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Economic Effects of Royal Chitwan National Park, Nepal

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Abstract

This study analyzes economic effects of Royal Chitwan National Park, Nepal. It emphasizes the socially inclusive and responsive process of development of the park resources. It concentrates on the use value of the park resources. The economic effect of the park has been divided into local and national level. The local effect includes those issues that create immediate impact of the park upon the way of life of the adjoining people surrounding the national park. The national effect consists of the prospect of sustainable tourism in the park. It estimates the probability of tourist demand for the park.

There are six definite areas on which the study is focused in connection to evaluating the economic effects of the park. Various economic methods have been synthesized to develop a simple methodology for the analysis of the economic effects. The outcome of this work provides a perspective of the willingness of the people to pay for the existence of the national park. The study has also much to do with the sustainable management of park resources.

Introduction

Protected areas in Nepal cover 18.33 percent of the land. They include 9 national parks with 6 buffer zones, 3 wildlife reserves, 3 conservation areas, and 1 hunting reserve (HMG, 2002:41). Among the national parks of the country, Royal Chitwan National Park is the first one established in 1973 under the National Parks and Wildlife Nature Conservation Act 1973. The Act defines a national park as an area set-aside for the conservation and management of the natural environment including fauna, flora and landscapes (HMG, 1988:62). In fact, national parks and reserves create avenue to sustainable development. Their establishment is inextricably linked with the concept of economic development. It is essential that the priority should be given to the sustainable management of resource base that can contribute to national income

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and at the same time fulfil local people's needs. Firewood, fodder, leaf litters are the types of products connected directly to the daily necessities of general people in the agricultural rural Nepal. They are to be protected and well managed. National park overcomes these challenges. National park is the infrastructure for economic development. It generates employment at local and national level, promotes sustainable tourism, mobilizes the resources, and provides marketing facilities for the local commodities through hotels & trade centers dealing with tourists of the park. It protects environment and wildlife and makes people feel and glorify that there is the existence of fund of natural resources. It also preserves the bio-diversity. In spite of resource conflict at local level arising due to the prohibition of traditional extraction of forest products from the park area, local people's willingness to pay for the park has been found substantial.

There are so many economic effects realized due to the establishment of the Royal Chitwan National Park. The present study concentrates only on those effects that are directly related to people's problem both at the local and the national level. The immediate concerns of local people surrounding the national park are mostly connected to the problem of extraction of forest products and the livestock raising. After the establishment of the park the local people are prohibited from the traditional extraction of forest products from this part of jungle. The park has affected the daily lives of the people. They are also faced with the problem of lack of grazing land for their cattle. The park has affected the women's way of life in relation to the time use in different activities. The economic valuation of the time use is the interest of the study.. The present study connects this problem with the conservation and utilization of park forest resource. The attitude of local people towards the park and its buffer zone is taken as the social value judgement for the over all performance and interrelationships. The study also considers that the choice of tourist for the visiting sites of the park and the factors determining the choice are the parameter of sustainable tourism industry in Royal Chitwan National Park. These are the main issues, which constitute the problem area of research. They are incorporated in the research questions designed in the following section. These questions also help specify the objectives of the study.

Research Questions

- To what extent do the local people depend on the forest products in and around the park?
- What about local people's attitude towards park and its buffer-zone management?
- What is the willingness of the people to accept compensation for the spill over effect?
- What is the opportunity cost of the park measured in terms of the local crop production?
- What is the opportunity cost of time use by women in dealing with forest products of the park?

- What factors determine the choice of tourist in relation to the demand for the visiting sites of the park?

Objectives

The objectives of the study are focused on the estimation of local and national economic effects of the Royal Chitwan National Park as classified below.

Local economic effect

- To estimate the consumption of forest products by adjoining household.
- To estimate the spillover effect of the park measured in terms of the reduction in livestock raising.
- to estimate the opportunity cost of the park measured in terms of agricultural production.
- To estimate the opportunity cost of time use by women in dealing with the forest products of the park.

National economic effect

- To estimate the demand of the tourist for the visiting sites of the park.

