ASIAN WOODLAND AND FAUNA HISTORY

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Summary

Asia is a continent of contrasts because both its plant and fauna have been determined by geographically dynamic circumstances. The bio-diversity of the woodlands has been enhanced by inter-connectivity between the Mediterranean to Asia. Such richness from tropical monsoon and rain forests attracted early traders for both faunal and plant products from both Europe and Asia. Deforestation for forest products over long periods of time has threatened this diversity.

Trade accelerated as sailing ships were used by Europeans since the fifteenth century. Asiatic woodlands were increasingly exploited for teak in ship-building of port towns. Such demands led to expansion of territorial controls by Europeans trading companies like the English EIC and the Dutch VOC.

Colonial establishments required state structures and forest departments to procure supplies for infra-structure like railways and roads which both deepened and widened the pressure on woodlands suitable for plantation crops like tea and coffee. With demand from growing populations of these countries to clear land for food there was pressure on the woodlands. The shifting cultivators and woodland folk got increasingly hemmed in by such varied demands. Forest Departments became concerned for both the environment as woodlands got eroded and so began restrictions on use. This triggered social unrest both inside and outside the forests.

With political independence from colonialism began the second phase of global impact on the woodlands of Asia after the middle of the twentieth century. Nationalized forests and centralized control over woodlands has caused stricter attention in some countries and exclusion of communities but greater exploitation in others with less left for both fauna and people in the woodlands. Thus Asiatic countries are now at the crossroads of taking decisions between regard for local concerns and conservation for global environment.

1. Introduction: The Global Context of 'Asian Woodland and Fauna History'

Maintaining diversity in an increasingly globalized world is not only a basic human right but an act of supreme collective intelligence. And, “it might seem essential to be an activist and extravagant to be only scholarly”.

Globalization in the twenty first century has sharpened the need to know how historical forces have come to threaten the rainforests in the woodlands of Asia which being the last frontiers of bio-diversity may possibly face extinction which "is the gravest aspect of the biodiversity crisis: it is irreversible." This line of inquiry in Asian woodlands provides a platform for: first, a common thematic approach to contain the enormous

diversity of Asian woodlands with even more complex histories in a single chapter; second, it may provide a diving board for global environmental policies to take off like those of 'forest offset markets' or REDD for Northern polluters, using forests on indigenous land.

1.1. Why a Definition?

Although Lund provides a list of at least 624 definitions of the term 'forest', two standard English terms are: a 'woodland' is a small area of trees with a canopy cover of about 40%, and a 'forest' as a relatively large group of tree types with a dense canopy. The difference in canopy is important for Asia's woodlands, because fragmented rainforests can be a threat to its diverse genetic resources of both plant and fauna. It matters too, because Asian woodlands are home to special indigenous communities who have their own terms which distinguish woodlands as fallows. Canopy matters in cultural and ecological spaces in a wide variety of woodland environments from primarily arid regions with less than 0.3% cover (such as in Kuwait, Oman and Qatar which have no forest cover) to the most heavily forested 'green archipelago' of Japan and those of Southeast Asia.

Recognition of indigenous terminology may possibly be a beginning to set records right for the UN Declaration on the Rights of Indigenous Peoples, 2007, to "free, prior and informed consent." And finally it may be possible to work towards global initiatives known as Indigenous Community Conserved Areas (ICCAs).

1.2. Grappling with 'Too Much' and 'Too Little': The Historical Approach

There is a history to writing forest history, a process which has helped broaden the perspective of forest historians to include the cultural context of humans collaborating with the woodland environment. Such a catholic approach is challenging, because Asia is a continent of cultural diversity shrouded in uneven areas of darkness. There is so much written about forestry for some areas and periods, but very little elsewhere. The following examples elucidate.

First, China for various reasons evokes the phrase "ponderous unknown" even in the modern era, while in Japan everything is recorded and clear. Yet the information that exists for China and Japan has, until recently, been inaccessible to conservation scientists. Such contrasts are sharper still for much documentation is available for South Asia in comparison to other parts of the continent. Such unevenness made historical synthesis less thorough, and consequently six areas of Asia were overlooked initially by the conservation scientists who initiated the "hotspot theory".

