IJASRM
International Journal of Advanced Scientific Research and Management, Volume 3 Issue 9, Sept 2018
www.ijasrm.com
ISSN 2455-6378

Spatial-Temporal Stakeholder's Tolerance Intolerance Level towards Elephant Conflicts in Coffee Agroforestry land use in Kodagu District, Karnataka, India.

Thammaiah, C.K. [1], Vijaya kumara [2]

[1] Department of Wildlife and Management, Jnana Sahyadri, Kuvempu University, Shimoga-577451, Karnataka, India

[2] Department of Wildlife and Management, Jnana Sahyadri, Kuvempu University, Shimoga-577451, Karnataka, India

Abstract

Conservation of elephant in the area where they damage and raid crops in human cultivated settlements have more priority for human-elephant conflicts mitigation measures and stakeholder needs, to know the tolerance level through over the time and distance. We have interviewed 90 stakeholders in study area which is buffered into three zones of 500 meters each away from the forest boundary up to 1500 meter, within the coffee plantation 94.4% stakeholders were intolerable for human-elephant conflicts, 26.3% are helpless and 18.9% respondent said both intolerable and helpless for the elephant presences and crop damage. Three stakeholders facing the issue for 0-5 years, 35 respondents have the issue for 6-10 years 32 people are facing conflicts for 11-15 years and four stakeholders reported more than 21 years. Our results highlight the zone where 0-500 meters facing the issue for 11-20 years reported intolerance and helpless less the 100% in the zones of 500-1000 and 1000-1500 reported 100% intolerance. As the conflicts are older intolerance level reduces and when the elephant conflicts are new to the area intolerance are in the higher level.

Key Words: *Human-elephant conflict, Tolerance, Intolerance Stakeholders, Kodagu.*

1. Introduction

Human practising agricultural in twentieth-century are facing continuous elephant conflicts in the farmland (Brown 1968; Kinloch 1972; Parker 1983; Parker & Graham 1989; Eltringham 1990; Barnes 1996) feeding on wide range of cultivated food crops and damaging food storage, water pipeline, ponds for agricultural fence barriers also cause injury and death to human are the problematic elephants extend their home range into human settlements (Hoare 1999). Mitigation measures have limited success due to the loss of elephant habitat and increasing in agricultural cultivation (Bell 1984; Hoare 1995). In elephant conservation and habitat, more priority is given to human-elephant conflicts as a major concern (Dublin 1994; Kangwana 1993) because it is both social and economic effects on the human and elephant. In recent years human-elephant conflicts issue is getting more political interest due to the widespread publicity (Hoare 1999) Africa savannah elephant shows a seasonal peak conflict in wet season because of the maturing of food crops in the wet season (Tchamba 1996; Kiiru 1995; Hoare 1995 Kangawana 1993). Increasing in elephant density resulting in increasing in crop raids due to loss of elephant home range (Barnes; Asika, Asamoah 1995) if elephant density remains static for many years but the loss of elephant home range increase the probability of facing conflicts and increasing in crop raids (Barnes; Asika, Asamoah 1995; Sukumar 1991). Increase in deforestation is the result of increase in human population for expansion of forest for cultivation and settlement (Hoare 1999), apart from the crop losses property damage and human lives injury and death many of the species still survival due to the tolerance for the species by the human (Krithi 2003) A known fact to accepted is people living in forest boundary are facing conflicts in increasing rate (Terborgh 2002; Karanth 2002; Saberwal & Rangarajan 2003; Rodger et al 2003). Merged village boundary in Bhadra Tiger Reserve evidence wild boar and elephant raiding crops up to 73% in their farms (Krithi 2003).

IJASRM
International Journal of Advanced Scientific Research and Management, Volume 3 Issue 9, Sept 2018
www.ijasrm.com
ISSN 2455-6378

