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Updated Status of Indian Pangolin in South East Asia

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ABSTRACT: *Indian Pangolin is the least studied mammal out of the 8 pangolin species. Since 2011, it is at risk of extinction because of illegal poaching for its scales and meat by local poor community and hunters. Its scales are used for medicines as well as making ornaments and meat is regarded as delicacy in different countries like China and India. Indian pangolin is economically very important as it serves as insect eater as well as provides shelter to other animals and aerates soil through borrowing. According to IUCN, it is regarded as ENDANGERED and will decline by about 50 percent over the next 20 years. So in order to save this species, there is need to aware people about its status at global level. In this article, past 10 years researches considering illegal trading of Indian pangolin in Asia have been reviewed.*

Keyword: Indian Pangolin, Illegal hunting, poaching, Conservation

INTRODUCTION

Pangolin belongs to order Pholidota which consists of a single family i.e. Manidae and 3 genera i.e. *Manis, Phataginus and Smutsia*. Total 8 species of Pangolin are found in Asia and Africa. Out of them, 4 species belong to genus *Manis,* 2 species belong to genus *Phataginus* and 2 species belong to *Smutsia* occupying Asian subcontinent and African subcontinent respectively. Among four species of Asian Pangolin, Indian Pangolin (*Manis crassicaudata*) and Chinese Pangolin (*Manis pentadactyla)* are found in Indian subcontinent. Indian pangolins are found through parts of South Asia, from Eastern Pakistan, India, southern Nepal, Bangladesh and Sri Lanka (Srinivasulu and Srinivasulu, 2012). Indian pangolin is considered to be the most under researched species among all the Asian species (Mahmood et al., 2019). Indian pangolin contributes a

major role in food web as it acts as a natural enemy against agricultural insect pests. Indian pangolin can ingest approximately 70 million insects per year (Schlitter, 2015; Kumar, 2016). Moreover, because of its burrowing nature, it provides shelter for many other animals thus playing a part in increasing the species diversity. Despite its ability to adapt to different habitats, Indian pangolin populations are considered to be declining across its range (Baillie et al., 2014; Heinrich et al., 2016; Perera et al., 2017). In the present times, many factors are putting extinction pressure on Indian Pangolins like habitat destruction, anthropogenic interference and climate change with severe poaching and thus are greatly reducing their survival chances (Challender, 2013; Aisher, 2016; Mwale et al., 2017).

The current study has attempted to address the status of Indian Pangolin in South East Asian countries by reviewing the past 10 years researches done on it. The country wise history of illegal hunting and poaching attempts has also been mentioned along with conservation plans and strategies regarding future protection of *Manis crassicaudata.*

PHYSICAL DESCRIPTION

The Indian pangolin is a mammal which has an elongated body and tail and is of medium size. The tail is covered with keratinous scales. It typically weighs between 8 and 16 kg and the length from snout to the tip of the tail is upto 148cm (Aisher, 2016). The tail looks flat, thick, and muscular grasping from dorsal side, wide at the proximal end, and narrow towards the distal end due to which it is also called "Thick-tailed Pangolin". The total body length includes 39-40% of tail. It is sexually dimorphic. The male of same age is heavier than female (Kumar, 2016).

BEHAVIOR

The Indian pangolin specie is poorly known. Its biology, ecology, and behavior have not been studied properly. The reasons could be its nocturnal and secretive habit (Mohapatra and Panda, 2014). Indian pangolin is largely a fossorial animal as well as agile climber. It walks by keeping its anterior body parallel to ground and posterior body slightly curved (Fig 1(A). Hind legs are kept upright while searching prey in air and forelegs are used for burrowing (Fig 1(C) (Israel et al., 1987; Perera et al., 2017). The Indian pangolin uses a unique mechanism of self-defense. It places the head down towards the chest, folds all the limbs in. Then curling the tail over the head, it rolls itself into a compact ball and only protective scales

are exposed to the predator (Fig 1(B). It also scares the predator by hissing sound. If it is distressed by humans or predators, it secretes a noxious substance from the anal glands with annoying odor (Perera et al., 2017; Roberts, 1997).