Second, literary sources require interpretation and obscure comparison over time and between regions. Sources for desiccation of historic Anatolia are available from classical authors like the Roman Titus Livius, born 59 BC (Livy in English), and Greek geographer and historian Theodoric Strabo born 63 BC. How does one compare this with China's deforestation before the beginning of the Ming dynasty in 1348 from the writings of a third century BC philosopher Mencius on the impact of grazing and tree lopping for fuel in exposing mountains, or about the working of the iron industry from

poems of the seventh to the tenth century poems of the *Shih Ching*? Then how does one synthesize observations like those of Alexander of Macedonia 326 BC, the chronicles of travelers like Marco Polo and those obtained from Kalhana's 11th century *Raj Taringini* attesting the refinements of courtly life in Kashmir.

Third, no less difficult are scientific micro-studies of pollen for these are not available in many regions to compare or generalize. It however establishes that forests were the most dominant vegetation type in the Himalayas in the Holocene era and that drastic changes in their composition were due to biotic and not climatic agents. Pollen from lake Haigam in Kashmir confirm the sequence of changes in tree types from 4500 BP of ash-elm-alder-oak to one of pine-fir-birch-walnut in 200 BP. Then there is satellite imagery, pollen-coring and soil-sampling for floral cover, and rainfall data for analyzing forests and urban civilization from the sixth to the fourteenth centuries. For instance, the Satingpra peninsula of south Thailand had a wide spectrum of products obtained from mountain forests for shipping, rigging and containers for products as also the local specialties which were palm wine and spirits, palm sugar aromatic products like resin and wood, frankincense, *gharu* wood and camphor.

Fourth, there is a contemporary shift in focus in historical accounts from mere narration of forest exploitation to changes in composition of woodlands. But such information is not available for all regions. Forests have not been inhabited by literate users and linguistic interpretations are incredibly difficult to reconstruct for a continent of Asia's proportions. For example, although it is known that forest cover has been disturbed over such a long time in Myanmar, Thailand, Cambodia, Laos, Vietnam and Southern China and that it is "doubtful if any untouched rain or monsoon forest still remains". Where the rain forests were disturbed, they developed characteristics of the monsoon forest, whereas the monsoon forest degraded into bamboo forests, or open woodland with grasses on the ground, particularly when subjected to regular burning. A possible sequence is that originally the people were hunter gatherers who used fire and cleared vast areas of forest; and converted the once extensive freshwater swamp forests along rivers by rice paddies. The drier monsoon forests were the first to go as the long dry season makes for better burning. From the end of the 19th century tea, coffee, rubber and oil palm brought pressure on the rain forests so much so that Asia has 7.8 percent of forest area under plantation which is the largest proportion in the world today.

Fifth, there is also a contemporary shift in focus to do with habitat degradation and fragmented patches of woodlands and the consequent impact on the state of bio-diversity in faunal and in plant species. For example, since the 1850s logging has taken place in established forests of Burma, initially with the help of elephants, but with the coming of chainsaws and mechanized extraction, the damage to forests has been much worse, even to the extent that the Asian elephant is in rapid decline. Burma is the eastern part of the Indo-Burma 'hotspot' and much of the region's wildlife is now endangered as a result of the fragmentation and degradation of rainforests. Wild relatives of cattle are now a cause of great concern in Southeast Asia: *kouprey* (*Bos sauveli*) is close to extinction, while the gaur (*Bos gaurus*) and banteng (*Bos javanicus*) are in decline. Vietnam has 34 threatened species including the Vietnamese pheasant (*Lophura hatinhensis*) until recently known only from two specimens; meanwhile Thailand has 39 threatened species including Gurney's pitta (*Pitta gurnei).*

Sixth, there is a difference in specific information like those of trade even from colonial records of the Dutch and the English. These sources provide long term information concerning historical impact of organized trade and later colonial exploitation of forests in South and Southeast Asia, but there is no comparable source for trade in the other parts of the region.

