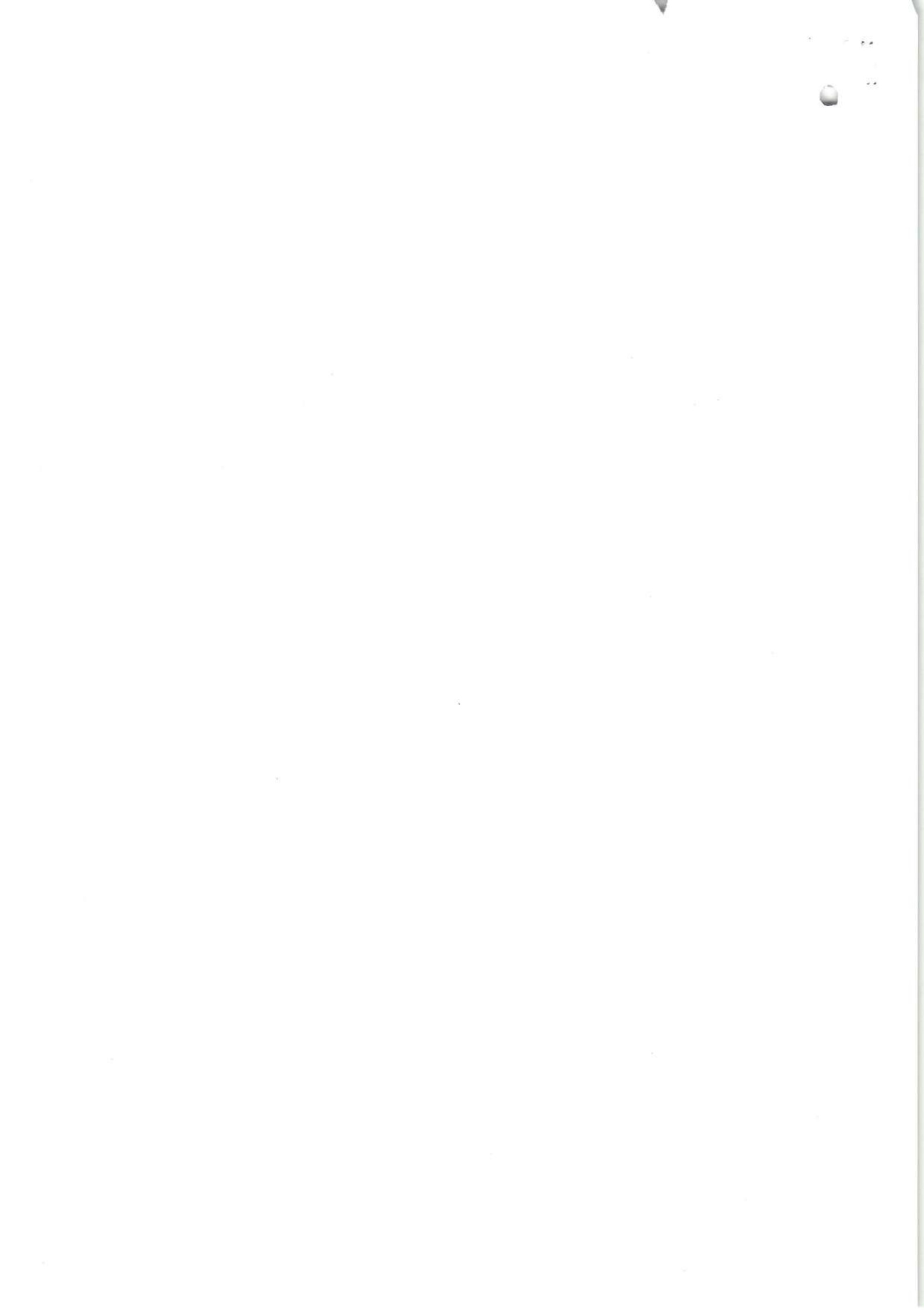


**Terms of Reference for the study “Human Elephant conflict -The mitigation methods employed and its impact on conflict resolution (covering issues like reasons for conflict, effectiveness of barrier, conflict spots, ex-gratia payments, spatial and temporal dispersal)**

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**Terms of Reference for the study “Human Elephant conflict -The mitigation methods employed and its impact on conflict resolution (covering issues like reasons for conflict, effectiveness of barrier, conflict spots, ex-gratia payments, spatial and temporal dispersal)**

**1. Title of the study**

“Human Elephant conflict -The mitigation methods employed and its impact on conflict resolution (covering issues like reasons for conflict, effectiveness of barrier, conflict spots, ex-gratia payments spatial and temporal dispersal)”

**2. Department implementing the scheme**

Wild life wing headed by Chief Wildlife Warden within Karnataka Forest Department is implementing man elephant conflict resolution.

