**4.0 Conclusion**

The Bengal tiger, also known as the Royal Bengal Tiger or the Indian tiger, is the subspecies with the largest population. It is the national animal of India, a place where its image is part of the traditions and the culture ("Bengal Tiger - Tiger Facts and Information," 2016). The main threats to this species are: poaching and conflicts with humans over the territories. Poaching’s aim is to illegally trade the products obtained from tigers, such as decorative objects or the active ingredient of “drugs” to cure various diseases, but which have no proven efficacy. Their habitat, severely degraded by logging and invasion of humans in their territories, continues to decline. When tigers attack domestic animals or even humans, they unleash the wrath of people who in retaliation kill them ("Bengal Tiger - Tiger Facts and Information," 2016). But directly or indirectly they are related to the decreasing forest or increasing urban settlement and agriculture. Still the government or the forest official has not been able to find the reason of tiger mortality. Every year more and more tigers are dying and there is no urge to investigate the reason behind the death. Therefore, there is more scope for further research in this area.

LULCC has been a major area of research for many years. Many scholars and researchers have been working on the different land cover such as forests, agriculture, urban lands and so on. Growing population, widespread poverty, limited employment opportunities in agricultural and industrial sector has resulted in heavy pressure on forests, primarily due to unsustainable extraction of fuel wood and over-grazing resulting in forest degradation. Hence, there should be stringent law to protect them (Joshi and Singh, 2003). Agriculture is the most important occupation for most of the Indian families. In India, agriculture contributes about sixteen percent (16%) of total GDP and ten percent (10%) of total exports. Over 60% of India’s land area is arable making it the second largest country in terms of total arable land.

Using different classification techniques like fusion, band ratio, principle component analysis, supervised and unsupervised classification, the detection of land cover change has become easier. In India, land cover changes have significance because of the decline of the forests and their conversion into agriculture. Deforestation is one of the major causes to the environmental degradation which is affected by the agents like small farmers, ranches, loggers and plantation companies (Mondal, n.d.).  Along with this, many wildlife species are also endangered such as tigers. Since it is an alarming situation, the Government of India has started making policies for forest and tiger preservation.

This study focuses on two sections. First, the LULCC over the years from 2009-2016 of forest, water, urban and agriculture of central India. Secondly, the effect of land change on the tiger’s mortality. The classification result shows that there has been decrease in forest and increase in urban and agriculture. According to the results, the area of agriculture land is double in 2016 as compared to 2009. The accuracy of the land cover classifications in this research is quite high and therefore, considered to be correct. The research was narrowed down to the 19 forest patches which concentrate on the tiger reserves and PAs. The observations from the repeated measure Poisson regression indicate that agriculture is an important land cover type that has effect on tiger mortality. If agriculture continues to increase, then forest shrinkage will increase leading to confinement to the movement of tigers. As a result, these big cats will interfere with the human habitation, destroying agricultural land and finally leading to death.

This research of LULCC has many limitations and constraints. The images obtained were having some percent of cloud cover. All the images are taken from the winter months of India but still they had some or few percent of cloud or haze. This caused some of the clouds to be classified in urban or water. Secondly, if high resolution images were obtained, the classification result would have been more accurate. For determining the forest patches used in the research there were no shapefiles available online. Therefore, these shapefiles were made by digitizing the borders of the forest. If these limitations were removed then the result would have been more accurate.

One of the objective of this study is to give suggestions to policy makers and environmentalists. Due to deforestation, the forest cover of India has fallen below the minimum recommended level. According to experts, forests should cover about one-third of the total area of country. But in India forests covers around 24% of the total area (Mehta, 2016). There are an estimated 300 million people living as shifting cultivators who practice slash and burn agriculture and are supposed to clear more than 5,000,000 ha of forests for shifting cultivation annually (Mondal, n.d.). There has been many non-governmental organization working in this field but none of them have got any support from the government. There have been laws made once in every five years but nobody pays attention to them. There should be an education or awareness program for the tribes, forest dwellers and urban cities or township near the forest boundaries. They should be educated on how forests and their resources are inseparable from their life, how wildlife eco-cycle works and if deforestation continues then what they will face in the future. The boundaries of the forests should be protected strictly. There should be more security in the buffer zones so that there should be no provision for encroachment and trespassing, illegal settlement and habitation. Among those 19 forest patches, few are located quite close and therefore, tigers use existing forest corridors to move from one patch to another. But urban settlement and agriculture expansion has started destroying them too. The principle of sustainable development must be recognized and emphasis on Environmental Impact Assessment is needed. Because India is a developing country, it concentrates on the socio-economic development but it must be in coordination with environmental upgradation. Though the Environmental (Protection) Act is very ambitious and maintained different components of the environment in India, environment protection has been dominated more by socio-economic constraints and the priority of development. Therefore, sometimes with several compromises, the objective lost which has resulted in the failure of legislative mission.

The existing legal provisions are inadequate to control the enormous problems of environmental pollution of various types in the country. Therefore, the judiciary has to play a more active and constructive role. Environmental law should be implemented effectively by adopting new instruments, mechanisms and procedures like environmental impact assessment and environmental audit and incorporate environmental objectives in manufacturing processes, minimum usage of hazardous materials and toxic chemicals, careful usage of toxic gases will reduce environmental load.