Literature Review

Economic Development, Natural Resource and Protected Area

Economic development is both a physical reality and a state of mind in which social, economic and institutional processes secure the means for a better life (Todaro, 1997: 18). Over the years the realization is that the growth does not trickle down and no one policy will trigger development. Sustained development can be achieved only through the integrated process of socially inclusive and responsive relationships. The sustainable management of natural resource is connected to the concept of people's participation. The question of empowering the local community in the management of natural resource has been the part of economic programs. The process of development gradually leads to the gradual integration of local community into a larger social and economic framework (WCED, 1987: 19). Protected areas have a valuable economic characteristic. Most of the benefit of a protected area can be consumed by one person without affecting the ability of another person to also benefit from the protected area (Munashinghe, 1994: 20).

The problem of population growth is also connected to the problem of resource utilization of the national parks and reserves. Population studies concentrate on the economic problem of whether or not the slower population growth leads to increase the growth rate of per capita income through increasing per capita availability of exhaustible resources. Most of the research works suggest that slower population growth mitigate the problem, provided an appropriate institutional and technological adaptation. If institutions do not adapt as rapidly as needed, slower population growth may cause the decline of labor productivity and the degradation of common resources (McNicoll, 1984:99; Pant, 1989:18; UN, 1994:278).

Almost all the literatures on national park and the management of the natural resources focus on the question of compromise between the conservation on one side and the consumption on the other. The crucial question in these respects is somewhat like the following. "Do you think, we can conserve oxygen because it is depletion?" The right approach should be the preservation along with the utilization (Saxena, 1990:22). The management of common property resources is a relevant area of the study. Rural people depend more on the common property resources such as community forests, pastures as well as other forest resources. But due to population induced land scarcity and the economic inefficiency of resources use under common property regimes, the question of sustainable resource management has been constrained (FAO, 1985: 3; Jodha, 1992: iv).

The consideration of environmental externalities with distributional objective is a controversial issue while dealing with protected area economics (Baumol, 1974: 265, 266). However the distributional effects of natural resource can be incorporated into economic calculation (Rees, 1985: 308). The program evaluation of a project include assessment of progress and impact, finding out areas of success and failure in implementation, analyzing the reasons, asserting people's acceptance of the program benefits and their reactions and deriving lessons for improvement in the formulation and implementation of program (Puttaswamaiah, 1989: 9).

Royal Chitwan National Park and the Economic Effects

There are very few literatures available particularly in the area of the economic effect of Royal Chitwan National Park. Most of the studies have been carried out on the ecological aspect of the park. A brief economic evaluation of Royal Chitwan National Park made by one of the earlier studies (Wells, 1992: 86) finds that except for grass collection from the park, the benefits flowing from the park to the local people are minor because most local people are not directly involved in the tourism.

The study in park-people interaction conducted by Sharma (1991) has focused on three main issues that involve conflict between the park and adjacent human communities: (1) illegal harvest of firewood (2) trespassing by domestic livestock for grazing and illegal harvest of fodder (3) Crop and livestock damages by wildlife. In addition, annual harvest of thatch grass and grass products have been assessed. His analysis is based on the socio-economic framework. The intensification of the land use outside the park and strict control of park forest and forests adjacent to the park have remained the strong recommendation for the sustainable development of resources in Royal Chitwan National Park (Sharma, 1991: 218).A similar study conducted by Nepal and Weber (1993: 89, 90) have stressed on the problem of integrating management of protected area with the development needs of the local people. It has been realized that natural resources cannot be looked away from the surrounding population. The study has stressed on the exigency of buffer-zone management. 'Barandavar' jungle has been serving both as the extension-buffering and socio-buffering of Royal Chitwan National Park. The main objective of the study is the resolution of the conflict between local people and the park management.

The proper balance between demand and supply of the exhaustible resources has been the main concern of Nepal's protected area management (KMTNC, 1986: 182; HMG, 1993: 30; Lama and Lipp, 1994: 16). The study of Gurung (1980: 260) awares the people of Chitwan in fencing around the national park.

