

HUMAN – ELEPHANT CONFLICT IN JHARKHAND***K. M. Khan¹,**

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ABSTRACT: The elephant is the largest land mammal of the family *Elephantidae* and order *Proboscidae*. Elephant are big, social, intelligent and nomadic animal. They are one of the largest land animal or mega herbivores so they need to eat a large amount of forage because of this they have to move if they do not found forage inside the forest, they themselves drive out of the habitat raiding agricultural field and grain storage at nearby human habitation. During movement they often move out from protected forest and through narrow tracts of land or corridors to access habitat within their home range. As elephants do come contact with human beings may leads to Human – Elephant Conflict. In India human – elephant conflict is the biggest threats to elephant. The government of India has a policy to conserves the elephant and considers elephant - the National Heritage Animals of India. Ministry of Environment and Forests started project elephant in various elephant ranges. Indian states with elephant have a state level project elephant coordinator from the forest department. The historical range of the elephant in India has shrunk confining them into distinct geographical zones (Fig.1). The elephant habitats in central India is extended over 17,000 km² in Orissa, Jharkhand and southern west Bengal and hold a population of about 2400-2700 elephant (Chowdhury, 2006). Biogeographically, this region falls in the Chhota - Nagpur plateau (Rodgers and Panwar, 1985). During the movement they come into contact with agricultural lands and human settlements (Sukumar, 1989). The human - elephant conflicts is due to economic loss because of crop and property damaged or even loss of human life. Every year, 100 humans (in some years it may be 300 people) and 40-50 elephants are killed during crop raiding in India. Total 576 human deaths due to elephants were recorded during the March 2005- March 2017 (Fig.3). So, inspite of very high human casualties and property damages the tolerance level towards elephants are very high in Jharkhand and elephants mortality is very low if compare to other parts of elephant range in India. Jharkhand face huge financial burden to pay compensation to victims of human elephant conflict. Therefore, Jharkhand need to prepare and implement an effective management strategy to reduce human elephant conflict.

KEY WORDS: Elephant, Conflict, Forest, Habitat, Deaths, Crops, Jharkhand.

1. INTRODUCTION:

1.1 PROBOSCIDEAN:

The elephant is the largest land mammal of the family Elephantidae and order Proboscidea. Elephantidae is the only surviving family of the order Proboscidea, others are now extinct, and members of the extinct order include Dinotheres, Gomphotheres, Mammoths and Mastodons. Elephant evolved at least 50 million years ago currently three species are recognized, the African bush elephant (*Loxodonta africana*), the African forest elephant (*L. cyclotis*) and Asia elephant (*Elephantphas maximus*). Elephant are distributed throughout sub-Saharan Africa, South Asia and South East Asia. Elephant are intelligent animals with complex social structure, and have a long lifespan averaging 60 years or more. Size of Asian and African elephant can be differentiated by five morphological characteristics.

1.2 BACKGROUND OF STUDY:

The Asian elephant (*Elephantphas maximus*) in India occurs in five major fragmented populations with about 25,000 individuals (Bist 2002). Though once ranged over a vast area from Tigris and Euphrates in West Asia to South East Asia (Olivier,1978). Asian elephant is presently confined to Bangladesh, Bhutan, Myanmar, China, India, Indonesia, Cambodia, Laos, Malaysia, Nepal, Sri Lanka, Thailand and Vietnam (Santiapillai, 1987). The historical range of the elephant in India has shrunk confining them into distinct geographical zones (Fig.1). These range in elephant reserves spread over about 110,000 km² of forests in north - east, central, north- west Bengal, north–west and south India (Bist, 2002). The elephant habitats in central India are extended over 17,000 km² in Orissa, Jharkhand and southern west Bengal and hold a population of about 2400-2700 elephant (Chowdhury, 2006). Biogeographically, this region falls in the Chhota - Nagpur plateau (Rodgers and Panwar, 1985). A major portion of the forests of Jharkhand, southern west Bengal and north western portions of Orissa is deciduous. The elephant habitats in Chhota Nagpur plateau are in Palamau, Singhbhum and Dhalbhum forests. The elephant habitat of Jharkhand is about 6000 km² in extent and forms about 37% of the forest in the state holding about 600-700 elephant (Singh and Chowdhury,1999). Orissa has about 57% of elephant habitat in central India and about 1800-2000 elephant are distributed over about 11,000 km² (Swain and Patnaik, 2002). Nearly 44% of the elephant habitats fall within Elephant Protected Areas and rest into the three Elephant Reserves viz. Mayurbhanj, Mahanadi and Sambalpur. The central Indian elephant population has been severely fragmented. The continued shrinkage of the habitat is a major source of conflict between human and elephant. In recent years, increasing human – elephant conflict has been the major issue for the wildlife manager in India (Sukumar,1990; Day,1991; Johnsingh & Panwar, 1992; Daniel *et.al*,1995; Nath & Sukumar, 1998; Easa and Sankar, 1999). The state of Jharkhand is situated between 23° 21' 0" N latitude and between 85° 19' 48" E longitude. Jharkhand has a common border with neighbouring states mention in (Fig.2). Jharkhand is surrounded by Bengal, Orissa, Chhattisgarh and Bihar respectively. Elephant also strayed out from their natural habitat in the neighbouring state of Orissa and Bengal and migrated to the nearby forest of Jharkhand. During the last few decades, elephant habitats in Jharkhand, Bengal and Orissa have become degraded remarkably due to illegal felling, encroachment and mining (Singh and Chowdhury, 1999). Villages around in the different forest divisions in Jharkhand faces serious problem of human-

