Exploitation of amphibians and reptiles in Pakistan

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2019

The story of human exploitation of natural resources in Indus valley, dates beyond 4000 BC. Natural resources were exploited for food, shelter and game. Indus valley once was seat of a highly developed urban society *The Indus civilization* (Khan 2006), its flora consisted of lush green forests of broad-leaved plants, and fauna of wide variety of animals: otters, alligators, turtles, wild variety of mammals elephants, tigers, rhinoceros, wild ox, antelopes etc., that roamed about on land and inland waters of the Valley (Kureshy 1986; Roberts 1991; F. K. Khan 1996; Khan 2006).

The apparent cause of decline was repeated flooding of Indus river system, triggered by wide felling and destruction of natural vegetation to make room for agriculture. That resulted in aridity and onslaught of desert habitat with thorn forests, replacing rich variety of animal and plant life depicted on small steatite seals recovered from excavations at different sites in the valley (See fig.)

Present day ecology of Indus valley

Now what we have in the Valley, is an arid grassland with scattered pockets of subtropical thorn forests around airfields, graveyards, and barren lands including saline flats or "pats," which are under growing pressure of rising human population, to be reclaimed for agriculture and industrialization (Khan 1980b, 1998, Khan 1990b, 1991b).

Water-logging and salinity

The subsoil rock under upper Indus Valley does not allow normal subsoil drainage, causing wide spread water logging and salinity problem, resulting in habitat destruction, exterminating or dislocating local flora, amphibian and reptilian species.

While lower Indus Valley, with normal subsoil drainage, is the most fertile part of the country, yielding more than 80% of country's produce. Xerophytic reptiles (mainly Palearctic) have been pushed westward, making room for the mesophilic**,** predominantly Oriental ones. Changing scenario of fauna and flora in the Indus Valley (Khan 1985a).

Habitat destruction

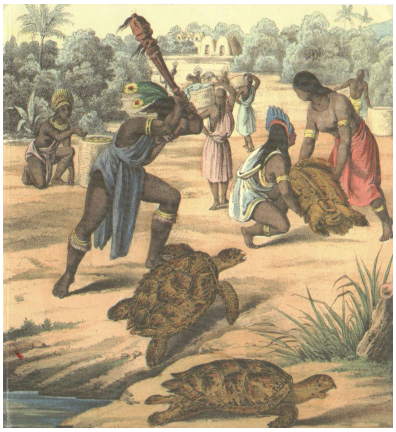
Natural prey of resident amphibians and reptile species is mostly exterminated due to frequent spray of insecticide on crops. Moreover, ongoing agriculture activity: ploughing and irrigation, have destroyed burrows, and flooded burrows and hideouts. The driven out animals have extensively been killed from the areas where once they abounded.

Natural populations of amphibians and reptiles are been broken, they against high odds survive in small pockets where undisturbed original habitat still lingers on.

The inter-riverine forests, which a century ago, provided natural habitat, and cover for large animals like *Crocodylus palustris, Gavialis gangeticus, Python molurus,* otters, large cats, elephants, and rhinos, have been cleared with complete extermination of most of resident species.

Exploitation of Sea turtles

Beaches along Pakistan coasts are visited annually by females of several sea turtles: *Lepidochelys olivacea, Chelonia mydas,* and *Dermochelys coriacea*, to lay eggs. The turtles and their eggs are a bonanza for poachers, human and other animals, who hunt and plunder eggs. Because of poaching most of the sea turtle populations are declining at alarming rates (Das, 1991).



The turtles of land and inland waters are under similar hazardous pressure by plunder and habitat destruction by increasing human intrusion in the ecosystem. Turtle eggs and turtle soup is

a popular relish dish, recommended by local physicians-"*hakims"* as a cure for several ailments (Vohora and Khan 1979; Das 1991).

Habitat destruction by floods

Heavily silted shallow rivers in Punjab almost regularly overflow during rainy season every year, disturbing habitat and disrupting turtle populations. The flood water carry turtles for away from home; when water recedes, the turtles are disorientated in search of suitable habitat. While crossing roads several are crushed under the flow of unheeding, rather aggressive traffic. Several suffer mortal injuries by playful adults and children. Adults and hatchlings are devoured by jackals, foxes, mongooses, kites, falcons, etc., few manage to survive.