Fig. 1: The Indian Pangolin (A) walking Adult male (B) Pangolin rolled up for its defensive mechanism (C) Forelimbs with sharp claws (Perera et al., 2017)

ECOLOGICAL IMPORTANCE

Indian Pangolin contributes a vital role in food webs as its role is very important in terrestrial agro-ecosystem regarding **insect pest control.** They feed upon termites keeping the insects and termites population under control. (Roberts, 1997; Mahmood et al., 2012). According to research one adult pangolin can eat more than 70 million insects annually (d'Aulaire and d'Aulaire, 1983).

Being fossorial animals, they contribute in increasing the species diversity by providing shelter and breeding habitat to many other animals (Hansell, 1993; Mahmood et al., 2012). Digging burrows aerate the soil and also provide a host for several organisms including *Amblyomma javanese*, *Cylicospirura* species, and *Strongyloides stercoralis* species (Thapa, 2013; Li et al., 2010; Escobedo, 2019). Hence they play a major role in maintaining a balance in the ecosystem food chain and food web.

DISTRIBUTION

Naturally Indian pangolin occurs largely in South Asia (Fig. 2) and it geographically extends from Eastern Pakistan, Sri Lanka, India, Nepal, Bangladesh and up to Myanmar (Wilson

and Reeder, 2005; Perera et al., 2017; Yasmeen et al. 2021). Some populations of Indian pangolin have also been found in southwest China (Roberts and Vielliard, 1971; Perera et al., 2017).

Fig. 2: Distribution of Indian Pangolin (Perera et al., 2017)

THREATS

In the ongoing framework, Indian pangolins are facing increased threats of extinction. Illegal trading, anthropogenic interference and climate change with extreme poaching have led to habitat loss (Challender, 2013; Pietersen et al., 2014; Waterman et al., 2016). Their scales, meat, and skins are of international demand which leads to their killing (Kumar et al., 2018). A Fig. 3 has been designed to show the percentage of different threats.

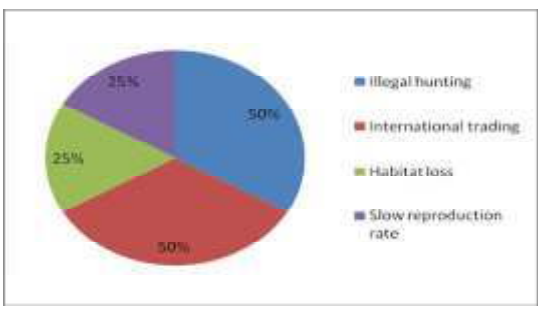

Fig. 3. Graph showing percentages of different threats to Indian pangolin

Illegal hunting

The main threat to this specie is illegal hunting for its scales which leads to large scale international trading. Studies reveal that hunters nationally and internationally trap and kill the Indian pangolins and use different techniques like smoking like smoking and flushing them out with water and trapping them with pitfalls I order to dig it out from its burrows. The seized pangolins are then either killed with boiling water or make them unconscious by beating them hard. Then they remove the scales by skinning or peeling them off. Moreover, people without any fixed habitat that regularly travel from one area to the other called nomads, are also greatly involved in this illegal hunting. They are in usually in direct contact with the dealers who pay a heavy amount of worth PKR 18000-2000 to them for hunted Indian pangolins. According to reports pangolin scales were sold for PKR 1000-2000/kg while live animals were sold for PKR. 50,000-60,000 (Mahmood et al., 2012).

International illegal trading

The demand for pangolin scales has led to illegal trade in the markets of East Asia and South-East Asia mainly China. Scales are used in preparation of Traditional Chinese Medicines (TCM), for making ornaments and other accessories and also for spiritual and ritualistic purposes (Anon, 1992; Boakye, 2004).

Habitat loss

Habitat degradation is another threat to the Indian pangolin and is responsible for its declining population since 2013. The preferred habitats of Indian pangolin includes tropical forests including moist forests, wet evergreen forests, thorn and scrub forests, dry deciduous and mid-elevated grasslands (Chakkaravarthy, 2012). Zoological Society of India (2002) highlighted many diverse factors that lead to the habitat loss of Indian pangolins including rapidly increasing human population density, destruction of natural habitats by humans for settlements, use of pesticides, an increase in the agrarian economy may also be a reason for habitat loss (Waseem et al., 2020). Increased deforestation and increase in the agricultural landscapes characterized by use of fertilizers, pesticides, farm machinery, are destroying its prey which ultimately posing serious threats to pangolins (Umar et al., 2020).