elephant conflicts. Every year large number of human deaths is due to human elephant conflict in Jharkhand.

1.3 THREATS AND CONSERVATION ISSUES:

Elephant are big, social, intelligent and nomadic animal. They are one of the largest land animal or mega herbivores so they need to eat a large amount of forage because of this they have to move, if they do not, they themselves drive out of a habitat raiding agricultural field and grain storage at nearby human habitation. It is part of a natural cycle for elephant to move locally across traditional tracks and return to the same forests once natural regeneration has brought back their food resource. They may range over 300-5000 sq. km annually. During movement they often move out from protected forest and through narrow tracts of land or corridors to access habitat with in their home range. This leads to cause human elephant conflict. In some parts of the India, the elephant habitat itself surrounded by human pressure, including agricultural field at the verge of elephant protected area, tea plantation, orchards, linear developments such as roads, railways tract, mining, construction of dam, extraction forest resources and human settlement, that leads to daily conflict. While today in India human – elephant conflict is the biggest threats to elephant, poaching for the tusks of male elephant for the illegal ivory trade continuous to be a big threat. Several reports reveal that in India every year over hundreds of elephants were killed for tusk. An elephant killing was reported peaking in the 1990s; this has come down drastically after taking initiative measurers taken by Indian government under the umbrella of project elephant. But pressure still exists because of high demand of ivory for Chineses medicine and use of ivory in signature seal (Hankos) in Japan. The government of India has a policy to conserve the elephant and considers elephant - the National Heritage Animals of the India. Project elephant was launch by the Ministry of Environment and Forests of India since 1992. Indian states with elephant have a state level project coordinator from the forest department. Many governments leading conservation organization and NGOs actively conserve elephant, under Elephant task force.

1.4 HUMAN – ELEPHANT CONFLICT:

Human – elephant conflict poses a considerable threat to the Asian elephant population, which is highly threatened due to habitat loss, fragmentation of forest and corridor encroachment. The extensive alteration of elephant habitat by the human population is constricting the species into small pockets of land that are connected only by agricultural lands and human settlements and these pockets are hardly adequate to meet the food and water requirements of the elephant. As elephant have very distinct patterns of movement by which they seasonally utilize the optimum habitats, it is likely that during this movement they come into contact with agricultural lands and human settlements (Sukumar, 1989). The human - elephant conflicts is leads to economic losses because of crop and property damaged or even loss of human life. Elephants and humans interact when elephants raiding crops, leads to human injuries and even human deaths during elephant drive from their agriculture field. Elephants are also killed due to retaliation and sometimes by poachers for ivory. Every year in India elephants cause damage amounting from a few thousand dollars to millions of dollars. Every year, 100 humans lost their life (in some years it may be up to 300 people) and 40-50 elephants are killed during crop raiding in India.