2. Materials and Methods

2.1Study Area

Coffee cultivation in India has a total land area of 55.5% these are fall in Karnataka, Kodagu district (75^o 25'- 76^o 14 E, 12^o 15'- 12^o 45 N) has upper hand in coffee cultivation with 53% (Deepika & jyothishi 2013). Kodagu is surrounded by forest in all side living small gap in the south and north part of the district (Fig 1). Kodagu lies at the centre of the Western Ghats in the southern tip of Karnataka adjoin to wynad district of Kerala, it has four major type of vegetation evergreen, semi-evergreen forest type found in the western side of the district, dry-deciduous and moist deciduous found in central, northeast and east part of the Kodagu district (Elouard 2000). Kodagu district is a hilly region with low land for paddy cultivation and upper land planted with coffee, Araca, Black Pepper, Cardamum along with native forest trees as the shade for crops. The study area has a common boundary with Brahmageri wildlife sanctuary which has the forest cover of evergreen to semi-evergreen in the low area towards the boundary and shola grassland in the upper hill of the sanctuary, Brahmageri wildlife sanctuary holds a good number of an elephant which results in conflicts in neighbouring villages. Forest cover is dense compared to other districts in Karnataka evergreen forest consists of 49.45%, deciduous forest 19.17% dry-deciduous forest 10.85% and semi-evergreen forest 1.94% of the total forest cover (Pramod et al 2012).

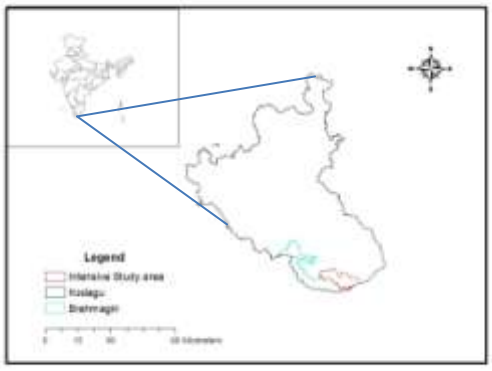

Fig. 1 Map of Kodagu district showing Brahmageri wildlife sanctuary and intensive study area.

2.2 Methods

The study conducted in Kodava regional language with a mobile application called Kobo Tool Box; questionnaires were uploaded to the application which helped in the easy and paperless process of the data collection and feature analysis. For the study we consider parameters like the location of the house to know the how far the stake-holders is away from the forest boundary how long conflict exist in his estate, responses towards the conflicts (Tolerance, Intolerance, Helpless and both Intolerance and Helpless) to the issue. Three layers of the buffer are layered with the interval of 500 meters each up to 1500 meters from the forest boundary toward the coffee plantation; this is to know how people are tolerance for the conflicts when they fall near to the forest boundary within 0-500, 500-1000 and 1000-1500 mts away from the boundary using *Arcmap 10.3* software (Fig 2).

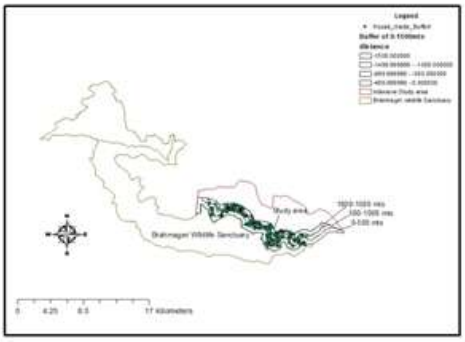

Fig. 2 Map of study area with 500 meters interval of buffer with Brahmageri wildlife sanctuary.

2.3 Data analysis

To evaluate the tolerance level of stakeholders we have consider how long the stakeholders are facing the conflicts and what do they express to the issue. To know how spatial variation in the tolerance level when an elephant enters into the new area creating the damage we have layered the buffer in three level 0-500, 500-1000 and 1000-1500 meters away from the forest boundary. There was the difference in a number of the house in three buffer zones 0-500 mts 61 houses 500-1000 mts buffer 145 houses and 1000-1500 mts buffer zone had 103 house which was marked in Google earth software and ground truth the marked house, so we have considered 30 houses in each buffer zones to an interview the stakeholders. The question we based on "do you tolerate the elephant damage to your property or estate; respondents answer could be "yes or no". Is it elephant conflicts is an intolerable issue for you respondent answer could be "yes or no". another question we asked the stakeholder is since when was the first time you face the elephant conflicts in your estate answer is in number if the stakeholder says a year(eg since 2005) of conflicts stated then the sum years are taken in the count if the answer is a total number of years facing the conflicts.

IJASRM
International Journal of Advanced Scientific Research and Management, Volume 3 Issue 9, Sept 2018
www.ijasrm.com
ISSN 2455-6378

4 Results and Discussion

A total of 90 interviews were conducted from the study where the ages are 18-65 years old. The boundary was very clear in the study area were a solar fence and elephant proof trench was digged along the boundary. A 500 meters buffer was layered from the common boundary of the forest and estate up to 1500 meters from the forest boundary toward the coffee plantation till the elephant has raided the crops. In each buffer zone, 500 mts 30 individuals were interviewed as there was an increase in a number of houses as the forest boundary was away in the buffer zone of 0-500 mts 61 houses 500-1000 mts 145 houses and 1000-1500 mts buffer 103 houses. Most of the respondents are intolerable up to 94.4% for human-elephant conflicts respondent feels helpless are 26.3% and few stakeholders reported both intolerable and helpless 18.94% for the elephant crop damage and presence of elephant apart from the zone difference (Fig. 3).

