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Abstract

Natural resources in the Himalayas are depleting at an alarming rate. Sadly, in most cases ,the rural poor are the ones blamed for the environmental woes. In reality, the problems effecting environmental degradation are multifaceted: high population growth, poverty, subsistence economy, lack of basic needs, over-grazing, lack of alternative sources of energy, lack of coordination, and lack of ecological consideration in development efforts, and most recently the heavy influx of trekkers. Isolating one of these problems as an important factor of environmental problems is, and will continue be, a mistake. Program development must address all these issues holistically and in an integrated manner. The needs of local people, the goals and objectives of nature conservation, and proper tourism management must be combined. The local people must be brought into the mainstream of conservation if sustainable development through conservation is to be achieved. The key is to raise awareness among all users of resources—both foreign countries and within the region, if conservation and rural development efforts are to be maintained. The Annapurna Conservation Area Project (ACAP), implemented by the King Mahendra Trust for Nature Conservation (KMTNC), is an attempt by Nepalese conservationists to consider environmental problems holistically. KMTNC believes that sustainable development is possible if conservation efforts are integrated to address all of the above issues.

Introduction

Natural resources, including forests, in developing countries are being depleted at an alarming rate. The reasons for environmental degradation and resource depletion in developing countries are multi-faceted and complex, and thus they must be addressed holistically and in an integrated manner. Such a strategy subscribes that every planning process of protected area management must address the needs of the people, rather than being restrictive in nature by excluding the local people from the use of resources on which their livelihood depends. Programs proposed in protected areas must be sustainable—where local people can manage their resources effectively. Conservation must be used as a means of sustaining the life-support system of the people, and through which the living conditions of human-beings are uplifted. Conservation must be used as a means to raise awareness among locals and visitors so that resources are used to fulfill their minimum requirements and are protected for future generations. The Annapurna Conservation Area Project (ACAP) implemented by the King Mahendra Trust for Nature Conservation (KMTNC), a non-government, non-profit, and an autonomous organization in Nepal, has incorporated many human related aspects and has developed an integrated resource management program that tries to balance human needs with nature conservation and tourism management.

The physical and cultural settings

Nepal, with an area of 147,181 sq. km, harbors diverse ecosystems from sub-tropical monsoon forests to the arid steppes of the Tibetan plateau. A population of 19 million with a staggering growth rate of 2.6% per annum, has pushed the environmental problems to an alarming level where more than 90% of the population is composed of subsistence farmers, more than half of whom are living below the poverty line. The ecological and cultural issues of the Annapurna area are not too different from

those in other Himalayan regions—except that they are greater in magnitude (Gurung and DeCoursey, 1988). Within less than 100 km, the altitude varies from a mere 1,000 m to 8,091 on Mt. Annapurna I, the tenth highest peak in the world. Due to its geographic features and terrain, the region provides many micro-climates, supporting sub-tropical lowlands and forests in the plains and valleys, lush rhododendron and temperate evergreen forests south of the Annapurna area, and alpine steppe and arid environment in the north of the Annapurna Himal. The area contains over 100 species of orchids, many of Nepal's 700 medicinal plants (Shrestha, 1987) and provides excellent habitat for rare and endangered species such as the snow leopard, musk deer, and five of the six species of pheasants (World Pheasant Association, 1986).

The Annapurna Conservation Area encircles the major peaks of the Annapurna Himal with an area of 4,633 sq. km. With the inclusion of Upper Mustang after ACAP'S gazettement on 20th July 1992 the area is now over 7,000 sq km, with catchments of three major river systems roughly bordered by the major trekking routes (Sherpa, 1987). Politically, it includes five districts and about 80 village development committees. It is also home to over 40,000 inhabitants of different ethnic and tribal groups with various religious backgrounds, practicing Hinduism, Buddhism, Bon Po, Shamanism and Animism. Gurungs, Magars, Thakalis and Manangis are the dominant ethnic groups. Thus, the region is not only rich in biological diversity but also very rich in cultural traditions and rituals.