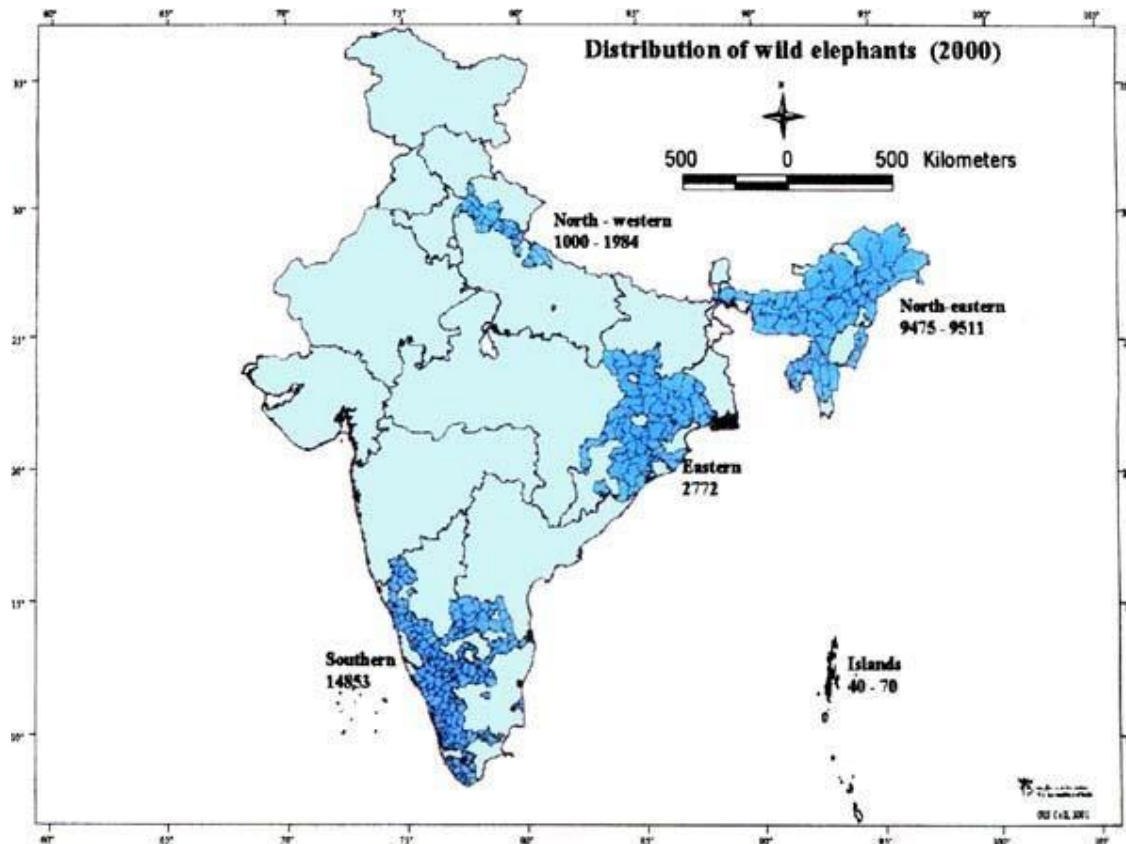


Fig.1. Distribution ranges of elephant in India.

Source: WII

2. OBJECTIVE:

The Asian elephant, once prevalent throughout many areas of India, is now listed as an endangered species by the Indian Government and included in the International Union for the Conservation of Nature (IUCN) Red List. Asian elephant populations have declined 50% over three generations and now number only around 40,000. Asian elephant faces its own unique threats to its continued existence. The Asian elephant is a “keystone species” meaning they play a crucial role in the ecosystem because they help to maintain forest clearing and distribute the seeds of trees and shrubs. For conservation prospective Asian elephant is very important. One of the major problems in conserving and managing large mammal species is the lack of reliable quantitative information regarding human-elephant conflict, animal movement pattern and threats, using for the effectiveness of management practices can be assessed and consequently goals set for the future. In case of elephants specially in highly endangered species, elephant which are facing severe threats due to conflict with humans and every year hundreds of people are dying in Jharkhand due to elephant. The main objective of this study is to address the human-elephant conflict in Jharkhand and mitigation measures taken by villagers and forest department. Management of HEC through the understanding movement patterns of elephant in Jharkhand. It is important to understand that human and elephant share the same landscape, HEC can never be eliminated but it can reduce. The objective of any HEC mitigation

measures should be to minimize the conflict and reduce the human deaths. From conservation perspective addressing HEC is important. Communities facing HEC would usually be unable to tolerate elephant until the conflict can be minimized to a tolerable level.

