Revised Detailed Project Proposal

MODEL CARBON POSITIVE ECO-VILLAGE IN PHAYENG OF MANIPUR

- a follow up action of Manipur State Action Plan on Climate Change

S E P T E M B E R 2 0 1 5

Submitted to
Ministry of Environment, Forests and Climate Change
Government of India
(National Adaptation Fund for Climate Change)

Submitted by

Government of Manipur
Directorate of Environment
Porompat, Imphal East, Manipur

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Project Summary

Project Summary

Title of the Programme	**:**	**Model Carbon Positive Eco-village in Phayeng of Manipur**
Problem Statement	**:**	The state of Manipur is part of the vulnerable Himalayan Ecosystem. The inhabitants have high natural resource dependency i.e. forest, natural streams, lakes and primitive agriculture and animal husbandry. The Manipur state is well known for its unique ecology and rich biodiversity. Forest is an important resource in the state and agriculture is the mainstay of the economy of the people. The state experienced an increase in minimum & maximum temperature during the last 100 years by ≥ 1.7°C and ≥ 1.5°C respectively. Annual total rainfall of the state has erratic in nature and varied from 956.5 mm to 2268.9 mm during the last 60 years. It has projected an increase in temperature above 1.7°C and rainfall of 15-19% by mid 2030s in the state. In INCCA's report, the climate change impacts &vulnerability in Manipur have been highlighted over4 sectors namely Water Resources, Forests, Health and Agriculture & its allied sectors. The traditional slash and burn method has reduced soil fertility and caused forest degradation. Poor run off management has implication on water conservation and overall enhancement of risk and vulnerability for the people living in the fringe. Poor employability in the villages have caused people to migrate and traffickers have caused larger societal damage to young mass. The programme takes into account a pilot village named "Phayeng" at Imphal West, near foothill of Kangchup Hill ranges at a distance of 14 km from the Imphal City. The village having a total population of about 7000 peoples with majority of schedule cast and 65 % of literate population. The village has about 42% of total worker population, of which about 18% as cultivator. Main occupation of the village is agriculture and animal husbandry with majority of piggery. This village is one amongst such villages that is trying to hold itself from rapid urbanization.

Project/programme Objective	**:**	To develop model eco-village in the Himalaya Ecosystem blending traditional and modern adaptive practices to reduce vulnerability and enhance resilience for traditional livelihood.
Vision	**:**	Sustainable habitat, mitigation of vulnerabilities and sustainability approach to replicate at other villages
Target	**:**	Conservation and use-wise practices of natural resources to adapt the future vulnerable climate change
Project programme sector	**:**	Himalayan Ecosystem (agriculture, forest, water) based Adaptation
Name of the executing entity	**:**	Directorate of Environment, Government of Manipur, the State Nodal Agency for Climate Change in Manipur in collaboration with Phayeng Village community ***Implementation partner (State Level)*** Department of Forest Department of Agriculture Department of Horticulture Department of Fishery Department of Veterinary and Animal Husbandry Department of Command Area Development
Beneficiaries	**:**	▪ Poor villagers of the Phiyang village. ▪ Local resource persons from the village have to showcase conservation and eco-system based adaptation with strong mitigation co-benefits.
Project Duration (in years)	**:**	3 (Three) Years (January 2016 to December 2019)
Amount of Financing Required (in RsCrore)	**:**	Rs. 10 Crore
Project Location	**:**	State: Manipur District: Imphal West Village : Phayeng
Contact Details of Nodal Officer of the Executing Entities:	**:**	Dr. M. Homeshwor Singh Director, Directorate of Environment, Govt. of Manipur State Nodal Officer for Climate Change
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Specific Objectives	**:**	The programme takes into account a pilot village near foothills. This village is one amongst such villages that is trying to hold itself from rapid urbanization. Specific objectives include: ▪ To protect the forest and natural streams near the village to reduce the climate variability ▪ To undertake structural measures to widen the canal for enhancing the command area ▪ To diversify livelihood from paddy monoculture and introduce horticultural activity in the village and medicinal plants in homestead and forest areas to improve livelihood security ▪ To introduce scientific piggery, poultry and fishery in the village for enhancing the household income ▪ To introduce bio-gas, solar energy in the village to reduce dependence on fossil fuel ▪ To develop a traditional knowledge centre on conservation and sustainability to act as a model for peers and large scale dissemination in the state and similar Himalayan states ▪ To have an eco-resort in 10 ha of community land for natural living and yoga. ▪ To demonstrate the carbon positive nature of the village
Rationale	**:**	***Climate Relevance*** The villagers are corroborating the history of 50 years and recount the high temperature and erratic rainfall due to the destruction of forest. Thereafter, a stronger community norm has emphasized the conservation of the forest and the mountain that is considered the lifeline. It has been established from the scientific data that the rainfall pattern has been erratic. Though the quantum of rainfall has not reduced intense rainfall getting concentrated in a few days enhanced soil erosion and also enhanced run-off.

