Landscape level conservation could promote a special category of protected areas

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Nepal's commitment to biodiversity is clearly reflected with the creation of an impressive network of protected area system. However, the protected areas are now turning out to be an island in the midst of human dominated landscapes. Therefore, an approach that seeks to reconcile the needs and aspirations of people without jeopardizing the conservation ethics turns out to be the most pragmatic approach to conservation. Biologists, economists, sociologists and conservationists have now realized that conservation cannot happen in isolation and a growing number of conservationists have chosen this moderate path that benefits both communities and supports development. This convergence approach of viewing conservation in unison among different stakeholders shows a significant departure from the conventional way of insular approach. Landscape level conservation is not new to Nepal, as many successful lessons have been learnt through our experience in community forestry, conservation areas and buffer zone programme. Development of biodiversity landscape through a holistic and integrated approach by incorporating all the ingredients of a landscape namely; national parks, reserves, conservation areas, buffer zones, national forests, community forests, farmlands, wetlands with supportive policy regimes and plans would pave the way towards achieving the landscape level conservation.

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Landscape level conservation approach neither advocates nor envisions creating additional special category of protected areas rather tries to integrate and harmonize the conservation and development needs putting local communities at the center stage. For this to happen, it is imperative to have a broad based multi-stakeholder partnership, supportive policy instruments, decentralized planning and a pragmatic mindset.

Nepal covers only 0.09 % of the total land surface of the world. However, the country is rich in its biodiversity assests, which can be exemplified from the following table MMGN/MFSC, 2002, But Nepal's forest resources are facing tremendous pressure from increment and migration of population and pervasive poverty. In the absence of reliable alternative income and employment opportunities, majority of the people depend on the natural resources for their subsistence need. Forests resources, particularly Terai forests are severely subjected to deforestation, degradation, fragmentation and encroachment. Similarly, productivity of the agricultural land is dwindling due to excessive use of chemical fertilizers and pesticides. The traditional crop varieties are being replaced by the modern varieties. Aquatic biodiversity is the most affected one due to increasing level of pollution (Jha and Parajuli, 2001). If we do not devise an appropriate mechanism to contain the overall threats, it is very likely that whatever biodiversity resources exist outside of protected areas are likely to vanish. Therefore, a two-pronged approach whereby consolidating the achievements made so far and embarking on a more aggressive approach to safeguard biodiversity resources through an effective and meaningful community participation stands the ultimate answer.

Nepal's experience in landscape level conservation

Landscape level conservation is not new Nepal. The science of landscape ecology has developed primarily

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from an applied viewpoint concerned with the intelligent use of land, as opposed to one, which was purely academic. There are two models of landscape level conservation in practice around the world. The first one is the Minimum Dynamic Area Model and the second one is Network Model (Agger, *et al.* 1991).

The first model emphasizes on the importance of maintaining an existing habitat of an appropriate size and character, which is suitable for the maintenance of biological diversity by isolating it from intensive land-use surroundings. The premise of this view is that the area available for nature reserve elements is large enough to provide well functioning populations or communities. This approach emphasizes a better protection for the habitats that still exist in and the Protected Areas. This can be accomplished by establishing Buffer Zones in and around those habitats. This model is by and large the existing conservation practice in Nepal.

The second model is based on the premise that for a number of more or less well defined species or communities the minimum area available in the existing landscape is too small to meet their requirements. In such a situation, connectivity between natural elements may provide an opportunity for exchanging genetic materials and consequently prevent genetic drift. This model advocates for the over all reduction of land use, protection of large areas for nature conservation and creation of a network of corridors or other small landscape elements. Reduction in land-use infer for discouragement of pesticides and heavy machinery in agriculture and forest management practice. Large areas for nature conservation mean areas from 10 sq.km. and upwards. The network of corridors has to be designed according to the landscape character, its history and the obvious deficiencies in connectivity. For instance none of the Protected Areas in the lowland Terai of Nepal is adequate for conserving a viable population of mega species such as rhinoceros, tigers and wild elephants in perpetuity.

The possibility of applying these models in practical situations depends on the political support that a country will receive (Agger, *et al.* 1991). These models can be modified to suit our ground realities. For instance, Nepal has already been practicing the minimum dynamic area model and is now geared towards operationalizing the second approach with the implementation of Western Terai Landscape Programme (WTLP) through the aegis of the Ministry of Forest and Soil Conservation (MFSC) with support from United Nations Development Programme (UNDP) / Global Environment Facility (GEF), Netherlands Development Agency-Nepal (SNV), World Wildlife Fund (WWF) and International Plant Genetic Resource Institute (IPGRI).