The Annapurna region is by far the most popular trekking destination in Nepal. Out of the total 70,000 trekkers visiting Nepal, over 38,000 (about 55% of the total—excluding Indian tourists who do not require a trekking permit) visit the Annapurna region each year. In addition, each trekker brings at least one porter which means about 80,000 outsiders visit the region each year.

Factors affecting the environment in the Annapurna

1. High Population Growth

With over 40,000 inhabitants in 1981, and a population growth rate of 2.6% per annum, the population of the Annapurna could easily be more than 50,000 people. A large part of the younger population outmigrated to join the British and Indian Gurkha armies and workers as migrant laborers. Thus, many villages have high percentages of children and elderly populations, creating a labor-oriented socio economic problem.

2. Poverty and Subsistence Farming

Because the mountains are marginal environments in which to make a living, many mountain dwelling societies are mobile, migrating to find livestock pasture, to seek trade opportunities, and to engage in smuggling if in border areas. The hill man/woman must commute between downhill paddy, uphill maize and further up for animal grazing. There are no other alternative economic opportunities (Gurung, 1987).

3. Traditional Methods of Cultivation and Over-grazing

In the Annapurna region hardly any stall feeding occurs. Each household unleashes their cattle once they are milked. Thus, the cattle roam nearby village forest and pasture lands. Transhumance is still practiced in the area. In addition, burning of forest for grass by the local people is still common. This traditional method of grazing and cultivation on steep slopes through slash and burn farming has further aggravated landslides and deforestation. Furthermore, due to population increase and subsistence farming, every year new forest and marginal lands are encroached upon for more cultivation.

4. Energy Requirements

Forests are disappearing rapidly. In the last decade or so, vast tracts of rhododendron forests were destroyed along the major trekking routes in order to fulfill the needs of locals and trekkers. If this continues at the present rate of destruction, the rhododendron forest will be almost impossible to replace as it takes approximately 240 years for these trees to reach a growth of 52 cm diameter (Jones, 1987).

5. Trekking Tourism

Out of a total of over 270,000 tourists in Nepal in 1991, 70,000 went trekking. Of this total, some 38,500 (55%) trekked in the Annapurna region. In addition, each of them brought an average of one porter. Besides that, about 60% come in the months of October, November, March and April, and are concentrated in certain places. Their needs, demands and requirements are very different compared to the local people. In order to provide services to these international visitors, over 700 tea-shops and lodges have been built. Lack of alternative sources of energy causes these shops to depend upon the forest for fuelwood and timber, thus the forests are devastated.

6. Sanitation and Litter

On most of the trekking routes, garbage disposal systems are virtually non-existent. As a result, major trekking routes are infested from pollution and litter, both biodegradable and non-biodegradable. According to Nick Nanna, 'some tea-houses are surrounded by piles of human excreta and toilet paper' (Nanna, 1986 quoted in Hutchinson, 1987). Toilet facilities, if they exist at all, are often found dangerously close to water sources. The sanitation and litter situation now pose a health threat to humans and wildlife, in addition to obvious aesthetic problems (DeCoursey, 1987).

7. Income from Trekking Tourism

While trekking tourism has brought many environmental problems to the region, the income from this industry is also rather deceptive. There is very little impact on the local economy from organized trekking tourism as everything has to be imported from Pokhara and Kathmandu. Only twenty cents out of the three dollars spent by an average trekker each day remains in the village. While tourism is Nepal's leading source of foreign exchange, it has produced negative effects on the natural environment, village economies and cultural traditions (Sherpa, 1987).

8. Depletion of Indigenous Cultures

Since life in rural areas is difficult, rural elites migrate into towns and cities where health care and education are better for their children. Many maintain a second home in urban centers. The Gurkha soldiers who used to be the main source of cash for villages in the past are now settling down in the towns of Pokhara and Kathmandu. Village youths are less attached to the village environment and they are also alienated from the traditional working situation. Many youths of villages along the trekking routes have now forgotten or given up their cultural practices.

