Installation of Solar Power Plant for Govt. Offices in Kumbadaje Gram Panchayat

Detailed Project Report (DPR)

SUBMITTED TO KERALA LOCAL GOVERNMENT SERVICE DELIVERY PROJECT (KLGSDP)

Prepared By
Centre for Rural Management (CRM), Kottayam, Kerala

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CONTENT

Chapter 1

INTRODUCTION & PROFILE OF THE GRAM PANCHAYAT

INTRODUCTION

The document contains the detailed project report (DPR) of the ***Installation of Solar Power Plant for Govt. Offices in Kumbadaje Gram Panchayat*** which has been prepared for the Kumbadaje Gram Panchayat of Kasargodu District in Kerala with the technical support of Centre for Rural Management, (CRM) Kottayam. The project is finalized by the joint sitting of the Project Management Unit of the Kerala Local Government Service Delivery Project (KLGSDP) and the functionaries of the Kubadaje Gram Panchayat. It is identified based on the socio economic conditions, the index of backwardness and the aspirations of the local citizens of the Panchayat. Participatory rural rapid appraisal tools were administrated for the identification and prioritization of the Project.

PROFILE OF KUMBADAJE PANCHAYAT

Kumbadaje Gram Panchayat is in Karadukka Block of Kasargodu District. The total area of the Panchayat is 31.03sq km. The east side of the Panchayat is Karadukka and Beloor Gram Panchayats, west side is Badiyadukka Gram Panchayat, south side is Chenkala and Karadukka Gram Panchayats and north side is Enmakaje and Badiyadukka Gram Panchayats. Majority of the people in the Panchayat are agriculturists and the major crops are arecunut,(47.79%), coconut (16.33%), rubber (16.59%) pepper (3.01%), paddy(6.02%) and plantain(2.3%). In addition to this cashew (3.52%) is also cultivated in the area. Total there are 2327 ha. of land under cultivation .There are ten *padashakaram samithis* for paddy cultivation. Though there are 7 perennial ponds, 12 stream and small rivulets, and number of public and private tube wells for irrigation, the required water is quite in sufficient for irrigation, particularly for paddy cultivation. There are total 13 wards in the Gram Panchayat. The total number of the households in the Panchayat is

2787. The density of population is 476 persons per sp.km. The total population of the Panchayat is 14772 among which 7370 are males and 7402 are females. The literacy rate of the Panchayat is 76.50 percent. Whereas the male literacy rate is 81 per cent and female literacy rate is 72 per cent. The sex ratio of the Panchayat is 1004. Out of the total population, 10.09 per cent are SC category and 0.26 per cent is ST category. Out of the total households in the Panchayat, 48.83 (1361) per cent belongs to BPL category, as per the recent BPL list. In the Panchayat, there are 24 recognized SC colonies with 255 households. The colonies are spread throughout the Panchayat, except in two wards (ward number iii & v). Among the SC community, some of them are Theyyam artists. There are 153 households under STs and they belong to two categories, *Marathi and Mavilan* .Under *Mavilan* category there are only 4 families.

SECTOR PRIORITY (LOCAL RESOURCE MOBILIZATION THROUGH INFRASTRUCTURE DEVELOPMENT)

Sector priority was made by the Panchayat with the support of Centre for Rural Management (CRM), Kottayam. The purpose was to assess the backwardness and to identify sector and essential projects which have the potential for sustainable local economic development and ensuring social justice. The potential projects under sectors were identified through three FGDs conducted in different parts of the GP and followed by transect walk. Discussions/consultations with the senior citizens and social workers in the Panchayat were also arranged to gather expert opinion.

To begin with the sector analysis in very precise, the consulting team (Centre for Rural Management) had a detailed discussion with the President, Vice President and other members of the GP on 31 May 2016. Subsequently, four Focus Group Discussions (FGDs) in different parts of the GP on 9th & 10th June were conducted and followed by transect walk on the same dates. Representatives of the political parties, members from community based organizations; teachers, *anganwadi* workers as well as members from *kudumbasree* were invited for active participation in the FGDs and to share their views

and suggestions in prioritizing the projects. While assessing the socio economic conditions and the index of backwardness of the Panchayat, all the sectors were analyzed in detail. And based on the detailed sector analysis, **Local Resource Mobilization through Infrastructure Development** was identified as one of the priority sectors.

PROJECT RATIONAL OF THE INSTALLATION OF SOLAR POWER PLANT FOR GOVT. OFFICES

Infrastructure and other Facilities in the Gram Panchayat

The Kumbadaje Gram Panchayat has an own office building; however this building is a very old one. A new shopping complex for the Gram Panchayat is under construction near the existing one. The present office complex had no sufficient space for office administration. The Krishi Bhavan and Primary Health Centre are functioning in the Panchayat compound. In the Kumbadaje Gram Panchayat there is one government lower primary school and two aided schools. Under upper primary, there are two schools each under government sector and aided sector. There is one high School and one higher secondary school functioning in the Panchayat under aided sector. In the health sector there are one Primary Health Centre and three family sub centers functioning in the GP. Total number of *anganwadies* in the Panchayat is 18 and also 3 mini *anganwadies* are functioning

The own income of the Panchayat is hovering around 3 per cent of the total turnover during the last three years. It is important to note that during the 2013-2014 financial year the total receipt of the Panchayat is Rs. 38,624,055.00 and whereas the own income is only Rs. 1,037,170.00 and which is only 2.69 percent of the total receipt. In 2014-2015 the total receipt has increased to Rs. 45,121,309.00 and own income to Rs. 1,394,649.00, which is 3.09 percent of the total receipt. During the last financial year, the total receipt has come down to Rs. 43,636,283.00 and the own income to Rs. 598,692.00 which is only 1.37 percent of the total receipt. There is more than 34 percent increase in own

income during 2014-2015 period when compared to previous year. However, 57 percent decrease of own income is registered in 2015-2016 when compared to previous year.

