**Certificate No.: - 21**

**Cost benefits analysis. Whether the area is more than 20.00 Ha.**

**Proposed Forest Area for diversion in Alibag Forest Division is 34.2028 ha (More than 20 Ha)**

**As per cost (Conservation) Rules 2003, Rules 6, Form 'A'S. No. 1 (v) and guidelines (Under Forest Act 1980).**

**Evaluation of Loss of Forest**
**Estimation of cost of forest diversion**

| Sl. No. | Parameters | Remarks |
|---|---|---|
| 1. | Ecosystem services losses due to proposed forest diversion | NPV for 34.2028 Ha @ Rs. 9,39,000/Ha = Rs. 3,21,16,429.2/- |
| 2. | Loss of animal husbandry productivity, including loss of fodder | 10% of NPV= Rs. 32,11,642.92/- |
| 3. | Cost of human resettlement | The cost of human resettlement is Nil. |
| 4. | Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project | Public facilities and administrative infrastructure like roads, building, schools, dispensaries, electric lines, railways, etc. Are not going to be affected due to the Diversion of forest land therefore the loss on this account will be nil. |
| 5. | Possession value of forest land diverted | 30% of NPV= Rs. 96,34,928.76/- |
| 6. | Cost of suffering to ousters | The cost of rehabilitation is Nil. |
| 7. | Habitat Fragmentation Cost | 50% of NPV= Rs. 1,60,58,214.60/- |
| 8. | Compensatory afforestation and soil & moisture conservation cost | @ Rs. 8,72,044 per Ha for 34.2028 Ha. = Rs. 298,26,346.52 + Soil & Moisture Conservation Cost of Rs. 326918.234 = 301,53,264.76/- |

Therefore, the total loss of forest, as per the approved parameters, works out to as under:

| Parameters No | Description | Loss (in Rs.) |
|---|---|---|
| 1. | Environmental losses | Rs. 9,11,74,480.04/- |

**Existing guidelines for estimating benefits of forest-diversion in CBA**

| Sl. No. | Parameters | Remarks |
|---|---|---|
| 1. | Increase in productively attribute to the specific project. | By creating the missing link, almost 86% of the LCV and LMV traffic traveling to Mumbai-Pune will be diverted along this route. Almost, 100% of the truck and bus traffic will also be diverted on this route. Due to this, the |

<table>
<tr><td></td><td></td><td>congestion and accident issues will be eliminated. The travel time will be reduced by 30 mins. min. and over 1 hour during peak congestion. Significant savings in fuel will be realized contributing to lesser pollution and green footprint, thereby significantly boosting productivity.</td></tr>
<tr><td>2.</td><td>Benefits to economy due to the specific project.</td><td>Saving in Vehicle Operating Cost (VOC) due to reduction in length is Rs. 21768.65 lacs per year. Saving in VOC for improved facility will be Rs. 36712.68 lacs per year when calculated for 2020 traffic projection. Total saving in VOC per year is Rs. 58481.33 lacs. Saving will go on increasing with increase in traffic in subsequent years.</td></tr>
<tr><td>3.</td><td>No. of population benefited due to specific project</td><td>Approx. 2.7 lakh commuters/day</td></tr>
<tr><td>4.</td><td>Economic benefits due to of direct and indirect employment due to the project</td><td>
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Number</th><th>Wage (Avg.) per person</th><th>Amount (Rs.)</th></tr>
<tr><td>1</td><td>Unskilled</td><td>150</td><td>1,80,000</td><td>2.7 CR</td></tr>
<tr><td>2</td><td>Semiskilled</td><td>250</td><td>4,00,000</td><td>10 CR</td></tr>
<tr><td>2</td><td>Skilled</td><td>100</td><td>12,00,000</td><td>12 CR</td></tr>
<tr><td colspan="4">Total</td><td>24.7 CR</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>Economic benefits due to Compensatory afforestation</td><td>Compensatory afforestation in land transferred to Forest Department – 34.2028 Ha.<br>NPV = 34.2028 x 9,39,000 = Rs. 3,21,16,429.2/-</td></tr>
</table>

Therefore, the total benefit due to Project, works out to as under:

| **Parameters No** | **Description** | **Benefit (in Rs.)** |
|---|---|---|
| | Benefit due to Employment Generation, Saving in vehicle Operating Cost and Compensatory Afforestation<br><br>Vehicle savings cost: Current AADT for 2018 = 54,000 total by 2021, it will be say 60,000. Assuming savings of at least Rs. 25,000 per year, total savings = 150 CR | Approx. 186 CR |

Therefore Benefit/Cost ratio works out as under:
Benefit/ Cost =1,86,00,00,000/ 9,11,74,480.04 = 20.40 or **Cost Benefit Ratio: 1:20.40**

**vi) Employment likely to be generated:**

**A. By Contractor During Construction on Temporary Basis (For 30 months construction Period)**

| **Sl. No.** | **Description** | **Man-days** |
|---|---|---|
| 1 | Unskilled | 1,62,000 |
| 2 | Semiskilled | 2,72,000 |
| 3 | Skilled | 1,08,000 |

Man-months created in a year

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | 54,000 |
| 2 | Semiskilled | 91,000 |
| 3 | Skilled | 36,000 |

**B. For Toll Collection and ITMS During Operation and Maintenance on Permanent Basis (Yearly)**

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | 7,200 |
| 2 | Semiskilled | 9,000 |
| 3 | Skilled | 5,400 |