Because of the factors stated above, the social, cultural, and natural environment of the region are in jeopardy. These problems are further aggravated by inappropriate development and poorly managed rural development projects. Rational forest management on a sustainable yield basis is non-existent (Sherpa, 1987). Poaching is rife and used as a way to make cash (Vinding, 1984).

Lack of conservation awareness at the local level as well as at the government level has contributed to the plight of the natural system. Conservation efforts in Nepal often fail because they focus mainly on an arbitrary enforcement of regulations (Sherpa, 1987). Even after the establishment of the first national park in 1973, the park-people conflict is still a burning issue (Mishra, 1982). The conventional approach in protected area management has resulted in achieving the goals of protecting the wildlife and forest yet has created a series of unforeseen socio-economic problems.

It has now come to our attention that unless the very basis for the survival of humanity is addressed, even the most sophisticated conservation models will fail. Conservation programs must now be redirected toward fulfilling the basic necessities of rural populations by providing small viable rural development projects while delegating responsibility for managing resources to the local people themselves. As an alternative to the traditional models, we need innovative, well-designed, integrated, conservation and development programs which are carefully implemented and constructively address local people-park relationships. This is essential to the conservation of biodiversity and thus to sustainable development (Wells, Brandon and Hannah, 1992). After all, it is they who are and should be the main beneficiary of their resources.

Integrating Conservation with Development

In order to carry out its activities, ACAP works on the basis of three principles:

1. Sustainability;
2. Local participation; and
3. Catalyst (or Lami or a match-maker).

1. Sustainability

Conservation activities are very expensive and require a large sum of funding. Thus, ACAP has designed a mechanism which will provide income to the project even after funding from various donors is exhausted. Similar financial bases are also incorporated in all community development projects implemented by ACAP through the local people. Similarly, some projects require basic management skills, as well as trained man-power. Therefore, ACAP strives to integrate appropriate training mechanisms.

2. Local participation

ACAP does not believe in free-lunch programs. It believes that motivation of local people and their participation is a must, so they feel the project is their own. Thus, it is imperative that they are involved in the initiation, planning, decision-making and implementation of their development programs.

3. Catalyst or Lami Approach

The rural masses are deprived of even the most basic necessities such as drinking water, health care and education. Thus, ACAP feels that it can play the role of facilitator in identifying rural problems and matching resources from the urban areas to fulfill the needs of local residents. The satisfaction of human needs and aspirations is the major objective of development.

In this context, I shall now discuss four cases of activities that ACAP has implemented.

Community Health and Sanitation Program

The majority of the rural masses in the Annapurna region were previously deprived of health care facilities. A sick person depends upon treatment from the traditional medicine men, such as shamans or witch-doctors. Sanitation and health care were in a poor state. Thus, ACAP established a health care program in conjunction with the District Public Health Office (DPHO). The DPHO provided its man-power, vaccines, and other facilities. ACAP'S role was to promote, publicize, and motivate local people to receive the services. For example, the superstition among the local community that a pregnant woman must hide her pregnancy from being seen by the evil spirits often led to delivery complications. Had there been pre-natal care provided, and if the pregnant mothers had gone for regular check-ups, the problems could have been mitigated in time. It took several years of health education on the part of ACAP for such changes to begin. When mobile clinics are in operation they are now often visited by pregnant mothers.

Similarly, the local people have requested a health post since ACAP established its headquarters in Ghandruk. A series of negotiations with local people was carried out in order to ensure that the health post would have sufficient funds to cover current costs. A system was developed where the local community raised NRS. 100,000 and the project invested NRS. 200,000 to create an endowment trust fund. The health post has been in operation since 1987 and in the last two years the management has been taken over fully by the local people. The interest generated by the trust fund pays the salary for health assistants working there.

