

# Social Impact Assessment

Draft Report



## Land Acquisition for Construction of Perandoor-Vaduthala Bridge, Ernakulam

*Requiring Body*



Kerala Public Works Department  
Roads Division  
Thrikkakara, Ernakulam

*SIA Unit*



Rajagiri College of Social Sciences (Autonomous)  
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## List of Abbreviations

APL	Above Poverty Line
BA	Bachelor of Arts
BC	Bituminous Concrete
BM	Bituminous Macadam
BPL	Below Poverty Line
DSR	Delhi Schedule of Rates
DSS	Diploma in Social Services
GCDA	Greater Cochin Development Authority
GDP	Gross Domestic Product
GO	Government Order
GoK	Government of Kerala
GSB	Granular Sub-Base
INR	Indian Rupee
IRC	Indian Roads Congress
KM	Kilo Meters
Kn	Kilo Newton
LP	Lower Primary
M	Meters
MA	Master of Arts
MBA	Master of Business Administration
MM	Millimetres
MoRTH	Ministry of Road Transport and Highways
MSW	Master of Social Work
OBC	Other Backward Communities
PM & IR	Personnel Management & Industrial Relations
PWD	Public Works Department
RCC	Reinforced Concrete Piles
RD	Revenue Department
RFCTLAAR Act	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
SC	Scheduled Caste
SIA	Social Impact Assessment
UG	Under-Graduation
UP	Upper Primary
WMM	Wet Mix Macadam

# Chapter 1

## Executive Summary

### 1.1 Project and public purpose

Perandoor and Vaduthala are two suburbs in the city of Kochi and Perandoor Canal separates the regions. Due to increasing traffic and congestions in the existing routes, Kerala PWD has proposed to construct a new bridge across Perandoor Canal to bypass the traffic towards Kaloor. The proposed bridge is having 78m length with 3 spans of 26 m each and 7.50m wide carriage way and 1.5m wide foot paths on both sides. A vertical clearance of 2m from water level has been provided anticipating country boat traffic. Further, the Approach Road having length of 315 and 75m at Vaduthala side and 130m on Perandoor side are also part of the project. Subsequently, Administrative Sanction is accorded for the work vide G.O (Rt) No. 606/2016/PWD dated 04/03/2016 for Rs. 2950 Lakhs.

Government of Kerala through Notification No. C5-68448/12 dated 27/02/2019 has conferred the project as for Public Purpose. Accordingly, 0.4970 Hectares and 0.2266 Hectares of Land respectively from Cheranallor and Edappally South Villages have identified in Kanayannur Taluk to acquire for the project.

### 1.2 Location

The project at Kanayannur Taluk in Ernakulam District is being planned in 0.4970 Hectares of Land in Cheranallor village covering Survey Nos. - 1090, 101, 1092, 1093, 1105, 1106, 1107, 1109, 1110, 1112 and 1113 and 0.2266 Hectares of Land in Edappally South covering Survey Nos. - 219/9, 219/10, 219/11 and 231/3.

The region is known for its serenity and backwaters, yet being a busy and growing urban habitat. The land to be acquired are mostly vacant land have been classified as wet land as per available land records.

### 1.3 Size and attributes of land acquisition

The project is mapped to acquire a total extent of 0.7236 Hectares of land and most plots are unused and classified as wet land. Accordingly, 0.4970 Hectares and 0.2266 Hectares of Land respectively from Cheranallor and Edappally South Villages have identified in Kanayannur Taluk to acquire for the project. Railway line that connects Edappally with



Ernakulam Town and Vallarpadam goes through the region and the Railway Over Bridge across Perandoor Canal is located near to the project site.

The proposed bridge is expected to result in increase of commercial and residential buildings as people commute between the regions. 12 affected persons have been identified, whose land (Mostly Wet Lands) will be affected for the development of approach roads. Land plots in Perandoor side, owned by five persons and plots in Vaduthala side, owned by seven persons are reported as NilamNikathuPurayidam. No Agriculture land is reported to be affected due to the project. Land acquisition is expected to be with minimum objections and public including affected persons are generally affirmative for the project. However, a fair compensation and other measures to mitigate impacts are to be adopted as per concerned Act and Policies.

#### **1.4 Alternatives considered**

The present site is identified for the project considering better road connectivity between Perandoor and Vaduthala towns and leaving minimal impact to the people and the environment. A vertical clearance of 2m from water level has been provided in the project design anticipating country boat traffic and hence the fishing and related activities are not disturbed in the Canal. The project at its present location is also expected to ease the traffic between Edapally and Ernakulam town by having an alternate route.

#### **1.5 Social impacts**

As per the alignment for the acquisition of land for Perandoor-Vaduthala Bridge and Approach Road, 12 affected persons will lose land and the same is understood to be the major impact. Apart from loss of land, one family whose residence under construction is understood to be affected and is reported as the only owned property of the four-member family. A brief summary of major impacts are as follows

Loss of Residential building and land	: 1 Family
Loss of Land	: 7 Families
Loss of Land	: 4 Organizations
Loss of Livelihood Opportunities	: 1 Family
Threat to Transportation	: Boating trough Perandoor Canal

Despite the negative impacts, the proposed project is expected to be beneficial for the people in the region as it ensures safer transportation and better access with other regions in the district.

## **1.6 Mitigation measures**

For affected persons whose land will be acquired, the Rehabilitation and Resettlement package as per the Policy issued by Revenue(B) Department, Government of Kerala vide G.O.(Ms)No.448/2017/RD dated 29/12/2017 for the rehabilitation and resettlement package for land acquisition in the state in lieu of RFCTLARR Act 2013 is expected to be appropriate. Further, recreation of common properties and livelihood opportunities will mitigate various impacts to an extent possible.

## Chapter 2

### Detailed Project Description

#### 2.1 Background of the Project, including developer's background and governance/management structure

Roads in India are considered as the most crucial mode of transportation; being cost effective and preferred for freight and passenger transport. India has the second largest road network connecting every nook and corner of the country with its 5.23 Million Kilo Meter roads comprising of National/State Highways, Districts and Village Roads (National High Way Authority of India, Annual Report 2016-17). It is estimated that road transportation contributes nearly 4.7 % towards India's GDP; whereas the railways contribute only 1 %. Besides its significance to the economy, roads enables social integration by connecting different regions, institutions and people across the country.

As per the Kerala PWD-Road Bridge Maintenance Policy Order (22, 10, 2016), the State has a network of roads over 1.5 Lakh KMs and except the National Highways (1542 KM), all other major roads are being constructed, maintained and managed by Kerala Public Works Department with the funding from Government of Kerala.

Kerala Public Works Department (Kerala PWD) is one of the important departments in the Government of Kerala and operates under Ministry of PWD. The department is responsible for design, implementation and maintenance of all public works undertaken by Government and thus improve mobility, safety and economic development of the state. The department operates through a structured system headed by 5 Chief Engineers supported by 20 Superintending Engineers, 76 Executive Engineers, 289 Assistant Executive Engineers, 639 Assistant Engineers and other supporting staff.

Kochi is the largest city in the State of Kerala, covering a metropolitan area of 732 sq.km under Greater Cochin Development Corporation (GCDA) and spread in Kochi Corporation, 6 Municipalities and 33 Panchayats in Ernakulam district. The city is also a major industrial/tourist/educational/health hub with a population of 2.5 million in the GCDA jurisdiction area. Categorised as a major Tier II city in India, Kochi has varied infrastructure requirements and roads infrastructure is considered to be most significant among. High population density and the large area covered with water makes planning and development of roads and bridges challenging, yet essential.

