 6,8%	40 90,9%	1 2,3%		44 100,0%
Hotel entrepreneurs	1 4,0%	22 88,0%	2 8,0%		25 100,0%
Local P. leaders	1 7,1%	13 92,9%			14 100,0%
BZ leaders	1 4,0%	23 92,0%	1 4,0%		25 100,0%
NP staff		24 96,0%	1 4,0%		25 100,0%
Total	20 7,1%	246 87,9%	10 3,6%	4 1,4%	280 100,0%

2.3.2 Attitudes toward rhino

Feeling of rhino subject to sex of respondents

Feeling of sad or happy seeing rhino

	Feeling					Total
	Very sad	Sad	Neutral	Happy	Very happy	
Male	8 4,2%	9 4,7%	24 12,5%	80 41,7%	71 37,0%	192 100,0%
Female	6 6,8%	5 5,7%	13 14,8%	40 45,5%	24 27,3%	88 100,0%
Total	14 5,0%	14 5,0%	37 13,2%	120 42,9%	95 33,9%	280 100,0%

Feeling of fear or entertainment seeing rhino

	Feeling					Total
	Very fear	Fear	Neutral	Entertainment	Very entertain	
Male	22 11,5%	35 18,2%	36 18,8%	48 25,0%	51 26,6%	192 100,0%
Female	21 23,9%	23 26,1%	16 18,2%	18 20,5%	10 11,4%	88 100,0%
Total	43 15,4%	58 20,7%	52 18,6%	66 23,6%	61 21,8%	280 100,0%

Feeling of hate or love seeing rhino

	Feeling					Total
	Hate more	Hate	Neutral	Love	Love more	
Male	11 5,7%	19 9,9%	34 17,7%	65 33,9%	63 32,8%	192 100,0%
Female	8 9,1%	8 9,1%	21 23,9%	31 35,2%	20 22,7%	88 100,0%
Total	19 6,8%	27 9,6%	55 19,6%	96 34,3%	83 29,6%	280 100,0%

Belief of cruel or kind nature of rhino

	Belief					Total
	Very cruel	Cruel	Neutral	Kind	Very kind	
Male	15 7,8%	36 18,8%	70 36,5%	47 24,5%	24 12,5%	192 100,0%
Female	21 23,9%	22 25,0%	27 30,7%	17 19,3%	1 1,1%	88 100,0%
Total	36 12,9%	58 20,7%	97 34,6%	64 22,9%	25 8,9%	280 100,0%

Belief of ugly or beautiful about rhino

	Belief					Total
	Very ugly	Ugly	Neutral	Beautiful	More beautiful	
Male	2 1,0%	14 7,3%	26 13,5%	83 43,2%	67 34,9%	192 100,0%
Female	4 4,5%	6 6,8%	11 12,5%	41 46,6%	26 29,5%	88 100,0%
Total	6 2,1%	20 7,1%	37 13,2%	124 44,3%	93 33,2%	280 100,0%

Belief of ugly or beautiful about rhino

	Belief					Total
	Very ugly	Ugly	Neutral	Beautiful	More beautiful	
Male	2 1,0%	14 7,3%	26 13,5%	83 43,2%	67 34,9%	192 100,0%
Female	4 4,5%	6 6,8%	11 12,5%	41 46,6%	26 29,5%	88 100,0%
Total	6 2,1%	20 7,1%	37 13,2%	124 44,3%	93 33,2%	280 100,0%

Belief of aggressive or calm nature of rhino

	Belief					Total
	Very anger	Anger	Neutral	Calm	Very calm	
Male	14 7,3%	28 14,6%	55 28,6%	58 30,2%	37 19,3%	192 100,0%
Female	7 8,0%	14 15,9%	31 35,2%	27 30,7%	9 10,2%	88 100,0%
Total	21 7,5%	42 15,0%	86 30,7%	85 30,4%	46 16,4%	280 100,0%

2.4: Acceptance of Rhino Conservation

2.4.1 BZ management program

	Opinion on BZ management program for rhino conservation						Total
	Not imp. at all	Not imp.	Neutral	Imp.	Very imp.	DK	
Farmers	2 1,4%	6 4,1%	7 4,8%	41 27,9%	83 56,5%	8 5,4%	147 100,0%
Teacher/students	2 4,5%	1 2,3%	4 9,1%	8 18,2%	27 61,4%	2 4,5%	44 100,0%
Hotel entrepreneurs		1 4,0%	2 8,0%	5 20,0%	17 68,0%		25 100,0%
Local P leaders			2 14,3%	5 35,7%	7 50,0%		14 100,0%
BZ leaders		1 4,0%	2 8,0%	7 28,0%	13 52,0%	2 8,0%	25 100,0%
NP staff		3 12,0%	5 20,0%	4 16,0%	12 48,0%	1 4,0%	25 100,0%
Total	4 1,4%	12 4,3%	22 7,9%	70 25,0%	159 56,8%	13 4,6%	280 100,0%