The highest item in own income is property tax, which is 48.61 percent during 2013-2014 period. This has gone up in next financial year to 50.25 per cent of total own income. The second highest item in own income is professional tax. During the financial year 2013-2014 the share of the professional tax is 36.66 per cent of the total own income and in the next year it decreased to 29.31 percent and in last financial year again it increased to 66.91 percent. It is important to note that the average property tax per household is Rs. 181/- during 2013-2014, which has increased to Rs.251/- during the next financial year. . During 2015-2016 period there is an income from 28 heads. More than 88 percent of income is from items like professional tax, registration fee (under common marriage rule), penal interest, permit fee for construction of buildings and building regularization fee etc. An increasing trend is noticed in the area of the own income for a period of first two years (2012- 2013 and 2013- 2014). It is very important that the own income of the Kumbadaje Gram Panchayat is quite insufficient for meeting even the establishment and administrative expense of the Panchayat. The President, Members of the Panchayat Committee and the Secretary explained the situation on the basis of figures. And most of the felt needs of the people still remain unaccomplished and the backwardness persists. In this context, it is practically impossible for the Panchayat to address any felt need of the community.

Many communities recognize the economic and environmental benefits of local renewable energy, generally, and solar energy, specifically. Homes and businesses with solar installations will have lower energy bills, and new solar energy systems mean new jobs for local installers. Also, by increasing their use of solar energy, communities can decrease air pollution, greenhouse gas emissions, and the secondary impacts that mining or drilling for fossil fuels have on the environment and surrounding communities. The State is facing an acute energy scarcity which is hampering its industrial growth and economic progress. Setting up of new power plants is inevitably dependent on import of highly volatile fossil fuels. Thus, it is essential to tackle the energy crisis through

judicious utilization of abundant the renewable energy resources, such as Biomass Energy solar Energy, Wind Energy and Geothermal Energy. Apart from augmenting the energy supply, renewable resources will help the State in mitigating climate change. India is heavily dependent on fossil fuels for its energy needs. Most of the power generation is carried out by coal and mineral oil-based power plants which contribute heavily to greenhouse gases emission. Solar Power a clean renewable resource with zero emission, has got tremendous potential of energy which can be harnessed using a variety of devices. With recent developments, solar energy systems are easily available for industrial and domestic use with the added advantage of minimum maintenance. Most of the developed countries are switching over to solar energy as one of the prime renewable energy source. Kumbadaje Panchayat is a revenue deficit one and the Government Departments have to spend considerable amount on electricity charges. It is in this background that installation of solar units is thought of in the Government Departments/institutions which are transferred to the Panchayat. The plants are intended to be installed in the Panchayat office (two sections), Krishi Bhavan, PHC, and proposed Agricultural Marketing Centre (solar power system is included in the design and drawing).

Chapter 2

PROJECT NAME, LOCATION AND OBJECTIVES

NAME OF THE PROJECT: Installation of Solar Power Plant for Govt. Offices in Kumbadaje Gram Panchayat

MAIN OBJECTIVES OF THE PROJECT

- Installation of solar power plants in the Government offices
- Serve the revenue of Panchayat

SUB OBJECTIVES/ BENEFITS

- The Panchayat will be moving towards 'Energy Security' through sustainable and green solutions.
- Model case for local citizens to replicate power plants in their house /business units as an alternative to conventional energy source.

PROJECT LOCATION

Ward Number: 11
Place Name: Three locations (Panchayat office two sections, PHC and Krishi Bhavan)in Kumbadaje Gram Panchayat, Kasaragod District
Survey Number: Rs no 477/pt

LAND DETAILS

OWNERSHIP PARTICULAR: The land for the proposed construction is owned by the Gram Panchayat

PHYSICAL INFRASTRUCTURE

The project has the following component
Solar power plants

:

PROJECT PARTICULARS

Solar Power Plants

ENVIRONMENTAL ISSUES (IF ANY) AND PROTECTIVE MEASURES

There are hardly any environmental issues associated with the installation of solar power plants. Solar energy is a win-win: in addition to its significant financial benefits, going solar is also great for the environment. When solar panels generate electricity, it produces zero emissions, which mean it don't contribute to climate change or health issues like more traditional sources of energy. Solar panels draw energy from the sun, an abundant resource that will be available and accessible across the world for the foreseeable future. Solar panels produce zero emissions once installed on the roof, which means their environmental impact is negligible for most of their life. However, solar panels aren't zero-emissions resources for their entire lifetime – as they have to be manufactured in a factory first, as well as recycled at the end of their useful life. These two processes are where solar actually has an environmental impact.

QUALITY ASSURANCE

Solar companies providing leasing options to their customers are in need of third-party quality assurance inspections to uphold standards. They bring the expertise needed and, as an impartial non-profit entity, assure that quality installations are achieved consistently. For the Solar Leasing providers, they provide investor confidence that Solar PV system installations will be performed as designed and quality standards are met. A third-party organization with the infrastructure to perform national quality assurance will enable leasing providers to achieve the investor-required inspections without having to build a team of inspectors.

