Wildlife farming to conserve nature's elusive wealth in North East India

Nazimur Rahman Talukdar and Parthankar Choudhury

Wildlife farming is increasingly popular in the areas where source animals are available. Conservationists have both favouring and counter-arguments on wildlife farming for conservation. We found that wildlife farming for meat demands is beneficial for conservation, when accompanied by strong laws and good governance. However, wildlife farming for commercialization of animal products and also to reduce pressure on wild species is difficult to achieve. Here, we suggest some criteria to be maintained in wildlife farming in the context of North East India to achieve conservation benefits along with farming.

Wildlife and its derivatives are traditionally used for food, ethno-medicine, ornamental and recreational activities[1,2]. They are part and parcel of life from human history and integrated well in our socio-cultural and religious practices. Geographical distribution of wildlife coincides with the basic needs of humans and was considered sustainable. Like any other resource on earth, wildlife resources are also unevenly distributed. Commercialization of wildlife to the non-distributional regions has posed a great risk to it despite habitat loss and developing activities in its range of distribution. The trade is now not limited by country or continental boundary, as the market size is huge. Increasing human population and subsequent pressure on wildlife and its habitats have been shaping its population and distribution again. Thus regions which are well linked with old species have great demand than those where the traditional linkage with wild species is less. For instance, Chinese pangolin is in great demand in China for meat and ethno-medicine, as the Chinese are traditionally connected with the species for their needs. Transportation of the species to the regions of high demand has been achieved through globalization. Currently, wildlife trade is the second largest illegal trade with an average turnover of over USD 20 billion annually[3,4].

Illegal wildlife hunting for meat, medicine and other commercial purposes for their body parts is widespread. Similarly, the species are not restricted to one or two groups; in fact, they cover most of the taxonomic groups[5]. The rich source of wildlife trade is mainly through its country of origin, i.e. from the rich source of biodiverse countries. Poor governance coupled with lack of public awareness make illegal wildlife trade easy, leading to the extinction of many wild species. For example, a century ago, the tiger population in India was approximately 40,000 (ref. 6) which has gone down to 3000 in 2019 (ref. 7). One of the major causes of declining species is the illegal trade for tiger skins and bones for ethno-medicine. Similar cases were also observed for the Chinese pangolin where much of their population has been declined because of the high demands of their derivatives in ethno-medicine[8]. Importantly, most of the illegal trade was found related to purposes other than meat, like skin, pelts, fur, ivory, bones, horns and teeth[5] as meat consumption is mostly limited to local markets.

India is home to 7%–8% of the recorded species on earth and is considered one of the 17 mega-biodiverse countries in the world. At the convergence of two biodiversity hotspots, viz. Indo-Myanmar and the Himalaya, the forests of North East India support huge biodiversity[9]. The region is also home to more than one-third of tribals of India, having about 200 dialects. The tribals are traditionally dependents on animal meat and this is related to their socio-cultural practices. Many tribes consider hunting as their pride and they preserve the animal's skull to illustrate the same. Several animals are the prime diet in many festivals[10] and hunters are looking to earn money. Importantly, threatened and rare animals are more in demand in the markets. However, common species are also regularly hunted and eaten.

Commercialization of wild animals and their products from NE India has intensified after globalization. Presently, the region is an important source of wildlife trade and also serves as a corridor from the rest of India to China through neighbouring countries like Myanmar[11]. It has been reported that between 2009 and 2017, about 6000 pangolins were illegally traded for their scales and other derivatives[12]. One-horned rhino (*Rhinoceros unicornis*) has also been targeted and 1168 individuals were reported to be killed during period 1963–2016 (ref. 13). Kaziranga National Park in Assam is where most of the species are currently surviving. Between 2015 and 2018, over 74 rhinos were killed for their horns and the Forest Department of Assam was able to arrest 316 poachers[14]. Although the illegal particle has reduced, is not fully under control. Poaching of rhinos is a routine practice in Assam. Many other animals and their products are transported from the northeast India considering their market demand.

Interestingly, most of the animals are poached for their derivatives, but not for their flesh[15]. Domestic meat demand from wild species may be mitigated by wildlife farming, whereas wildlife farming for commercialization of wild animal products is not a solution as it increases further demand[16–19]. However, hunting for animal meat is playing a decisive role in the extinction of many animals. For instance, Mishmitakin (*B. taxicolor taxicolor*) is restricted to the narrow region of Arunachal Pradesh, and hunting is considered to be the main reason for its population reduction. Considering the importance of conservation of species which are killed for local consumption, wildlife farming may be legalized to a certain extent. Demand of wild species can be minimized if farmed products are equal in quality and taste and provide an alternate for the wild products[20]. This is however difficult to achieve completely as farmed products are always considered inferior[17].

Although many studies found that wildlife farming for meat can reduce the dependence of wild species, the preference is always greater as farm animals are considered tasteless[17,21,22]. Yet, wildlife farming reduces hunting pressure as market demand for meat on a particular

species is reduced upon farming. For instance, local fowl and broiler fowl; increasing price on local fowl increases the sale of broiler fowl in the market. Another example is piggery farming. Although broiler pig is different from wild species, piggery farming reduces wild boar hunting even though wild boars are causing conflict with humans. Therefore, although demand for wildlife products is high, wildlife farming replacing wild species consumption can limit the demand in many ways. In Arunachal Pradesh, Mithun (*Bos frontalis*), a strongly socio-cultural related mammal has been increasing upon domestication and in 2012, it was reported that domestication of the species has increased to 23.36% from 2007 (ref. 23). The domestication of Mithun has reduced hunting pressure on the species. Currently, porcupine farming is popular in countries like Malaysia, Thailand and Vietnam to reduce the local demand for wild porcupine. However illegal hunting still persists in Vietnam[24] due to lack of strict enforcement of law.