2.4.2 Rhino translocation program

	Opinion on rhino translocation program						Total
	Not imp. at all	Not important	Neutral	Imp.	More imp.	DK	
Farmers	11 7,5%	18 12,2%	27 18,4%	51 34,7%	14 9,5%	26 17,7%	147 100,0%
Teacher/students	5 11,4%	2 4,5%	8 18,2%	15 34,1%	12 27,3%	2 4,5%	44 100,0%
Hotel entrepreneurs	1 4,0%	6 24,0%	7 28,0%	10 40,0%	1 4,0%		25 100,0%
Local P. leaders	1 7,1%	2 14,3%	2 14,3%	5 35,7%	4 28,6%		14 100,0%
BZ leaders	3 12,0%	1 4,0%	5 20,0%	6 24,0%	8 32,0%	2 8,0%	25 100,0%
NP staff		1 4,0%	5 20,0%	8 32,0%	11 44,0%		25 100,0%
Total	21 7,5%	30 10,7%	54 19,3%	95 33,9%	50 17,9%	30 10,7%	280 100,0%

2.4.3 Anti poaching program

	Opinion on anti-poaching program for rhino conservation						Total
	Not imp. at all	Not imp.	Neutral	Imp.	Very imp.	DK	
Farmers	5 3,4%	6 4,1%	21 14,3%	26 17,7%	12 8,2%	77 52,4%	147 100,0%
Teacher/students	1 2,3%	2 4,5%	3 6,8%	4 9,1%	11 25,0%	23 52,3%	44 100,0%
Hotel entrepreneurs		1 4,0%	1 4,0%	5 20,0%	9 36,0%	9 36,0%	25 100,0%
Local P. leaders		2 14,3%	1 7,1%	6 42,9%	3 21,4%	2 14,3%	14 100,0%
BZ leaders	1 4,0%	1 4,0%	2 8,0%	6 24,0%	10 40,0%	5 20,0%	25 100,0%
NP staff			2 8,0%	7 28,0%	14 56,0%	2 8,0%	25 100,0%
Total	7 2,5%	12 4,3%	30 10,7%	54 19,3%	59 21,1%	118 42,1%	280 100,0%

2.4.4 Existing legal provision for rhino conservation

	Opinion on legal provision to control rhino from poaching						Total
	Not at all	Not sufficient	Neutral	Sufficient	Enough	DK	
Farmers	14 9,5%	29 19,7%	23 15,6%	30 20,4%	14 9,5%	37 25%	147 100%
Teacher/students	5 11,4%	11 25,0%	11 25,0%	7 15,9%	6 13,6%	4 9,1%	44 100%
Hotel entrepreneurs	4 16,0%	5 20,0%	7 28,0%	2 8,0%	5 20,0%	2 8,0%	25 100%
Local P. leaders	2 14,3%	4 28,6%	5 35,7%	2 14,3%		1 7,1%	14 100%
BZ leaders	2 8,0%	2 8,0%	9 36,0%	5 20,0%	4 16,0%	3 12%	25 100%
NP staff	5 20,0%	4 16,0%	4 16,0%	3 12,0%	9 36,0%		25 100%
Total	32 11,4%	55 19,6%	59 21,1%	49 17,5%	38 13,6%	47 17%	280 100%

2.4.5 Stakeholders' participation on rhino conservation

Expectation level of participation by different stakeholders on rhino conservation (Mean for each stakeholders groups)

Respondents	Local People	Private Sec.	Local P. Inst.	NGOs	BZDC	HMG (NP)
Farmers	4.48	3.59	4.07	4.00	4.83	4.67
Teacher/students	4.29	3.89	4.27	4.20	4.70	4.34
Hotel entrepreneurs	4.48	4.56	4.36	4.40	4.80	4.88
Local political leaders	4.86	3.64	4.50	4.21	4.86	4.64
BZ leaders	4.52	3.20	3.52	3.72	4.76	4.88
NP staff	4.24	3.84	4.00	4.28	4.44	4.76
Total	4.45	3.71	4.09	4.08	4.77	4.66

Present level of participation by different stakeholders on rhino conservation (Mean for each stakeholders groups)

Respondents	Local people	Private sec. hotel entrepreneurs	DDC/VDC	NGOs	BZDC	National office
Farmers	3.88	3.14	3.62	3.40	4.42	4.22
Teacher/student	3.61	3.29	3.57	3.68	4.34	4.00
Hotel entrepreneurs	3.76	4.24	3.68	3.52	4.20	4.36
Local Political leaders	3.50	2.36	3.00	3.07	4.07	4.00
BZ leaders	3.60	2.72	3.12	2.88	4.44	4.52
NP staff	3.00	3.04	3.04	3.44	3.88	4.44
Total	3.70	3.18	3.49	3.39	4.33	4.24

Level of Participation of Different Stakeholders on Rhino Conservation

Mean level of participation	Stakeholders					
	Local People	Private Sec hotels	Local Political. Inst.	NGOs	BZDC	HMG (NP)
Expected	4.45	3.71	4.09	4.08	4.77	4.66
Present	3.70	3.18	3.49	3.39	4.33	4.24