		Vulnerability **Food security**: The key vulnerability in the areas is reduced food security due to decreasing of yield as a factor of climate change. Moreover, erratic rainfall and drought like situation has also been affected in the agriculture practices. Besides of that there is only one season crop (rice) getting cultivated because of non-irrigated facilities. Even the village receives a good quantum of rainfall, there is no any irrigation facility. The existing perennial stream name as Maklang River has not been developed properly for irrigation purposes as well as treatment plant for drinking purposes. Due to decline in soil fertility the problem gets acute and people migrate. Rapid urbanization in the fringe is reducing the area under agriculture. **Water scarcity**: There is only one open well and one perennial stream name as Maklang River, where all the population depend for drinking & irrigation. Most of the population in the village used un treated drinking water. They also suffer from water borne diseases like diarrhea and dysentery. The villagers do expend about Rs. 2400 – 3000 per month by a family for buying drinking water from commercial distributers. Most of the stream around the village has been dried up except the Maklang river due to climate factor like increase in temperature & evaporation, which is the only source of water in the identified village. This river also one of the future vulnerable stream. Therefore, conserve, recharge and harvest of the water resource of the Maklang River in Phayeng village is right time to protect before it dries up in the near future. ***Urgency:*** The key urgency in this area is to preserve the traditional method of forest conservation, use-wise practice of the natural resources and develop resilient livelihood

		framework. Without this, the ecosystem will be destroyed endangering not only the Phayeng village but also the main Imphal town with depleted and contaminated ground water and adverse climate variability. ***Co-benefit:*** The project is structured to make the model carbon positive village (sequestration + sustainable practices-emission). There will emission reduction through solar energy intervention, bio-gas use, methane management through SRI and higher sequestration through forest conservation and growing of tree crops. This project will have both high adaptation and mitigation co-benefit.
Indicators	**:**	C1.1 Resource user groups develop a participatory resource management plan C2.1 Structural measures of climate proofing the canal & stream implemented C2.2 Residual moisture in the command available for a second crop C3.1 Use-wise crop calendar prepared C3.2 1200 no of family take up horticultural interventions C4.1 Training & Pilot Demonstration on SRI, Integrated pest and nutrient management taken up at 428 Ha C4.2 Targeted to 500 nos. of farmers undertake the SRI, IPM and INM C5.1 Aromatic and medicinal plant for the area inventoried C5.2 Conservation plan and propagation training material developed C5.3 1200 no of households plant medicinal and aromatic plants in their homestead C6.1 Training on scientific management of piggery and manure management to 54 existing practitioners C6.2 All the Household participate in the programme C7.1 3 units of Community bio-gas plant established and gas used for cooking

		C7.2 Solar street lighting system introduced C8.1 Priority target groups and messages defined C8.2 Education and awareness materials targeted to key audiences C8.3 FPO/FIG training imparted C8.4 Revolving fund created C8.5 Market linkage established with FPO/Panchayat C9.1 Local Conservation unit developed, with requisite infrastructure C9.2 Models, Methods, Programme audio-visual materials on the values and threats to the area developed C9.3 No. of exposure visits initiated and feedback systematically captured C9.4 Local communities exchange resource use information and methods C10.1 Eco-village plan and sustainable design developed C10.2 Resort developed in a PPCP mode C10.3 Programme on yoga and natural living advertised with strict environmental and conservation guidelines for the tourists C10.4 100 nos. of footfall observed C11.1 Steering committee established, PMU notified in Climate Change Cell C11.2 The Monitoring and coordination system established C11.3 Best practices are documented and widely shared through website, policy briefs, operational guidelines C11.4 Ex-ante, ex-post, concurrent monitoring and review undertaken by external agency
Relationship with other programs	**:**	***NAPCC Mission:*** Himalayan Ecosystem ***SAPCC identified Mission:*** Ecosystem, Biodiversity & Livelihood ***SAPCC identified activity:*** - Natural resources Management (Forests, Land & Water),

		- Promote traditional knowledge with micro-finance, - skill development, human resource development, etc. in a model eco-village - Linkages with NREGA (for canal widening) - Linkages with RKVY
Activities	**:**	**Broad activities** Conservation & improvement of Mountain Eco-system Livelihood improvement & sustainable habitat Natural resources management & proper utilization Conservation, storage and optimizing usesof Water Improvement of land cultivation and management Afforestation and Deforestation Protection of soil erosion and degradation
		Specific Activities of this Project C1. Sustainable management of land-water and forest C2. Structural measures to climate proof the canal irrigation and enhanced command area C3. Integrated mountain farming, use-wise introducing pisciculture practice , horticultural & cash crop species C4. Sustainable agriculture with introduction of SRI, integrated pest and nutrient management C5. Conservation of indigenous species of medicinal and aromatic plants in the homestead C6. Enhance the existing piggery in a scientific approach C7. Sustainable energy by using biogas and solar system C8. Capacity building and Institutional Development (micro-finance, micro-insurance, skill development, market linkage through Farmer Producer Organizations) C9. Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood C10. Development of an eco-resort in 10 ha community lad for yoga and natural living C11. Project management and monitoring system to get the carbon positive tag for this model village C12. Setting up a climate change observatory and climate information networking unit