Slow reproduction rate

Indian pangolins are solitary in nature. Only once in a year they meet to mate usually in July to October and the new born pangolin can be observed in

January. They have a litter of one offspring and have a gestation period of more than 80 days and usually give birth in November (Robert, 1997; Mohapatra et al., 2018).

EASY TO HUNT

Indian pangolin can be caught with the help of sniffers dog. If sniffers dog are not available, they can easily be trapped by using pungent smelling pills. As they have extremely strong sense of olfaction, they get attracted to the pills smell and they get forced to move out of their burrows (Mahmood et al., 2012).

The Indian pangolin is a slow mover, fearful and harmless. One more behavior which is responsible for their easy hunt is the ability to roll up like a ball in response some predator. But the poachers recognize them and pick up their rolled body and put them in a sack and thus hunt them easily. (Mohapatra and Panda, 2014).

IMPORTANCE OF SCALES

Indian Pangolin faces a massive pressure of illegal killing due to worldwide demand of scales (Broad et al., 1988; Mahmood et al., 2012).

Fig. 4. Sun drying of Indian Pangolin scales (Traffic, 2019)

The scales of Indian pangolin grow continuously and are composed of keratin of yellow-grey or yellow-brown in color. They are of great medicinal and ornamental throughout the world. They are used in making traditional Chinese Medicines and for making ornamentations and other accessories like jackets, pendants etc. (Anon 1992; Boakye et al. 2004; Challender, 2011; Mahmood et al. 2012). It is also believed that they congeal blood and promote lactation in Asian medicine. Pangolin claws are used to pierce boils or skin abscess by some ethnic groups in India. It is believed that pangolin scales

and claws possess antiseptic properties and therefore these are used to make ointments to heal wounds and inflammations. (Mohapatra et al., 2015). Splenomegaly is being cured by the bile of Indian pangolin in some communities of Arunachal Pradesh, India (Chinlampianga et al., 2013). Moreover, some forest-dwelling tribes in Orissa, India, wear rings made of Indian Pangolin as a remedy for piles (Mishra and Rout, 2009). Nematocidal properties are also believed to exist in Indian Pangolin's scales (Betlu, 2013).

Using the following factor the number of scales was converted to weight (Mitra, 1998)

1 pangolin scale = 10 g

CONSERVATION STATUS

Studies have shown that after 2012, there was a huge rise in crime rate towards Indian pangolin and getting scales for unlawful trading was emerging problem. Before 2011, there was not much knowledge about the importance of Indian pangolin. But with the passage of time, people knew about the importance and delicacy of pangolin scales and meat, which aroused much lust in the local community. It is considered as "endangered" specie by the **IUCN** (Pietersen et al., 2014; Waterman et al., 2014) and being considered in **Appendix I** of Convention on International Trade in Endangered Species of Wild Fauna and Flora **(CITES)**. The IUCN indicated the alarming decrease of half of Pangolin population in time frame of next 21 years; this has raised the need of conservation of this specie against illegal killing (Mahmood et al., 2019).

STATUS IN PAKISTAN

Out of four Asian Pangolin species, the only specie studied in Pakistan is Indian pangolin *(Manis crassicaudata)*, (IUCN, 2008). Local name of Indian Pangolin in Pakistan is "**Salla**" (Prater 1971). It has been found throughout Pakistan But it has its main occurrence in Jhelum, Sialkot, and Gujrat districts in Punjab Province. Meanwhile, it has also been reported over the Salt Range into Kohat area and from Attock to Mardan region territory. In KPK, it has been frequently reported in Peshawar.

In Pakistan, Indian Pangolin has protection under the Islamabad Wildlife Ordinance, 1979 and Khyber Pakthunkhawa Province Act, 1975. It has also been notified in 3rd Edition of Punjab Wildlife Act, 1974 (Amendment 2007) (Waseem et al., 2019).