2.4.6 People's intention for rhino population in RCNP in future

	Intention for rhino population			Total
	Less than now	Same as now	More than now	
16 - 20	1 3,3%	4 13,3%	25 83,3%	30 100,0%
21 - 40	10 9,1%	21 19,1%	79 71,8%	110 100,0%
41 - 60		4 6,2%	61 93,8%	65 100,0%
> 61	3 12,0%	4 16,0%	18 72,0%	25 100,0%
Total	14 6,1%	33 14,3%	183 79,6%	230 100,0%

	Intention for rhino population			Total
	Less than now	Same as now	More than now	
Illiterate	6 5,7%	20 18,9%	80 75,5%	106 100,0%
Literate - SLC	8 7,4%	12 11,1%	88 81,5%	108 100,0%
College & above		1 6,3%	15 93,8%	16 100,0%
Total	14 6,1%	33 14,3%	183 79,6%	230 100,0%

	Intention for rhino population			Total
	Less than now	Same as now	More than now	
< 1 km	6 14,0%	7 16,3%	30 69,8%	43 100,0%
1 - 3 km	4 4,7%	14 16,3%	68 79,1%	86 100,0%
3 - 6 km	1 2,3%	4 9,3%	38 88,4%	43 100,0%
6 - 9 km		3 18,8%	13 81,3%	16 100,0%
> 9 km	3 7,1%	5 11,9%	34 81,0%	42 100,0%
Total	14 6,1%	33 14,3%	183 79,6%	230 100,0%

ANNEX 3: TERMS AND CONCEPTS

Buffer zone (BZ)

A buffer zone (BZ) is an area surrounding the protected area, for example national parks or wildlife reserves. The objective of such a zone is to give added protection to the protected area and to compensate local people for the loss of access to the biodiversity resources of the reserve.

Biodiversity

The variety of life in all its forms, levels and combinations is called biodiversity. It includes ecosystem diversity, species diversity, and genetic diversity (IUCN, UNEP and WWF, 1991).

Conservation

The management of human use of organisms or ecosystems to ensure such use is sustainable use; conservation includes protection, maintenance, rehabilitation, restoration and enhancement of populations and ecosystems (IUCN, 1991:210).

District Development Committee (DDC)

The District Development Committee is the highest local government structure. Nepal is divided into 75 districts. Each district has a District Development Committee. The District Development Committee has one Chair, one Vice Chair and members. The number of members in a DDC depends on the size of the district. All these positions are elected, not by direct election from the citizens, but from the Village Council or Municipal Council members. The primary responsibility of the DDC is to manage development money and projects for the district.

Ecosystem

An ecosystem is the dynamic and interrelating complex of plant and animal communities and their associated non-living environment. It is a totality of all factors, which make up a particular environment.

Ecology

Ecology is the study of the interactions of organisms with their environment and with each other, the study of the dynamic relationships between organisms and the total environment.

Eco-tone

Eco-tone is a transition area between two adjacent ecological communities (as the park and the agricultural area in its vicinity). The area usually exhibits competition between organisms common to both (McNeely et al., 1990:153).

Eco-tourism

Travelling to and visiting relatively undisturbed or uncontaminated natural areas with the specific purpose of studying, admiring and enjoying the scenery, its flora and fauna, as well as existing cultural manifestations which are found in these areas (Thorsell, 1990:54).

Farmer

One who resides in a village and cultivates his farmland as the major source of living.

Household

A group of individuals related to each other by blood, marriage or co-operation, living in one and the same residential unit contributing to and/or sharing the group's material and financial resources and partaking meals prepared at the same fire place or stove or from one kitchen with a single fire place or stove.

Indigenous

People, who are born, grown up and still living in a special region, in which is also lying the origin and home of their family or tribe; natives are called indigenous people.

Local People

Individuals living within the buffer zone boundary of RCNP area are called local people for this study.

Local Political Leader

Leaders or representatives elected by local people for local development institutes namely District Development Committee (DDC), Village Development Committee (VDC). DDC president and vice president; VDC chairperson and vice chairperson; ward chairperson and women ward level members are considered as *local political leader* in this study.

National Park

It is a relatively large area of national or international significance that is not to be materially altered by human beings. Access is controlled, but visitors are encouraged to use the areas for recreation and study (IUCN 1985).

Protected Area

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, of natural and associated cultural resources, and managed through legal or other effective means. Protected areas include national parks, game reserves, multiple-use areas, biosphere reserves, and wildlife reserves, among others.

World heritage site: an area protected for its natural features for which it is considered to be of outstanding universal importance. Incorporated into a selected list of the world's unique natural and cultural sites nominated by countries which are members of the World Heritage Convention (IUCN, 1991:193).

Village Development Committee (VDC)

Village Development Committees are in areas where there are no cities. Municipalities are in areas with cities. The Village Development Committee is made up of nine wards; each Ward President is a member of the Village Development Committee. A Municipality may have more than nine wards according to the size of the population of the city, and similar to the VDC each Ward President is a member of the Municipality. Additionally, citizens elect the President and Vice President of the VDC (or Mayor and Deputy Mayor of the Municipality). The VDC and Municipality are responsible for all the development projects occurring in the villages or cities under their jurisdiction.

ANNEX 3: LOCATION MAP OF RCNP