Expected Results	**:**	In the target model carbon positive eco-village: - Improved management and conservation of forest and bio-diversity reinforcing norms using the tools and processes developed during the project implementation - Enhanced irrigation command area through climate proofing of the canal - Diversification of livelihood achieved through sustainable use-wise mountain faming such as horticulture and medicinal plants in homestead and slopes - Enhancement of yield of major crop paddy through climate adaptive methods - Clean and scientific piggery and improved health benefits through methods and processed developed in the project - Community based institution (Panchayat) empowered to handle livelihood shock better through the capacity building input - A fully functional village resource and knowledge centre complete with tools, processes and local resources- a model for the region - Eco-friendly resort developed for sustainable living and yoga with health care - Distribution of safe treated drinking water through conventional treatment of water resource from the Maklang River of Phayeng village - There is systematic monitoring of the climate change and livelihood impact (adaptive capacity) in the village, multi-agency coordination platform established and best practices are documented and widely shared
Dedicated Institutions	**:**	Climate change cell for project management and coordination; partner departments are planning, agriculture, horticulture, forest, fishery, water resources
Target Group	**:**	Inhabitants of Phayeng Village, Imphal West
Approx. Budget in Rs Crore	**:**	Pilot scale Rs 10 crore

Chapter 1 :

Project Background

1 Project Background

1.1 Background and Context

Most of the north-eastern states including Manipur are part of highly fragile eastern Himalayan eco-system. The region has wide spectrum of ecological zones and three Global Bio-diversity hotspots. It is also centre of origin of cultivated plants as over 50 important tropical and sub-tropical fruits, cereals, and types of rice originated in the region. The Eastern Himalayan region also provides a diverse range of ecosystem services (provisioning, regulating, cultural, supporting). The diversity of services is in part the result of the geographic complexity, which exerts considerable influence over the weather patterns in the region. It is a natural barrier to south-west monsoon resulting more precipitation to the east and 4 out 10 major rivers in the region get their recharge.

Climate change in general would have a significant effect on all natural ecosystems. However, the impacts will be far greater on the already-stressed ecosystems of the Eastern Himalayas. The state of Manipur as part of this ecosystem is highly vulnerable both due to geological reasons and on account of the stress caused by increased pressure of population, exploitation of natural resources and other related challenges. The rapid urbanization is causing decline in agriculture and forest resulting in food insecurity and social unrest. The loss of ecosystem due to unsustainable management of land-water and forest is causing irreversible loss to bio-diversity and long term damage in form of ground water depletion and stream drying and loss of aquatic and terrestrial flora and fauna. Its role as a carbon sink too is getting reduced. With these background, the **Phayeng Village** in Imphal West district of Manipur has been identified to develop as a **Carbon Positive Eco-Model village** to adapt climate vulnerabilities so that the same practices may be replicated in other such villages.

Figure 3.1: Aerial View of the Project site Phayeng Village, Imphal West
(Source : Google Earth)

The proposed village Phayeng comes under Imphal West District of Manipur. The terrain itself is very eco-sensitive and in a sense is the feeding channel of water to state capital. The village lying on the foothill taps a natural stream and preserves the forest attached to this stream.

Fig 1.2 : Phayeng Village of Imphal west District, Manipur

a. Brief Information on the Problem :

In such circumstances, certain villages (like the proposed village Phayeng) are fighting the adversity to enforce strong community norms on conservation. However, little has been done to protect or diversify their livelihood. This has resulted in some societal conflict between younger aspirational generation and older generation committed to the value of nature. Many young have moved out of the village and this is a major concern. Some villages where there strong conservation norms are there, those have to be showcased to inspire others. Moreover additional resilience features in these villages need to be built in so that they conform to model eco-village concept and act as resource centre.

b. Outlines of Economic Social :

It is essential to understand the economic profile of the state, in order to assess the impact of the climate change on ecosystem and therefore on the livelihood issues. There has been a transformation in the composition of the State Domestic Product. During the last decades, there is a decrease in contribution of primary and tertiary sectors to the state GDP which is taken over by the secondary sector viz. Agriculture, Fishery and allied sectors. Manipur's population stands at 2,721,756 (2011 provisional Census) which continues to be predominantly rural, with rural population being 73.82 % of the total. Considering the large percentage people living in rural areas, livelihood of people in Manipur is heavily dependent on Agriculture, Fishery and Natural Resources including Forest and Wetland Ecosystems.

