Nature-assisted re-establishment of Greater one-horned rhinoceros, *Rhinoceros unicornis* in its historical distribution range

The Greater one-horned rhinoceros or Indian rhinoceros, *Rhinoceros unicornis* (Figure 1) has been listed as ‘Vulnerable’ by the International Union for Conservation of Nature, and presently, 2575 individuals of the species inhabit Nepal and the Indian states of West Bengal, Uttar Pradesh and Assam. Population of the species is increasing overall due to strict protection, especially in India. However, populations especially in Nepal and parts of Northeast India are decreasing. Threats before the species include fragmented population, habitat degradation, and poaching. And, conservation measures cover bolstering the stressed population, starting a new population, anti-poaching action, habitat improvement, strengthening the management, and reducing conflict with humans.

Existing population of the species can broadly be categorized into: (i) naturally occurring sub-population in protected areas in the northeastern part of India (Kaziranga, Orang, Pobitora in Assam, and Gorumara and Jaldapara in West Bengal), and south-central Nepal (Chitwan National Park); (ii) reintroduced sub-population in India (Dudhwa in Uttar Pradesh (UP)) and southwestern Nepal (Bardia National Park and Sukhlabhanta Wildlife Reserve), and (iii) transient population in Katernia Ghat Wildlife Sanctuary (UP). In recent years, the rhinoceros population in Manas, Assam was extirpated by poaching during civil unrest in the region, which is now being reintroduced under Indian Rhino Vision 2020 (ref. 2).

Apart from the sub-populations mentioned above, in recent years, a small population of the one-horned rhinoceros has settled in Valmiki Tiger Reserve (VTR), situated in the Himalayan foothills in the West Champaran District, Bihar, India (Figure 2). The VTR is contiguous with the Chitwan National Park of Nepal in the north, where rhinos are found in high densities along the floodplain grasslands and riverine forests bordering the Rapti, Narayani, Reu, Dungre and Icharni rivers. The Narayani River, joined by Rapti from eastern side inside Nepal, flows southwards and enters India at Valmikinagar forming the western border of the Madanpur Forest of VTR. A barrage has been constructed across the Narayani (known as ‘Gandak’ in India) at the Indo-Nepal border.

Rookmaaker has summarized the historic records of the species in northern India and illustrated that the rhinos were occasionally found in Champaran and the adjoining Gorakhpur District in Bihar and UP respectively. Rhinos were shot in Champaran in 1939 and 1960. In 1982, a male rhinoceros was caught in VTR and sent to Patna Zoo. These rhinos supposedly wandered from the Chitwan National Park in Nepal. During 2001–02, a few rhinos from Chitwan National Park drifted down in the floodwater of the Gandak and crossed the barrage through its gates raised due to high water level. The rhinos floated downstream and took refuge in the Madanpur Forest on the left bank of the river. The forest spread across over 100 sq. km is characterized by West Gangetic moist mixed deciduous forest, khair-sisso forest, eastern wet alluvial grasslands, cane brakes and *Barringtonia* swamp forest. Agricultural lands mainly cultivated with paddy, wheat, oil seeds and sugarcane surround the forest area. All these provided suitable habitat to the species. A calf was also born in 2003, and indirect signs suggested five individuals of the species in the area. In April 2006, a female rhinoceros died after being hit by a train on Bagaha–Chhitai railway line passing through the forest. In January 2008, one male rhinoceros was drowned to death in a canal, in the adjoining area of UP. Evidence suggests the presence of three rhinos in VTR.