It will be ensured that the installation company provides the following services:

- **Quality Control Field Inspections** – Field inspectors verify installations meet best practices and code compliance. Inspections are documented using a tablet-based quality assurance tool that collects data and photographs accurately and reliably in the field. Once the information is captured in the system, the synchronized database allows near real-time analysis. Customized field QC inspections to meet specific needs and requirements will also be ensured.
- **Solar Installer Qualification and Shade Analysis** – an outsourced service to vet potential solar partners through on-site visits to verify quality of work and safety.

Solar module quality assurance involves testing and evaluating solar cells to ensure the quality requirements of them are met. Solar modules (or panels) are expected to have a long service life between 20 and 40 years. They must constantly and consistently deliver the power expected. In addition, modules are exposed to a wide array of weather conditions along with usage in differ climates. Therefore it is critical to determine if a module is capable of performing over many decades with exposure to differing conditions. Solar modules can be tested through a combination of physical tests, laboratory studies, and numerical analyses. Furthermore, solar modules need to be assessed throughout the different stages of its life cycle.

Chapter 3

FINANCIAL DETAILS

Details on Cost Estimate

To

September 14 2016

The President/ The Secretary
Kumbadaje Gram Panchyat
Kasaragod District
Respected Sir,

Thank you for your interest in SELCO India. We hope to work with you in our journey towards sustainability.

Based on the discussion with you, we are submitting a proposal that provides the technical details and cost references.
The solution has been designed optimally taking into account the type of loads and number of hours of utilization. We have also, in some places, recommended other options for better efficiency and with a long term view.

We will be happy to provide further clarification if needed and hope to have a meeting to explain the proposal in person.

Regards,

Krishnraj

Sr. Manager
SELCO Solar Light Pvt. Ltd.
Ph no: 9448450302
email: krishnaraj@selco-india.com

Location: Kumdadaje Gram Panchayat Office Section-1 - Primary Solar System

Sl.No.	**Products**	**Capacity**	**Qty**
1	Solar Module (72 cells)	300 Wp, 24 V	20
2	Solar battery	200 Ah, 12 V	20
3	MMS	300 Wp, 1M	20
4	PCU with MPPT & isolation transformer	7.5 kVA, 120 V	1
5	Cable red+black	10 sq.mm.	50
6	Cable red+black	4 sq.mm.	80
7	Cable red+black	25 sq.mm.	30
8	Earthing Cable	10 sq.mm.	50
9	AJB with MCB & SPD	4 IN, 1 OUT	1
10	Grid Input Protection Box	With SPD & MCB	1
11	Single pole MCB	16 A, 230 Vac	2
12	Battery Rack	200 Ah X 10 (2stacks of 5 batteries)	2
13	Earthing Kit		4
14	Consumables		1
	Basic Price (in Rs)		**814356**
	Tax 1% (Kerala)		8144
	SB		12500
	Total Price		**835000**
	Total Price		**835000**
	Total Price		**835000**
Sl.No.	**Products**	**Capacity**	**Qty**
1	Solar Module (72 cells)	250 Wp, 24 V	20
2	Solar battery	150 Ah, 12 V	20
3	MMS	250 Wp, 1M	20
4	PCU with MPPT & isolation transformer	7.5 kVA, 120 V	1
5	Cable red+black	6 sq.mm.	50
6	Cable red+black	4 sq.mm.	80
7	Cable red+black	25 sq.mm.	30
8	Earthing Cable	10 sq.mm.	50

9	AJB with MCB & SPD	4 IN, 1 OUT	1
10	Grid Input Protection Box	With SPD & MCB	1
11	Single pole MCB	16 A, 230 Vac	2
12	Battery Rack	150 Ah X 10 (2stacks of 5 batteries)	2
13	Earthing Kit		4
14	Consumables		1
	Basic Price(in Rs)		**721683**
	Tax 1% (Kerala)		7217
	SB		11100
	Total Price		**740000**
Location: Kumdaje PHC - Primary Solar System			
Sl.No.	**Products**	**Capacity**	**Qty**
1	Solar Module (72 cells)	300 Wp, 24 V	20
2	Solar battery	200 Ah, 12 V	20
3	MMS	300 Wp, 1M	20
4	PCU with MPPT & isolation transformer	7.5 kVA, 120 V	1
5	Cable red+black	10 sq.mm.	50
6	Cable red+black	4 sq.mm.	80
7	Cable red+black	25 sq.mm.	30
8	Earthing Cable	10 sq.mm.	50
9	AJB with MCB & SPD	4 IN, 1 OUT	1
10	Grid Input Protection Box	With SPD & MCB	1
11	Single pole MCB	16 A, 230 Vac	2
12	Battery Rack	200 Ah X 10 (2stacks of 5 batteries)	2
13	Earthing Kit		4
14	Consumables		1
	Basic Price (in Rs)		**814356**
	Tax 1% (Kerala)		8144
	SB		12500
	Total Price		**835000**
	Total Price		**835000**
	Total Price		**835000**

Chapter 3

FINANCIAL DETAILS

Component wise details for each Item

MATERIALS: Since it is proposed to be a work by a recognized wholesaler/retailer, the material will be supplied by the authorized person as per the specification in the tender notification. The cost of the materials is included in the estimate. It is included in the special provisions and may be made to assure the quality of all the materials used.