Aspect of tourism is an important issue with regard to the economic effect of the park. The unique heritage of Nepal is of considerable value for the tourist industry. If it is properly managed, it contributes to the national income, otherwise a decline of the heritage value. Tourism demand needs to protect the quality and integrity of heritage sites as well as to protect those living heritage items that reflect the details of Nepali culture. Folk music, folk dances and Thanka painting are those living heritage items that foster the tourist market (NPC, 1992: 11). Tourism sector contributes one –fifth of convertible foreign currency earning and 4% of Gross Domestic Product of Nepalese economy. It is the economic rewards that provide the impetus for the development of eco-tourism and alternative tourism (Rogers, 1997: 194).

There are three detriments to the sustainable tourism in Nepal. The first has to do with the exploitation of and impingement on natural resource endowments beyond sustainable limit. The second and the third are related to inappropriate distribution of tourism benefits. There is lack of positive linkage between tourism and the farming system. Economic benefits are limited only to the employment of porters, guides and to very few private business. Lack of retention of substantial benefits in tourist area is the third element of unsustainable tourism (Sharma, 1992: 116). In Nepal national parks and reserves play a very important part in the development of a wilderness oriented tourist industry based on the non-consumptive use of natural resources (Majupuria, 1998: 182). But the promised benefits of tourism have not materialized (Mishra, 1991: 151). The economic benefits have failed to speed to those hardest hit by the establishment of the park.

Royal Chitwan National Park has been considered as one of the Natural World Heritage Sites by UNESCO in 1984. According to the information published in Visitors' Centre at Sauraha, Chitwan, 1996, following are the statements of World Heritage Significance.

- It represents the unique inner tarai eco-system consisting of wide varieties of tropical and sub-tropical flora and fauna.
- It is the habitat of several threatened species.
- It represents an area of great cultural interest associated with the Tharu community.
- It represents several religious sites.

The study in the marginal cost of endangered species management (Hyde et al., 1994:175) offers a comparative study of the net social costs of protection of rhinoceros in Chitwan National Park with the costs for the management of the red-cockaded wood peeker (RCW), an endangered bird species nestling over 46 years in the Croatan National Forest in the United States. The net social cost of protection of rhinoceros many be small because its protection also brings economic rewards in the form of tourism. This conclusion is derived from the calculation of costs for RCW.

Environmental problems are often addressed at local and national level. However, international commitment is also equally important to the integration and change (World Bank, 1992 : 178). There are four world conferences organized in national parks and reserves since the first world conference in Seattle Washington, 1962. The first conference realized the exigency of preserving the wildlife in Chitwan, Nepal and explicitly expressed, "An additional rhino population of unknown numbers lived in the Chitwan Royal Hunting Preserve in the remote Rapti valley of the kingdom of Nepal" (Talbot, 1962: 301). It also realized the international supervision of the parks and the economic benefit of the park in encouraging tourism. The fourth world conference in Caracas Venezuela, 1992 has emphasized in its strategy the need for economic as well as the multi criteria analysis for the non-valued environmental impact of national parks in general (McNeely, 1993: 78).

In view of these experiences, theoretical and empirical judgements and their relevancy in the Nepalese context, the present study focuses on the economic and social effect of the Royal Chitwan National Park in the central development region of Nepal and the environmental implication of the same. Therefore the study is expected to review the concept of the park development as a part of the local and national development efforts as well as international dimension of the effect in Nepal.

Methodology

The present study is based mainly on primary cross section data. The main sources of primary data are household survey and visitor survey conducted through the formal method of interview in a designed questionnaire. Altogether 180 households from the adjoining villages of Royal Chitwan National Park for the household survey and 98 visitors from Kathmandu valley for visitor survey have been selected.

Two-stage random sampling has been followed for household survey. The area selection at the first stage and the household selection at the second stage have been conducted. For the visitor survey, foreign visitors from different country have been selected purposively at random.

Support zone of Royal Chitwan National Park covers almost 320 villages with 261000 people adjoining to the park including Makwanpur, Nawalparasi and Chitwan district. However, the major portion of the support zone lies within Chitwan district. So the present study concentrates only in the Chitwan district. For the purpose of the present study the household survey areas have been redefined and classified in six different village categories corresponding to the location of the park.

The concept of 'comity village' has been introduced to indicate the environment friendly region. The term 'comity' is meant for harmonious friendliness. This research work strives for the environment friendly co-existence in and around the milieu.