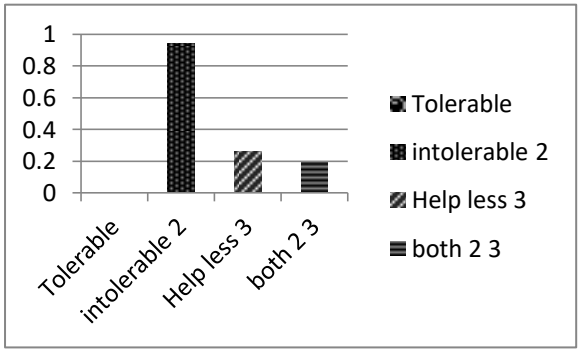

Fig. 3 Graph represent total percentage of intolerable helpless and both.

In the first zone of 0-500 mts near to the forest boundary stakeholders reported intolerable of 83.3% helpless of 66.6% and both 46.6% compared to the zone of 500-1000 mts 1000-1500 mts reported 100% intolerable and 13% each of helpless and 1000-1500 mts zone stakeholder reported intolerable only because they are new to the issue (Fig 4).

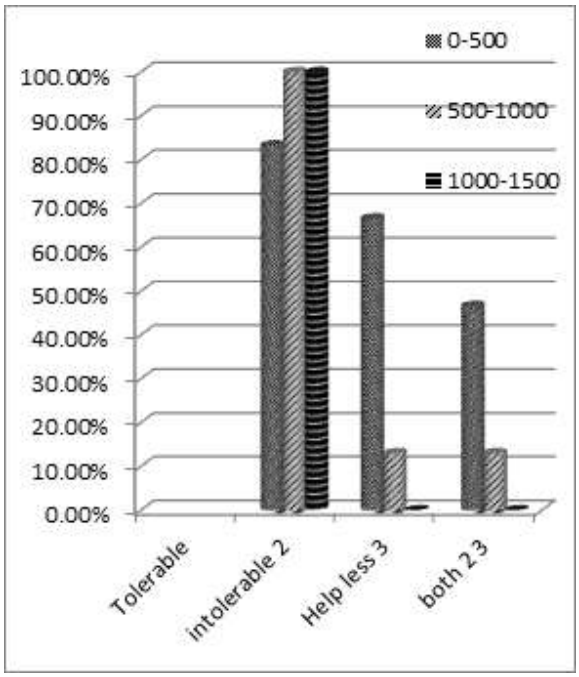

Fig. 4 Graph representing buffer zone stakeholder views towards elephant conflicts.

We have categorized years into five levels 0-5 years 6-10, 11-15, 16-20, and 21 years and more, 3 stakeholders reported elephant conflicts from 0-5 years, 35 stakeholders facing the issue from 6-10 years, 32 stakeholders are facing the conflicts 11-15 years, 16 stakeholders reported between 16-20 years and 4 stakeholders facing as old as 21 years and more. Zonally divided data shows that stakeholder in the first of 0-500 mts are older to the conflicts with 4 stakeholders reported more than 21 years 11-15 years reported by 11 stakeholders and 15 stakeholders reported 16-20 years than that of other two zones with 6-10 years 8 stakeholders 11-15 years 21 stakeholders 1 stakeholder reported 16-20 years in the zone of 500-1000 mts. In the zone of 1000-1500 mts 0-5 years 3 stakeholders 6-10 years by 27 stakeholders and all other zero which says that in the zone of 1000-1500 mts the conflicts are new to that stakeholder than the near to the forest boundary (Fig 5).