3. METHODOLOGY:

3.1 Secondary data on HEC were collected from different forest divisions of Jharkhand. On the basis of data analysis most affected forest divisions survey was done on the basis of low, medium and high levels of conflict. Most affected forest divisions were surveyed and villagers were interrogated. Mitigation measures taken by villagers and forest divisions were inspected. Through questionnaire, survey information was collected on human deaths and elephant deaths.

3.2 Field surveys were conducted on the basis of secondary data collected from forest department. During the survey, basic information was collected through direct sightings and from indirect evidences. Elephant entry points in different forest divisions and source of population was identified. Affected areas were check for elephant evidences (crop and house damages, foot prints and dung shown in Plate – 1-5) either on foot or by vehicle. Information on the presence of elephant in some areas were obtained from interviews with local people and forest staff. Status surveys involved more intense tracking of elephant routes to assess distribution, habitat availability, quality and threats within the surveyed areas. Discussions were also held with the forest officials on the issue and primary data was collected.

3.3 The movement path of elephant in the areas were be recorded with GPS and plotted on a map. The responses of the local people towards the elephant were also assessed from the affected forest divisions. All evidences were properly documented with photograph during the study.

4. RESULTS AND DISCUSSIONS:

As per census of India 2001, Jharkhand has a population of 32.96 million. Forests in Jharkhand contribute a very rich biodiversity. In Jharkhand, forests form an integral part of the socio-economic setup and largely contribute towards the economy of the state. Forests in Jharkhand spread over an area of 23605 square kilometres, which constitutes about 29.61% of the total area of Jharkhand. Moreover, out of the 23605 square kilometres of forests, 82% of area falls under the protected forests, whereas 17.5% come under reserve forest. Jharkhand is administrated by 24 districts, out of 24 districts approximately 2300 - 2266 villages of 23 districts of Jharkhand are less, moderately or severely affected due to Human – Elephant Conflict. Affected areas of Jharkhand due to Human – Elephant Conflict are well marked in the (Fig. 2). Out of which, Ranchi Forest division attributed highest deaths (n=89) followed by Khunti (n= 79) and Saraekela (n=70) from March 2005 to March 2017 shown in (Fig.3) between the period of twelve years. Among the forest divisions, Ranchi Forest division attributed highest proportion of human casualty (14.06%) caused by elephants followed by Khunti forest division (13.7%) and Saraekela (12.5%). The lowest proportion of deaths was recorded in Saranda Forest division (1.21%). The average yearly casualty was between 40-45 deaths shown in (Fig.4). The trend has dissimilar changed as 68 human deaths were occurred during 2005 and the subsequent years of 2008 to 2010 the casualty ranged from 50-56. Similarly, most of the victims were recorded outside of the forest areas during March 2005- March 2017, in contrast most of the victims

were recorded outside the forest (human habitations, agricultural lands, villages, barren lands and any sort of lands located outside the boundary of reserved and protected forests) areas since March 2005. Most of the human deaths were occurred outside the forest areas contributed (89.2%) and considerable human deaths were recorded inside the forest areas during the firewood collection or primary forest products were (10.8%) shown in (Fig.5). The casualties were recorded, varies due to landscape, movement pattern of elephants and cropping pattern in different forest divisions of Jharkhand. The time of deaths caused by elephants were recorded during the study. Most of the incidences occurred during night. In spite of huge loss of human life, casualties and properties damaged, only 30 elephant deaths were recorded from 2004 to 2017. The main cause of deaths, were due to were diseases or natural deaths (n=12) and also due to other factors such as electrocution (n=7) and followed by poisoning (n= 2), poaching (n=4) and due to train hits (n=7). The present study in various forest division of Jharkhand on HEC found that totally 576 people killed by elephants while only 30 elephants were reported dead between March 2005 and March 2014. The trend of human deaths over the last 12 years clearly revealed that drastic increased human elephant conflict in Jharkhand. In spite of human casualties and property damages shown in (Plate- 1-4) the tolerance level towards elephants is very high, if compare to the other parts of elephant range in India. This is a good sign for the conservation point of view, and the authorities would do well to take this advantage into account and consider local communities into confidence while preparing collaborative conservation plans to ensure long-term survival of Asian elephants in the region and country as well. The present study findings are compared with the various studies that were conducted in different part of the elephant ranges of India by Datye & Bhagwat (1995) recorded most of incident occurs in Dalma Wildlife Sanctuary Jharkhand during the day time within the forest during the fire wood collection. North eastern of India severely affected by human –elephant conflict (Williams, A.C. and A.J.T. Johnsingh (1996). Sukumar (1989) pointed out that of 123 human mortality cases reported in the Karnataka, 55% occurred in forests during the day and 45% in settlements at night. Similar findings recorded by Sukumar et al. (2003) in north Bengal (Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary), that 75% occurred in crop lands and villages and the rest in forests during 2002-2003. On contrary finding of Datye & Bhagwat (1995) shows that 24 out of 25 human deaths occurred within the forest in Dalma Wildlife Sanctuary. Another study by Nath & Sukumar (1998) in Kodagu district, Karnataka indicated that most adverse elephant-human interactions took place within the forest or along the boundary. The accounts of the circumstances in which people have been killed or injured by elephants include, farmers/dwellers attempting to defend their crop near settlements, entering forest for collection of fire wood and forest produce, passing through forest and bush and often intoxicated unaware of proximity of elephants (Thouless, 1994; Datye and Bhagwat, 1995; Sukumar, 1989). The age category of victims revealed that 41-70 age class people were highly affected outside forests (77%), whereas 41-50 age class people were more affected inside forests (42%). In terms of sex category, more men (78%) were killed by elephant irrespective of location. Bist (2002) recorded that an average of 41 elephants died annually due to human–elephant conflict with poisoning taking the major share (61%) followed by electrocution (39%). The intensity increased during 2002–03 as 53 elephants died due to electrocution and poisoning across India (Project Elephant 2009) accounting for 36% of total elephant mortality recorded during that period. Conclusion and management implications of human deaths caused by elephants were increased drastically in last five years in Coimbatore Forest Division. This negative experiences and fear of the elephant is likely to create a more negative attitude