The total cropland area of the proposed village is estimated about 1500 ha, which are non-irrigated and with mono cropping pattern i.e. 95% of paddy, others 5%, etc. The village totally depends on rain, simply no rain no cultivation. The main cropping system is pre-kharif paddy and kharif paddy, followed by pulses and some fruit crops like pineapple, orange and lemon at less percentage where individual irrigation facilities like ponds, etc. are available. Due to non availability of the irrigated water facilities, farmers are fully dependent on the rain. Since, farming is seasonal (i.e. rain fed agriculture), most of the farmers have been converted to fish farming, animal husbandry (like piggery, livestock/poultry, etc.). But there is still a need for skill development and modernization of the practices for hygienic and better environment. The economy of Manipur state is primarily dependent on agriculture and its allied sector. The agriculture sector contributes a major share to the total statedomestic product and provides employment to about 57.04 % of the total workers in Manipur. Agriculture in the state is confined to 10.48% of the total geographical area with 47% of the land in valley districts and 53% of the land in hill districts. The cropping intensity of the state is 149%. Productivity of the state is recorded as Rice:

4358 Kg/ha, Maize: 2158.3 kg/ha (kharif), Pulses: 1100 Kg/ha. Rabi productivity is about half of Kharif productivity. Cabbage, Cauliflower, Peas, Tomatoes, Pine apple, Banana are grown in rabi and are sensitive to moisture. The cultivation of horticulture crops is by and large practiced as non-commercial enterprise by farmers in their homestead and orchard, it hardly helps in development of proper market of horticultural crops. The learning from the project can address some of the issues faced by the state agriculture and eco-system conservation.

c. Vulnerability context

i. Climatic and Bio-physical :The village has high exposure and high sensitivity to climate stressors such as temperature, precipitation and soil degradation. The aquifers in this area is responsible for providing water to the state capital. Phayeng village, part Eastern Himalayan ecosystem is highly vulnerable both due to geological reasons and on account of the stress caused by increased pressure of population, exploitation of natural resources and other related challenges (it is very close to Imphal town and already showing signs of rapid land use change). These effects may well be exacerbated due to the impact of climate change. Climate change may adversely impact the Himalayan ecosystem through increased temperature, altered precipitation patterns, episodes of drought, and biotic influences. This would not only impact the very sustenance of the indigenous communities in uplands but also the life of downstream dwellers.The mean annual minimum temperature in Manipur in last 50 years has been 14.5 deg C. July is the hottest month and January is the coldest. The maximum temperature recorded in fifty years was 38.9 deg C (in Sep 2014) and minimum average temperature was 4 deg C. The coldest temperature recorded in January 1970 was 1.2 deg C. The expected rise in temperature in the state by the turn of the century (2100) is likely to be more than 1.5-2 deg C. The spatial distribution has been given in the section 2 below. While the overall precipitation has increased in this area, it is concentrated in a few days and followed with dry spells. Heavy rain fall in few days has adversely affected the soil conservation with the denudation of the upper catchment. The run-off has increased and water quality decreased. It has also affected many sensitive herbs and plants. The main crop paddy has been affected due to this erratic pattern. Several other horticultural crops used to be taken by the village are not being taken up now due to dry spells. The area also faced severe drought event in 2009. Though the rainfall forecast for the current period is optimistic (+40%) the high soil erosion is envisaged.

The rivers Imphal, Nambul, Thoubal and their tributaries mainly drain the district. The Nambul River is made up of number of small streams on its upper course and

flows through the Imphal town dividing the town almost into two equal halves. The course of the rivers is short and falls in the Loktak Lake. Hydrogeologically the district is proved to be moderately potential where ground water occurs under water table to confined conditions. Depth to water level in major parts of the district varies from 2-5 m bgl. Manipur has the richest reservoir of plant diversity and supporting about 50% of India's biodiversity (Mao and Hynniewta, 2000). Several flora and fauna are likely to be extinct if the proper conservation measures are not undertaken now. It is reported thatbout 18 species of fishes have been extinct from Loktak Lake during the last decade. The State animal, the Brow-antlered deer (*Rucervuseldieldi*), is already listed as Critically Endangered (CR) by the World Conservation Union (IUCN 3.1). This proposal is primarily aimed to focus on eco-system based adaptation approach in the model eco-village.

ii. Vulnerability of the hill stream and forests:

The Phayeng village is located at the foothill of Kangchup hill range. It has good resources and unique micro climatic condition. However, from the study based on remote sensing and GIS technique as at Fig. 1.2 and 1.3, it has been reported that most of the stream heads in the hill area of the village has been dried up except only one stream named Maklang River which is the only water source of the village. This river is also drying up slowly and decreasing its yield. Therefore, the Maklang River in Phayeng village of Imphal West District is also one of the most vulnerable water sources. The dense forests coverage has also been changed from 683.3 Ha to 96.98 Ha. during the 41 year (1974 – 2015). Forest vulnerability index has been also developed and reported in SAPCC with three indicators viz. distribution index, fragmentation status and biological richness. The value of each of the indicators was reduced to a scale of 1.0 (very low vulnerability) to 5.0 (very high vulnerability). As per model developed by the INCC and the available climate related data, the village is treated as future CFVI (Composite Forest Vulnerability Index). Moreover, evaporation has also been increases day by day with increasing of temperature. The erratic rainfall pattern has been affected a lots in the agricultural production system. Due to increases in temperature – humidity index (THI) at certain extent, livestock has also been impacted. Considering these changes in micro climatic condition, climate change related intervention in to important sectors i.e. agriculture and water may be focused in different dimensions like

Sector	**Impacts and intervention due to climate change**
Agriculture and its allied	Decrease in rice yield, high inter-annual variability in crop yields, incidence of pests and diseases, increase in soil erosion, etc
Water resources	Drying of stream heads, increase evaporation, runoff & decrease of soil moisture recharge, frequent flash flood for to high intensity of rainfall