LABOR: The labour charge is included in the estimate. Since it is proposed to be a work by a recognized wholesaler/retailer/contractor/business farm, the labour will be employed by the contractor as per the specification in the tender notification. Special provisions may be made to assure the quality of workmanship. The cost of labour would comply with the present schedule of rates.

TRANSPORT: The transporting charge is included in the estimate. While transporting the materials, all necessary care will be taken to avoid casualty.

ENVIRONMENTAL COMPLIANCE: All environmental laws, regulations, standards and other requirements (site permit, fire clearance certificate and pollution certificate) will be obtained. Environmental concerns and compliance activities are increasingly being integrated and aligned to some extent in order to avoid conflicts, wasteful overlaps and gaps. All precautions would be taken for safeguarding the environment during the course of construction.

CONSULTANCY: No major consultancy is envisaged.

STATIONARY COMPLIANCE COST: Detailed costing included

PROCUREMENT: Procurement charge is envisaged

FINANCING SOURCE: Fund from Kerala Local Government Service Delivery Project (KLGSDP)

Chapter 4

INSTITUTIONAL FRAMEWORK

ROLE OF DIFFERENT OFFICIALS:

Panchayat Committee: The project has to be approved by the Panchayat Committee.

ANERT: After the approval, the materials will be supplied by ANERT.

Engineer from the LSGD Engineering Wing: The materials will be checked by the LSGD Engineering Wing.

Panchayat Committee: Panchayat Committee officially submits the project to the District Planning Committee (DPC) for approval.

Procurement / Tender: After the approval of the DPC, the Panchayat has to tender the work as per the procumbent /tender rule. The Panchayat would then tender the bids (or tenders) and award the project to a successful bidder/contractor/ wholesaler/retailer/business farm, who would then undertake the project. The bidder would supply materials, labour and transportation.

Implementation: The project will be implemented by ANERT along with the support of the Gram Panchayat.

Monitoring: the Project will be monitored by the Panchayat Committee..

Beyond Panchayat: No activity is visualized beyond the Panchayat.

Chapter 5

PROJECT MANAGEMENT

PRE CONSTRUCTION PHASE

The overall planning, coordination, and control of the project from inception to completion aimed at satisfying the requirements of the Panchayat are listed in the project management phase in order to produce a functionally and financially viable project. This brings in the need for an appropriate scale to plan the implementation solar technology to appraise the differential demands in a contiguous area to accrue the economies of scale, ensure quality of system components and for creating a local business model for operation and maintenance to ensure sustainability. As per the 73rd amendment to the Constitution of India (Panchayati Raj Act), among the 29 development areas designated as specific responsibilities of Panchayati Raj institutions, the important ones include rural electrification, distribution of electricity, and promotion of non conventional energy sources. Considering the above facts, an initiative to drive a decentralized solar energy project for rural areas planned and implemented at a micro scale (Panchayat level) becomes important. This also became a motive behind the formulation of this initiative, a part from the one to address the deficit financial position of the Panchayat. After the installation of the units the Panchayat can save the amount of electricity charge of the government offices which are transferred to the Panchayat. Since these institutions are transferred to the Panchayat it has to pay the electricity charges. The Detailed plan was drafted with the help of the technical personnel of ANERT.

Proper institutional set up and organizational structure will be identified for the implementation of the project. How to make maximum benefit of current central and state subsidy schemes and identification of the options for financing the systems will be done. The Panchayat would then tender the bids (or tenders) and award the project to a successful bidder/contractor/agency, who would then undertake proposed project. The bidder would supply materials, labor and transportation. Pre-construction services grew out of construction cost estimating to encompass the other activities in planning a project.

The intent is to work with the Panchayat to help deliver a model project that meets the objectives of the proposed project. In addition to estimating, the pre construction team participates in design decisions, evaluations, value engineering, value analysis, scheduling, constructability reviews, and more. Design costs and permitting are included. Many items under pre-construction services are included in the project construction services. This is also accomplished in the project cost. The constructing firm then delivers the project as per the proposed tender agreement. The Panchayat and the constructing firm share any cost savings realized during construction. Before implementation a wide range of issues needs to be considered. The availability of finance for construction is important. As in case of the proposed project, it is assured from the KLGSDP. Preparation of tender/bid documents; and· choice of an appropriate type of construction contract is another landmark.

PHASING OF DEVELOPMENT

Setting targets for the entire work is the important step under the pre construction phase. The programme has incorporated practical time-frames for the construction contract lengths and the periods required for the pre-contract stages. Sufficient time is allowed for examination of detailed design, the preparation of tender documents, tendering and tender analysis, recommendations and acceptance; and the contractor's mobilization. Other matters requiring careful consideration are also included into the separate construction contracts and scheduling of equipment procurement. In order to accelerate implementation some activities are designed in such a way that it can be initiated before the real start of a project. The pre-qualification, selection of design, supervision of consultants, the preparation of tender documents are included in the initial actions .

CONTRACT ADMINISTRATION SYSTEM

The Engineer from the LSGD Engineering Wing would be responsible person to oversee the works with the technical support of ANERT. Apart from day-to-day supervision of the project, it is his / her responsibilities to cover the preparation of the tender (or "bid") documents, including working details, tender drawings, specifications and bills of quantities, an overall cost plan and procurement schedules for obtaining equipment.