Necessary training has been provided to the local community in order to build proper toilet facilities among households. Regular cleaning campaigns have been carried out within villages up to the Annapurna Sanctuary, mobilizing local school children and the villagers. Now, it has become a regular

Annapurna Sanctuary, mobilizing local school children and the villagers. Now, it has become a regular monthly program for the mothers' group to keep their village clean. Thus, it can be said that health and sanitary conditions in Ghandruk have improved significantly.

Alternative Sources of Energy

The challenge for conservationists "is to meet the growing needs for fuelwood, which must be addressed through policies that reduce demand, increase supply, and encourage an alternative sources of energy ... Demands can be reduced through direct interventions to encourage conservation and use of more efficient technologies" (World Bank, 1992: 57).

ACAP has been approaching this problem through many different channels; forming Forest Management Committees, giving them full responsibility to manage, to protect and exploit forests. Secondly, many tree nurseries have been established and are distributing saplings to local people for plantations on community and private lands.

However, those two approaches described above are not enough to withstand the ever-increasing pressure for fuelwood from the growing population or from the trekkers. Thus, ACAP has been stressing the provision of "green and clean" energy to reduce pressure on forests.

Back-boiler Water Heater

In the past, local people used an open-hearth system for cooking which was inefficient in terms of energy consumption. On the other hand, the lodges in the trekking routes used a separate fireplace for heating hot water. ACAP introduced a "back-boiler water heater" a simple technology which could be fixed in the existing stove with a slight modification. Over 200 back-boilers have been installed in local lodges in the Annapurna region. This simple technology has saved 40% of firewood consumed.

Solar Water Heater

However, back-boilers were based on the forest resources and hence "solar water heaters" were introduced. This was thought to be "green and clean energy" from the conservation perspective. Secondly, it was realized that people would adopt it easily after the initial investment, as it would not require any sort of fuel for burning. However, the technology that we thought from conservation perspective as appropriate was not appropriate for the local lodge owners. For three years of constant demonstration, ACAP was unable to motivate a single lodge owner because they found it very expensive (costing about US$ 1000 in 1987) and the technology for their level of knowledge was very sophisticated. Thus, only within the last two years was ACAP able to motivate three lodge owners to install the solar water heaters. This was because the cost has now come down (US$ 400). People have already seen the benefit of these heaters.

Kerosene Only Policy

Some of the areas within ACAP are very fragile with little bio-mass for cooking available particularly in the Annapurna Sanctuary. A kerosene depot was established at Chomrong village to be managed by a Kerosene Depot Management Committee of local people. It took two years for ACAP and the local Lodge Management Committee to motivate the 6 lodge owners in the Sanctuary to use kerosene for cooking. Since 1987, the local lodge owners and trekking agencies have used kerosene. However, because kerosene is imported from India and changes in the geo-political situation affect the availability of kerosene, the depot had to be shut down twice: in 1989 and 1991. This created problems as people had to use firewood for cooking during certain seasons.

Micro-hydro Electricity Installation

With the problems created by imported fossil fuel and the forest base resources, ACAP realized that its alternative energy source must be based on a renewable resource. Further, it was also realized that technology introduced in the region must be available within Nepal, making it easier for its repair and maintenance.

After looking into various possibilities, it was realized that installation of small micro-hydro electricity plants would be the one in which after the initial investment, the energy produced out of it would be clean and green.

Since energy coming from the water can be produced four hours a day without extra-burden for burning fuel, it would be optimal if the energy could be stored to be used later. Two technologies, "Bijuli Dekchi" or low-wattage cooker and "heat-storage cooker", have been developed in Nepal which were designed to store energy during the time people do not make use of it for cooking or lighting. The researchers have found that the Nepalese style of cooking, 80% of the energy was used just for boiling water and once hot water was available, very little further energy was requiredfor cooking. Thus, "bijuli-dekchi" can boil as well as store energy in the form of hot water whereas "heat-storage cooker" can store energy which can be used later for frying. Thus, these two technologies together can have a drastic impact on the cutting down of trees.