**3. Background and the context**

In nature existence of both man and elephants is necessary. The same is recognized in the Constitution of India. The courts at all levels are also seized of the matter. Government of Karnataka has been a pioneer in protection of elephants in wild by way of preservation of forests, by creating Sanctuaries, National Parks and Tiger Reserves. Due to various reasons, mainly due to competition for Space {area} and Food, conflict between man and elephants which was existing at low key earlier has increased now. This may also be attributable to irrigation facilities, enhancement of population of both humans and elephants, loss of habitat, the carrying capacity of the forests being lowered, etc,

Human Elephant conflicts especially Man – Elephant conflict has been steadily on the rise in and around the Protected Areas / Forests due to the increase in the number of wild elephants attributable to various steps taken by Karnataka Forest Department, due to the loss of corridors and shrinkage of habitats etc. This results in conflict, which often ends up as damage to crop, assets {properties} and sometimes even in injuries to or loss of human life. The state government has laid down the

norms for relief due to damage by wild elephant. In the case of crops, it is generally limited to the investment made by the farmers, whereas the real loss is in terms of income from the crops / assets are still higher. Hence, the relief seldom satisfies public. Even so, total number of compensation cases has been rising steadily over the years. Hospitalization costs, compensation for loss of limbs and disability or loss of human life are paid in case humans suffer physically. Here again the public are seldom satisfied with compensation. They often resort to protests and agitations to contain damages caused by wildlife.

Wild elephants require not only food but also enough space / territory to wander. They wander in search of food and water primarily. They do not recognize ownership of the land / territory. They rule / work based on might is right and in this context human beings loose out.

In order to mitigate the conflict Karnataka Forest Department has been setting up a variety of barriers such as stone walls, electric fences, spiked RCC pillars, elephant proof trenches, steel fencing, Solar Fencing and so on. Generally, any one type of barrier is erected. However, in some cases, due to increasing incidence of wild elephants straying out too frequently, combinations of such barriers are also adopted for further strengthening and reinforcing.

To complicate further forest boundaries are long, traverse in different directions and across different terrains. The barriers erected are not in one go or continuous. The work is executed in discontinuous segments. The planning also gets distorted when the priority of covering those areas where the wild elephant straying is too frequent over rides. The wild elephants also acquire experiential learning to breach the barriers and find newer escape routes. Even the best of the barriers often proves inadequate. Continued crop raids / injuries / loss of human life brings immense misery to the neighboring habitations and tensions between the frontline staff that face the challenging task of driving the wild elephants back into the forests and public. An effective solution has to be determined which meets the needs of the

villagers, effectively barricades the elephants and the frontline staff to mitigate the problem. In this background this particular evaluation study is being taken up.

**Table-1 Progress in construction of different types of Barricading  
2008-09 to 2019-20 (Kms)**

Sl. No	Details of Work	Unit Cost Average Rs. in lakhs per Km	2008-09	2009-10	2010-11	2011-12	2012-13	2013-04	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20 Target
1	EPT - Soil, Soft rock, and hard rock,	10.00/kms.	33.07	26.95	41.55	47.48	113.8	150.55	69.639	268.54	104.35	94.09	244.59	384
2	Solar Fencing	2.35/kms.	62.62	49.35	41.041	66.8	168	141.45	63	398.65	105.9	537.09	318.91	420
3	Rubble Stonewall / Special Structures	6,233/cmtr	-	-	-	-	16.79	18.3	29.21	13.77	21.69	698	1986	199
4	Rail Fence	116/kms	-	-	-	-	-	-	0.65	15.987	22.318	31.809	12.83	118
5	Procurement of Rails	Tonnes	-	-	-	-	-	-	6663.33	-	-	3197.02	2767.38	-

Source: Forest Dept.

#### 4. Evaluation scope, purpose and objectives

**Scope:** This evaluation study covers essentially the elephant country in the southern districts of **Chamarajanagar, Ramanagara, Mandya, Mysuru and Kodagu** where much barrier construction work was accomplished in the recent past. The period of evaluation is 2014-15 to 2018-19.