CONTRACT ADMINISTRATION ISSUES

Before initiating construction operations, a number of issues related to construction supervision and monitoring procedures have to be resolved, that is on the responsibility for setting out the works the authority for giving instructions on the site, the scope of any materials-testing programme, the date for completion of the work and the date for occupation. It is better to settle these issues by the Panchayat with the contractor/farm .

FINANCIAL MANAGEMENT

The timely administration and financial management of payments to contractors is the responsibility of the Panchayat, who will undertake valuations of the work completed and then prepare a certificate showing the amount for interim payment. An amount of around 5-10 percent is normally retained from the valuations to cover the making good of defects. On completion of the works the Engineer from the LSGD Engineering Wing with the technical support of ANERT is entitled to prepare a final account, which will form the basis of the final payment, including the release of the retention amount. With a contract based on measured quantities (rather than a fixed price) the final account will adjust the tender sum amount to correspond to the actual works completed.

SELECTION AND PRE-QUALIFICATION OF CONTRACTORS

Generally, bidding should be on a selective tendering basis, taking into account the need for the contractors/farms to have experience in high quality construction and installation of Solar Power Plant for Govt. Offices. The proposed project requires experience in safe and secure implementation and therefore a set of technicians form a reputed; preferably a Govt. Agency (say, ANERT) with relevant good will, experience and professional quality would be appropriate.

CONTRACT CONDITIONS

Conditions must be clear and it should be easily administered contractual arrangements**.** Local conditions of contract are likely to exist and these may be appropriate for proposed types of work. The contract should be on a measure and pay basis, tendered on the basis of bills of quantity, for which the local conditions are ideally suited.

Chapter 6

FINANCIAL VIABILITY AND SUSTAINABILITY

ECONOMIC COST BENEFIT ANALYSIS (CBA):

The analysis undertaken is to comprehend whether the implementation of solar power plants is worthwhile in terms of economic rationality. In the exercise many components of the benefits and costs are obvious and therefore the basic principles are applied for the exercise. When the impact of the project is studied and computed, 'the particular area under construction' has contributed additional weightage. It is a positive amount for the particular project area, the Kumbadaje Panchayat offices where there is a financial deficit to address.

We have constructed two hypothetical illustrations by applying 'with and without' comparison and 'before and after' comparison. (i) What the situation would be with the project and what the situation would be without the Project. (ii) What the situation would be before the project and what the situation would be after the project. All the comparisons are positive and justified economic rationality of the project. The measurement of value of human wellbeing expected to be supported by the proposed project is also favorable though there is considerable reservations to the idea of placing money value on human wellbeing. When all this has been considered, the decision making for this project is one for which the discounted value of the benefit exceeds the discounted value of cost. The net benefits are positive, this is equivalent to the benefit cost being greater than one and the internal rate of return being greater the cost of capital.

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SOCIAL/INSTITUTIONAL COST BENEFIT ANALYSIS

All the societal effects, like, pollution, environment, safety, travel times, spatial quality, health, legal aspects, etc had been taken into consideration. We have tried to attach a

price to as many effects as possible in order to uniformly weigh the above-mentioned heterogeneous effects. It has enabled us to form an opinion about the net institutional effects of the project and set against the 'null alternative hypotheses. We have identified direct, indirect and external effects of cost benefit. Direct effects are the costs and benefits that can be directly linked to the users of the project. All relevant costs and benefits of the project is identified and monetized as far as possible. The general principle is that the benefits of a project do not always get to the groups bearing the costs. A social cost benefit analysis gives insight in who bears the costs and who derives the benefits. Here as per our observation, who bears the costs of the project are those who derive the benefits. Our method of monetizing effects could also influence the outcome of the social cost benefit analysis and the predictions contained major elements of uncertainty. Therefore, we are fully conscious that the result of the social cost benefit analysis was not absolute. Nevertheless, it has acted a good instrument to investigate the strong and weak points of the different aspects of the project. No social cost is identified.

Cost Saving:

All intense, precise, and detailed cost saving measures will be applied. Mainly, it will be achieved by competitive bidding process. Pre ender documents will be prepared in such a way to select and manage the best providers for the project in terms of service, quality and cost. It looks at how processes and procedures can be made more efficient, increasing productivity. Apply protocol checklist for simple observations on how products and services are used and recommends ways to save money. Correction of billing errors will be made by double checking. Elimination of overcharges and/or unnecessary services is another way to reduce cost .Rate reductions from current providers will be made friendly negotiations. The project steering committee will be constituted to avoid gaps in project planning, deficient contract management, and ineffective monitoring, which is mainly taking the responsibility of cost saving in the project.

Accountability

Accountability is the key element in project management. It outlines the different ways in which project activities are accountable and the mechanisms they use to account to the local communities. Since the process and end result aim to results-based management the proposed project activity should begin by introducing key features of governance and management structures in relation to the principle of accountability. The organizational culture is designed in such ways which lead to accountability in project management and accountability in their dealings with all stakeholders. An accountability manual would be designed to give instructions on how to keep clear, accurate financial records in accordance with international best practice.

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Negative Effects

No negative efforts are listed.