In view of the above facts, it can be assumed that wildlife farming is helpful for the conservation of species which are hunted locally only for consumption. Therefore, we suggest wildlife farming in NE India with a view to conserve wildlife. First, wildlife farming may be allowed for the species which are hunted for their meat and those showing a decline in population. Government agencies and conservationists can jointly identify species which are declining due to local consumption. For instance, porcupine can be farmed in NE India owing to its demand for meat and illegal hunting. Secondly restriction should be placed in transportation of farmed meat and other derivatives outside of their origin to limit the demands in other areas. Like other animals, illegal trade on farmed animals cannot be under full control; but illegal trade on farm animals will divert focus from the wild species as farmed animals can be easily targeted than the wild species. It will also help balance the demand for farmed and wild animals which is important for conservation. In case transportation of meat is allowed, there should be a clear distinction of legalized meat tagging on the packets by the authorities to stop illegal laundering. The complete absence of illegal laundering could be beneficial for conservation[19], as has been observed in the case of farmed alligator skin[25]. Thirdly, farmed practices should be under government control by providing license to farmed animals. Without the help of government agencies for source animals of farming, farm owners cannot begin farming and restocking of animals. Even transferring animals from one farm to another should require valid permission from the Government authorities. This criterion will help reduce dependency on wild species for farming and restocking of animals. Also, restocking from other farms is easier and cost-effective than buying from hunters.

1. Challander, D. W. S., Harrop, S. R. and MacMillan, D. C., *Global Ecol. Conserv.*, 2015, **3**, 129–148.
2. TRAFFIC, The Wildlife Trade Monitoring Network, Our work: wildlife trade, 2008; http://www.traffic.org/trade/ (accessed on 6 March 2019).
3. Wyler, L. S. and Sheikh, P. A., International illegal trade in wildlife: threats and US policy. Congressional Research Service, Report for Congress, 3 March 2008, p. 49.
4. South, N. and Wyatt, T., *Deviant Behav.*, 2011, **32**, 538–561.
5. Rosen, G. E. and Smith, K. F., *EcoHealth,* 2010, **7**, 24–32.
6. Check, E., *Nature*, 2006, **441**, 927–930; https://doi.org/10.1038/441927a.
7. BBC, India tiger census shows rapid population growth, 2019; https://www.bbc.com/news/world-asia-india-49148174 (accessed on 10 August 2019).
8. Zhang, M., Gouveia, A., Qin, T., Quan, R. and Nijman, V., *Global Ecol. Conserv.*, 2017, **10**, 23–31; http://dx.doi.org/10.1016/j.gecco.2017.01.006.
9. Myers, N., Mittermeier, R. and Mittermeier, C. G., *Nature*, 2000, **403**, 853–858.
10. https://timesofindia.indiatimes.com/india/Rare-animals-meat-being-sold-at-Manipur-fest/articleshow/17367183.cms (accessed on 5 March 2019).
11. Zhang, M., Gouveia, A., Qin, T., Quan, R. and Nijman, V., *Global Ecol. Conserv.*, 2017, **10**, 23–31; http://dx.doi.org/10.1016/j.gecco.2017.01.006.
12. https://www.traffic.org/news/nearly-6-000-pangolins-in-illegal-wildlife-trade-in-india-since-2009/ (accessed on 2 March 2019).
13. https://en.wikipedia.org/wiki/Rhino_poaching_in_Assam#cite_note-7 (accessed on 2 March 2019).
14. https://www.ndtv.com/india-news/poachers-killed-74-rhinos-in-assam-in-3-years-forest-minister-1810310 (accessed on 2 March 2019).
15. IUCN, The IUCN Red List of Threatened Species, 2017; www.iucnredlist.org
16. Stiles, D., *Environ. Conserv.*, 2004, **31**(4), 309–321.
17. Bulte, E. H. and Damania, R., *Conserv. Biol.*, 2005, **19**(4), 1222–1233.
18. Drury, R., *Conserv. Lett.*, 2009, **2**, 263–270.
19. Abbott, B. and Van Kooten, G. C., *Ecol. Econ.*, 2010, **70**(4), 721–728.
20. Tensen, L., *Global Ecol. Conserv.,* 2016, **6**, 286–298; http://dx.doi.org/10.1016/j.gecco.2016.03.007.
21. Brown, G. and Layton, D. F., In *Protecting Endangered Species in the United States: Biological Needs, Political Realities*, *Economic Choices* (eds Shogren, J. and Tschirhart, T.), Cambridge University, Cambridge, UK, 2001.
22. Mitra, B., *Far East. Econ. Rev.*, 2005, **168**, 44–47.
23. Chavan, S., Yuvaraja, M. and Sarma, H. N., *Con. Dai. Veter. Sci.*, 2018; http://dx.doi.org/10.32474/CDVS.2018.01.000122.
24. Brooks, E. G. E., Roberton, S. I. and Bell, D. J., *Biol. Conserv.*, 2010, **143**, 2808–2814.
25. Hutton, J. and Webb, G., In *The Trade in Wildlife Regulation for Conservation* (ed. Oldfield, S.), Earthscan, London, UK, 2003, pp. 108–120.

Nazimur Rahman Talukdar and Parthankar Choudhury are in the Wildlife Research and Conservation Laboratory, Department of Ecology and Environmental Sciences, Assam University, Silchar 788 011, India; Nazimur Rahman Talukdar is also in the Centre for Biodiversity and Climate Change Research, Udhayan, Hailakandi 788 155, India.*
**e-mail: parthankar@rediffmail.com*