Vaduthala is a suburb in the city of Kochi and is located on Chittoor road between Pachalam and Chittoor. It is straddled by Cochin backwaters on one side and Perandoor Canal on the other side with the Ernakulam-Aluva railway line passing right through it. Towards Kaloor, the nearest over bridge to cross Perandoor Canal through SRM road junction via Pottakuzhy

road would take over 6 KMs and is not conducive to develop as public transport route. Due to increasing traffic and congestions in the existing routes, Kerala PWD has proposed to construct a new bridge across Perandoor Canal to bypass the traffic towards Kaloor. Subsequently, Administrative Sanction is accorded for the work vide G.O (Rt) No. 606/2016/PWD dated 04/03/2016 for Rs. 2950 Lakhs.

Vide Kerala Gazette Order No. 733 dated 18.03.2019, the SIA Unit of Rajagiri College of Social Sciences, Ernakulam was appointed to conduct Social Impact Assessment Study and to prepare a Social Impact Management Plan as per section 4 (1) of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013.

## **2.2 Rationale of the project including how the project fits the public purpose criteria listed in the act**

Vaduthala is one of the important suburbs as part of Greater Cochin and hosts varied institutions such as Banks, Hospitals, Educational Institutions, Religious Organisations, and Government Offices etc. The region is surrounded by water on its North, West and East. While the existing Vaduthala Bridge facilitates road traffic towards Chittoor at North, the road traffic through Pachalam connects Ernakulam Town at South. The frequent congestions along with rise in number of vehicles and commercial establishments in the region demand a separate route that connects Kaloor at South-east. Kerala PWD has designed a bridge and approach road across Perandoor Canal at East of Vaduthala which bypasses the traffic to the extent possible. The proposed bridge is also expected to ease the commute between Elamakkara and Vaduthala across Perandoor Canal.

Government of Kerala through Notification No. C5-68448/12 dated 27/02/2019 has conferred the project as for Public Purpose. Accordingly, 0.4970 Hectares and 0.2266 Hectares of Land respectively from Cheranalloor and Edappally South Villages have identified in Kanayannur Taluk to acquire for the project. Further, as per Section 2 b (i) of The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (RFCTLARR Act), the project fits in for public purpose.

## **2.3 Details of project size, location, capacity, outputs, production targets, costs and risks**

The proposed construction of Perandoor-Vaduthala Bridge is aimed to improve the living condition of the native population and to ease the transportation through the region. The project at Kanayannur Taluk in Ernakulam District is being planned in 0.4970 Hectares of Land in Cheranalloor village covering Survey Nos.- 1090, 101, 1092, 1093, 1105, 1106, 1107,

1109, 1110, 1112 and 1113 and 0.2266 Hectares of Land in Edappally South covering Survey Nos. - 219/9, 219/10, 219/11 and 231/3.

The estimate of the bridge is prepared as per the Tentative General Design Drawing issued by the DRIQ Board. The estimate is prepared in two appendices. Appendix A- BRIDGE PROPER The proposed bridge is having 78m length with 3 spans of 26 m each and 7.50m wide carriage way and 1.5m wide foot paths on both sides. A vertical clearance of 2m from water level has been provided anticipating country boat traffic. Foundation consists of bored cast in situ RCC piles of 1.2m diameter. The pile group consists of 4 piles under each pile cap at abutments and 6 pile piles under piers. Based on the bore-hole details available, an approximate depth of 68m is considered for piles while preparing the estimate. The substructure consists of RCC seating pedestals at piers only. The superstructure of the bridge is proposed with precast post tensioned girders, cast in place diaphragms and deck slab. Appendix-B- APPROACH ROAD Approach roads of length 315 and 75m at Vaduthala side and 130m on Perandoor side are to be constructed with GSB and WMM and BM&BC. Taking into account the poor sub soil conditions, the retaining wall is proposed with gabion structure. Soil stabilisation using coconut piles is also incorporates in the estimate. The estimate has been prepared based on MoRTH specification and DSR 2014 with a cost index of 46.08 %. Necessary amount for utility shifting and land Acquisition are included in the estimate. The estimated amount is Rs. 2940 Lakhs.

## **2.4 Examination of alternatives**

The present site is identified for the project considering better road connectivity between Perandoor and Vaduthala towns and leaving minimal impact to the people and the environment. A vertical clearance of 2m from water level has been provided in the project design anticipating country boat traffic and hence the fishing and related activities are not disturbed in the Canal. The project at its present location is also expected to ease the traffic between Edappally and Ernakulam town by having an alternate route.

## **2.5 Phases of the project construction**

The proposed Perandoor-Vaduthala Bridge having 78m length with 3 spans is planned to complete in multiple stages involving Land Acquisition, Piling and Construction of Substructures, Superstructures and Carriageways.

## **2.6 Core design features & size and type of facilities**

The proposed bridge is having 78m length with 3 spans of 26 m each and 7.50m wide carriage way and 1.5m wide foot paths on both sides. A vertical clearance of 2m from water level has been provided anticipating country boat traffic. Foundation consists of bored cast in situ RCC piles of 1.2m diameter. The pile group consists of 4 piles under each pile cap at abutments and 6 pile piles under piers. Based on the bore-hole details available, an approximate depth of 68m is considered for piles while preparing the estimate. The

substructure consists of RCC seating pedestals at piers only. The superstructure of the bridge is proposed with precast post tensioned girders, cast in place diaphragms and deck slab. Approach roads of length 315 and 75m at Vaduthala side and 130m on Perandoor side are to be constructed with GSB and WMM and BM&BC. Taking into account the poor sub soil conditions, the retaining wall is proposed with gabion structure. Soil stabilisation using coconut piles is also incorporated in the estimate. The estimate has been prepared based on MoRTH specification and DSR 2014 with a cost index of 46.08 %. Design features and specification of different facilities are given below

## **Material Specifications**

### **A. COCRETE:**

1. The type of cement used for preparation of concrete shall be any one as specified in Cl.18.4.1 of IRC:112-2011 and the selected one shall be appropriate for the intended use
2. All coarse and fine aggregates shall conform to IS:383 and shall be tested to conform to IS:2386 (Parts I to VIII).
3. Water used for mixing and curing of concrete shall be as per the requirements of Cl.18.4.5 of IRC:112-2011
4. Chemical admixtures conforming to IS:9103 may be used to improve the properties of fresh concrete such as workability. Chemical admixtures as per Cl.18.4.3 of IRC:112-2011 may be used in concrete to improve its performance
5. Concrete shall have minimum 28 days characteristic strength on 150mm cubes for all elements of structure as indicated in Table A
6. Design mix is preferred for ordinary concrete. In the absence of design mix, the proportion of ordinary concrete (M15 and M220 grades) shall be based on nominal mix as specified Table 18.7 of IRC 112-2011
7. Design mix shall invariably be used for standard concrete (M25 and higher grade) and shall be established by laboratory/field testing and controlled at site by conducting tests to confirm suitability for constituent materials.
8. The concrete shall meet the acceptance criteria as per Cl. 18.6 of IRC:112-2011. The mix design shall be modified if it does not meet the acceptance criteria

### **B. REINFORCEMENT**

1. All reinforcement shall be high yield strength deformed (HYSD) bars with grade/designation, Fe500/Fe500D conforming to IS:1786, and which shall be manufactured from Primary Steel Procedures classified as per the notification No.4 (8)2010-SD-1, Dated: 12/12/2013 of Ministry of Steel, Government of India

## **Foundation**

The foundations shall be constructed as per the norms of IRC: 78 and the guidelines given in mORTH specification for Road and Bridge works