Apart from the settled population in Madanpur Forest, rhinos often stray out of the Chitwan National Park to the eastern as well as western portion of VTR, and take refuge in the grasslands and moist areas along Pandai and Sonha-Pachnad Rivers respectively. A female rhinoceros came to the western portion of VTR from Chitwan in March 2011 and got poached. Carcass of the animal...
was recovered in May 2011 in Valmiki-nagar Range of VTR. Cases of crop raid-
ing by the rhinos in Madanpur have been
reported by villagers. Initially, there
were some human casualties since the
villagers were unaware of the behaviour
of the rhinos, which used to attack them
on approaching closer.
However, naturally settled rhinos
along the Gandak floodplain in VTR
provide an interesting case of species oc-
cupying its historic distribution range as
a result of natural forces. This newly set-
tled population needs to be managed for
long-term conservation of the species in
the landscape. Based on the ecological
conditions and anthropogenic influences,
the IUCN Rhino Specialist Group and
the Rhino Sub-committee of the Indian
Board for Wildlife suggested Dudhwa
National Park (UP), Jaldapara (West
Bengal), Intaki (Nagaland), Laligahabri
Sanctuary (Arunachal Pradesh) and Champanar forest (which is restricted to the
present VTR area) in Bihar as poten-
tial areas for re-introduction of the one-
horned rhinoceros in India. Based on
this, rhinos were re-introduced in Dud-
hsa National Park in 1984–85 (ref. 6).
Strengthening of the recently established
population through translocation of rhi-
os from other populations in Northeast
India, providing adequate protection to
the species and its habitat, and taking
measures to reduce its conflict with
human beings would be helpful in long-
term conservation of the species in its
new-found home in VTR.

CORRESPONDENCE

An exposition on environmental ethics

In 1854, when the environmental ethics
was not yet conceived, Chief Seattle in
his letter to the then President of the
United States of America penned warnings
as environmentally pensive and poignant
as any uttered in the 150 years since:
‘continue to contaminate your bed and
you will one day lay in your own waste’.

More than 150 years later today, Chief
Seattle’s words echo in every Superfund
site, landfill and oil spill. Public opinion
has swung to the greenside and a new
ethics known as ‘environmental ethics’
has evolved. Recently, with the environ-
mental movements gaining strong ground
all over the world, the concept of com-
mon good has expanded and been em-
phasized. Specifically, it lies at the heart
of determining if an action is ethical.

‘Ethics’ in fact is defined as the sci-
ence of human duty – the moral science;
it expresses the basic principles of right
action. ‘Environmental ethics’ thus means
the principles of right action to sustain
the environment in its pristine state.

Historically moral theories and philo-
sophies have governed ethics. Also, his-
torically ethics can be grouped into one
of the following as it has expanded and
emphasized (not a new ethic at all): (i)
Utilitarianism focuses on good conse-
quences for all. (ii) Duties ethics focuses
on one’s duties. (iii) Rights ethics
focuses on human rights. (iv) Virtue
ethics focuses on virtuous behaviour.

The modern mainstream involves two
facets of environmentalism: Pure envi-
ronmentalism for its own sake and Envi-
ronmentalism for humanity’s sake.

Both share a concern for the well be-
ing of the natural world, but there are
fundamental differences between the two:
(a) Environmentalism for its own sake is
primarily ecological – ‘A thing is right
when it tends to preserve the integrity,
stability and beauty of the total biotic
community (redefining community to
include non-human habitats of the land)
and the existing landscape which includes
the “land ethic”’. (b) Environmentalism
for humanity’s sake displays the inherent
ego-centric attitude of human kind. Thus,
it is secondarily ecological.

What is needed is a widespread adher-
ence to a perfectly familiar ethic, already
defined. However, it is important to con-
tinuously remind ourselves that the major
sources of ecological disasters, apart
from ignorance are greed and shortsight-
edness, having no concern for the biotic
community and the elements of nature.

The mainstreaming of the environment
is, however, not by any means world-
wide. The countries in which the greatest
impact has been felt are the most indus-
trialized countries. Actually industriali-
zation itself has been crucial to the
development of the environmental move-
ment. Not only do its environmental
problems and pollution create concern,
the citizens of the industrialized nations
enjoy lives with the luxury of free time
and options necessary to be able to
devote themselves to such a concern. In
poorer communities, the struggle of every-
day survival far outweighs any aesthetic
concern for the environment. Abraham
Maslow’s (in Barbour1) concept of a ‘hier-
archy of needs’ can be applied in ex-
plaining the difficulty of establishing the
environmental movement in poor coun-
tries. However, the exponential increase
in population in the said communities
and countries is a serious add-on prob-
lem. The questions sometime do arise in
this context, whether a sense of ethics
can be instilled into the minds of the
poorer section of the human world. On
the basis of five levels of need in the hi-
erarchy of needs for every human being,
the corporate social responsibility (CSR)
concept in poor countries may be ac-
commodated. The five levels of need in
the hierarchy from the bottom to top are:
(i) Survival (physiological needs): food,
safety needs: protection from danger
and threat. (ii) Belonging (social needs):
friendship, acceptance and love. (iv)