among the people. If this negative trend continues further, elephant conservation in this region would be a very tough challenge for the managers, elephant scientists and conservationists in forthcoming years. A total of 133 elephants died due to various causes such as train hit, slipped from slopes, disease, natural death and electrocution in Coimbatore Forest Division between 1999 and 2014. Of these 24 elephants died due to electrocution that accounts for 67% male and 33% female. Sukumar (1989) recorded elephant deaths of at least 3-8% male and 17-19% female in various crop protection measures out of the total elephant death from state of Tamilnadu and Karnataka between (1975 -1987). A recent study of Ramkumar & Ramakrishnan, B et al., (2007- 2014) found that even Elephant proof trench is not very affective to reduce conflict and revealed that even though HEC is in increasing trend over the years near forest areas in Coimbatore Forest Division. The main reason behind conflict in Jharkhand is crop damage, property damage and loss of human life which leads to antagonizing human towards elephants. Rice is the staple food of the people of Jharkhand, all farmers predominantly cultivate paddy. Most of the tribal people live below the poverty line with paddy cultivation being their sole income source. The majority of farmers practice one time, rain –fed farming which is the only source for subsistence. Thus, even slight damage to the crop is problematic for farmers. Crop raiding by elephants has been recorded from most part of the Jharkhand. Compensation claimed for crop damage increased each year. So, inspite of very high human casualties and property damages the tolerance level towards elephants are very high in Jharkhand and elephants mortality is very low if compare to other parts of elephant range in India. Jharkhand face huge financial burden to pay compensation to victims of human elephant conflict. Therefore, Jharkhand need to prepare and implement an effective management strategy to reduce human elephant conflict. Beside human elephant conflict other wild animals also cause deaths of human followed by Bear, Hyena and wild boar.

5. SUGGESTIONS FOR REDUCING HUMAN – ELEPHANTS CONFLICTS IN JHARKHAND:

- (I) This is recommended that an early warning system about the presence of the elephant, may be required for the villagers who live close vicinity to the elephant range areas that will ensure more protection.
- (II) Secure elephant's corridor in Jharakhand and its neighboring states W. Bengal, Orissa and Chattisgarh.
- (III) Inspite of severe conflict most of the people in Jharkhand has positive attitude towards elephant conservation. So, management strategies should emphasize in affected forest divisions aimed to regulate land use patterns at least 2 km from forest boundary.
- (IV) Habitat improvement in forest foothill and detailed research on factors which enhance conflict
- (V) At least 500m from all corridors should be freed from all sort of physical barriers and corridors must be secure for the free movement of elephants.
- (VI) Driving squad for elephants must be stopped because this led to divert natural movement of elephants and created more rampage by elephants.
- (VII) Water holes should be constructed along every 5 km in the forest foothills during summer or dry seasons to reduce the dependency of water requirement for elephants to move further near the human habitation areas.
- (VIII) Monitoring of movement pattern of elephants throughout the years.
- (IX) Evaluate landscape level of utilization by elephants and cropping patterns in Jharkhand.
- (X) Evaluation of elephant's habitat.
- (XI) Compensation scheme should be properly implemented.
- (XII) HEC awareness campaign should start in affected villages.