Medicinal exploitation

Several nomadic tribes trade in selling animals parts as medicine in local health markets. They actively participate in destruction and depletion of reptilian populations. They deal in the trade of reptiles and other wild animals, are known as "*sanyasies"*, "*gagras"* or "*Tapri-was",* they have menaced the natural reptilian population throughout Indo-Pakistan subcontinent (Minton and Minton 1964; Khan 1993a).

Due to high demand in market, they mercilessly and endlessly hunt several reptilian species: *Varanus bengalensis, V. griseus, Uromastyx hardwickii, U. asmussi, Trapelus agilis, Python molurus, Ptyas mucosus, Spalerosophis diadema,* etc., lured by the high prices skins of these species fetch. Moreover, the body parts of these reptiles are in great demand in local health markets, as native physicians use them in preparation of recipes for treatment of several common ailments (Konieczny 1969b; Vohora and Khan 1979; Khan 1993a, 2000a).

Extraction of oil of Uromastyx

Wildlife protection laws

Despite legislation banning trade in wild animals and their parts; export of live reptiles and their products is going on, doing havoc to already decimated natural populations of local herpetofauna. Several rare species are being exported to western countries where they are in great demand in pet-markets. A friend in Belgium recently accosted a dealer in Holland who had 200 *Echis carinatus,* more than 100 *Eristicophis macmahonii* (a very rare snake found only in the Chagai Desert, adjoining Iran and Afghanistan border) and about 30 *Naja naja* from

Pakistan, available for sale. The poor animals were in very bad health, kept under unhygienic conditions.

Havoc done to wildlife by pesticide

To boost yield of cash crops, improved long-acting pesticides are being freely used. Affecting field animals: toads, frogs, and skinks, *Eutrophis dissimilis* and *Eurylepis taeniolatus* etc., are well illustrated by number of dead animals lying around the sprayed fields (Khan 1990b). Most of the victims are time tested friends of local farmers. While, tadpoles and fishes have been found killed in nearby ponds and puddles receiving runoff water from sprayed fields; birds die by eating dead sprayed insects and caterpillars (Khan 1990b).

Exploitation in the name of health

Most of the Scincid species are particularly in great demand in local health markets, are sought after at a high price by "*hakims"*. While preparing a catch to sell in market, the animals are mercilessly eviscerated alive, dried in the sun, and sold at high prices as "*reg-mahi",* an important ingredient of recipes which are said to be strong sex promoters (M. S. Khan and M.R Z. Khan 1997).

The body fat of several reptiles is said to have curative properties for several diseases and is widely used in preparation of balms etc. *Uromastyx hardwickii* fat "oil" is considered to have special aphrodisiac properties (Vohora and Khan 1979; Khan 1991b). It is extracted from living lizards, made impaired by breaking spine to prevent escape, to extract slit belly of the poor animal is pressed on a hot plate, the animal struggles helplessly as its body fat simmers out, and it slowly succumbs to the heinous treatment (Khan 2000a).

Use to demonstrate vertebrate anatomy in educational educations

Uromastyx hardwickii and *Hoplobatrachus tigerinus* are widely used in educational and research institutions throughout India and Pakistan. These animals are dissected to demonstrate vertebrate anatomy, and used in physiological experiments. *Uromastyx hardwickii* are dug out of their burrows, while *Hoplobatrachus tigerinus* is caught from ponds and puddles. In Balochistan *Euphlyctis cyanophlyctis* and *Crisopaa sternosignata* are used for this purpose. Local populations of these species are being increasingly depleted (Khan 1990b, 1991b).

Havoc done by use in Health Institutions

To extract venom from venomous snakes for preparation of antivenin and antisera, *Bungarus caeruleus, Naja naja, Naja oxiana, Echis carinatus,* and *Daboia russelii* are in great demand by health institutions. These species are randomly caught from wild without taking into account the damage done to the natural populations and ecosystem as a whole.

While, in lab the snakes are not fed, are kept in congested pens under awful unhygienic conditions, several die are either thrown away or are burned.