In Pakistan, there are no reports of pangolin killing for purpose of meat and scale consumption, So international trading is found to be the main cause of

increased poaching (Malunood et al., 2019: Irshad et al., 2015). Major illegal poaching was reported in Potohar Plateau and it was further confirmed in May 14, 2012. In midnight of 13rd May, a Chinese passenger was caught by Shenzhen Bay Customs in China, while he was smuggling 55.997 lb scales of this endangered species from Hong Kong to Shenzhen. The passenger recorded his confession that he unlawfully hunted the Indian Pangolins for scales while working in Pakistan for selling them in China (Mahmood et al. 2012). Furthermore, Beijing customs reported that a criminal gang smuggled a total of 1030 kg scales which later on estimated to be taken from 1660 pangolins from Pakistan (Traffic, 2017: Waseem et al., 2019). During a market survey in 2018, “Thokar Niaz Baig", in Lahore, had also been reported as a highlighted area for smuggling of Pangolin meat and scales as shown in Fig 5 (Waseem et al., 2019).

Fig. 5. *Manis crassicaudata* with its scales reported from Lahore during the market survey in 2018 (Mahmood et al., 2019)

A huge number of local smugglers has been reported from Chakwal District (n=21) and then the graph drop down towards Mirpur (n=9), Rawalpindi (n=8), Jhelum (n=12) and Attock (n= 16) as shown in Fig 6 and Fig 7 (Waseem et al., 2019).

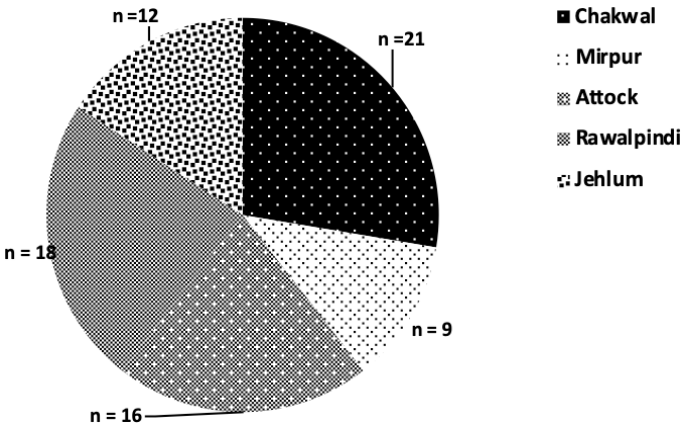

Fig. 6. Records of local hunters involved in illegal hunting of Indian pangolin in Pakistan (n is the numbers of hunters) (Waseem et al., 2019).

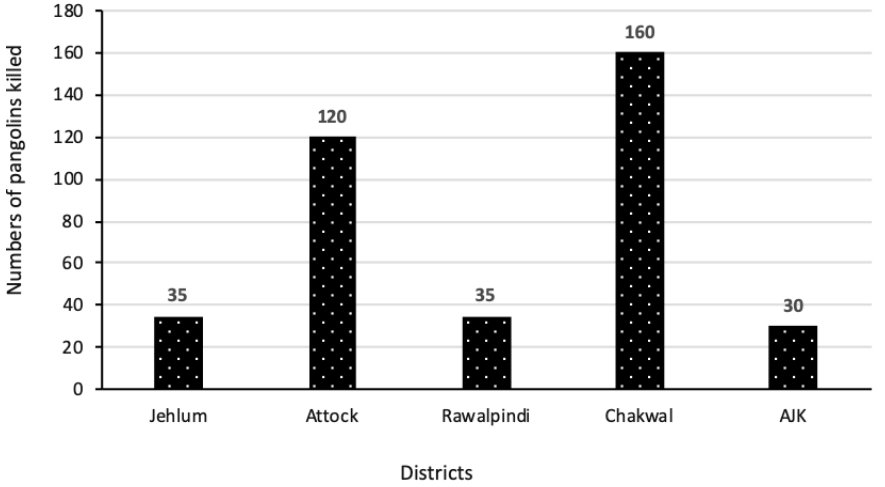

Fig. 7. Number of Manis crassicaudata killed during 2013-2018 (Waseem et al., 2019).

STATUS IN INDIA

India is among the major countries where pangolins are being trafficked. Researches revealed that almost 6000 pangolins are being smuggled in India during the years from 2009 to 2017 (Choudhary et al. 2018; Ghosh 2019). During the last decade from 2009 to 2018 in India, it is estimated that 7500 individuals have been killed for their biological parts (Choudhary et al., 2018). A research was undertaken which recorded 119 pangolin seizures, out of which >7500 kg pangolins were captured for scales, >11 were for meat, >13 were living individuals and >4 were dead animals as shown in Fig. 8 (Kumar et al., 2020).