Tourism Management

As described above, the Annapurna region is a heavily trekked area. In order to cater to trekkers, large tracts of forest were cut down each year. Problems of pollution and litter had reached a level that if allowed to continue, it would result in a situation whereby tourists would have to change their destination. Also, in the past, some trekkers lost their life from robbery. It was realized that crime was a problem associated with the local lodge owners as well as tourists. Hence, it was thought that in the first place, the local lodge owners must be trained to run a lodge without extra investment. Secondly, materials must be developed whereby tourists are provided information and a thorough briefing before they depart for trekking.

This training began with the trekking lodge owners, who were present through the development of an integrated curriculum. The curriculum covered food preparation, sanitation and cleanliness, garbage disposal system, fuel-wood saving devices, menu budgeting, cultural differences, and finally safety and security of trekkers. A week long training course was held at several places in the Annapurna region in conjunction with the Hotel Management Tourism and Training Center in Nepal.

The training course was found to be very relevant and many positive changes have been seen in the Annapurna area, particularly in terms of cleanliness and hygiene in and around the lodges. Most importantly, the safety of trekkers has improved where the training sessions were held.

Conservation Education and Training

What ACAP has realized is that in order to achieve its goals of sustainableconservation, raising awareness among the local people through conservation education is a must. The educational component could be both formal, teaching conservation education at local schools, and informal teaching through adult education classes. Appropriate training for the local people is necessary.

Firstly, ACAP has identified three main target groups: the local adult population, children at schools and tourists. Various programs have been developed for different target groups. Dialogue, motivation, adult education classes, videos and slide programs, and study tours have been organized for the adult population. Conservation education classes have been running as regular class work at the local high schools. Slide shows, video brochures and minimum impact codes are produced for tourists.

Discussions and conclusions

Poverty, environmental degradation and population growth are inextricably related. None of these fundamental problems can be successfully addressed in isolation (WCED,1987). In Annapurna, large scale poverty, subsistence farming, large but ecologically fragile areas, lack of alternative sources of energy, over-grazing, high population growth and heavy influx of tourists have complicated environmental issues. Isolating one of them as the root cause would not alleviate conservation problems nor would enforcing stricter rules and regulations through the use of external force help to ensure the

maintenance of biodiversity. We have experienced negative repercussions in other parts of Nepal where local residents were virtually excluded from all the decision making processes in the management of protected areas. As a result, people of protected areas are still encroaching on the parks for fuelwood and fodder and poaching wildlife.

In the Annapurna region, programs have to be developed in a way that will fulfill the local residents' basic needs first . Food comes before conservation. Secondly, in a country like Nepal, where the very existence of the people is dependent upon the resources within a protected area, it is most important that the local residents be included in the management of the park and in the decision-making processes. For example, ACAP was unable to enforce the kerosene policy in the Annapurna sanctuary without consulting the local people.

It took two years to motivate residents, but once it was accepted by the local residents, it has lasted. As the Coordinating Body for Indigenous People's Organizations of the Amazon Basin (COICA) leader Nugkuag (1990) puts it succinctly, "to save the forest, you must first save the indigenous people who live there."

Therefore, ACAP from the beginning of its implementation has adopted a grass-roots approach. This has moved ACAP from myth to reality. All ACAP programs had to be sustainable both in terms of financial base, as well as training the local people who can manage it properly. Local residents are made aware through conservation education programs that they are the custodians of the resources and they need to manage them. They are told that they must exploit natural resources sustainably saving them for future generations. In fact, ACAP believes that the focus of whole conservation efforts is the "people" and not any particular species of flora and fauna. As the Chairman of the King Mahendra Trust for Nature Conservation (1984) succinctly puts it:

What is conservation—if not for the people? It must be viewed only as a means, the end being the improvement of the quality of our very existence.

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