**Purpose:** The study intends to collect and map the details of boundary barriers already erected in the above districts, classifying them into different categories and combinations, collecting the information on costs and their deterrence capabilities. The evaluation study should make a detailed analysis of the number, type, frequency,

distribution over time period, and seasonal occurrences of conflict and temporal distribution of wildlife raids and determine the potential reasons for straying of wild elephants and suggest suitable measures for reducing the human wildlife conflict effectively at optimal cost. The purpose of the study is to find out most effective single or combination of barriers which can contain the wild elephant raids and reduce the cost of compensations substantially. Past data on number of crop raids, injuries and deaths can be an indicator of such raids. However, the unreported incidences when the ex-gratia was less need to be factored in the statistic obtained. The study should identify the high, moderate and low risk areas and priority areas for suitable barricading.

**Objectives:** The main objectives of this evaluation study are:

- i) To map the details of boundary barriers already erected in the above districts and their deterrence capabilities and make a cost benefit analysis of different types of barriers in terms of investment and the returns on it.
- ii) Make a detailed analysis of man elephant conflict in terms of number, type, frequency, density, distribution seasonal & perennial over time period.
- iii) To Identify the potential reasons for straying of wild elephants and also to bring out the proximate reasons for persistent behavior of straying,
- iv) Using the information from the effectiveness of existing barriers and the proximate reasons for straying of wild elephants identify suitable measures for reducing the human wildlife conflict effectively and find out most effective single or combination of barriers.
- v) To identify the high, moderate and low risk areas and priority areas for suitable barricading.
- vi) To examine any effective barricade models adopted in different States and explore the possibilities of their adoption in the state.
- vii) To Assess the quantum of relief / ex-gratia paid over the period and its adequacy in different contexts. Analyse the issues with specific case studies

## 5. Evaluation questions (Inclusive not exhaustive)

The following are the major issues for evaluation.

### Structural Issues

Assess the need and functioning of different types of barriers in other States and the country & based on the review of literature prepare a framework for analysis.

- Different kinds of barriers erected in the study area in the past two decades-? What is the magnitude of each type of barrier & the degree of overlap (combination), proportion of the existing forest boundaries covered by them?
- Effectiveness and efficiency of different types of barriers and their combinations.
- Assess the quality of work in sample locations.
- Life cycle of the barrier & reasons for failure in general and specific to locations.
- Find out the most effective single or combination of barriers which can contain the wild elephant raids and reduce the cost of compensations substantially.
- Find the other practicable complementary measures which can be taken for mitigating the human-wildlife conflict.
- Examine any effective barricade models adopted in different States and explore the possibilities of their adoption in the state.

### Cost -Benefit Issues

- i. Magnitude of both physical and financial investment taluk and district wise.
- ii. Make a cost benefit analysis of different type of barriers in terms of crops saved and compensation reduced and safety of human life attained as well as wild life saved.
- iii. Estimate the optimal investment in the barrier/ combinations that results in minimizing the human elephant conflict.

- iv. Estimate the budget requirement for covering the remaining forest boundaries with effective barriers in the next 5 years in the study area.

### **Human Elephant conflict Issues**

- i. The number, type, frequency, distribution over time and locations and seasonal occurrences of conflicts and wild life raids and potential reasons for straying of wild elephants.
- ii. Based on the analysis of secondary as well as primary data, identify the high, moderate and low risk areas and priority areas for suitable barricading.
- iii. Assess the quantum of relief / ex-gratia paid over the period and its adequacy in different contexts and the problems if any in ex-gratia payments. Analyse the issues with specific case studies
- iv. Based on the primary data collected assess the satisfaction of the people in provision of protection to human life and crops.

## **6. Evaluation Methodology and Sampling**

The following research tools to be used (but not limited to) during the assessment for collection of the required data.

- ***Secondary data and Literature Review***

The Consultant Evaluation Organization will have to review the existing literature that may exist in the Gazetteers of the districts of Karnataka (particularly those written in the British period) and news items reporting about the man-elephant conflict, essays, theses or research papers on man-elephant conflict available. The review should also include documentation and review of the formal and informal measures taken by the government, district administration and society at large to counter man-elephant conflict and the outcomes of it.



- **Primary data**

The methodology for field work includes collecting 100% details of boundary barriers already erected and map them, classifying them into different categories and combinations, collecting the information on costs and their deterrence capability. The evaluation study also should make a detailed analysis of the number, type, frequency and temporal distribution of wildlife raids and determine the potential reason for straying of wild elephants. Past data on number of crop raids injuries and deaths can be an indicator of such raids. However, the unreported incidences if available may also be factored in the statistics obtained.