1. Bored cast-in-situ piles having diameter as indicated in the Drawing shall be provided and socketed as per Table b
2. Piles shall be constructed as per the guidelines given in IS:2911 subject to limitations/stipulations given in IRC:78
3. Piles have minimum working load carrying capacity as mentioned in Table B (excluding staff weight)
4. Routine load test as per IS: 2911 (Part IV) shall be done for a working pile in a group of alternate foundations of piers and abutments, if the same is resting on hard rock, to reconfirm the allowable pile capacity mentioned above. In the case of piles resting on soft rock or dense land, the test shall be done for a working pile in a group of all the foundations of piers and abutments. Test load shall be 1.5 times working load capacity of piles
5. The permissible tolerance for piles shall be such that the shift at platform level not exceeding 75mm and the tilt not exceeding 1 in 150.
6. Drilling mud such as bentonite suspension having properties in confirmation with Annexure –D of IS: 2911 (Part-1/sec 2): 2010 shall be maintained throughout the boring process to ensure the stability of the walls to bore holes until the pile has been concreted.
7. Permanent mil steel liner ( casing pipe) having thickness 6mm shall be provided for all piles from bottom of pile cap to at least 1.0 meter below the Max. Scour level (MSL). Wherein the wall of boreholes cannot be stabilized by bentonite suspension for situations mentioned in Cl. 709.1.4 of IRC:78 and for short piles to be socketed into hard rock, additional length of permanent lines below scour level shall be provided. The total estimated length of permanent Liner/casing pipe, required for each pile is given in Table B.

## **Substructure (Abutments and Piers)**

1. Vertical Construction joints are not permitted and horizontal construction joints shall be avoided as far as possible by arranging the concrete pour in one single operation
2. Adequate number of weep holes having 75mm diameter at spacing not exceeding one metre in both directions shall be provided to prevent any accumulation of water and building up of hydrostatic pressure behind the abutment and wing wall

## Superstructure

The superstructure adopted in continuous precast post tensioned girder and cast in situ RCC slab integrated with bridge abutments and piers constructed as per drawing issued from PWD office subsequently

## Approach Embankment

- A. Back Filling
  1. Type of Material to be used for filling behind abutments and wing shall be selected as per the guidelines given in Appendix-6 of IRC 78-2014
  2. The filter material shall be well packed to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment and wing wall to the full height
- B. Approach Embankment

Approach embankment on either sides of the bridge shall be constructed as per the guidelines given in Section 305 of moRTH Specification for Road and Bridge Works (5<sup>th</sup> revision)

## River Training and Protection Works

Adequate River training and protection works such as guide bunds, guide walls, spurs, groynes, bank protection, flooring, cut-off walls, apron and approach embankment protection, for ensuring safety of the bridge structure and its approach embankment protection shall be provided as per Section 2500 of moRTH Specifications for Road and Bridge Works (5<sup>th</sup> Revision) in confirmation with IRC: 89 and IS: 10751.

Table (2.6.1)

Table A: Concrete Mix for Bridge Components						
Sl. No.	Component	Grade of Concrete	Max. W/C ratio	Min. cement content (kg/cum)	Clear Cover	Exposure Condition
1	Superstructure (All Spans)					
(a)	Pre Cast Beams	M45	0.35	400	As per drg	Severe
(b)	Cast in Situ Slab & Diaphragm	M40	0.40	380	50	Severe
2	Pier, Pedestal, Pile Cap	M35	0.40	380	50	Severe
3	Piles	M40	0.40	380	75	Severe



Table (2.6.2)

<b>Table B: Design Parameters of Foundation</b>							
Abutment /Pier No.	Foundation type	Diameter of pile (mm)	Pile Load (Kn)		Horizontal Load on pile (Kn)	Embedment/Socket depth into hard rock/strata (mm)	Estimate length of MS liner/casing pipe for pile (mm)
			Max	Min			
A1, A2	Pile	1200	2000	-	200	600	15000
P1, P2	Pile	1200	1750	-	120	600	15000

Table (2.6.3)

<b>Estimated Quantities of Materials for Superstructure Per Span</b>		
<b>Item</b>	<b>Quantity*</b>	<b>Unit</b>
Prestressing steel	5800	Kg.
Reinforcing steel	24750	Kg.
Structural Concrete	165	Cu.m.

\*This quantity does not include the handrail, footpath, Kerb etc.

## **2.7 Need for ancillary infrastructural facilities**

Vide the same G.O (Rt) No. 606/2016/PWD dated 04/03/2016, the administrative sanction for the approach road was granted. Further the bridge has provisions for walkway and carriageways on both sides. Upon completion of the project, some renovation works to enlarge existing roads may arise in the future.

## **2.8 Workforce requirements (temporary and permanent)**

The appropriate combination of consultants, permanent and contract workforce will be deployed along with the right set of machineries and equipment as to be decided by Kerala PWD during tendering process.

## **2.9 Details of social impact assessment/ environment impact assessment if already conducted and any technical feasibility reports**

As per the available information, no studies to assess social or environment impact of the project are conducted in the past. Existence of any technical feasibility reports with respect to the project are also not found in any possible sources.

## **2.10 Applicable legislations and policies**

The applicable laws on land acquisition, rehabilitation and resettlement for the proposed land acquisition for constructing Perandoor-Vaduthala Bridge are:

- The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
- Government of Kerala – Revenue (B) Department -State Policy for Compensation and Transparency in Land Acquisition vide G.O (Ms) NO.485/2015/RD dated 23/09/2015.
- Government of Kerala – Revenue (B) Department -State Policy for Rehabilitation and Resettlement Package for Land Acquisition in the State in lieu of RFCTLARR Act 2013 vide GO(MS)No.448/2017/RD dated 29/12/2017.
- Right to Information Act, 2005

## Chapter 3

### Team Composition, Approach, Methodology and Schedule of the Social Impact Assessment

#### 3.1 Team Members

Vide Kerala Gazette Order No. 733 dated 18.03.2019, the SIA Unit of Rajagiri College of Social Sciences, Ernakulam was appointed to conduct Social Impact Assessment Study and to prepare a Social Impact Management Plan as per section 4 (1) of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013. Further, a team was constituted with experts who have engaged in similar projects and deployed them into the project with a set of definite roles and responsibilities.

Table (3.1)

Sl. No	Name	Qualification and Designation	Experience
1.	Dr. Binoy Joseph	PhD, MA (PM& IR) Principal and Chairperson	25 Years in Management and Development
2.	MeenaKuruvilla	MSW Project Director	30 years in development sector
3.	Maria Tency V S	MA, DSS Research Associate	27 years in development sector
4.	Biju C P	BA Development Officer-SIA	24 years in development sector
5.	Tony Babu	MSW Research Associate	2 years in development sector

#### 3.2 Methodology and Rationale

As per the Notification (No.CS-68448/12) and Schedule issued by District Collector, Ernakulam dated 27/02/2019, 11 extent of land in Cheranalloor Village and 4 extent of land in Edappally South Village are reported to be acquired for the construction of Perandoor-Vaduthala Bridge and Approach road. Our researchers have identified 12 Affected Persons who own and hold land in the specified survey Nos. To infer crucial information required to assess the impact and to prepare Mitigation and SIA Management Plan, our field investigators have visited households and commercial offices in the region and collected information through a structured questionnaire. Further, to collect the information and assess the impact of the affected parties whose residence are not in the vicinity, a formal

letter was sent requesting their participation in a telephonic survey. While 11 persons have participated in our survey directly, one person has responded to the question over Telephone.

Focus Group Discussion and Key Informant Interviews of Affected Persons, Administrators, Civil Officers and other important stakeholders were also held by the expert qualitative researchers of the SIA Unit to gather common, specific and perceived impact of the project. The published reports and designs from Roads Division of PWD, Ernakulam was also referred in this study.