Chapter 7

MONITORING AND EVALUATION

Post implementation evaluation and monitoring to ensure the proper working of the systems will be carried out during this phase. Maintenance, monitoring and evaluation should be considered a part of the asset management system. Asset management may be defined as minimizing the life cycle cost of managing deteriorating facilities, including construction costs, while maintaining the level of economy and safety with limited financial and human resources, maintaining the existing asset in good condition. On completion of the work the Panchayat Committee will take over responsibility for looking after the infrastructure. The responsibility of monitoring and evaluation would be attached to the Engineer from the LSGD Engineering Wing with the technical support of ANERT. The Gram Panchayat is in effect, the manager of the infrastructure system. To do this, the Panchayat will have to consider how the periodic monitoring and maintenance of the plants will be undertaken. At the end of an implementation period the solar plants should be fully operational. However, the impact of the project on its beneficiaries is likely to be difficult to measure, particularly in the short term of a project life.

Recurrent maintenance is required at intervals during the year depending on the climatic characteristics of the area. It mainly involves the maintenance of the plants, its materials etc. The Panchayat Committee is mainly responsible for monitoring and evaluation of the solar plants.

Proforma C

E&S Clearance and Compliance Format for GPs

Village: Kumbadaje GP: Kumbadaje Taluk: Kasaragod District: Kasaragod
Title of Proposed Activity:
Proposed date of commencement of work: Installation of Solar Power Plant of Govt offices.

1. Does any item in the Regulatory list apply to the proposed activity? ☐Yes ☑No
2. If yes, have necessary permissions been obtained? ☐Yes ☐No ☐NA
3. Does any item in Level 1 of Control List apply? ☐Yes ☐No
4. Does any item in Level 2 of Control List apply? ☐Yes ☑No

MITIGATION PLAN

Likely Environmental and Social Risks	Mitigation Measures to be adopted

Additional cost on account of mitigation measures added to overall project cost, if any:

Note: Use Environmental Mitigation Guidelines (Proforma E) in case of Level-1 activities or LESA report (Proforma F) in case of Level-2 activities to fill in the above section. Write N/A if answers to questions 2 and 3 are 'No'

KUMBADAJE GRAMA PANCHAYAT P.O Kumbadaje Kasaragod

Filed by: Implementing Officer (Signature) Assistant Engineer L S G D Sect Kumbdaje H Q / Bellur Bellur Gramapanchayath

Working Group Chairman (Signature)

APPROVALS

☐ Cleared ☐ Not cleared Chairperson GP (Signature & Comments) Faithimath President Kumbdaje Grama Panchayat Ph: 04998

☐ Cleared ☐ Not cleared Block Level Officer in the next higher tier (Signature & Comments)

☐ Cleared ☐ Not cleared Chairperson DPC (Signature & Comments)

COMPLIANCE VERIFICATION

Verified that all mitigation measures proposed have been ☐ implemented / ☐ not implemented as per the mitigation plan mentioned above.

Additional comments, if any:

Signatures: GP Implementing Officer Chairman, Monitoring Committee Block Level Officer

Assistant Engineer L S G D Section Kumbdaje H Q / Bellur Bellur Gramapanchayath

പ്രൊഫോർമ-എഫ് -

പാരിസ്ഥിതിക-സാമൂഹിക നിരൂപണത്തിന്റെ രണ്ടാം ഘട്ട (Level 2) പ്രവർത്തനത്തിനുള്ള ഫോറം

(Limited Environmental and Social Assessment - LESA)

പ്രോജക്ടിന്റെ പേര് മലയാളത്തിൽ / ഇംഗ്ലീഷിൽ Installation of Solar power Plant for Govt offices.

പ്രോജക്ട് കോഡ്

മുനിസിപ്പാലിറ്റി / ബ്ലോക്ക് പഞ്ചായത്ത് പേര് Kumbadaje ജില്ല Kasaragod

പ്രോജക്ട് നടപ്പാക്കുന്ന സ്ഥലം സ്ഥലപ്പേര് Marpunedka വാർഡ് നമ്പർ 11

മുടക്കുമുതലും കാലയളവും മുടക്കുമുതൽ 325000 കാലയളവ് മാസങ്ങൾ

പദ്ധതി വിലയിരുത്തൽ

പ്രശ്നങ്ങൾ	ഘടകങ്ങൾ	ആവശ്യമായ സ്രോതസ്സുകൾ / സാങ്കേതിക വിദ്യ
പരിസ്ഥിതിയെ ബാധിക്കുന്ന പദ്ധതി പ്രവർത്തനങ്ങൾ	1 2 NA	3 4
സൂചിപ്പിച്ചിട്ടുള്ള പരിഹാരമാർഗ്ഗങ്ങൾ	1. NA 2.	3. 4