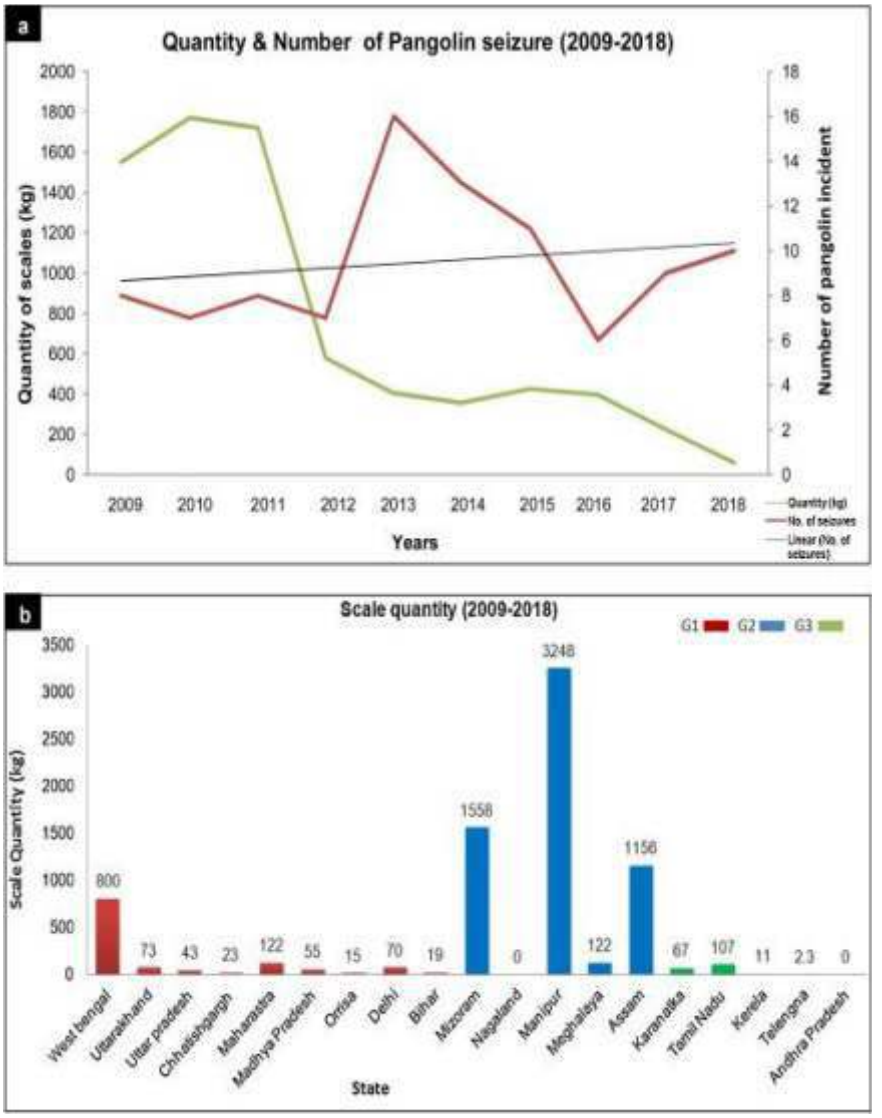

Fig. 8. (a) Yearly pangolin scale seizures from 2009 to 2018 in India **(b)** Scale smuggling in different states of India from 2009 to 2018 (Kumar et al., 2020)

STATUS IN SRI LANKA

In Sri Lanka, Indian Pangolin is the sole specie that exists. Investigations suggest that, Sri Lankans do not consume Pangolin body parts for traditional Ayurveda (Karawita et al., 2016). Instead, local communities consume its meat. For example, in Sri Lanka, there is a "Vedda" community and ethno-archaeological studies suggest that they traditionally consume the flesh of Indian Pangolins. Also, they expertly use smoke to force the Pangolins out of their burrows. (Chandraratne, 2016). Moreover, several

bone parts of the Indian pangolin in a prehistoric cave of Sri Lanka namely "Beli-Lena" have also been found (Kajale, 2014).