IJASRM International Journal of Advanced Scientific Research and Management, Volume 3 Issue 9, Sept 2018
www.ijasrm.com
ISSN 2455-6378

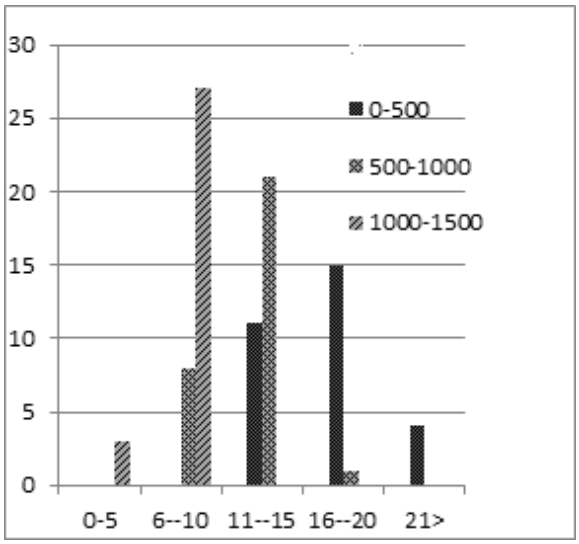

Fig 5 Graph showing number of year's stakeholders facing conflicts in their estate.

But there is relation in old the conflict intolerable level is reduced to 83.3% helpless to 66.6% and both 46.6% in the 0-500 mts as they are facing the conflicts for past 20 and more years where other two zones show 100% intolerance, helpless 13%, and both 13% in 500-1000 mts and 0% of helpless and both in 1000-1500 mts of zone for facing the issue for 0-15 years.

4.1 Discussion

Human-elephant conflicts are older issue for the stakeholder where they are near to the forest boundary and tolerance level have reduced than compare to the other two zones this is due to the unsolved issue of human-elephant conflicts for 20 and more years. In Virajepet division conflicts incident reported increased over the past years (Bal, Nath et al 2011). in another study in Kodagu region concentrated to the south of Kodagu in Verajapet division stakeholder interview suggested that visit of elephant towards the estate other cropland are old phenomenon (Bal, Nath et al 2011) present study shows similar kind of result indicated the conflicts are of 15-20 years and more. Kodagu is a coffee growing district along with the agroforestry which is cash crop; this could be a reason where they face huge losses. In Uganda Bundongo forest reserve where sugar cane was promoted as a cash crop village around this reserve forest killed one chimpanzee that was not heard of in 10 years ago when they were growing maze cobs or fruits people showed great tolerance towards the chimpanzees (Catherine M. 2004) there is a significant level tolerance of crop damage by the domestic animals but shows intolerance for the crop loss by wildlife (Hill 1998; Naughton, Treves et al 1998). Conservation policy and practices have discouraged and prevented frames for taking any direct against crop raiding species where they expect the government come under action to provide the crop protection against wildlife (Campbell 2000; Knight 2000; Naughton, Treves 1999) this reason have more percentage of intolerance in all the zone 85% and helpless 24%, in this area there was no incident of human death and elephant death if the conflicts continuousness and increases causing the death of human then there might be a chance of elephant death as the tolerance may peak with the stakeholders.

5. Conclusions

Rural people's livelihood have the significant impact by the elephant conflict by crop raid and damage to the property, it is important for the conservation of the elephant and its habitat for the growing population of human and demand for the space for both the species. As the stakeholder are helpless and intolerance for a long period there will be loss of lives for both side forest department should work towards the people to conserve the elephant and fast implementation of new or improvised mitigation measures.

References

[1] Bal, P., Nath, C. D., Nanaya, K. M., Kushalappa, C. G., and C.Garcia, Elephants Also Like Coffee: Trends and Drivers of Human–Elephant Conflicts in Coffee Agroforestry Landscapes of Kodagu, Western Ghats, India. Environmental Management 48:263-275 (2011).
[2] Barnes, R.F.W., The conflicts between humans and elephant in the central African forests. Mammal Review 26:67-80 (1996).
[3] Barnes, R.F.W., Asika, S., Asamoah-Boateng. B, Timber cocoa and crop-raiding elephant. A preliminary study from southern Ghana. Pachyderm (1995).
[4] Bell, R., The man-animals interface: An assessment of crop damage and wildlife control. Paper present at the peace corp seminar, conservation and wildlife management in Africa, Malawi (1984).
[5] Brown, D.W.J., Game control in Kenya East African, Agriculrural and Forestry Journal Special Issue 209-212 (1968).
[6] Campbell, B., Animal behaving badly indigenous perceptions of Wildlife protection in Nepal. In J. Knight(Ed), Natural Enemies. People- wildlife Conflicts in Anthropological perspective London: Routledge. 124-144 (2000).
[7] Catherine, M. Hill, Farmers' Perspectives of conflicts at the wildlife-Agriculture