**C. For Facility Management During Operation and Maintenance on Permanent Basis (Yearly)**

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | 3,600 |
| 2 | Semiskilled | 3,600 |
| 2 | Skilled | 1,800 |

**D. Indirect Employment Generation per Year (Rest Area, Commercial Spaces, Fuel Station, Vehicle Maintenance etc.)**

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | - |
| 2 | Semiskilled | - |
| 2 | Skilled | - |

Date 30/5/18
Place: Mumbai

MSRDC LTD., MUMBAI BANDRA

(Sanjay Gangurde)
Executive Engineer
Maharashtra State Road Development Corporation Ltd, Mumbai

**Certificate No.: - 21**

**Cost benefits analysis. Whether the area is more than 20.00 ha.**

**Proposed Diversion of Forest Area in Pune Forest Division is 40.5074 ha (More than 20 ha)**

**As per cost (Conservation) Rules 2003, Rules 6, Form 'A'S. No. 1 (v) and guidelines (Under Forest Act 1980).**

**Evaluation of Loss of Forest**
**Estimation of cost of forest diversion**

| Sr.No. | Parameters | Description |
|---|---|---|
| 1 | Ecosystem services losses due to proposed forest diversion | NPV for 40.5074 ha @ Rs. 9,39,000/Ha = Rs. 3,80,36,448.60/- |
| 2 | Loss of animal husbandry productivity, including loss of fodder. | 10% of NPV= Rs. 38,03,644.86/- |
| 3 | Cost of human resettlement | The cost of human resettlement is Nil. |
| 4 | Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project | Public facilities and administrative infrastructure like roads, building, schools, dispensaries, electric lines, railways, etc. Are not going to be affected due to the Diversion of forest land therefore the loss on this account will be nil. |
| 5 | Possession value of forest land diverted | 30% of NPV= Rs. 1,14,10,934.58/- |
| 6 | Cost of suffering to ousters | The cost of rehabilitation is Nil. |
| 7 | Habitat Fragmentation Cost | 50% of NPV= Rs. 1,90,18,224.3/- |
| 8 | Compensatory afforestation and soil & moisture conservation cost | @ Rs. 8,72,044 per Ha for 40.5074 Ha. = Rs. 3,53,24,235.126 + Soil & Moisture Conservation Cost of Rs. 387179.0519 = 3,57,11,414.178/- |

Therefore, the total loss of forest, as per the approved parameters, works out to as under:

| Parameter No | Description | Loss (Rs.) |
|---|---|---|
| 1 | Environmental losses | 10,79,80,666.52/- |

**Table-C - Existing guidelines for estimating benefits of forest-diversion in CBA**

| Sr. No | Parameters | Description |
|---|---|---|
| 1 | Increase in productivity attributable to the specific project. | By creating the missing link, almost 86% of the LCV and LMV traffic traveling to Mumbai-Pune will be diverted along this route. Almost, 100% of the truck and bus traffic will also be diverted on this route. Due to this, the |

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<tr><td></td><td></td><td>congestion and accident issues will be eliminated. The travel time will be reduced by 30 mins.and over 1 hour during peak congestion. Significant savings in fuel will be realized contributing to lesser pollution and green footprint, thereby significantly boosting productivity.</td></tr>
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<tr><td>3</td><td>No. of population Benefited</td><td>Approx. 2.7 lakh commuters/day</td></tr>
<tr><td>4</td><td>Employment potential</td><td>
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Number</th><th>Wage (Avg.) per person</th><th>Amount (Rs.)</th></tr>
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</td></tr>
<tr><td>5</td><td>Economic benefits due to Compensatory afforestation</td><td>Compensatory afforestation in land transferred to Forest Department – 40.5074 Ha.<br>NPV = 40.5074 x 9,39,000 = Rs. 3,80,36,448.6/-</td></tr>
</table>

Therefore, the total benefit due to Project, works out to as under:

| **Parameters No** | **Description** | **Benefit (in Rs.)** |
|---|---|---|
| | Benefit due to Employment Generation, Saving in vehicle Operating Cost and Compensatory Afforestation<br><br>Vehicle savings cost: Current AADT for 2018 = 54,000 total by 2021, it will be say 60,000. Assuming savings of at least Rs. 25,000 per year, total savings = 150 CR | Approx. 186 CR |

Therefore Benefit/Cost ratio works out as under:
Benefit/ Cost =1,86,00,00,000/ 10,79,80,666.52= 17.22 or **Cost Benefit Ratio: 1:17.22**

**vi) Employment likely to be generated:**

A. **By Contractor During Construction on Temporary Basis (For 30 months construction Period)**

vi) **Employment likely to be generated:**

**A. By Contractor During Construction on Temporary Basis (For 30 months construction Period)**

| Sl. No. | Description | Man-days |
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| 1 | Unskilled | 1,62,000 |
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Man-months created in a year

| Sl. No. | Description | Man-days |
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| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | 7,200 |
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**C. For Facility Management During Operation and Maintenance on Permanent Basis (Yearly)**

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | 3,600 |
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| 3 | Skilled | 1,800 |

**D. Indirect Employment Generation per Year (Rest Area, Commercial Spaces, Fuel Station, Vehicle Maintenance etc.)**

| Sl. No. | Description | Man-days |
|---|---|---|
| 1 | Unskilled | - |
| 2 | Semiskilled | - |
| 3 | Skilled | - |

**Note:** This is as per guidelines of GoI

Date: 30/5/18

Place: Mumbai

MSRDC LTD., MUMBAI BANDRA

(Sanjay Gangurde)
Executive Engineer
Maharashtra State Road Development Corporation Ltd, Mumbai