

WHAT IT TAKES TO THWART SEEDS OF DESTRUCTION?

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With the establishment of the Chitwan National Park in 1973, the knowledge to manage protected areas was gradually amassed with more than 30 years of uninterrupted scientific information in Nepal. Yet with this discursive knowledge, unsustainable harvesting of natural resources and their consequent depletion are persistent largely because of widespread poverty, pervasive social inequality, low economic growth and the legacy of a quasi-feudal political structure (Paudyal, 2007; ADB, 2006). Forest resources including its life forms within are fundamental to support subsistence living and attempts to manage these resources should be more exploratory and explanatory in a way that it is recognized, defined for decision making, implemented and evaluated. For each newfangled conservation crisis; our science self-critically beseech biologists to gradually traverse into the untrammelled knowledge track to explore opportunities and ensure long term species and habitat rescue.

While considering biodiversity conservation and environmental protection, non-native, invasive plant species are emerging as a serious concern in Nepal. In this issue I have discussed the status of invasive alien plant species in Nepal with particular emphasis on herbaceous climber *Mikania micrantha* to know, how its uncontrolled growth had suffused impediments to ensure long term maintenance, restoration and enhancement of biodiversity, habitats and conservation values of the protected areas of Nepal.

WAVING WEED INVASION

A recent inventory and assessment carried out by IUCN Nepal has identified 166 different non native invasive plant species that are found in both biologically rich areas as well as human dominated landscape such as forests, fallow lands, grasslands, croplands, and wetlands of Nepal (Tiwari et al, 2005). Among the reported alien invasive species, high risk invaders includes six species; *Ageratina adenophora*, *Chromolaena odorata*, *Eichhornia crassipes*, *Ipomea carnea*, *Lantana camara* and *Mikania micrantha*. Medium risk invaders includes three species; *Alternanthera*

philoxeroides, *Myriophyllum aquaticum* and *Parthenium hysterophorous*. Low risk invaders includes seven species; *Ageratum conyzoides*, *Amaranthus spinosus*, *Argemone mexicana*, *Cassia tora*, *Hyptis suaveolens*, *Leersia hexandra* and *Pistia stratiotes*. Insignificant risk invaders includes five species; *Bidens pilosa*, *Cassia occidentalis*, *Mimosa pudica*, *Oxalis latifolia* and *Xanthium strumarium*. All these species are native to American continent and most of them are terrestrial herbs. Nearly third of these risk labeled species belongs to Asteraceae family.

THE FALL OF INTEGRITY

Among the high risk invaders, on-going colonization of *Mikania micrantha* (Asteraceae) is concurring damage to resident species with clear indication of incompetent biotic resistance to exclude further invasion process. *Mikania* was first reported in 1963 in the eastern belt of Nepal and due to its spatial spread from east to west it now occurs in some 15 eastern and central lowland Terai districts of Nepal between 72 to 1200 m altitudinal ranges (Tiwari et al, 2005). The available literature suggests that in recent 10-15 years, its eminent proliferation wreak havoc in both biologically rich as well as human dominated landscape. This is placing two major constraints for long term biodiversity conservation in Nepal. First, it had reduced food availability of wildlife species found in Koshi Tappu & Parsa Wildlife Reserve and Chitwan National Park areas. Second, this had reduced local communities' benefits by cutting out the expected annual natural regeneration yield from the forest and agro-forest resources. The interlaced consequences of the *Mikania* evolution is largely marked by the buffer zone communities, as they are capped with bizarre choice to use protected areas resources to backup their demand for forest products in the village. Perhaps, the increasing incidences of human-wildlife conflicts in the adjoining villages of the protected areas may have resulted from the food/habitat loss. Thus, the problems that protected area and people face are multifaceted with unprecedented ecological decline and socioeconomic turmoil.

THE WICKED CREEP

Mikania micrantha is native to USA and is a fast growing (27 mm/day), perennial, creeping and twining terrestrial plant, commonly called mile-a-minute because of its vigorous and rampant growth habit (ISSG: web content; Tiwari et al, 2005). It has no known specific local host or parasites and for this reason it grows best where fertility, organic matter, soil moisture, and humidity are all high and damages or kills other plants by curbing out the light and smothering them. *Mikania micrantha* propagates by means of wind-dispersed achene's and stem fragments. The flowering occurs during November to February. A single plant covers an average 25 m² and releases over 40,000 viable seeds every year (ISSG: web content; Tiwari et al, 2005). *M. micrantha* not only perturbs the growth and development of trees, crops, and ornamental plantings but also reduces the density of wild herbaceous species (Isamil & Mah, 1993). It has been suggested that allelopathy plays an important role in *M. micrantha*'s dominance besides it competing for light and nutrition (Ismail and Mah, 1993; Cock et al., 2000). As a result of these invading potentialities, many agro forestry, forest plantations, natural forests and grasslands areas of low land Terai belt of Nepal have been affected by its growth. Though the conservation problems of *Mikania* infestation were already recognized in Chitwan by William Andrew Laurie in 1978 particularly noting its potential threat to rhino population, the spread and growth of *Mikania* have been far-reaching with enormous social and biological costs (Laurie, 1978; Amin et. al, 2006)

LOADING WAYPOINTS

The local communities are manually uprooting the early seeds of destruction as they can, but are failing because new plants can grow even from the tiniest stem fragments. Moreover, it has been found to be of least households use and is not palatable to livestock and wildlife. Burning and chemical control often found to be ineffective as it is impossible to burn out all plant body especially roots. Continuous herbicides spray can results into yet another threats to non target species (Tiwari et al, 2005). Nevertheless, scholars from CAB International, UK have devised the classical biological control method for *M. micrantha* by introducing *Puccinia spegazzinii* an autoecious, microcyclic rust fungus (Kumar et al, 2004) as a candidate species to suppress its growth. The operation

is based on Natural Enemy Introduction Hypothesis. This is an attempt to solve the problems by going back to the center of origin of the species, by studying their natural enemies and introduce species that are host specific and damaging to invasive range of the weed. Till now among 43 fungal pathogens recorded, *P. spegazzinii* is effective bio-control rust which is proven to be safe, environmentally benign solution to suppress *M. micrantha* growth (Poudel et al, 2005). Therefore, how we effectively supersede from our existing spatial and temporal knowledge of conservation science to cherish new ones is crucial to transform our ways of living to maximize chances; that environmental and social condition will indefinitely support and secure both human and wildlife.

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