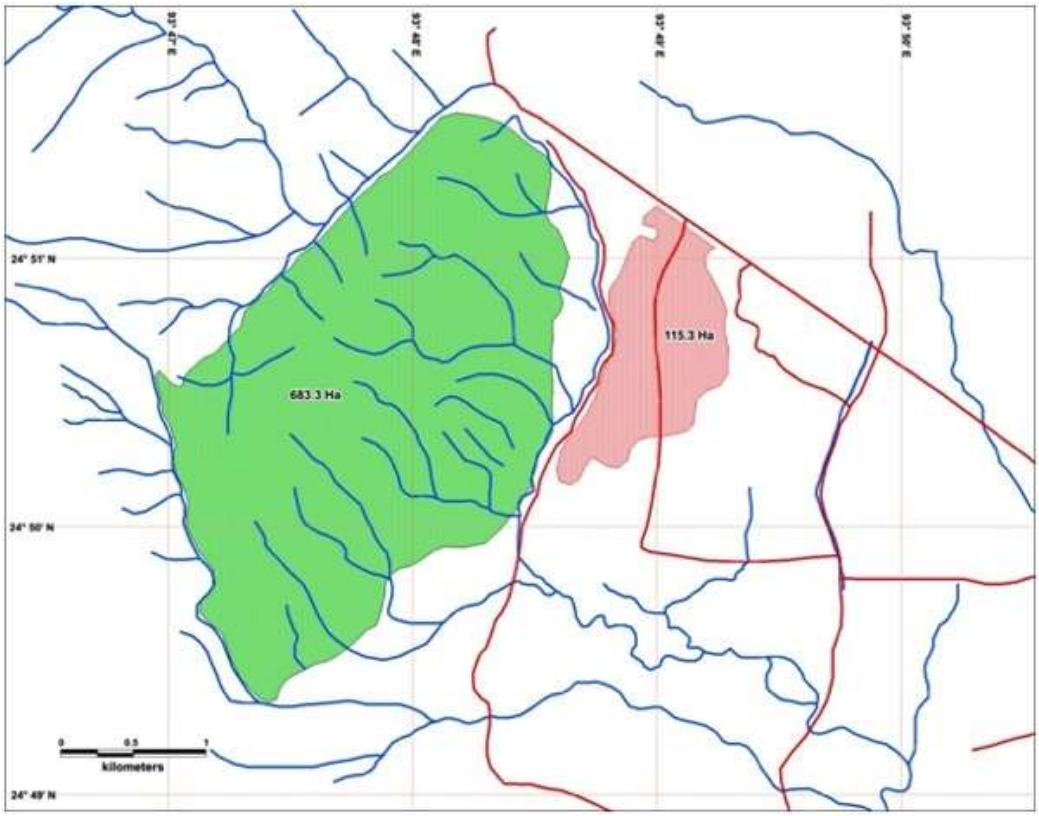


Figure 1.3 : The hill-stream as in 1974 based on toposheet

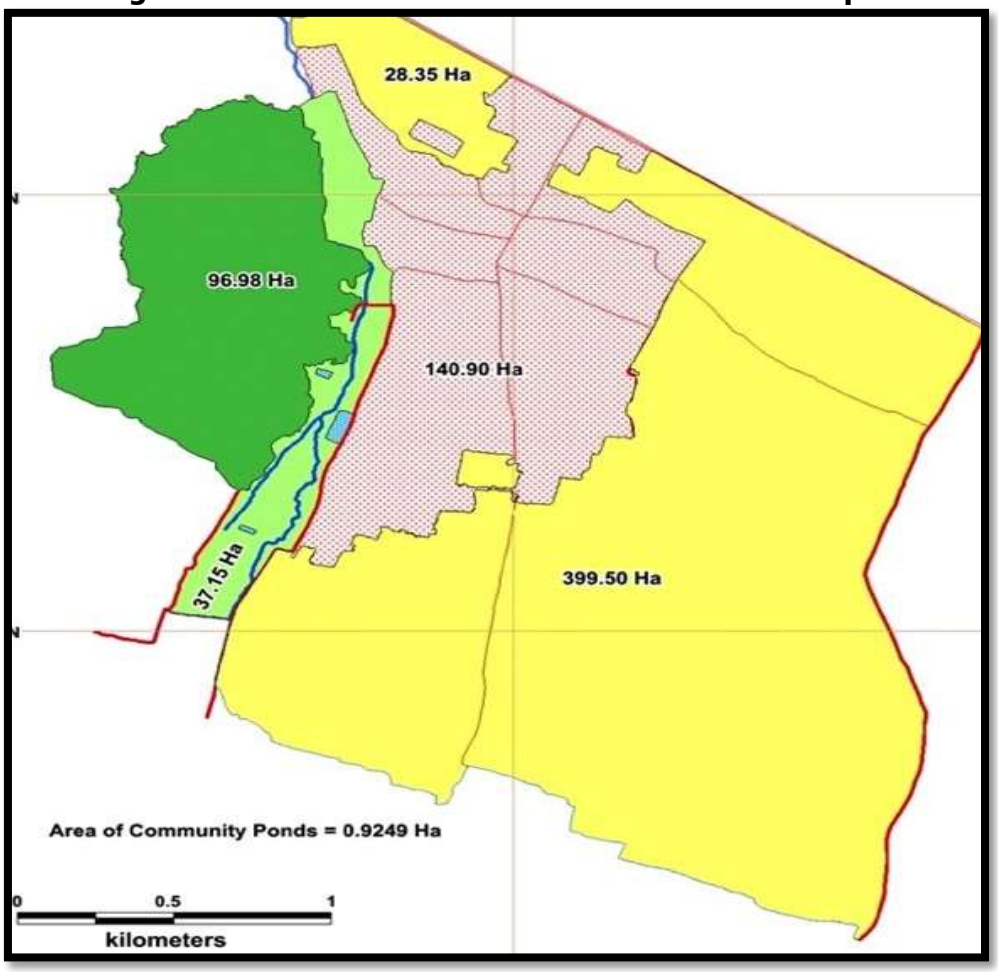


Figure 1.4: Project location layout showing only one hill stream, 2015
(Source : Climate Change Cell)

Table 1.1: Socio-economic and demographic context based on 2011 Census

Category	Total	Male	Female
No of Households	660		
Total Population	2728	1334	1394
Scheduled Castes population	2551		
Scheduled Tribes population	45		
Literates Population	1777		
Total Worker Population	1168	657	511
Main Working Population	878	599	279
Main Cultivator Population	490	321	169
Main Agricultural Labourers Population	128	106	22
Main Household Industries Population	21	2	19
Main Other Workers Population	239	170	69
Marginal Worker Population	290	58	232
Marginal Cultivator Population	4	2	2
Marginal Agriculture Labourers	73	37	36
Marginal Household Industries	7		
Marginal Other Workers Population	206	19	187

Source : Population Census Report, RGI, Govt. of India, 2011

The table above shows high marginalization of the work force and also high percentage of scheduled castes and tribes with high natural resource dependency. The good sign is about the three forth of the villagers are into cultivation for more than six months in a year. There is also high literacy. This is a potential place to further enhance the adaptive capacity. The total population of the urban below poverty line of the Imphal city is 61,397, which denotes 12,100 household from 27 ward of the Municipal council, which consists of 7 wards in Imphal East district and 20 wards in Imphal West district. The decadal growth rate of the district is below state average. The district has very high level of urbanization (double than the state average) at 55.50%. Little less than a quarter in the district hold BPL ration cards.

iii. Linkage of the proposed project with NAPCC and SAPCC

The proposed project is tightly linked to **Sustainable Himalayan Mission** (one of the eight mission under National Action Plan on Climate Change).The proposed activities have been prioritized clearly under the State Action Plan on Climate Change under **Ecosystem, Bio-diversity and Sustainable Livelihood**. The project links up all four strategies under SAPCC (Table 4.1 of SAPCC).