പരിസ്ഥിതിയെ ബാധിക്കുന്നത് സംബന്ധിച്ചുള്ള സംക്ഷിപ്ത വിവരം

(ബാധിക്കുന്നതിന് നേർക്ക് ശരി (√) അടയാളമിടുക) NA

	√	ഉദ്ദേശിക്കുന്ന പരിഹാരം	ചെലവ്
1. വായുവിനെ ബാധിക്കുന്നത്			
• അന്തരീക്ഷത്തിൽ പൊടിപടലം കലരും			
• പുകയും അഴുക്കും കലരും			
• വായുപ്രവാഹം കൊണ്ട് മണ്ണ് നഷ്ടപ്പെടും			
2. വെള്ളത്തിനെ ബാധിക്കുന്നത്			
• ജലാശയങ്ങളിൽ ചെളി വർദ്ധിക്കും			
• ജലഭൗമഘടനമാറും			
• മണ്ണും ഭൂമിയും ഒലിച്ചുപോകും			
• ഭൂഗർഭജലം കുറഞ്ഞുപോകും			
• പെരിയല ജലാശയങ്ങളിൽ വെള്ളം കുറയും			
• ജലാശയത്തിലെ പുനഃസംഭരണശേഷി കുറയും			
• ജലാശയങ്ങളിൽ ഖരപദാർത്ഥങ്ങൾ അടിയും			
3. ഭൂമിയെ ബാധിക്കുന്നത്			
• സ്ഥലത്തെരുക്കുമ്പോൾ സ്ഥലത്തിന് രൂപമാറ്റം വരികയോ മണ്ണ് നഷ്ടപ്പെടുകയോ ചെയ്യും			
• നിലവിലുള്ള സ്വഭാവങ്ങൾക്ക് തടസ്സം നേരിടും			
• സ്വാഭാവിക നീർച്ചാലുകൾ തടസ്സപ്പെടും			
• നിലവിലുള്ള മാടകളും വെള്ളത്തിന്റെ ഒഴുക്കും തടസ്സപ്പെടും			
• തുറസ്സായ സ്ഥലത്തിൽ മാലിന്യവും മറ്റുപദാർത്ഥങ്ങളും നിക്ഷേപിക്കപ്പെടും			
• [illegible]			
• തുറസ്സായ സ്ഥലം നഷ്ടപ്പെടും			
• മേൽ മണ്ണ് നഷ്ടപ്പെടുകയും മണ്ണിന്റെ ഗുണമേന്മ കുറയുകയും ചെയ്യും			
4. പൊതുജനാരോഗ്യത്തേയും സുരക്ഷിതത്വത്തേയും ബാധിക്കുന്നത്			
• ഗാർഹിക മാലിന്യങ്ങൾ കൂടിക്കുഴയും			
• ജൈവ-ഔഷധ മാലിന്യങ്ങൾ കൂടിക്കുഴയും			
• പൊതു ടോയിലറ്റുകൾ പരിപാലിക്കുന്നതിൽ അപര്യാപ്തതയുണ്ടാകും			
• അപകടങ്ങൾക്കും ആപത്തുകൾക്കും സാധ്യതയുണ്ടാകും			
• അണുബാധയും അസുഖങ്ങളുണ്ടാകും			

▪ പകർച്ചവ്യാധികളുണ്ടാകും			
▪ സുരക്ഷാ സംവിധാനങ്ങളുടെ അപര്യാപ്തതയോ ഇല്ലായ്മയോ കൊണ്ട് അപകടമുണ്ടാകും			
▪ അപായകരമായ വാതകങ്ങൾ പുറന്തള്ളപ്പെടും			
5. ജൈവവൈവിധ്യത്തെ ബാധിക്കുന്നത്			
▪ മരങ്ങൾ വെട്ടേണ്ടിവരും			
▪ വംശനാശം നേരിടുന്നതോ തദ്ദേശീയമായതോ ആയ സസ്യ-ജന്തുജാതിക്ക് ഭീഷണിയുണ്ടാകും			
▪ ദേശാടനപ്പക്ഷികളുടെ പാതയ്ക്ക് തടസ്സമുണ്ടാകും			
▪ വന്യമൃഗങ്ങളുടെ സ്വാഭാവിക സഞ്ചാരപാതയ്ക്ക് തടസ്സമുണ്ടാകും			
▪ മറ്റു സസ്യങ്ങളുടെയോ ജന്തുജാതികളുടെയോ അധിനിവേശമുണ്ടാകും			
▪ കീടാണുക്കളുടെയോ കീടനിയന്ത്രണത്തിന്റെയോ ഭീഷണിയുണ്ടാകും			
6. സമൂഹത്തേയും സമുദായങ്ങളേയും ബാധിക്കുന്നത്			
▪ വീടുകൾക്കോ ആശുപത്രികൾക്കോ ഉയർന്ന ശബ്ദം കൊണ്ടുള്ള ശല്യമുണ്ടാകും			
▪ വിഭവ സ്രോതസ്സുകളുടെ ഉപയോഗത്തിന്റെ കാര്യത്തിൽ അഭിപ്രായഭിന്നതയുണ്ടാകും			
▪ തദ്ദേശവാസികളെയോ ദുർബല വിഭാഗങ്ങളെയോ മാറ്റിപാർപ്പിക്കേണ്ടി വരും			
7. മുകളിൽ സൂചിപ്പിച്ചവയിൽ ഉൾപ്പെടാത്ത മറ്റെന്തെങ്കിലും കുഴപ്പമുണ്ടെങ്കിൽ വിശദമാക്കുക			

ഇതര പരിഹാര മാർഗ്ഗങ്ങളെക്കുറിച്ചുള്ള വിശകലനം NA

	പാരിസ്ഥിതിക ബന്ധം	വേണ്ട പരിഹാര മാർഗ്ഗങ്ങൾ
മറ്റു പരിഹാര മാർഗ്ഗങ്ങൾ എന്തെങ്കിലുമുണ്ടെങ്കിൽ (അത് കൂടുതൽ മെച്ചപ്പെട്ടതാണെങ്കിൽ മാത്രം) വിശദീകരിക്കുക	1. 2.	1. 2.
നിർദ്ദേശിക്കപ്പെട്ട പരിഹാര/ലഘൂകരണ പദ്ധതി	പരിഹാര/ലഘൂകരണ പദ്ധതി നടപ്പാക്കാൻ എന്തെങ്കിലും ചെലവു വരുമെങ്കിൽ അതിന്റെ വിശദാംശങ്ങൾ		