Rationale for Landscape level conservation

The following reasons clearly imply why Nepal has to opt for landscape level approach. First, the areas allocated for Protected Areas are likely to be inadequate on their own to ensure the long-term conservation of the flora and fauna, particularly endangered wildlife species that occur within the country. So far, Nepal has been able to protect 80 ecosystems of the existing 118 ecosystems within the protected area network (Maskey 2001).

Secondly, the Protected Area system does not fully represent all components of biodiversity, and many known areas of importance for the flora and fauna lie outside the protected area system. The most important biodiversity hotspots outside the protected area system include the area between the Kanchenjunga Conservation Area (KCA) and the Langtang National Park (LNP), Milke-Danda and Jaljale Himal, between Makalu Barun National Park (MBNP) / Sagarmatha National Park (SNP), Langtang National Park and Northern Mustang, Annapurna southern extension – Chitwan, Ilam – Morang Broadleaf Forests, Phulchoki – Mahabharat region, Central Nepal and Sapta Koshi Gorge, Nepal (Dinerstein 1998). Table 1 shows the distribution of the protected areas with respect to the ecosystems in

Table 1: Overview of the distribution of protected areas with respect to ecosystems

Physiographic Zone	Surface area %	Number of Total Ecosystems	Number in Protected Areas	% in Protected Areas
Terai and Siwalik	27	23	15	65
Midhills	30	52	33	63
Highlands and others	43	43	32	74
Total	100	118	80	68

Source: modified from HMGN/MFSC 2002

Nepal. As can be seen from the table, still over 30% of the ecosystems remain to be protected to ensure the long-term survival of biodiversity resources.

Nepal has achieved significantly towards the minimum dynamic model by declaring six Buffer Zones in and around the protected areas, which very well fits into the first model. Some of the examples to support the first model in and around the protected area include King Mahendra Trust for Nature Conservation executed rhino-tiger conservation programme in Chitwan, the Buffer Zone programme of Department of National Parks and Wildlife Conservation supported by United Nations Development Programme in seven Protected Areas, the World Wildlife Fund initiated Terai Arc Landscape programme and the Western Terai Landscape Programme would fit into the broader Terai Arc landscape vision towards contributing to the network model. This would help connect 11 protected areas that spread across the boundary of Nepal and India to ensure the conservation globally significant biodiversity on the long run. However, a great deal has to be done to integrate and build on the experiences that have been learnt.

Third, the forests in the Terai are diminishing at a faster rate than before. Table 2 depicts the transformation of forests land into shrub land between 1978/79 and 1990/91.

Lastly, Nepal's rural populations have high level of dependence on natural resources for their survival. Consequently, an approach that seeks to extend conservation beyond the parks/ reserves system must recognize the place of human communities, and their aspirations and impacts on the land. Nepal's population stands 23.2 million according to the 2001 census. The average population density is 157.73 km^2. The annual average growth rate was 2.08% between 1981 and 1991, but the latest figures from the 2001 census indicate a population growth rate of 2.27% (HMGN/MFSC 2002). Therefore, it is apparent that the pressure has to be contained if we are to save our valuable biodiversity resources through a meaningful engagement of our local communities.

The possible solution

Based on the above scenario, it is essential for Nepal to opt for a two-pronged strategy, first to protect and manage forests aggressively, and second to devise a science based forest management for effective conservation and utilization. This means we have to find ways and means to effectively engage local communities in forest management for mutual benefit.

Landscape level conservation

Landscape level approach of biodiversity conservation is an important strategy to protect biological diversity since many mega species do not confine themselves to a particular area or habitat, but traverse between multiple land uses or habitats or between different geographical locations. For these mega species, different matrices of habitat types on a regional scale are of critical importance. Therefore, a holistic and integrated approach of biodiversity conservation, where all the ingredients of a landscape including protected areas, farmland, wetlands, forest, etc. would become a part and parcel of a larger habitat networks thereby forming a mosaic of interconnected systems.