The specific guidance under the Himalayan Mission are tightly integrated in this adaptation project and are detailed below:

- To ensure proper structural measures and ensure land-use planning for soil water conservation with proper treatment practices for sustainable development of mountain ecosystem
- To adopt eco-village model for infrastructure constructionin this mountain regions to avoid or minimize damage to sensitiveecosystems and despoiling of landscapes.
- To encourage cultivation of traditional varieties of crops andhorticulture
- To Promote sustainable tourism through adoption of "best practice"norms of eco-friendly and responsible tourism, creation ofappropriate facilities and access to ecological resources, and multi-stakeholderpartnerships to enable local communities to gainlivelihoods, while leveraging financial, technical, and managerialcapacities of investors.

Some of the other missions under NAPCC and SAPCC that can be linked include Sustainable Water Mission, National Mission on Sustainable Agriculture, Green India (Forestry and Biodiversity) Mission and Solar Mission.

iv. Project Location Details :

Name of proposed site	:	Phayeng
village No. / Code	:	2,70,083
District	:	Imphal West District,
State	:	Manipur

1.2 Project/Program Objectives

Primary objective of the programme is ***"to develop a model carbon positive eco-village in the Himalayan Ecosystem blending traditional and modern adaptive practices to reduce vulnerability and enhance resilience for traditional livelihood"***. The programme takes into account a pilot village near foothills. This village is one amongst such villages that is trying to hold itself from rapid urbanization.

The **specific objectives** of this project are as follows:

- To protect the forest and natural streams near the village to reduce the climate variability [Bio-diversity, soil stabilization, carbon sequestration and water flow regulation]

- To undertake structural measures to widen the canal for enhancing the command area [Water flow regulation, Water quality]
- To diversify livelihood from paddy monoculture and introduce horticultural activity in the village and medicinal plants in homestead and forest areas to improve livelihood security [Primary Production, Food security & Nutrition, Disease Control]
- To introduce scientific piggery, poultry and fishery in the village for enhancing the household income [Primary Production, Food security & Nutrition, Disease Control]
- To introduce bio-gas, solar energy in the village to reduce dependence on fossil fuel
- To develop a traditional knowledge centre on conservation and sustainability to act as a model for peers and large scale dissemination in the state and similar Himalayan states
- To have an eco-resort in 10 ha of community land for natural living and yoga.
- To demonstrate the carbon positive nature of the village

The project would use an innovative method of resource conservation and eco-system based adaptation in the model village. While this project will be implemented in a pilot scale, the same framework can be used for covering additional villages. The criteria for village selection shall be as follows:

Table 1.2: Criteria for selection of project site, the Phayeng Village

Criteria	**Description**
Exposure	The target village must have strong linkages to key issues like increasing of night & day temperature, increasing of weather events like erratic rainfall, high rainfall intensity, decreasing of rainy days, etc., degradation of forests, depletion of wetlands/streams, depletion of endangered flora and fauna native to the village, rapid urbanization and potential land use change
Sensitivity	Sensitivity in terms of loss in productivity, water availability, limited scope for livelihood diversification, stunted growth or extinction of native species
Adaptive capacity	Reasonable evidence of strong social norms on conservation, presence of good NGO/CBOs, low level of social conflict in the village, evidence of reasonable access to natural capital, evidence of participation, savings,etc.

The key vulnerability is the eco-system risk. Fig. 1.3 and 1.4 of the report is based on satellite data which is clearly showing only one surviving stream. One part depletion and other part greenery is showing divergent conservation.

There are about 1500 ha of non irrigated agri land in the village. Since there is no any irrigation facility, they are practicing only mono-cropping in a year. If once such model for integrated approach like carbon positive eco-model village is being introduced by facilitating proper irrigation facilities, rain water harvesting practices, modernization of agriculture with new techniques with changing of cropping pattern, etc. the villager will improve their livelihood along with conservation of the eco-system.

The proposed widening of the water body and earthen dam will help in better recharge and enhance climate resilience with improvement of livelihood. They can 2-3 different types of seasonal crops besides on paddy (discussed in the report). Moreover, the same may be replicated at many vulnerable places as clearly focused in the Manipur State Action Plan on Climate Change report. The proposed **model village** is to be **carbon positive** village which requires all that it takes SRI, methane management, creation of carbon sink, discourage critical ground water depletion through pumping, solar street lights, etc. all in an eco-system adaptation approach.

Table 1.3: Major Objective of the project and the Climate Stress

Sl. No.	Proposed Project Objective	Existing/Projected climate Stress	How proposed project will address the existing stress?
1	Protect the forest and natural streams near the village to reduce the climate variability	• Variability of precipitation level and projected increase in annual average temperature are likely impact crop yield and increased incidence of pest and diseases • Streams in the proposed village are drying out reflecting the ground water/ aquifer stress. • This might impact the agriculture which is totally rain fed and dependent upon the water in the stream.	• Protection/ conservation of forest including promotion of artificial and/or natural regeneration of the forest will improve the microclimatic condition and maintain the temperature and humidity locally. Increased plantation will prevent soil degradation / erosion in case of projected increased runoff; enhance water retention and additional ground water recharge.