After milking the snakes they are to be released in nature, rather than allowed to die unattended.

Havoc done by ignorance of general public

Peoples kill snakes and other reptiles on sight, since every species is they regard to be **venomous,** following the philosophy "kill it before it harms you" (Khan 2002).

Havoc done on roads

During summer, lot of amphibians and reptiles are killed on roads. Khan (1990b) recorded data pertaining to the road-killed common toad, *Bufo stomaticus*. However, several species, i.e., *Euphlyctis cyanophlyctis*, *Fejervarya limnocharis, Calotes versicolor, V. bengalensis, V. griseus*, boids, colubrids, and freshwater turtles are killed by playful drivers just for fun and for the amusement of the passengers. The vehicle is purposely manoeuvred to crush the animal when it chances to cross the road at the same time (Khan 1993a). In the countryside, the strength of a turtle shell is usually tested by pelting it with heavy stones or passing a vehicle over it, until the poor animal is crushed dead or is mortally injured (Khan (2006): Plates 178, 179, 180). Due to pressures from all sides, the populations of the resident reptiles in Pakistan are fast depleting, as demonstrated by the record of killed/alive reptiles received by the author during 1964 and 1998 (Table 12.1). Note the decrease in receipts from 243 in 1964 to 44 in 1998.

Conclusion

Overall survey of amphibians and reptiles in Pakistan indicates that these animal are endangered in the country. The situation is worsening day by day and demands immediate efforts and attention of conservationists to educate general public, and make them aware of the importance of these animals in the ecosystem. Moreover, there is a dire need for organizing a force of honest law-enforcement workers for strict implementation of the conservation laws.

In addition to 24 species of Pakistani herpetofauna listed in IUCN Red Data Book (Table 12.2), several other Pakistani species come under the definition of endangered species i.e., any species of plant or animal that is threatened with extinction (see note under Table 12.2).

Table 12.2. List of threatened Pakistani amphibian and reptilian species included in IUCN Red Data Book.

Amphibia	Chelonian	Crocodilian	lizards	snakes
Hoplobatrachus tigerinus	*Dermochelys coriacea* *Geoclemys hamiltonii* *Kachuga tecta* *Lissemys punctata* *Argrionemys horsfieldii* *Geochelone elegans* *Aspideretes gangeticus* *Aspideretes hurum*	*Crocodylus palustris* *Gavialis gangeticus* *Crocodylus palustris* *Gavialis gangeticus*	*Uromastyx asmussi* *Uromastyx hardwickii* *Varanus bengalensis* *Varanus flavescens* *Varanus griseus caspius* *Varanus griseus koniecznyi* *Uromastyx asmussi*	*Python molurus* *Ptyas mucosus* *Spalerosophis diadema* *Xenochrophis piscator* *Naja naja* *Naja oxiana* *Daboia russelii*

	Dermochelys coriacea *Geoclemys hamiltonii* *Kachuga tecta* *Lissemys punctata* *Argrionemys horsfieldii* *Geochelone elegans* *Aspideretes gangeticus* *Aspideretes hurum*		*Uromastyx hardwickii* *Varanus bengalensis* *Varanus flavescens* *Varanus griseus caspius* *Varanus griseus koniecznyi*	

Additional species recommended for inclusion in IUCN listing

Eurylepis, Novoeumeces, Eutrophis, *Scincella*, and *Ophiomorus*: Threatened by extensive use in health recipes as "*reg mahi"*.

Tropiocolotes persicus euphorbiacola, Enhydris pakistanica, and *Xenochrophis cerasogaster*: Threatened by disturbance in their restricted specialized habitat

Eristicophis macmahonii: Threatened by poaching.

Spalerosophis arenarius: Threatened by extensive killing for skin. *Eurylepis, Novoeumeces, Eutrophis*, *Scincella*, and *Ophiomorus*: Threatened by extensive use in health recipes as "*reg mahi"*.

Tropiocolotes persicus euphorbiacola, Enhydris pakistanica, and *Xenochrophis cerasogaster*: Threatened by disturbance in their restricted specialized habitat

Eristicophis macmahonii: Threatened by poaching. *Spalerosophis arenarius*: Threatened by extensive killing for skin.

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