Brahmapuri village has been chosen as the 'comity village'. The village lies within Patihani VDC. This village has been the memorized village of the researcher. It lies almost at the centre of the support zone corresponding to the location of the national park. This village has been considered as the nucleus [central part] of the household study area.

Various economic methods that the study adopts to quantify the economic effects of the Royal Chitwan National as identified in the objectives of the study are as follows.

Labor-Day Method of Shadow Pricing

This method is used to estimate the economic value of forest products consumed by the local people in and around the park. Economic value is calculated in terms of shadow prices of the products. Shadow price of the forest product = Shadow wage rate[1] +maintenance cost[2] + permit charge[3]

Contingent Valuation Method

This method is used to estimate the economic value of the spillover effect of the park at the local level. The method is applied to estimate the loss of income in livestock raising. Households are directly asked about the amount of compensation they would be willing to accept for the loss in income from the decrease in livestock raising due to the creation of national park

Crop Yield Conversion Factor

The opportunity cost of the park is measured in terms of the local crop production. The existing practice of agricultural production in and around the park is considered as the basis for the estimation. The lump-sum annual net income from one unit of the land is taken as the conversion factor to obtain the total benefit forgone from the establishment of the park.

Time-use Study Method

Time use study is based on the distribution of activity hours of a day. A time table has been designed and administered to the household to record the distribution of the 17 activity hours of a day (from 5am to 10pm). This method is applied to estimate the opportunity cost of time use by men and women in different activities. The present study concentrates on the economic value of time use by women in dealing with the forest products of the park.

Logit Binary Choice Model

This model is used to estimate the visitors' demand for the park. The present study selects the yes-no type dependent variable. It is in the form of binary choice of the visitor either to visit or not to visit the park. Logit model is useful in case of dichotomous dummy dependent variable. The SPSS computer package is used for the desired model estimation with reiterative process.

Estimated Logit Model:

$$L_i = l_n \left(\frac{P_i}{1 - P_i} \right) = \beta_1 + \beta_2 X_{1i} + \beta_3 X_{2i} + \mu_i$$

Where, L_i is the estimate of L_i; logit of park visit or the visitors' demand (V_D), a dummy dependent variable; D = 1 if 'yes' (like to visit the park) and D = 0 if 'no' (do not like to visit the park), P_i is the estimate of Pi, X_{1i} is the sex (gender) of the visitor, qualitative variable (X_1= 1 if male and 0 if female), X_{2i} is the income of the visitor, a quantitative variable, m_i is the stochastic disturbance term, B_2 is the differential intercept coefficient. It tells by how much the value of the intercept term of the category that receives the value of 1 differs from the intercept coefficient of the base category.

Conclusion

The specific objectives based on the research questions have been pursued by various economic methods to find the economic values, estimates and the outcomes of the research work. The following section presents a summary of the relationships.

The observations on the household attitude towards park and its buffer-zone suggest that the adjoining people are not in conflict with the park objectives. They do not look the park with the negative perspective. However, human life and crop damage by wildlife of the park can be considered as one of the conspicuous problems in the adjoining area. This problem of depredation is widely realized. It is desirable that special department under the park management that deals with depredation should be established.

According to the household survey estimates, the economic value of consumption of forest products per household from the park source is found to be Rs. 9,843.54 per annum and per capita consumption is valued at Rs. 1441.69. Altogether twelve various kinds of forest products have been extracted from the park. The fuel wood has remained the largest consumption item. Consumption of fuel wood per household is 2618.9 kilogram with the economic value of Rs. 5,299.74. The national park authority gives permission, once a year for 10 days, to collection these products under grass cutting project. People collect all the required products in this period. But the existing supply does not meet the total demand for the product. Illegal extraction has been a sort of compulsion for the local people. The demand is fulfilled partly from the private plantation and adjoining forest source. The study estimates per capita annual economic value of the products from these sources as Rs. 265.46 and Rs. 623.82 respectively. In addition to these sources, the local people use kerosene and biogas to meet their demand for the fuel wood.

The special attention must be given to the sustainable management of fuel wood. The encouragement for the private plantation is one of the positive steps in this direction. Providing the credit facility for the biogas plant is another strong device to mitigate the pressure on the park resource.