തയ്യാറാക്കിയത്
ഒപ്പ്
പേര്
പദവി/തിരിച്ചറിയൽ നമ്പർ
തീയതി

Assistant Engineer L S G D Section
Kumbdaje HQ / Bellur
Bellur Gramapanchayath

LESA സംബന്ധിച്ച കുറിപ്പ്

LESA നടപ്പാക്കേണ്ടത് ബന്ധപ്പെട്ട മുനിസിപ്പാലിറ്റി / ഗ്രാമ പഞ്ചായത്ത് എൻജിനീയറോ, ഒരു പരിസ്ഥിതി വിദഗ്ദ്ധനോ, വിദഗ്ദ്ധ ഏജൻസിയോ പ്രൊഫോർമ-എഫിൽ പറഞ്ഞിരിക്കുന്ന മാതൃകയിൽ ആയിരിക്കണം. പരിസ്ഥിതി ശാസ്ത്രം/പരിസ്ഥിതി എഞ്ചിനീയറിംഗ്/സിവിൽ എഞ്ചിനീയറിംഗ്/അതുമായി ബന്ധപ്പെട്ട വിഷയങ്ങൾ പഠിപ്പിക്കുന്ന വ്യക്തിക്കോ ഏജൻസിക്കോ പരിസ്ഥിതി സംബന്ധമായ വ്യക്തമായ കാഴ്ചപ്പാടുള്ളവർക്കോ LESA നടപ്പാക്കാം. പ്രാദേശിക ഗവൺമെന്റുകൾക്ക് അനേഷണ പ്രക്രിയയിലൂടെ അവരെ കണ്ടെത്തി പട്ടിക തയ്യാറാക്കിക്കൊണ്ട് ഇതിനായി വിനിയോഗിക്കാം. കൺസൾട്ടേഷൻ പ്രതിഫലമായി കുറഞ്ഞത് 1500 രൂപയും, പരമാവധി പദ്ധതിച്ചിലവിന്റെ 0.75% ഉം നൽകാവുന്നതാണ്.

LESA നടപ്പാക്കുന്നതിന് അഭിലഷണീയമായ നിബന്ധനകൾ ഇവയാണ്.

- പദ്ധതി പ്രവർത്തനങ്ങൾ വിലയിരുത്തി പാരിസ്ഥിതികവും സാമൂഹികവുമായ ഗൗരവതര പ്രശ്നങ്ങളുണ്ടാക്കുന്ന ഘടകങ്ങൾ കണ്ടെത്തുക.
- ഇത്തരം പ്രവർത്തനങ്ങൾ പരിസ്ഥിതി ഘടകങ്ങളായ മണ്ണ്, ഉപരിതലജലം, ഭൂഗർഭജലം, അന്തരീക്ഷ വായു, ശബ്ദതലം, സസ്യ-ജന്തുജാലം എന്നിവയിലും സമൂഹപുരോഗതിയിലും വരുത്തുന്ന ആഘാതങ്ങൾ എന്തെല്ലാമെന്നു കണ്ടെത്തി പരിസ്ഥിതി നാശം കുറയ്ക്കാനുള്ള മാർഗ്ഗങ്ങൾ നിർദ്ദേശിക്കുക.
- പദ്ധതിയുമായി ബന്ധപ്പെട്ട് കൂടുതൽ മെച്ചപ്പെട്ട പാരിസ്ഥിതികവും സാമൂഹികവുമായ പ്രശ്നപരിഹാര മാർഗ്ഗങ്ങൾ ഇതര പദ്ധതികളിൽ നിലവിലുണ്ടോ എന്നു പരിശോധിക്കുക.
- പദ്ധതിയുടെ പ്രവർത്തനത്തോടനുബന്ധിച്ച് അപകടങ്ങൾക്കുള്ള സാധ്യതകളുണ്ടോ എന്നു കണ്ടെത്തുകയും അതു തടയാനുള്ള മാർഗ്ഗങ്ങൾ നിർദ്ദേശിക്കുകയും ചെയ്യുക.
- പദ്ധതിക്ക് പകരമുള്ള വഴികളുണ്ടെങ്കിൽ അതു പരിഗണിക്കുക-പ്രധാനമായും പദ്ധതിയുടെ സ്ഥലവും സാങ്കേതിക വിദ്യയും മാറ്റുന്നതിനെക്കുറിച്ച് ചിന്തിക്കുകയും അത്തരം മാർഗ്ഗങ്ങൾ സ്വീകരിച്ചാലുണ്ടാവുന്ന പ്രശ്നങ്ങളും ഇപ്പോഴുള്ളതും തമ്മിൽ താരതമ്യം ചെയ്യുക.
- പദ്ധതി കൊണ്ടുള്ള പാരിസ്ഥിതികവും സാമൂഹികവുമായ പ്രശ്നങ്ങൾ കുറയ്ക്കുന്നതിനും പരിഹാരം നടപ്പാക്കുന്നതിനും എന്തെങ്കിലും ചെലവുണ്ടെങ്കിൽ അതു നിശ്ചയിക്കുക.