2. Mapping Deforestation and Diversity

This section will map out the bio-diversity of Asia's woodlands which have been de-forested by historic factors to do with global forces of the market, technology and state structures. These forces outmaneuvered the indigenes in Asia with one exception – Japan. From being a highly deforested country prior to the seventeenth century and with a heavily populated society it had kept itself in isolation for two hundred years, finally emerging at the beginning of the twentieth with a forest cover of 68.2 percent and with 200 deciduous and 30 conifer species to match that of USA. For the rest of Asia deforestation has been a continuum, intensifying in contemporary times just in those areas where people are poor as in Myanmar; are vulnerably dependent on forests, are least capable of stemming the tide as in Aceh and Timor; and are captives of political turmoil as in Iraq and Afghanistan. Six such "hotspot" areas in Asia were identified by Norman Myers in 1988 which were bio-diverse rich but habitat loss was of serious concern. The Irano Anatolian region (Iran, Iraq) the mountains of Central Asia (Afghanistan), Indo-Burma (Myanmar), Sundaland (Aceh) Wallacea (Timor), the Southern Philippines, east Melanasian Islands (Solomons).

2.1 Deforestation in Asia

2.1.1. Asia: A Continent of Historic Contrasts

Deforestation in Asia is a situation of striking contrasts within the same region as in the Irano-Anatolian region where it can be traced back to the Greco-Roman colonization and nomadization in the post eleventh century which has therefore reduced habitat for fauna, yet, it contains ancient woodlands of walnut trees which are estimated to be 800 years old, located above the steppe zone in warm sheltered places in the Western Pamir Alai and Tien Shan of Central Asia. The area occupied by this habitat has greatly declined with almost 90% lost during the last 50 years. This valuable forest type contains ancestors of domestic fruit varieties and is an important storehouse of wild genetic diversity.

These forests are composed of walnut, (*Juglans regia*), Almonds (*Amygidalus communis* and *A Bucharensis*) pears (*Pyrus korhsinskyi* and (*P regelii*) plums (*Prunus sogdiana* and *P ferganica*), cherry (*Cerasus mahaleb)* along with apple and maples (*Acer turkenistanicum* and *A semenovii*). A few Chinese walnut (*Juglans Cathayana*) trees survive at one locality in the eastern Tien Shan.

Second, in China there are significant discoveries of preservation despite long periods of almost linear deforestation starting from as early as the Sung (960 -1127) and Ming (1386) dynasties and again in 1596 and later through 1776 and the energy crisis starting from 1400 until mid-nineteenth. In southeast China small stands of the longest survived

conifers were found of the Maidenhair Tree (*Ginkgo billoba*) a species whose fossil find traces it back to 150 million yeas ago; then botanists discovered a living sequoia in 1949 – *Metasequoia glyptostroboides* – previously "known only as a fossil".

Third, there are sharp contrasts in inter-regional occurrences of deforestation as in West Asia and Japan which occupy two extreme flanks of the continent; both have experienced periods of historical deforestation and both import a large bulk of their consumption of wood today. Whereas West Asia has only one percent of its land under forests which explains why its imports rose nearly fourfold between 1972 and 1996; Japan however is the world's largest importer of tropical woods even though it has turned round its historic deforestation and is now one of the world's five most forested countries.

Fourth, the wetter regions of South and Southeast Asia are remarkably rich in species both plant and fauna as in the rainforests in spite of having been logged both legally and illegally and hunted and poached. A hectare (2.5 acres) of Malaysian rain forest can contain as many as 180 different species of trees, whereas a temperate woodland would be unlikely to have more than ten. Now only 20% of the Philippines, once blanketed in tropical forests, has significant forest cover.

2.1.2. Early Concerns for Deforestation in Asia

In Japan, during the last decades of sixteenth century control over woodlands strengthened. Daimyo fostered protection of forests as well as timber stands. They discouraged 'slash-and-burn, constructed dikes and forbade cutting trees on levees and riverbanks Seventeenth century Japan saw an era of regulation, silviculture and planting unprecedented in Asia. At the time when China and to a much lesser extent southern and western Europe were nearly bankrupt, Japan was embarking on an ethos of care and sensitivity about the forests that pervaded Japanese society. These were evident from writings like the *jikatasho* or *nosho*, "agricultural treatises" and a wide-range of farm manuals written by itinerant scholars, practicing farmers and minor officials and one of the treatises written by Miyazaki Antei in 1697 on woodlots and rural life was seminal and later by Sato Shin'en. The context of these writings was on intensifying scarcity in Tokugawa society and soil erosion, and unseasonal weather conditions of 1630 in north eastern Japan, crop failure and denuded mountain arising from tillage etc.