### Sampling Methodology

A 10% of the sample villages to be identified based on the maximum number of the wild life raids from the data for the past five years. A detail study about maximum ten cases of raids in these villages to be made based on canvassing an interview schedule to the victims/ affected persons. The sample will be given by KEA.

**Table-2 Types of barricades and their coverage (2014-15 to 2018-19) (Kms)**

Type	Average Cost per Km/Rs. In Lakhs	2014-15	2015-16	2016-17	2017-18	2018-19	Total (in Kms)
EPT - Soil, Soft rock, and hard rock,	10.00/kms.	69.639	268.54	104.35	94.09	244.59	781.209
Solar Fencing	2.35/kms.	63	398.65	105.9	537.09	318.91	1423.55
Rubble Stonewall / Special Structures	6,233/cmtr	29.21	13.77	21.69	698	1986	2748.67
Rail Fence	116/kms	0.65	15.987	22.318	31.809	12.83	83.594
<b>Total</b>		<b>162.499</b>	<b>696.947</b>	<b>254.258</b>	<b>1360.989</b>	<b>2562.33</b>	<b>5037.023</b>

Source: Forest Dept.

The total length of different types of barricades constructed during last five years is 5037.023 kms. Out of this 10% will be covered in the sample for verification at different locations.

## 7. Qualitative data

- *Interviews with key persons*

The Consultant Evaluation Organization will have to interview the following Stakeholders.

- a) Those who have suffered themselves in person of man-elephant conflict, documenting the nature of their efforts, the support they received (or did not receive) from the society or State/ District administration in their efforts and the result of it.
- b) Those members of society / village where man-elephant conflict exists, their sufferings, for documenting the nature of their efforts, the support they received (or did not receive) from the society or State/ District administration in their efforts and the result of it.
- c) Different levels of Officers in the hierarchy of Karnataka Forest Department to document their perception / experiences.

- *Focus Group Discussions (FGD)*

The Consultant Evaluation Organization should conduct FGD of groups each consisting of 10 to 15 participants at village level. Separate FGDs should be conducted for public and officers.

10 FGDs 2 in each District	1 with people Affected Members and other knowledgeable persons in village & one with field level officials
IDI's	30 out of which 5 at each district level officers & 5 at State level officers.

## 8. Qualities expected from the Report

The evaluation report should generally confirm to the United Nations Evaluation Guidelines (UNEG) "Standards for Evaluation in the UN System" and "Ethical Standards of Evaluations".

The report should present a comprehensive review of the Scheme/ programme in terms of the content, implementation process, adequacy, information and access to beneficiaries.

The Report should provide a scientific assessment of the impact of different types of barricades on reducing Human Elephant conflict.

The qualitative data collected through FGD and discussions with the officials should be used in unbiased manner to support or for further analysis of the reflections from the quantitative data. The analysis should provide adequate space for assessing the variations across the regions and social categories. Case studies to be presented to bring out the realities at the household level.

The report should come out with specific recommendations based on adequate field evidence for any modifications in the programme design, content, implementing procedures, and any other modifications to improve the access and impact of the Scheme/Programme.

## 9. Structure of the report

The following are the points- only inclusive and not exhaustive- which need to be mandatorily followed in the preparation of evaluation report:

By the very look of the evaluation report it should be evident that the study that of Forest Department and Karnataka Evaluation Authority (KEA) which has been done by the Evaluation Consultant Organization. The report should be complete and logically organized in a clear but simple language. Besides confirming to the qualities covered in the Terms of Reference, report should be arranged in the following order:

## Preliminary Part

- Title and Opening Page
- Index
- List of acronyms and abbreviations
- Executive Summary- A section that describes the program, purpose and scope of evaluation, research design and methodology, key findings, constraints and recommendations.

## Chapter-1 Introduction and Study design

- Background- A section that briefly covers the history or genesis of the sector under which the programme/scheme being evaluated covered. It should give recent fact sheets taken from reliable and published sources and review of the progress of the scheme at Taluka/District level.
- Log Frame theory/ Theory of change
- Objectives and performance of the program - This section includes the stated objectives of the program and the physical and financial achievements of the selected program in the period of evaluation. It should cover the description of the target group, aim of the program, the programme guidelines and method of selection of beneficiaries and the physical and financial achievements.

## Chapter –II Review of literature and Evaluation Methodology

- Review of past evaluation reports and their findings- Theoretical background.
- Evaluation Methodology - This should include research design, hypotheses for testing, evaluation matrix sample design and size, Methodology for data collection and analysis- questionnaire design and pilot test, data analysis.
- Limitations/constraints in the evaluation study.