### **3.3 Sampling**

As the size of land to be transferred for the project by the affected person and extent of impact due to latter is unique for each, a population Socio-Economic-Impact Survey was found to be appropriate over sampling method. Further, the respondent size was found to be 12 land owners and was possible to collect the information in the limited timeframe as per the scheme of the study.

### **3.4 Overview of Data Sources**

Both primary and secondary information were collected and analysed through mixed method by the expert quantitative and qualitative researchers. Secondary information and published reports from concerned PWD/Revenue/Civil Stations were collected/ referred by the field investigators at multiple stages.

A structured questionnaire was prepared, tested and validated to collect information from affected persons through Socio-Economic-Impact Survey. All affected persons were participated in the survey and have responded to the questionnaire interview. Survey contained questions aimed to collect the information such as Demographic/ Economic/ Family/ Livelihood, details of performing/non-performing assets in the project land and the types/degree of impact. The response and data points were analysed through a statistical software and findings have reported along with recommendations.

### **3.5 Schedule of Consultation Meetings/ Public Hearings**

As part of the study, multiple meetings/interviews/discussions were held with important stakeholders.

Table (3.5)

Date	Activity/Event/Meeting	Venue
9.05.2019	Pilot Study and Key Informant Interviews	Perandoor and Vaduthala
10.05.2019 14.05.2019	Socio-Economic Survey and Key Informant Interviews	Perandoor and Vaduthala
13.06.2019	Meeting with Land Acquisition Officer,	Perandoor and Vaduthala
22.06.2019 24.06.2019	Distribution of Notice and broadcasting about Public Hearing Meeting	Perandoor and Vaduthala

## Chapter 4

## Land Assessment

### 4.1 Description with the help of the maps, information from land inventories and primary sources

The proposed Perandoor-Vaduthala Bridge would require 0.4970 Hectares of Land at Vaduthala side in Cheranalloor Village and 0.2266 Hectares of Land in Perandoor Side which belongs to Edappally South Village. The region is known for its serenity and backwaters, yet being a busy and growing urban habitat. The land to be acquired are mostly vacant land have been classified as wet land as per available land records. Site plan cum alignment published by Kerala PWD is exhibited below.

Exhibit 4.1



### 4.2 Entire area of impact under the influence of the project (not limited to land area for acquisition)

Vaduthala and Perandoor are two important suburbs in the Kochi city and located west of Edappally. Vaduthala is surrounded by water at its North, West and East side. Perandoor on the other hand is located closer to Elamakkara, a busy town in Edappally region.

Perandoor Canal separates Vaduthala and Perandoor and developing new ways of commute between the places have been significant for the region. The area is also home to many religious institutions, schools and hospitals which lead to rise in residence buildings and commercial establishments.

The project is mapped to acquire a total extent of 0.7236 Hectares of land and most plots are unused and classified as wet land. Railway line that connects Edappally with Ernakulam Town and Vallarpadam goes through the region and the Railway Over Bridge across Perandoor Canal is located near to the project site. The proposed bridge is expected to result in increase of commercial and residential buildings as people commute between the regions.

#### **4.3 Total land requirement for the project**

As per the Notification and Schedule released by District Collector, a total extent of 0.7236 Hectares of land (Mostly Wet Lands) from Kanayannur Taluk of Ernakulam district is mapped to be acquired; of which 0.4970 Hectares of land (Survey Nos. - 1090, 101, 1092, 1093, 1105, 1106, 1107, 1109, 1110, 1112 and 1113) belongs to Cheranalloor Village and 0.2266 Hectares of land is part of Edappally South Village (Survey Nos. - 219/9, 219/10, 219/11 and 231/3).

#### **4.4 Present use of any public, utilized land in the vicinity of the project area**

Railway line that connects Edappally with Ernakulam Town and Vallarpadam goes through the region and the Railway Over Bridge across Perandoor Canal is located near to the project site. Besides, public road beside Canal exist at Perandoor as well as Vaduthala area and the proposed bridge is expected to connect these roads. At Perandoor side, few concrete piling done as per a former plan is spotted, but details of the same in records have not been found.

#### **4.5 Land (if any) already purchased, alienated, leased or acquired, and the intended use for each plot of land required for the project**

The concerned authorities have mapped to acquire 0.7236 Hectares of land for the proposed construction of Perandoor-Vaduthala Bridge over Perandoor Canal. As per the available information from the concerned departments, no land has been either leased or purchased for the project yet.

#### **4.6 Quality and location of land proposed to be acquired for the project**

The project site is spread in Cheranalloor and Edappally South Villages in Kanayannur Taluk of Ernakulam district. Vaduthala and Perandoor are two important suburbs in Greater Cochin and hosts varied institutions such as Banks, Hospitals, Educational Institutions, Religious Organisations, and Government Offices etc. Perandoor Canal separates the regions and 0.7236 Hectares of Wet Land is mapped for the project. The proposed bridge will connect Balabhadra Devi Temple Road at Perandoor Side at Coordinates of 10.015494, 76.282535 and Pallikavu Temple Road at Coordinates of 10.015325, 76.281607 at Vaduthala side. Considering the soil condition of the project site, appropriate piling and structure design is incorporated in the design adopted by Kerala PWD.

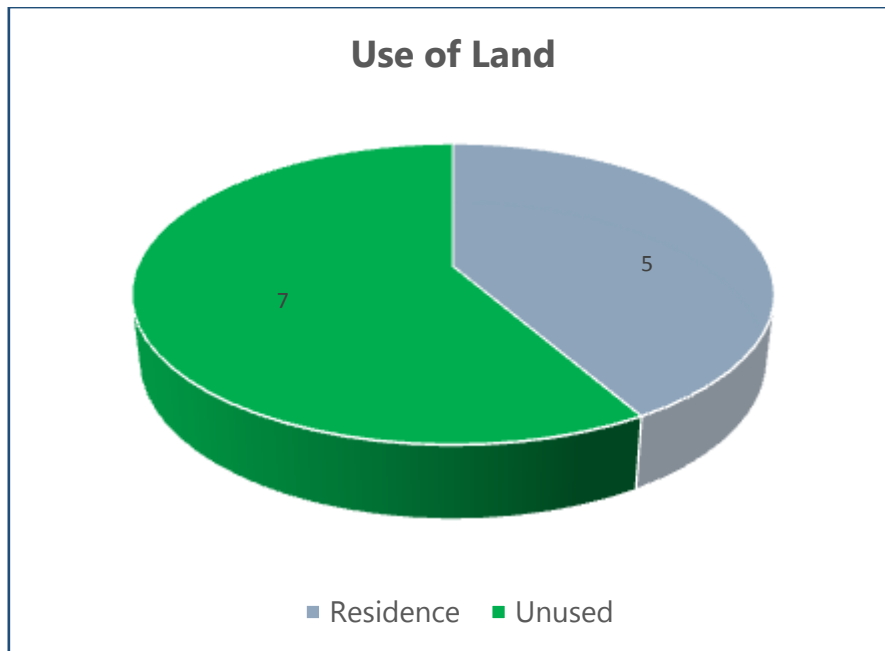
#### **4.7 Nature, present use and classification of land and if agriculture land, irrigation coverage and cropping patterns**

The proposed Perandoor-Vaduthala Bridge accounts construction of new bridge across Perandoor Canal along with widening and renovation of existing roads at either sides. 12 affected persons have been identified, whose land will be affected for the development of approach roads. Land plots in Perandoor side, owned by five persons and plots in Vaduthala side, owned by seven persons are reported as Nilam Nikathu Purayidam. No Agriculture land is reported to be affected due to the project.

While analysing the present use of land (Figure 4.7), it is found that the majority of the affected persons have kept their land unused (N-7). Whereas, 5 residential plots are being affected including the extent of land used for road which is owned by Nakshatra Residence Association. However, no building will be affected with the acquisition of land except one of the affected persons whose two storeyed residential building under construction in the plot at Perandoor side.