Average annual loss of income per household in livestock, due to the establishment of

the park, has been found to be equal to Rs. 13,400. This amount is equivalent to the willingness of the local people to accept compensation. It represents the most remarkable spillover effect of the park. It must be compensated directly or indirectly. The establishment of income generating projects for the local people may be the indirect method of compensation. Providing the marketing facility for the livestock product is one of the practical solutions. The economic value generated from such projects must at least be equal to the willingness of the people to accept compensation for the loss.

The people are sacrificing the large amount of opportunity cost in terms of crop production. Had the park been cultivated for the agricultural production, it would yield an equivalent of Rs. 1,845.9 million per year. The opportunity cost of the park that the present study estimates seems to be high enough in comparison to the present benefit from the park. However, the potential of the park resources to meet the future need has been the most important motivation for the people.

Women's role in household affair is strongly connected to the objective of the park. Deforestation and degradation of environment implies the misuse of women's time in fetching forest products and other products of household needs. The time use study shows that the women in unpaid housework including fetching, storing and utilizing the forest products have used 10.71 hours out of 17 activity hours of a day. It is only 5.23 hours for man.

Thus, a woman spends 63 pecent of her time in the unpaid housework including the forest resources of the park. The economic value obtained from the opportunity cost of time use by women in dealing with the forest products of the park is Rs. 123/- per day. This value should not be underestimated. The study strongly recommends the empowering of women in decision making for the sustainable management of forest resources of the park.

With regard to the visitor demand for the park, the estimated sex (gender) differential intercept coefficient suggests that the female tourist have higher demand than that of male for the same level of income. The null hypothesis that there is sex discrimination in the demand for park is not rejected in the t test of significance. The probability that a male visitor with an income of Rs. 200,000 equivalent will visit Royal Chitwan National Park is 76%, but the probability that a female visitor with the same level of income will visit the park is about 95%. However, the probability is not constant. It changes with the change in visitor income as established by logit model. Since the probability of female tourist to visit the park is high, the activity related to tourist should be managed in the way that facilitates and gives priority to the female visitors. The tourist products should be developed in this line.

The present study considers the Chitwan Tharu folk songs and dances as the economic resources associated to the park activity. It is a beautiful tourist product. One of the statements of World Heritage Significance also emphasizes the park as an area of great cultural significance associated to the Tharu community. Folk songs are the most influential part of the culture. The present work attempts to preserve these unique resources by maintaining a paper recording of Chitwan Tharu folk songs. The study strongly recommends preserving these resources deserving immense economic value.

REFERENCES

Baumol, William J. (1974). "Environmental Protection and Income Distribution." In Richard Zeckhouser et al. (eds.), *Benefit-Cost and Policy Analysis*. Chicago: Aldine Publishing.

Food and Agriculture Organization of the United Nations (FAO) (1985). *Tropical Forestry Action Plan*. Committee on Forest Development in the Tropics. Rome: Food and Agriculture Organization of the United Nations.

Gurung, Harka (1980). *Vignettes of Nepal*. Kathmandu: Sajha Prakashan.

His Majesty's Government, Nepal (HMGN) (1988). *Building on Success: The National Conservation Strategy of Nepal*. Kathmandu: HMG/IUCN (International Union for Conservation of Nature and Natural Resources).

His Majesty's Government, Nepal (HMGN) (1993). *Annual Report 1993*. The Makalu Barun Conservation Project. Kathmandu: The Department of National Parks and Wildlife Conservation, Babar Mahal; West Virginia: Woodlands Mountain Institute.

His Majesty's Government, Nepal (HMGN) (2002). *Protected Area of Nepal*. Kathmandu : The Department of National Parks and Wildlife Conservation, Babar Mahal.

Hyde, William F., Keshav R. Kanel, and Ernest D. Misomali (1994). "The Marginal Costs of Endangered Species Management." In Mohan Munasinghe and Jeffrey McNeely (eds.), *Protected Area Economics and Policy: Linking Conservation and Sustainable Development*, pp. 171-180. Washington, D.C.: World Bank and World Conservation Union (IUCN).

Jodha, N. S. (1992). *Common Property Resources: A Missing Dimension of Development Strategies*. World Bank Discussion Papers 169. Washington, D.C.: The World Bank.