Indian pangolin is declared as one of the country's five 'most concerned' animals by The Department of Wildlife Conservation of Sri Lanka (DWC, 2016). Some major causes of Indian pangolin decreasing number in Sri Lanka appears to be illegal trafficking and habitat degradation In Sri Lanka, international trading is not very common however, the major threat is from local hunters (Perera et al., 2020). Sri Lankan Customs (2012 and 2016) have recorded narrowly 3 smuggling cases of scale poaching since 2000 to June 2017 (Fig. 9).

Fig. 9. Scales of Pangolin seized at the Bandaranayake International Airport of Sri Lanka (Sri Lankan Customs, 2017)

DWC and Sri Lanka Customs summarized the Indian pangolin poaching and hunting crimes from the year 2000 to 2018. Total 59 cases were reports, out of which 46 Out of the 59 reported crimes, 46 were of meat consumption and killing. 13 out of these 49 cases were revealed sanctuaries while remaining were from unprotected spots. In 3 cases, India was considered to be the suspected smuggling destination while, in 1 reported case, China was considered to be the intended destination. A major shipping of 11kg pangolin scales was caught by the Sri

Lanka Customs at the BIA (Perera et al., 2017).

Status in Bangladesh

According to investigations (Trageser, 2017), Lawachara National Park still have some species of Indian Pangolin residing in the adjoining protected areas. However, several village surveys suggest that in 2010, high level poaching occurred in most areas of the Chittagong Hill Tracts resulting termination of Indian Pangolin by 2014 (Challender et al., 2014; Ahsan & Chowdhury, 2008). However, some small populations of Indian Pangolin may exist in those areas like forest areas where there is scantiness of trained hunters like forests.

Status in Nepal

In Nepal, pangolin is used for various remedial purposes. Its flesh is considered to be effective in treatment of asthma and rheumatic fever. Similarly, oil withdrawn from its scales is customary to use for bone and muscle diseases (Kaspal, 2010) and women infertility (Katuwal et al., 2013). In Nepal, there is decline in Indian pangolin populations over the years due to Cultural and mythical beliefs of certain tribal communities. For instance, people illegally hunt Indian pangolin for its scales to use them in children's' jewelries as a protection against evil spirits and bringing luck to them (Katuwal et al., 2013).

Nepal Trading status of pangolin is little known. In Sankhuwasava District of Nepal, a study was undertaken to reveal the condition of Pangolin poaching. In this research, trade status was assessed by performing semi-structured questionnaire (n=75) and focus group discussion (n=4) and key respondents Interviews (n=30). Data collected by law enforcement agencies during 2009 to 2017 were also considered in order to get some idea about trade routes. Hunting turned out to be the major threat. Sankhuwasava District is now considered to be the major poaching transit for Indian pangolin (Katuwal et al., 2013).

Conservation plans

- Due to large illegal trafficking of pangolins, coupled with the poor knowledge, the IUCN SSC Pangolin Specialist Group was founded to create a group whose mission was to preserve the species on time.
- In 2015, Pangolin was added on Google in its Earth Day 2015 doodle quiz.
- TRAFFIC undergoes examination surveys of pangolin

trade centers, transportation hubs, high smuggling spots regarding poaching and illegal trafficking of pangolins. In February 2015, TRAFFIC, in partnership with WWF-India and Wildlife Crime Control Bureau (WCCB) commenced an awareness campaign regarding illicit Pangolin hunting.

CONCLUSION

Indian pangolin is concluded to be least studied mammal out of its 8 species. Its population is towards rapid extinction due to illegal national and international poaching. Since 2011, the lust for money and the poverty has diverted the attention of local communities to smuggle Indian pangolin to the peak. It is one of the most frequently encountered mammals seized from illegal traders in South East Asia. Indian pangolin is considered as **'Endangered'** specie by the International Union for Conservation of Nature (IUCN). It has been listed in Appendix I of CITIES. India is being included in the top countries regarding Pangolin's smuggling. The IUCN has projected that the Indian pangolin will decline by about 50 percent over the next 20 years. Indian pangolin is economically very important so there must be proper law enforcement against poaching and illegal hunting as shown in the final flow sheet in Fig 10.