Figure (4.7)





#### 4.8 Size of holdings, ownership patterns, land distributions and number of residential houses

The affected plots of 12 affected persons include residential as well as non-residential lands in varying size ranging from 3 cents to 4 acres. However, these lands will be partially affected with minimal loss to each affected person.

While 10 affected persons have reported in the Socio-Economic Survey that they own land out of a Purchase Transaction, 2 have not responded to the question. Further Three affected persons have bought the land in the year 2017, the remaining have not responded to the question with respect to the date of ownership.

It is reported in the survey that no functional residential buildings will be affected, barring one of the affected persons whose two storeyed residential building under construction in the plot at Perandoor side.

#### 4.9 Land prices and recent changes in ownership, transfer and use of lands over the last three years

The market value of the land per cent is reported to be around INR 14 Lakhs per Cent and will be varied based on the size of plots and value in the specific area. Three affected persons have bought the land in the year 2017, the remaining have not responded to the question with respect to the date of ownership.

## **Chapter 5**

## **Estimation and Enumeration (Where Required) of Affected Families and Assets**

### **5.1 Estimation of families**

As per the information from Land Acquisitions Office, land plots of 12 persons are to be affected. This includes plots owned by three builders namely E P Builders, Parinee Developers and J.M Gardens at the Vaduthala side in Cheranalloor Village. The remaining plots are owned by individuals either for residential use or kept as open land and being classified as NilamNikathuPurayidam.

#### **5.1.1 Families which are directly affected (own land that is proposed to be acquired)**

The list of 12 directly affected persons whose land is being projected to acquire for Perandoor-Vaduthala Bridge is given in Table 5.1.1

### **5.2 Family of scheduled tribes and other traditional forest dwellers who have lost any of their forest rights**

The construction of Perandoor-Vaduthala Bridge across Perandoor Canal in Kochi requires acquisition of Dry and Wet Lands in Chernalloor and Edpapally South Villages in Ernakulam district. Neither any Scheduled Tribes, nor any other community with special forest rights are reported to be affected with the project.

### **5.3 Families which depend on common property resources which will be affected due to acquisition of land of their livelihood**

Except the extent of land being presently used for Road owned by Nakshatra Gardens Residence Association, no major common property and resources are found to be affected with the proposed construction of Perandoor-Vaduthala Bridge.

Table (5.1)

<b>S. No.</b>	<b>Name and Address of Land Owner/ Affected Person</b>	<b>Extent of Land to be</b>	<b>Village</b>	<b>Resurvey No.</b>
---------------	--	-----------------------------	----------------	---------------------

		Acquired (in Hectares)		
1	Lissy Mathew, 35/2566, Janatha Road, Palarivattom	0.4970	Cheranalloor	1113
2	Nakshatra Gardens Residence Association, Vaduthala		Cheranalloor	1113
3	Suresh P, Nandanam House, Vaduthala		Cheranalloor	1113
4	E.P Builders, Ernakulam		Cheranalloor	1090, 1091, 1093
5	Robin P. Cherian, Flat No.37, J.M Gardens, Vaduthala		Cheranalloor	1093
6	Parinee Developers, Kochi		Cheranalloor	1112, 1105,1106, 1107, 1092,1109, 1110
7	J.M Gardens (Apartments) , Vaduthala		Cheranalloor	1112
8	Jayan G, Padikaparambil House, Chelanjeri Road, Thevara	0.2266	Edappally South	231
9	Dasan K.N, Kavungumkootathil House, Perandoor, Elamakkara		Edappally South	231
10	V.V George, Mathew Mammen, Shirley Philip and Mollykutty, Perandoor		Edappally South	219, 231
11	Mathew Abraham and Varghese Thariyan, Perandoor		Edappally South	219, 231
12	Ambujakshan S, Panavelil House, PadinjarekizhakkumMuriyil, Sooranad, Kollam-690522		Edappally South	219/11

#### **5.4 Families which have been assigned land by the State Government or the Central Government under any of its schemes and such land is under acquisition**

No families in recent years were assigned land by any government and no such land will be affected.

#### **5.5 Families which have been residing on any land in the urban areas for preceding three years or more prior to the acquisition of the land**

As reported in the Survey conducted by SIA unit, three affected persons have acquired the plot in the last three years and none of them reside in the affected land.

## **5.6 Families which have depended on the land being acquired as a primary source of livelihood for three years prior to the acquisition**

The land mapped to be acquired for the project is classified as Wet Lands and no farming activities are prevalent in the affected land or in its vicinity. One of the affected persons whose Bottled Drinking Water Unit is understood to be affected, however is reported that the latter is not the major source of income in the family. Besides, three land plots owned by different Builder organisations are mapped for the project and the loss of land is expected to impact income source of these companies.

### **5.6.1 Families which are indirectly impacted by the project (not affected directly by the acquisition of own lands)**

The affected land doesn't engage any commercial or farming activities and hence the indirect effect is understood to be very minimal. Moreover, the bridge is designed in such a way that country boat can pass the Canal without any hurdle and hence the fishing and its related prevailing activities are also have the least adverse impact with the project.

### **5.6.2 Inventory of productive assets and significant lands.**

The project area largely covers Wet Lands and no major productive assets are expected to have an effect. Moreover, the land of ChinmayaVidyala, a school in the vicinity is excluded for widening the road, leaving the least impact to the life of people in the region.

## **Chapter 6**

### **Social Economic and Cultural Profile (Affected Area and Resettlement Site)**

## 6.1 Demographic details of the population in the project area

Vaduthala and Perandoor are two busy suburbs in the city of Cochin with presence of water in a large area. Fishing has been the sole livelihood means in the region and as city grew in the last few decades, more institutions such as Banks, Commercial establishments, Schools, Hospitals etc. have started in Vaduthala as well as in Perandoor. This led to growing demand for residential properties and many Villas and Apartments have commenced for local as well as for people from elsewhere.

The proposed project of Vaduthala-Perandoor Bridge will have varied impact on the people and Socio-economic profile of 12 affected persons are given here.

As given in the figure 6.1, 14 families follow Hinduism and Christianity each. The affected population also includes three reality companies as well as a residence association and categorised them in the head 'Others'.

While 3 families belong to Other Backward Community (OBC), 5 families fall in the General category. Affected organisations have categorised into 'Others'. (Figure 6.1.2)

While analysing age of the affected population, it is found that adult in the age group of 26-40 outnumbered the rest with 8 of them followed by 6 persons falling in 41-60 age group. Similarly, presence of younger children (0-6) and elders (60-80) in the families are comparatively high with 5 and 4 numbers respectively. Number of children under age group of 6-17 and adults in 18-25 age group have counted as 2 each. (Figure 6.1.3)

Figure 6.1.4 explains classification of population in terms of Gender. As per the primary information through questionnaire survey, population of male is 15 and of Female is 17.

As illustrated in Table 6.1.1 detailing the marital status, 17 persons are married and 14 are reported as unmarried. Survey counts 1 person as widow.