In India the advent of professionalization of natural history and the growing diffusion of climatic environmentalism after the 1760s more so from experiences in Mauritius and in the Caribbean and India after the 1820s were strongly reinforced by the writings of Alexander von Humboldt. Humboldt's interpretation concerned the ecological threat posed by unrestrained activities of man. This became influential among the Scottish scientists employed by the East India Company. Thus Alexander Gibson, Edward Balfour and Hugh Cleghorn pioneered a forest-conservancy system in India which connected the relation of deforestation, water supply, famine, climate and disease and so provided pioneering effort for a forest-conservancy system in India on a hitherto un-equaled geographical scale. Their contribution can almost be summarized by the publication of a report of a committee appointed by the British Association "…to Consider the Probable Effects in an Economic and Physical Point of View of the

Destruction of Tropical Forests" published in 1852 which had warned that a failure to set up an effective forest-protection system would result in ecological and social disaster. With these scientists and surgeons grew a corpus of ideas gaining in strength to influence policy change and these may have been speeded up by the official experiences of Indian and Irish famines.

There was much debate about the connections between deforestation and rainfall change and what is now known that: "deforestation had global implications not amenable to local solutions." Also that there had been "important connections between the incidence of drought in India, institutional response to it, and the beginnings of modern understandings of climatic teleconnections between global-scale tropical circulation and the strength of the Asian monsoon. It is now established that 1877-79 event in India was global in its impact…". What is more this was not the first time that ENSO or the El Nino and Southern Oscillation impact had brought in its wake devastation. It had happened in 1791 and even earlier but that the severity of ENSO in 1791 was equaled only in 1720, 1728, 1828, 1877-1878, 1891, 1925 and 1982-83.

In Japan, care for forests was generated by military and defensive needs just as in Europe medieval forests were protected for hunting. The daimyo appointed officials to ensure timber and bamboo groves as they were obstacles against cavalry and peasants were not allowed to fell tree or engage in slash and burn practices. In China, too some of the enclosures were for imperial hunting protection against nomadic attacks from the west, but woodlands were protected as temple and monastic forests, community forests and trees grown in agroforestry systems such as silk-worm cultivation. In India there were indigenous concerns for forests as in the case of sacred groves or *orans* [see section on cultural roots] both in arid regions of north India and the *Kans* in the Western Ghats. Hunting grounds in Mughal India also preserved forests. Concern for afforestation is evident from the example of the Amirs of Sind who between 1690 and 1830 were responsible for re-forestation of over a million acres of Indus flood plain with up to eighty-seven *shikargah*, or hunting and forest reserves.

2.1.3. Regional Deforestation

Information from Livy and Strabo reveal that in Anatolia the forests were much more extensive two millennia ago than they are now; the sacred groves at Daphne near Antioch and the royal forests between Mysia and Lydia are all gone and land clearing for human settlements and agriculture in mountainous areas along the coasts of the Mediterranean in Lebanon and Syria has been carried out throughout history. The "nomadization" of the countryside in Anatolia and other regions of West Asia after the eleventh century ensured that the summer pastures - the *yaylas* - in the higher regions would grow anything higher than close-cropped grass or scrub. Traditional sheep and goat herding is still practiced in *Juniperus excelsa* forest ecosystems in the Anti-Lebanon mountains and on the Syrian steppes where relics of *Pistacia atlantica* trees still remain. In northern Iraq the few remaining tracts of natural forests in the more isolated northern mountains are now probably nearly depleted, largely because of intensive wood cutting exacerbated by the political situation there. As the forests receded so did the fauna. The lion was widespread throughout the Near-East in antiquity. The Emperor Julian flushed them from burning grass in the districts of North

Syria and even in the nineteenth century they were to be seen in the Amanus and Taurus mountains and near Aleppo. The species is now extinct in this entire region, as are the wild cattle in the Troad and elsewhere.