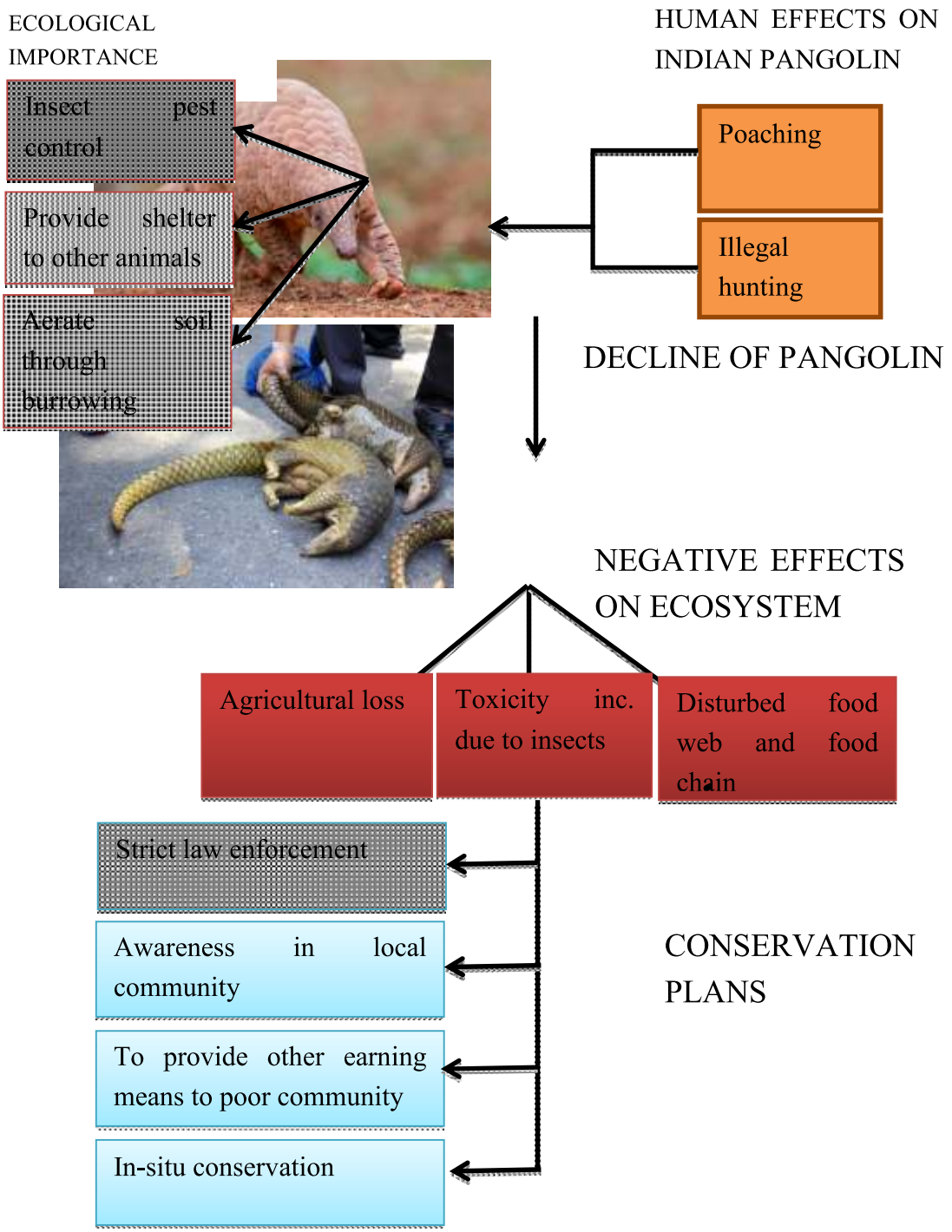

Fig. 10. Flow sheet diagram of Indian pangolin importance and threats to ecosystem.

RECOMMENDED MANAGEMENT PLANS

To tackle the trend of its international hunting, following steps should be taken to protect the Indian Pangolin from further damage:

1. Driving awareness among law enforcement agencies and the judiciary concerning the unlawful pangolin trade all across Asia.
2. Improve co-operation and management among various enforcement agencies for better future planning and working. .
3. In order to control the cross-border smuggling, regional co-operation among South Asian countries should be promoted.
4. India being included in the top countries regarding illegal smuggling, a population census must be commenced there to get an idea of conservation status of wild species of Indian Pangolin.
5. Raise awareness among local communities and the common public of the ecological role played by pangolins in the wild.
6. Rural communities must be provided with alternative means of subsistence to protect Indian Pangolins from slaughtering.

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