King Mahendra Trust for Nature Conservation (KMTNC) (1986). The Story of the Mount *Everest National Park*. New Zealand: Cobb/Horwood Publications.

Lama, Tshering Tenpa and Judith R. Lipp (1994). *Annapurna Conservation Area Project: Annual Progress Report 1994*. Kathmandu: King Mahendra Trust for Nature Conservation.

Majupuria, Trilokchandra and Rohit Kumar Majupuria (1998). *Wildlife, National Parks and Reserves of Nepal* (Resources and Management). Know Nepal Series Number 11. Saharanpur (Uttar Pradesh), India: S. Devi.

McNeely, Jeffrey A. (ed.) (1993). *Parks for Life*. Report of the IVth World Congress on National Parks and Protected Areas, 10-21 February 1992. Switzerland: IUCN-The World Conservation Union.

McNicoll, Geoffrey (1984). *Consequences of Rapid Population Growth*: An Overview. World Bank Staff Working Papers Number 691, Population and Development Series Number 16. Washington, D.C.: The World Bank.

Munasinghe, Mohan (1994). "Economics and Policy Issues in Natural Habitats and Protected Areas." In Mohan Munasinghe and Jeffrey McNeely (eds.), *Protected Area Economics and Policy: Linking Conservation and Sustainable Development*. Washington, D.C.: World Bank and World Conservation Union. (IUCN).

National Planning Commission (NPC) (1992). *The Conservation of National Heritage in Nepal*. Kathmandu: National Planning Commission/IUCN/National Conservation

Nepal, Sanjay Kumar and Karl E. Weber (1993). *Struggle for Existence: Park People Conflict in the Royal Chitwan National Park, Nepal*. Bangkok: Asian Institute of Technology.

Pant, Raghab D. (1989). "Population, Basic Needs and the Environment of Nepal." In *Population and Development Integration Volume II*. Asian Population Studies Series Number 93. Bangkok: Economic and Social Commission for Asia and the Pacific, United Nations.

Puttaswamaiah, K. (1989). "Objective, Scope and Methods of Evaluation." In K. Puttaswamaiah (ed.), *Project Evaluation Criteria and Cost-Benefit Analysis*, pp. 9-22. New Delhi: Oxford and IBH Publishing.

Rees, Judith (1985). *Natural Resources: Allocation, Economics and Policy*. London: Methuen.

Rogers, Paul (1997). "*Tourism Development and Change in the Sagarmatha National Park and its Environs*." Ph.D. Dissertation, University of Wales.

Saxena, S.C. (1990). "Conservation of Natural Resources and Its Implementation." In V.P. Agrawal and S.V.S Rana (eds.), *Environment and Natural Resources*. Muzaffernagar, India: Society of Biosciences.

Sharma, Pitambar (1992). "Tourism and Sustainable Development." In *Nepal Economic Polices for Sustainable Development*, pp. 112-119. Manila: Asian Development Bank; Kathmandu: International Centre for Integrated Mountain Development.

Sharma, Uday Raj (1991). Park People Interactions in Royal Chitwan National Park, Nepal. Ph.D. Dissertation, University of Arizona.

Talbot, Lee M. (1962). "The International Role of Parks in Preserving Endangered Species." In Alexander B. Adam (ed.) *First World Conference on National Parks*. Proceedings of a Conference Organized by International Union for Conservation of Nature and Natural Resources in Seattle, June 3-July 7, 1962. Washington, D.C.: National Park Service, United States Department of Interior.

Todaro, Michael P. (1997). *Economic Development*. Sixth Edition. England: Addison Wesley Longman.

United Nations (UN) (1994). *Population, Environment and Development*. Proceedings of the United Nations Expert Group Meeting on Population, Environment and Development, United Nations Headquarters, 20-24 January 1992. New York: United Nations.

Wells, Michael and Katrina Brandon with Lee Hannah (1992). *People and Parks. Linking Protected Area Management with Local Communities*. Washington, D.C.: The World Bank/The World.

World Bank (1992). *World Development Report 1992*. New York: Oxford University Press.

World Commission on Environment and Development (WCED) (1997). *Our Common Future*. Oxford: Oxford University Press.