Habitat loss has intensified in contemporary times in Central Asian mountains where the increase in population even in low density areas has in some places risen to unsustainable levels. The transition to market economy and the withdrawal of government subsidy in the post-Soviet era has caused large proportions of the population to live below subsistence. There is over grazing and unregulated hunting of animals and collection of plants. And as coal and other fuel become unavailable and unaffordable, the cutting of trees and shrubs for fuel and building timber has been exacerbated. This together with forest fires has greatly reduced the area of these habitats, especially in the case of the steppe shrub communities and the unique and valuable walnut-fruit forests.

In South Asia too there has been human habitation over long periods of time in the sub-continent of India and the vegetation here has been arboreal with the exception of high mountains of Baluchistan or arid areas of the Thar Desert. The process of denudation has ancient roots. Detailed pollen studies establish that forests were the most naturally dominant vegetation type in the Himalayas in the Holocene era and that drastic changes in their composition were likely due to biotic and not climatic agents. Pollen from the lake Haigam in Kashmir showed the sequence of changes in tree types from 4500 BP of ash-elm-alder-oak to one of pine-fir-birch-walnut in 200 BP.

Deforestation has occurred in India earlier than the Western interest in teak in Malabar and ship building. As Mughal control collapsed and other states which came up with their elites there were dramatic rises in timber demand and commoditization of forests for revenue demand for the need of the state long before the East India Company became a significant power in the land. The predominant tree which was much exploited is the *Shorea robusta* or *sal* and it is said to have been an important component of the original vegetation of the Gangetic plain until the later Vedic period (1000-600 BC) but the domain of the *sal* was reduced by the middle of the seventh century due to large scale expansion of permanent cultivation. Then again there was a shrinkage in the area between the eighteenth and nineteenth century because of conversion of forest land by cultivation.

In the Himalaya the broadleaf forests in the Himalayas have lost almost seventy percent of its natural habitat. While only small patches remain in the sub-tropical forests and larger patches still survive in the temperate forests in the east, that is in Bhutan. Likewise in the Brahmaputra valley there is a long history of cultivation with the largest forest blocks confined to protected areas in central Assam. Forest loss in the Western Ghats has been most likely to have been driven by population density, and shifting agriculture; conversion to plantations of tea, coffee, teak, eucalyptus, and wattle, as well as for the creation of reservoirs; and construction of roads and railways. The forests are in a highly fragmented state, and the only tracts greater than 200km^2 are found in the Agasthyamala Hills, Cardamom Hills, Silent Valley-New Amarambala Forests, and southern parts of the South Kannada District in Karnataka State.

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Biographical Sketch

Dr. Minoti Chakravarty-Kaul was born in Nagpur, India. She has a PhD in Economics (Delhi University, 1991), an MA in Economics (Delhi School of Economics, 1961), and a BA Honours in Economics (Delhi University, 1959).

She worked for 40 years 1961-2002 as a lecturer first and then a Senior Reader in Economics in Lady Shri Ram College, University of Delhi. She has held a number of fellowships, including: Visiting Fellowships at the Workshop in Political Theory and Policy Analysis, Indiana University (1999-2000) and Chair for International Economic Development (2002-2003); Shastri Indo-Canadian Senior Fellowship at the University of British Columbia (1993 and 1998); the S.V. Ciriacy-Wantrup Post-doctoral Fellowship (1993-1995); and Ford Foundation Fellowship at Workshop in Political Theory and Policy Analysis (1990-1992). She is the author of *Common Lands and Customary Law, Institutional Change in Northern India in the past two centuries* (Delhi: Oxford University Press, 1996) and a variety of conference and journal articles, including: "Dam a river, why Damn a People?", *Alp Jan*, Vol.II, No.2, pp.28-37, Jan-March, 2002; and "Market Success or Community Failure? Common Property Resources in Colonial North India and a Case Illustration from a Cluster", *Indian Economic and Social History Review*, Vol. XXXVI, No.3, pp.355-87, August, 1999. Her current research interests include the historical development of the commons in Delhi and Eco-systems of the Himalayas, the northern plains and the Hindu Kush and how this history feeds into contemporary events for the peoples of those areas.

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