(XIII) Elephant movements monitoring squads should be formed with the collaboration between neighbouring state viz. W. Bengal, Orissa and Chattishgarh and share information of elephant’s movement with each other.

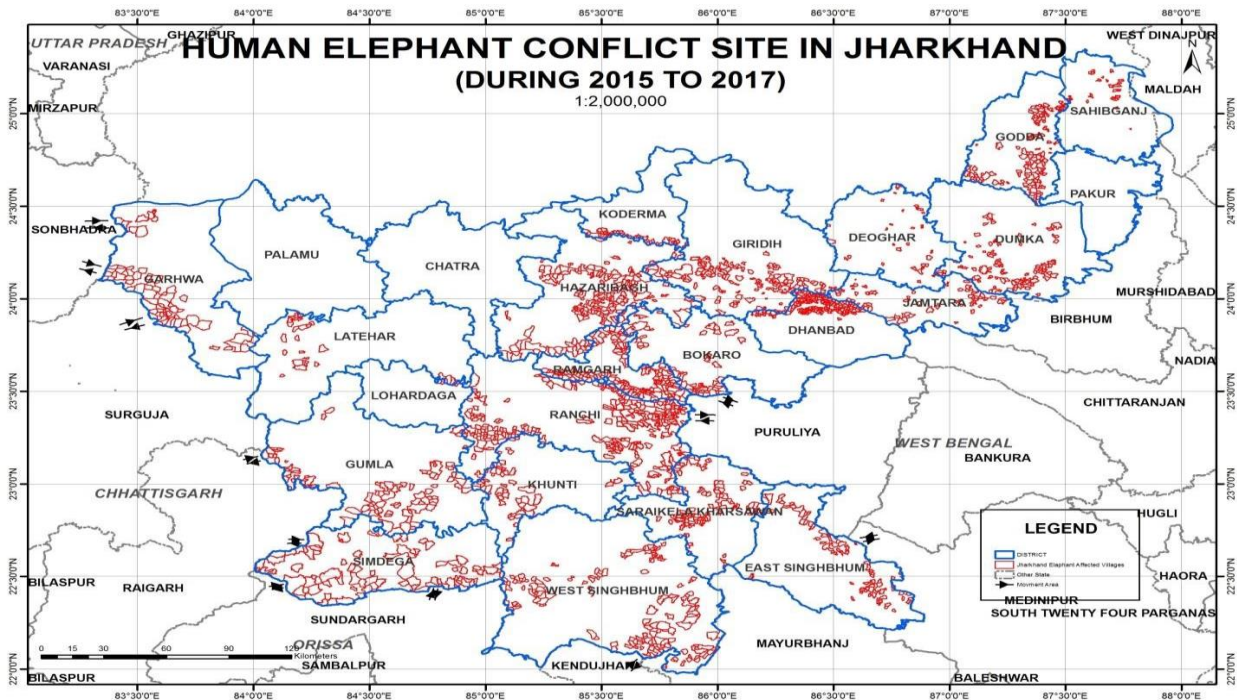


Fig. 2 GIS Image of Human-Elephant Conflict sites in different forest divisions of Jharkhand.