With regards to the education background of the affected persons, survey reveals that Nine (9) people in the affected families are college graduates. Number of individuals with High School, UP School and LP School qualification are 3, 4 and 2 respectively. (Table 6.1.2)

Figure (6.1.1)

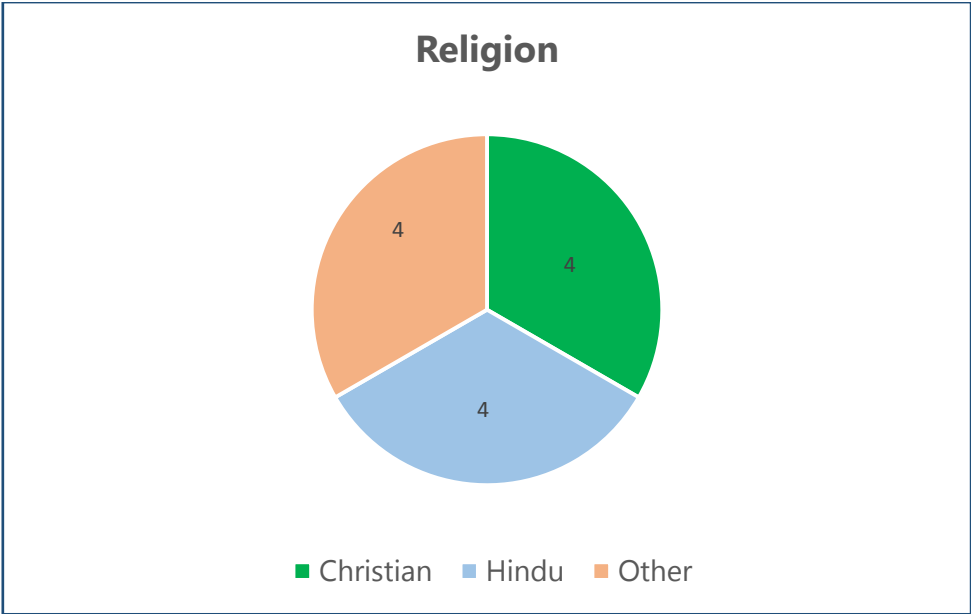


Figure (6.1.2)

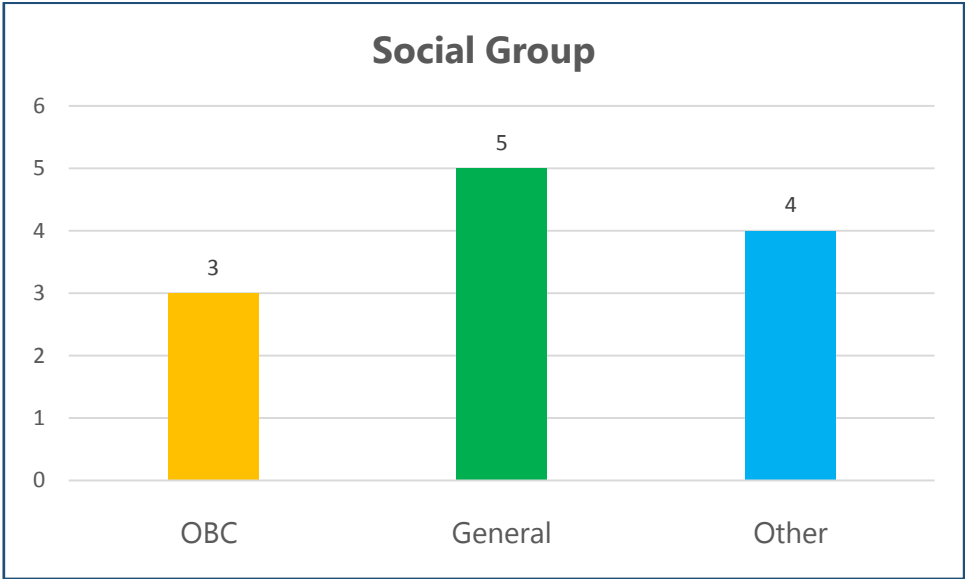


Figure (6.1.3)

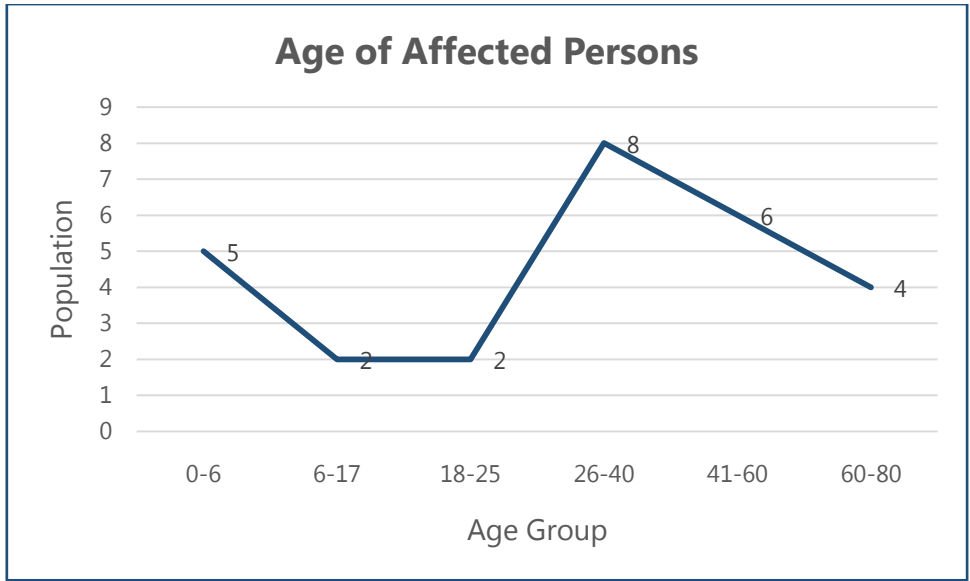


Figure (6.1.4)

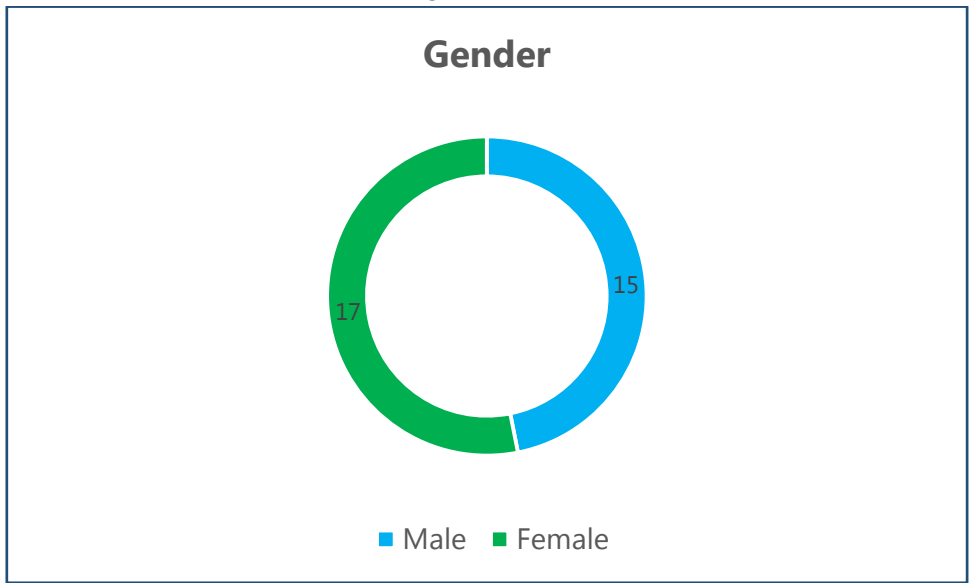


Table (6.1.1)



<b>Marital Status</b>	<b>No. of Persons</b>
Married	17
Unmarried	14
Widow/Widower	1

Table (6.1.2)

<b>Level of Education</b>	<b>No. of Persons</b>
LP School	2
UP School	4
High School	3
UG	9

## **6.2 Income and poverty levels**

Income level of the affected families is found to be above average as per the available information and varies between 30,000 to 1, 50,000 per month. Only five families have responded to this question and three have not given the information. Four affected parties are known to be private limited companies/association.

While Two (2) families have only one earning member, four persons earn in one of the affected families. Survey also reveals that two (2) families have two earning members each and contributes to the family income. The average No. of Dependents in the family is two (2).