### Chapter III - Findings and discussion

- Tables and figures are to be used to present results in summary and/or graph format to add clarity to the presentation. In addition to simply presenting the results in a straightforward manner, the author also has to provide the readers with his/her interpretation of the results, implications of the findings, conclusions. Each result is discussed in terms of the original hypothesis to which it relates and in terms of its agreement or disagreement with results obtained by other researchers in similar/related studies.
- A detail analysis of Case Studies, Best Practices and Focus Group Discussions

### Chapter IV Summary and Conclusions

Chapter V- Recommendations – Recommendations to be evidence based- short term for mid course corrections & long term for change in program design/ policy change.

### Annexure

- a. Sanctioned Terms of Reference of the study.
- b. Survey tools and questionnaires
- c. Place, date and number of persons covered by Focus Group Discussion (if applicable).
- d. Table showing details of major deviations, non-conformities, digressions of the program.

## 10. Deliverables and time schedule

Following are the list of deliverables and time schedule:

Sl.No.	Item of work	Time in months
1	Work Plan preparation and approval	1
2	Survey and field data collection	3
3	Data processing and report writing	1
4	Draft report submission and approval	1
5	Final report submission	1
	<b>Total</b>	<b>7 months</b>

The work is expected to start and conclude during the financial year 2019-20. Sufficient number of field teams should be constituted for field data collection and timely submission of the final report.

## 11. Qualifications of the Study Team:

Consultant Organizations should have and provide details of evaluation team members having in depth knowledge of the issue, have had done previous studies and written publications in this or relevant subject with support team having fluency in Kannada and English and skills in research methodology having technical qualifications/capability as including as follows:

Sl. No	Subject Experts Requirement	Experience
1.	<b>Principal Investigator:</b> Retired Forest official (not below the rank of Additional Principal Chief Conservator of Forests)/ wild life expert/First class MSc in Life Sciences/ Forestry/ Ph.D is preferable.	Should have at least 10 years of experience working in Forests / Forest Management
2.	1 <sup>st</sup> Core 1st Team Member: Civil Engineer	With at least 3 years of field experience in related field/ quality check.

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3.	2 <sup>nd</sup> Core Team Member: Resource Analyst /Chartered Accountant/ Data Analyst with Post Graduate degree in Statistics/ Computer Science.	With at least 3 years of field experience in financial analysis/ cost benefit analysis
4	3 <sup>rd</sup> Core Team Member Social Scientist	A Ph. D/ First class post graduate degree in Social Sciences 3 years experience in the field. (Knowledge of Kannada is essential)

**Consultant Organizations without the above appropriate kind of personnel will not be considered as competent for the status study.**

**12. Cost and schedule of budget releases**

Output based budget release will be as follows:

- a. The **first instalment** of Consultation fee amounting to 30% of the total fee shall be payable as advance to the Consultant after the approval of the Work Plan, but only on execution of a bank guarantee of a scheduled nationalized bank, valid for a period of at least 12 months from the date of issuance of advance.
- b. The **second instalment** of Consultation fee amounting to 50% of the total fee shall be payable to the Consultant after the approval of the Draft report.
- c. The **third and final instalment** of Consultation fee amounting to 20% of the total fee shall be payable to the Consultant after the receipt of the hard and soft copies of the final report in such format and number as prescribed in the agreement, along with all original documents containing primary and secondary data, processed data outputs, study report and soft copies of all literature used in the final report.

Taxes will be deducted from each payment, as per rates in force. In addition, service tax will be paid as prescribed by law.

13. **Method of selecting the consultants**


The selection of the ECO shall be done on QCBM as defined in the KTPP Act and Rules 2000 and its amendments from time to time.

14. **Contact person for further details**

Dr. Chaya Degaonkar, Consultant (Evaluation) and Smt.Jyothi S Jenni, Associate Director (Procurement) Karnataka Evaluation Authority, Phone number 22032561 will be the contact persons for giving information and details for this study.

**The entire process of study shall be subject to and conform to the letter and spirit of the contents of the Government of Karnataka Order no. PD/8/EVN (2)/2011 dated 11<sup>th</sup> July 2011 and orders made there under.**

**The Terms of Reference were approved by the Technical Committee of KEA in its 44<sup>th</sup> Meeting held on 17<sup>th</sup> July 2019.**

  
Chief Evaluation Officer  
Karnataka Evaluation Authority