Boundary: Some lessons learned from African subsistence farmers, Human Dimension of wildlife, 9:4, 279-286 (2004).
[8] Dublin, H.T. In the eye of the beholder: our image of the African elephant. Endangered Species Technical Bulletin, 19, 5-6. (1994)
[9] Deepika, M. G., Amolendu, Jyotishi, Assessing risk and risk mitigation strategies of small coffee growers. A study of Kodagu districts in Karnataka. Northwest rural Public Power District (2013).
[10] Elouard, C, Guilmoto, C., Vegetation features in relation to biogeography. In: Ramakrishnan PS, Chandrashekara UM, Elouard C, Gulimoto CZ, Mailkhuri RK, Rao KS, Sankar S, Saxena KG, (ed) Mountain biodiversity land use dynamics and traditional ecological knowledge. UNESCO, Oxford and IBH publishing, New Delhi, 25-42 (2000).
[11] Eltringham, S. K., Wildlife carring capacity in relation to human settlement. African protected area conservation and science (1990).
[12] Hill, C. M., Conflicting attitudes towards elephant around the Budongo Forest Reserve, Uganda. Environmental Conservation, 25, 244-250 (1998).
[13] Hoare, R., Option for the control of elephant in conflicts with people. Pachyderm (1995).
[14] Hoare, R. E., Determinants of human elephant conflicts in a land-use mosaic. Journal of Applied Ecology 36:689-700 (1999).
[15] Kangwana, Elephant and Maasai: Conflicts and Conservation in Amboseli, Kenya. University of Cambridge (1993).
[16] Kiiru, W., The current status of human elephant conflicts in Kenya. Pachyderm, 19, 15-19 (1995).
[17] Karanth, K. U., Nagarahole Limits and Opportunities in Wildlife Conservation in making parks work Strategies for preserving Tropical Nature, John Terborgh, Corel Van Schaik. Lisa Daven Port and Madhu Roa(eds) Wasinton, D.C. Island press (2002)s
[18] Krithi, D. Karanth, Forest use and Human-Wildlife conflicts in Bhadra Wildlife Scanctuary, Karnataka, India. Tropical Resources: Bulletin of the Yale Tropical Resources Institute. 23. 48-58 (2003).
[19] Kinloch, G. C., The Sociological Study of South Africa (1972).
[20] Knight, J., Introduction. In J. Knight (Ed), Natural enemies: People- wildlife Conflicts in Anthropological perspective London: Routledge. 1-35 (2000).
[21] Naughton-Treves, L., Whose animals? A history of property right to wildlife in Toro, Western Uganda. Land Degradation & Development, 10, 311-328 (1999).
[22] Naughton-Treves, L., Treves A. Chapman C. Wrangham R., Temporal patterns of crop-raiding by primates: Linking food availability in cropland and adjacent forest. Journal of Applied Ecology, 35, 596-606 (1998).
[23] Pramod Kumar, G. R., A. M. Hemanjali, P. Ravikumar, R. K. Somashekar, B. C. Nagaraja, Assessing the historical forest Encroachment of Kodagu region of western Ghats, South India Using remote sensing and GIS (2012)
[24] Parker, I.S.C. Rainfall, geology, elephants and men. Proceedings of a Symposium on the Extinction Alternative (ed. P.J. Mundy). Endangered Wildlife Trust., Johannesburg. 137-177 (1983)
[25] Parker, S. C. Ian., Alistair, D. Graham, Elephant decline: downward trend in African elephant distribution and numbers. International Journal of environmental studies (1989).
[26] Rodgers, A., Hartley, D., Bahir, S., Community Appproaches to Conservation: Some Comparison from Africa and India. In Battles over Nature: Science and Politics of Conservation, Vasant Saberwal and Mahesh Rangarajan (eds). New Delhi, Permanent Black. (2003)..
[27] Saberwal, V., Rangarajan, M., Introduction. In battles over Nature: Science and politics of Conservation, Vasant Saberwal and Mahesh Rangarajan (eds). New Delhi, Permanent Black. (2003).
[28] Sukumar, R., The management of large mammals in relation to male strategies and conflicts with people. Biological conservation 55, 93-102 (1991).
[29] Tchamba, M. N., History and present status of the human/elephant conflicts in the waza-Logone region, cameroon, west Africa. Biological conservation, 75, 35-41 (1996).
[30] Terborgh, J., Overcoming Impediments to Conservation. In Making park work: Strategies for preserving Tropical Nature, John Terborgh, Carel van Schaik, Lisa Davenport and Madhu Rao (eds) Washington D. C, Island Press. (2002).