Only Three (3) families have disclosed information about the Ration Card they hold and it is reported that two have 'Blue' coloured Ration Card, whereas one hold 'White' coloured Ration Card, indicating the above average income level of the affected families.

## **6.3 Vulnerable groups**

The proposed Perandoor-Vaduthala Bridge across Perandoor Canal would require acquisition of land from both sides at Edappally South and Cheranalloor villages. Though major aspects of Human Development Index such as education, income, health etc. are found to be positive, there are certain vulnerable groups especially children and elders who would require special attention while implementing the project. No. of Children under 17 years of age is Seven (7) and elders whose age is above 60 years is Four (4).

## **6.4 Land use and livelihood**

As furnished in Figure 4.7, Seven (7) Land plots are classified into 'Unused', whereas Five (5) are being used as residential land. No farming or commercial establishments are present in the affected land except in one case, wherein the affected family uses the land space for bottling drinking water for commercial transaction. Moreover, land plots of Three (3) builder firms are mapped to be acquired which is expected to adversely affect the source of income to these organisations.

### **6.5 Local economic activities**

Vaduthala and Perandoor are two growing towns in the Kochi city with population rising in the region. The boom in the Reality sector have played a significant role in the development of the region. Since then, institutions such as Banks, Schools, Hospitals etc. have started operating out of the region, resulting in more inflow of residents from other parts. Business and Employment in Private Firms are known to be major sources of income in the affected families.

### **6.6 Factors that contribute to local livelihoods**

Due to presence of water in a large area, Vaduthala, a suburb in Kochi city was known as a fishing hub. As the road and other connectivity developed in the last few decades, the region has made progress especially in the Reality sector. Many apartments and residential buildings have commenced in the serene region. Similarly, institutions such as Banks, Educational Institutions, Religious Organisations and Hospitals have started operational which gave an urban outlook to the region. Development in neighbouring areas of Kaloor, Edappally and Elamakkara have also played a crucial driving force for the economic wellbeing of the people in the region

### **6.7 Kinship patterns and social and cultural organization**

As observed by the expert team of SIA, people generally live in harmony and work together for the development of the region. Various Residents Associations in the region also play a vital role in encouraging collaborations. Schools, Religious and Cultural Organisations are also present in the region and the most notable being ChinmayaVidyalaya.

### **6.8 Administrative organization**

The affected land is spread in two villages- Cheranalloor and Edappally South of KanayannurTaluk in Ernakulam District. No Administrative Organisations are present in the region.

## **6.9 Political organization**

The Perandoor-Vaduthala Bridge is planned in such a way that the individual and common properties are affected the least. No political organisation is observed to be located in the vicinity of the project location.

## **6.10 Community based and civil society organizations**

Though the project area has presence of all major religions, Hinduism and Christianity are two dominant religions in Vaduthala as well as in Perandoor. The major religious organisation at Vaduthala side is Pallikkavu Devi Temple. Whereas, three major temples are located at Perandoor side and they are PerandoorBhagavathi Temple, SreeBalaBhadra Temple and Ganapathi Temple.

## **6.11 Regional dynamics and historical change processes**

Since the inception of Greater Cochin Development Corporation (GCDA), the suburbs and islands in Ernakulam district have witnessed major changes and modernisation of its infrastructure. Due to presence of water in a large area, Vaduthala, a suburb in Kochi city was known as a fishing hub. As the road and other connectivity developed in the last few decades, the region has made progress especially in the Reality sector. Many apartments and residential buildings have commenced in the serene region. Similarly, institutions such as Banks, Educational Institutions, Religious Organisations and Hospitals have started operational which gave an urban outlook to the region. Development in neighbouring areas of Kaloore, Edappally and Elamakkara have also played a crucial driving force for the economic wellbeing of the people in the region.

## **6.12 Quality of the living environment**

Major population in the project area live Above Poverty Line with access to facilities such as Schools, Hospitals, Civil Organisations, Social Groups etc.. Due to its close access with other major towns in Kochi City, the facilities in the neighbouring places are also being used widely.

## Chapter 7

### Social Impact Management

#### 7.1 Approach to mitigation

To assess the mitigation, the expert research team of SIA Unit has adopted an approach that is spanned in three phases. In the first phase, a physical observation of the area was held and conducted a pilot study to understand major risks and opportunities involved with the project. Through a structured questionnaire, detailed dynamics of risks of each affected person is collected and analysed. Further, to understand generic and common risks involved with the project, in-depth interviews were held with selected key persons and stakeholders of the project. A public hearing is being scheduled for a comprehensive measurement of risk and to mitigate it in the third phase.

#### 7.2 Measures to avoid, mitigate and compensate impact

The proposed construction of Perandoor-Vaduthala Bridge at Kanaynnur Taluk in Ernakulam District is planned by the requiring body by minimising the risk in the most possible manner. Except one residential building under construction, no major structure is understood to be affected as the alignment of the Bridge and Approach Road was made by avoiding residential dwelling coming on the proposed project to minimum. Further the project site mostly covers wet land and hence no farming activities are disturbed. However, the project is assumed to adversely affect 12 families/organisations and the following measures may be taken to avoid, mitigate and compensate impact

- Ensure hassle-free water transportation while designing the Bridge and its related civil structures.
- Coordinate with other Government Departments such as Bhavanam Foundation, who is responsible for revamping Perandoor Canal for multiple urban development projects
- Reinstall common facilities such Roads and Walkways to residential/ other properties which are expected to affect due to the implementation of the project
- Recreate income source for one of the affected persons whose Bottling Drinking Water Unit is being affected.
- Safety of the people while constructing the Bridge/Road and healthy disposal of wastages arise out of construction should be ensured.

### **7.3 Measures that are included in terms of Rehabilitation and Resettlement and Compensation as outlined in the Act**

The Rehabilitation and Resettlement package as per the Policy issued by Revenue(B) Department, Government of Kerala vide G.O.(Ms)No.448/2017/RD dated 29/12/2017 for the rehabilitation and resettlement package for land acquisition in the state in lieu of RFCTLARR Act 2013 shall be provided to the affected land owners.

### **7.4 Measures that the Requiring Body has stated it will introduce in the project proposal**

Measures stated by the requiring body in the project proposal as sufficient fund has been reserved as compensation.

### **7.5 Alterations to project design and additional measures that may be required to address the extend and intensity of impacts across various groups as identified during SIA**

Two storeyed residential building under construction of one of the Affected Persons is understood to be affected fully. Realignment of land for broadening the existing road would prevent demolition of the building.

### **7.6 Detailed Mitigation Plan including detailed activities to be carried out for each mitigation strategy, timelines for each mitigation strategy**

The Rehabilitation and Resettlement package as per the Policy issued by Revenue(B) Department, Government of Kerala vide G.O.(Ms)No.448/2017/RD dated 29/12/2017 for the rehabilitation and resettlement package for land acquisition in the state in lieu of RFCTLARR Act 2013 shall be provided to the affected land owners.

Table (7.6)

S #	Mitigation Strategy	Activities	Timeline
1	Compensation and Resettlement	Assessing the impact	
		Calculation of Compensation	
		Transfer of land and Disbursement of Compensation	
2	Recreation of Common Facilities	Construction of common facilities along with Bridge and Road construction	
3	Livelihood Impact Mitigation	Reinstall livelihood opportunities for the affected person whose Bottling Drinking Water Unit is to be affected	
5	Mitigation to ensure safety and continuous transportation	Implement safety measures and develop plan of action for the uninterrupted transportation and to dispose construction wastages	

**7.7 The SIA plan indicating which measures the Requiring Body has committed to undertake and those that have been proposed, but not committed to be undertaken by the Requiring Body**

Not Applicable

## Chapter 8

### Social Impact Management Plan Institutional Framework

#### 8.1 Description of institutional structures and key person responsible for each mitigation measures

The project of constructing the Perandoor-Vaduthala Bridge across Perandoor Canal in Ernakulam District is proposed by Kerala PWD Roads Division. Government of Kerala has appointed various key persons through formal order with clear roles and responsibilities in accordance with the Right to Fair Compensation and Transparency in Land Acquisition, Resettlement and Rehabilitation (RFCTLARR) Act, 2013.