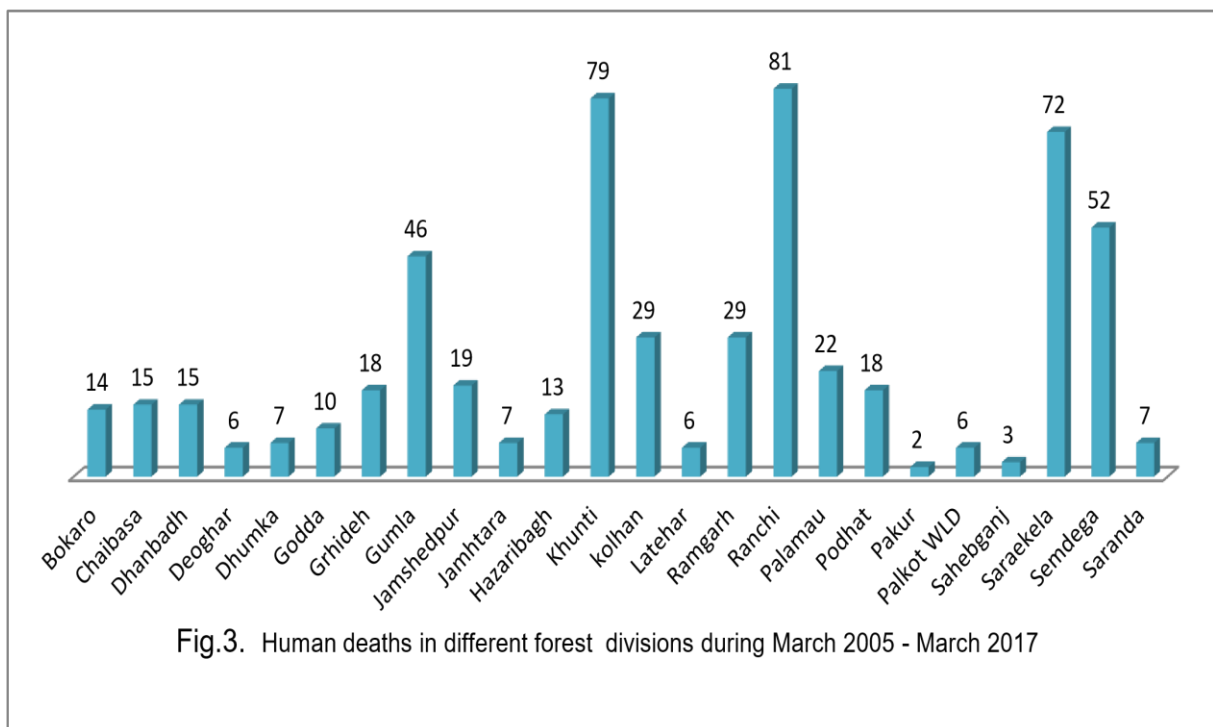


Fig.3. Human deaths in different forest divisions during March 2005 - March 2017

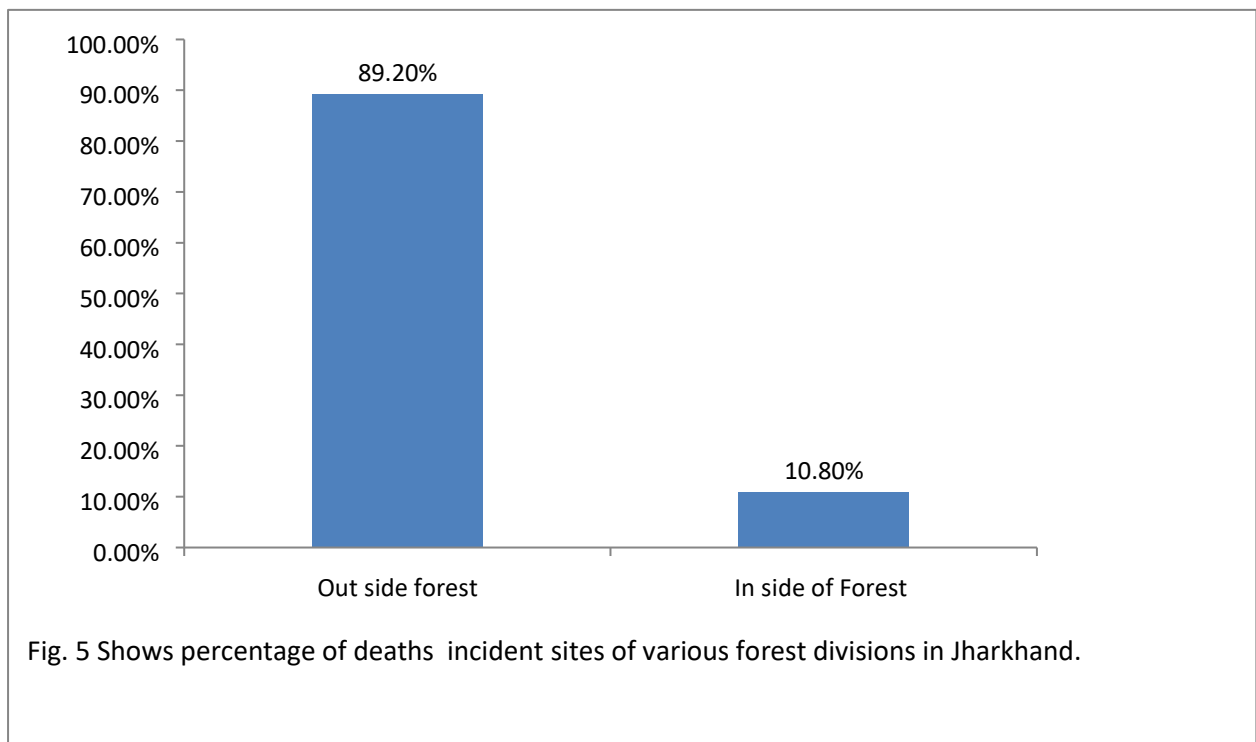
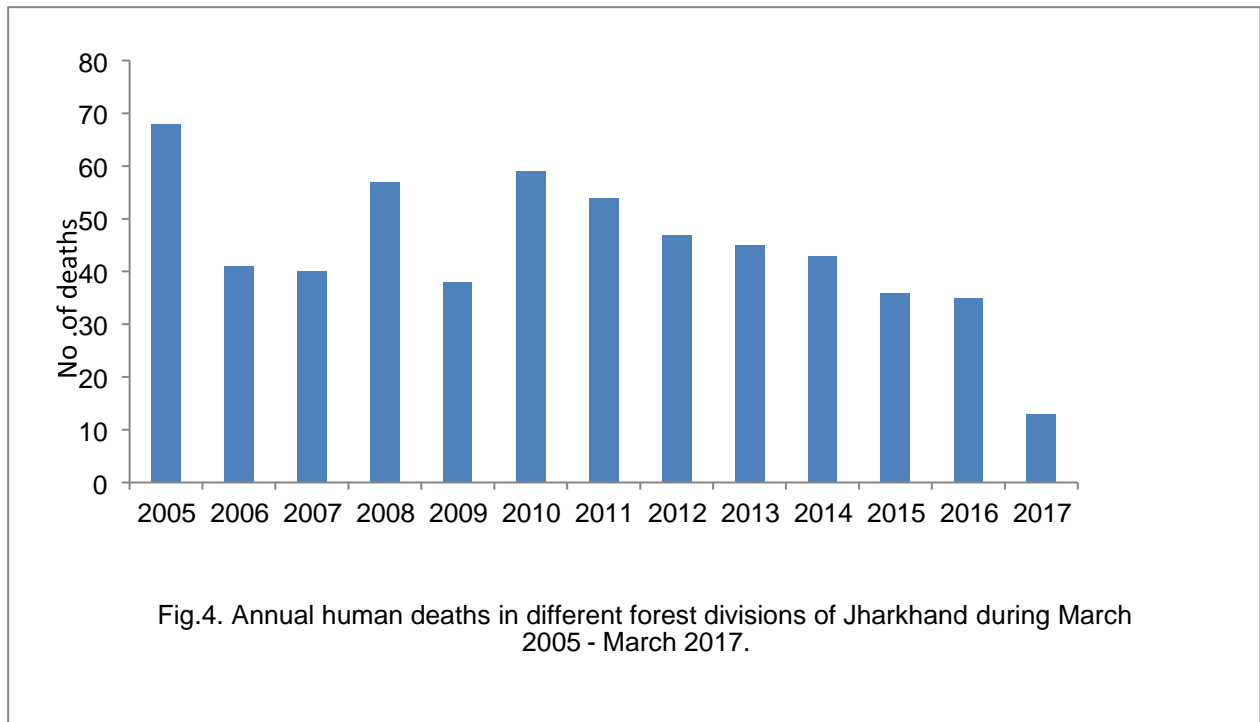




Plate –1. Shows house damaged caused by elephant.



Plate – 2. Shows crop damaged caused by elephant.



Plate – 3. Shows elephant foot prints in the agricultural field.



Plate – 4. Shows house damaged caused by elephant.

ACKNOWLEDGEMENT:

I am highly grateful to UGC to sanctioned fund to initiate scientific study of Human – Elephant conflict in Jharkhand. I am also grateful to the Principal Chief Conservator of Forests and Chief Wildlife Warden, Government of Jharkhand, IFS, District Forest Officers, various Divisions for permission to use the information on HEC and all other logistic support. I would also thanks to my Principal, HOD, Colleagues, family members and field assistants for their support and cooperation during the study.

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