The following strategies could pave the way towards this direction:

Harmonization of conservation and development needs

It has now become imperative for us to blend our conservation and development needs. The reason being it is neither feasible nor realistic for us to create extra coverage of protected area network. We have to find ways and means to maximize the benefit with the existing resources that we have. For this to happen local communities have to become the main actors and principal beneficiaries of our conservation initiatives. This will only become possible if they see economic benefit out of conservation. The conservation area and Buffer Zone model have the required elements to address the issues discussed above.

Declaration of Buffer Zones

As we know important biodiversity hotspots still occur outside of Protected Areas, forest patches that

Table 2: Changes in forest and shrub-land in Nepal between 1978/79 and 1990/91

Year	Forest % of total land of Nepal	Shrub land % of total land of Nepal	Total	Source
1978/79	38.0	4.70	42.7	LRMP
1990/91	29.0	10.6	39.6	NFI

Source: HMGN-DFRS 1999

are contiguous to PAs have high biodiversity value. Therefore it is essential for us to bring them in some form of protection regime by including them within the Buffer Zone. This can be achieved by declaring Buffer Zones in the remaining National Parks and Reserves.

Protection of Terai block forests

We have known from the past and history stands testimony that the forests are the one who bear the brunt of all shocks be it natural or human induced in the pretext of relief measures emanating from natural calamities, re-settlement programme, and other political events. Therefore time has come for an effective zonation of forest to curb further encroachment. It is also equally important for us to revise our policy to hand over community forest in Terai areas particularly the ones adjoining block forests. This is important as to create a layer of community protection to curb further penetration into the core block.

Upscale community forests, introduce biodiversity criteria and diversity forest products for enterprise development

Community forests that are contiguous to Protected Areas or large block forests have high level of biological importance. These areas could also serve as an extended habitat for wildlife where, ecotourism could be promoted. Bagmara and Kumrose community forest adjoining Royal Chitwan National Park present a good example. This would entail having biodiversity friendly management prescriptions. In other community forests biodiversity criteria could be introduced. Science based production oriented management can also support biodiversity. Development of different layers of vegetation strata can also enhance biodiversity within community forests. Community forests not only cater the basic needs of local users but also open new opportunities for economic enhancement. Cultivation of high value NTFPs is one option. Landless and poor people can greatly benefit with this kind of enterprise as this creates employment opportunities.

Integration of biodiversity criteria across multiple land use

Species that utilize specialized habitat types, or have specialized food sources, often also occur at low population densities because such specialized resources are uncommon or are patchily located in the landscape. Example of such specialized habitat includes farmlands, swamps, marshes, ponds, pools, community forests, reservoirs and wetlands. These important habitats have to be protected and restored by mobilizing local farmers and communities. The following strategy would help:

- **by sensitizing locals on the importance of agro biodiversity**

  Local people can contribute to biodiversity conservation with the adoption of biodiversity friendly agricultural practices. Farmers can manage traditional crop varieties in their farmlands if educated properly. What is required is an effective conservation and dissemination mechanism about educating the importance of biodiversity.

- **by promoting agro forestry, on-farm forestry and private plantations**

  Promotion of agro forestry, on-farm forestry in agricultural lands can also help maintain biodiversity. Promotion of cash crops that enhance greenery and cover and have longer harvesting period such as *Cajanus cajan,* sugarcane, etc. can support a wide range of biodiversity.

Conclusion

Nepal has emphasized people centered participatory approach of biodiversity management for the last few years and has been duly acknowledged by the global community. Community forest and Buffer Zone programmes are the success stories that Nepal can be proud of. However, the concept of managing within a landscape context is quite a new and little practical experience exists in Nepal. Development of biodiversity landscape approach by incorporating biodiversity components across various land uses namely; national parks, reserves, conservation areas, buffer zones, national forests, community forests, farmlands, wetlands with supportive policy regimes and plans would pave the way towards achieving the landscape level conservation. We have all the required elements but we need to weave it together. The operationalization of western terai landscape programme is geared towards this direction and will showcase that the long-term conservation of biodiversity means working in broader ecological areas covering multiple land uses.

To sum up, landscape level conservation approach neither advocates nor envisions creating additional categories of protected areas rather tries to blend

and harmonize the conservation and development needs putting local communities at the center stage. For this to happen, it is imperative to have a broad based multi-stakeholder partnership, supportive policy instruments, decentralized planning and a pragmatic mindset.

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