RFCTLARR Act, 2013 defines the Administrator appointed by the State Government would be the person responsible for Preparation of Rehabilitation and Resettlement Scheme for affected families of Land Acquisition. Subject to the superintendence, directions and control of the appropriate Government and the Commissioner for Rehabilitation and Resettlement, the formulation, execution and monitoring of the Rehabilitation & Resettlement Scheme shall vest in the Administrator.

As per G.O. (Ms) No.485/2015/RD, dated 23/09/2015, The Kerala State Policy for Compensation and Transparency in Land Acquisition, the District Level Fair Compensation, Resettlement and Resettlement Committee comprising :

- District Collector, Administrator for resettlement and rehabilitation,
- Land Acquisition officer
- Finance Officer
- Representatives of the requiring body to take financial decisions on its behalf,
- Representatives of Local Self Government Institution to monitor the Rehabilitation Action Plan

#### 8.2 Specify role of Non-Governmental Organizations

Not applicable

### **8.3 Indicate capacities required and capacity building plan, including technical assistance if any**

Road division of Kerala PWD will finalise the resources and capacities.

### **8.4 Timelines for each activity**

Timeline will be finalized as per the Kerala Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2015.



## Chapter 9

### **Social Impact Management Plan Budget and Financing of Mitigation Plan**

#### **9.1 Costs of all resettlement and rehabilitation costs**

For the construction of Perandoor-Vaduthala Bridge, a total amount of INR 2940 Lakhs (Two Thousand Nine Hundred and Forty Lakhs Only) is budgeted by Kerala PWD which includes the cost for land acquisition and rehabilitation.

#### **9.2 Annual budget and plan of action**

Not Applicable

#### **9.3 Funding sources with break up**

Not Applicable

## Chapter 10

### Social Impact Management Plan Monitoring and Evaluation

#### 10.1 Key monitoring and evaluative indicators

The proposed Perandoor-Vaduthala Bridge across Perandoor Canal in Ernakulam district will affect 12 families/organisations. The key monitoring and evaluative indicators are

- Fair compensation and resettlement measures as per RFCTLAAR Act, 2013
- Timely disbursement of funds to the affected families
- Implementation of the proposed project in the timeframe defined
- Safety and environmental measures
- Recreate livelihood opportunities

#### 10.2 Reporting mechanisms and monitoring roles

Rehabilitation and Resettlement procedures as stated in the Kerala Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules 2015 will be applicable.

#### 10.3 Plan for independent evaluation

Not Applicable

## Chapter 11

### Analysis of Costs and Benefits and Recommendation on Acquisition

#### 11.1 Final conclusions on assessment of public purpose, less displacing alternatives, minimum requirements of land, the nature and intensity of social impacts, and viable mitigation measures will address costs

A large area in Ernakulam district is surrounded by water and connectivity with other regions have always been a demanding requirement of the people. Over the years, there has been a large inflow of population in the city, leading to development of residential and commercial infrastructure in suburbs and islands. Perandoor and Vaduthala are two such areas in Ernakulam district and to ease the traffic, Kerala PWD has proposed to build a new Bridge named 'Perandoor-Vaduthala Bridge' across Perandoor Canal. Government of Kerala through Notification No. C5-68448/12 dated 27/02/2019 has conferred the project as for Public Purpose. Accordingly, 0.4970 Hectares and 0.2266 Hectares of Land respectively from Cheranalloor and Edappally South Villages have identified in Kanayannur Taluk to acquire for the project.

With the current land mapping done for the project, land plots of (Mostly Wet Land) of 8 families are reported to be affected. Further, land plots of three Builder Firms and one Residence Association will also be affected. Suitable Resettlement/ Rehabilitation/Compensation measures should be taken to mitigate the impact of the affected.

The proposed bridge is having 78m length with 3 spans of 26 m each and 7.50m wide carriage way and 1.5m wide foot paths on both sides. A vertical clearance of 2m from water level has been provided anticipating country boat traffic. Further, the Approach Road having length of 315 and 75m at Vaduthala side and 130m on Perandoor side are also part of the project. However only 0.7236 Hectares of land needs to be acquired in total from 12 families/organisations.

The nature of impact vary from one to another. Land plot and Residential Building under construction of one of the Affected Person is mapped to be acquired. This property is understood to be the only land and building asset the family possess and is known to be the most intense impact among others. Threat to water transportation through Perandoor Canal, adverse impact on livelihood, reduction in ownership and possession of land etc. have also emerged as other major impacts to mitigate. Fair compensation and R & R Package based on RFCTLAAR Act, 2013 is expected to cover major risks through its mitigation measures.

Further, the affected persons in general are very positive on the proposed construction of the Bridge and Road as it is expected to reduce traffic, improve connectivity with other locations and is likely to result in appreciation of commercial value for land and other assets.

**11.2 The above analysis will use the equity principle as a framework of analysis for presenting a final recommendation on whether the acquisition should go through or not.**

Based on the analysis and assessment of the positive and negative impacts of the project of constructing Perandoor-Vaduthala Bridge in Ernakulam District, SIA Team recommends the project to implement with the possible alteration of the existing land mapping if any to help one of the affected person to retain residential building under construction and acquisition plans accordingly. The project is expected to improve quality of living in the region especially on transportation and the same is empathised by the affected persons despite the negative impact the project leaves. The following are recommended to mitigate the impact

- The Rehabilitation and Resettlement package as per the Policy issued by Revenue(B) Department, Government of Kerala vide G.O.(Ms)No.448/2017/RD dated 29/12/2017 for the rehabilitation and resettlement package for land acquisition in the state in lieu of RFCTLARR Act 2013 shall be provided to the affected land owners.
- Reinstall common facilities and way to residential/ other properties which are expected to affect due to the implementation of the project
- Recreate livelihood opportunities of the affected persons whose dependence on the affected area is crucial for the means of future income
- Safety of the people while constructing the road and healthy disposal of wastages arise out of construction should be ensured.

## References

1. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
2. Rehabilitation and Resettlement Package for acquisition of Land in the State in lieu of RCFTLAAR Act, 2013 G.O. (Ms) No. 448/2017/RD dated 20/12/2017
3. Notification and Schedule (No.C5-68448/12) from District Collector, Ernakulam dated 27/02/2019
4. Form No.2 as Requisition for Acquisition of Land by Kerala PWD Roads Division, Ernakulam
5. Site Plan cum Alignment, Kerala PWD Roads and Bridges, Ernakulam
6. Tentative General Design Drawing (File No. BD/23/2014/Design/HW), Kerala PWD DRIQ Board, Thiruvananthapuram dated 27/12/2017
7. Estimate Report of Kerala PWD Roads Division, Ernakulam 'B/W 2015-16 Construction of VaduthaPerandoor Bridge across Perandoor Canal in Ernakulam district'
8. Kerala Gazette G.O. No. 733 dated 18-03-2019
9. National Highways Authority of India, Annual Report 2016-17
10. Kerala PWD- Road Bridge Maintenance Policy G.O (Ms.) No. 72/2016/PWD DATED 22/10/2016
11. [www.keralapwd.gov.in](http://www.keralapwd.gov.in)
12. GCDA Administration Report 2017-18