Sl. No.	Proposed Project Objective	Existing/Projected climate Stress	How proposed project will address the existing stress?
2	To undertake structural measures to widen the canal for enhancing the command area	• Streams in the proposed village are drying out reflecting the groundwater/ aquifer stress. This might impact the agriculture which is totally rain fed and dependent upon the water in the stream. • Increased runoff due to projected increase in the precipitation quantum and extremes concentrated in fewer numbers of days.	• Undertaking of structural measures will regulate water flow and water quality of the stream. • The creation of structural measures including widening of canal and construction of water retention structure will help in storing of water which can be used for the purpose of irrigation including increase of the existing command area. • The structural measures will also prevent soil erosion and stabilization in case of increased runoff. • The conservation of stream will reduce the water stress and improve hygiene. The stream acts as lifeline/ source of drinking water for human and livestock population of the village.
3	To diversify livelihood from paddy monoculture and introduce horticultural activity in the village and medicinal plants in homestead and forest areas to improve livelihood security	• The agricultural productivity is likely to be impacted along with increased incidence of pest and diseases and increased soil erosion. This is most likely in the projected scenario of increased rainfall and increased annual temperature.	• Inclusion of horticulture species will enhance the livelihood security of the farmer which in turn is less impacted to climate variability as proposed in the region.
4	To introduce scientific piggery, poultry and fishery in the village for enhancing the household income	• The agricultural productivity is likely to be impacted along with increased incidence of pest and diseases and increased soil erosion. This is most likely in the projected scenario of increased	• Poultry, piggery and fishery will act as an alternate source of livelihood for the village in case of crop failure. This will also acts for food security in the village.

Sl. No.	Proposed Project Objective	Existing/Projected climate Stress	How proposed project will address the existing stress?
		rainfall and increased annual temperature.	• Introduction of modern piggery or fishery will also reduce the likely incidence of water contamination and water borne diseases in case of excess precipitation/ flood scenario.
5	To introduce bio-gas, solar energy in the village to reduce dependence on fossil fuel	• Likely hood of climate extremes	• The availability of alternate source of energy for lighting and cooking will help in sustaining in case of climate extreme events
6	To develop a traditional knowledge centre on conservation and sustainability to act as a model for peers and large scale dissemination in the state and similar Himalayan states	• There has been an observed variability of the weather profile of the region and is likely to be exacerbated under the projected scenarios of climate extreme events.	• Improve in the microclimatic condition through forest conservation, addressing water stress through stream restoration and prevention of soil erosion might motivate other villages with evident climate stress to take up similar measure and increase resilience.
7	To have an eco-resort in 10 ha of community land for natural living and yoga	• Existing livelihood interventions are likely to be impacted under the projected climate extreme events scenario.	• The projected infrastructure will act for alternate source of livelihood and also prevent urban migration.

1.3 Details of Project/ Programme Executing Entity:

(a) Name, Registration No. & Date, Registered Address, Project Office Address (for the proposed project)

Name & Address: Directorate of Environment
Department of Forests & Environment
Govt. of Manipur
Porompat, Imphal East, Manipur State, Pin – 795 005

Registration No. & Date: NA since the office is under State Government

Available technical manpower for the proposed project implementation: 12 Nos.

Climate Change Adaptation Projects handled by the Project Executing Entity (EE), as

Project	**Objectives & geo. coverage**	**Amount Sanctioned**	**Funding Agency**	**Geographical Coverage**	**Implementation Period & Outcome**
Climate Change Cell	To improve knowledge about climate change and associated risk to the state of Manipur as well as the entire Indian Himalayan Region Coverage at all districts	Total Project outlay: Rs. 1.77Crs.	Central Sector Scheme	Manipur State level	Implemented since December 2015

d) Three largest community NRM based projects handled : No

e) Three largest Climate Change Adaptation / NRM projects of State / Central Government (taken up by other agencies)

Project	**Objectives & geo. coverage**	**Amount Sanctioned**	**Funding Agency**	**Geographical Coverage**	**Implementation Period & Outcome**
Conservation and Sustainable Development of Loktak Lake (Manipur)	Restore and develop Loktak Lake resources and biodiversity for present and future generations through participatory processes, research and conservation activities.	Total Project outlay: Rs. 324.31 Crs.	CSS	Notified Loktak lake area and its catchment	Restoration and development of Lokatak lake and conserve its biodiversity for current and future generation
North East Region Community Resources Management Project for Upland Areas-II	To improve the livelihoods of vulnerable groups in a sustainable manner through improved management of their resource base in a way that contributes to the preservation and restoration of the environment"		IFAD	Meghalaya, Manipur, Assam	

f) Comment of availability of suitable infrastructure for implementation proposed projects (vehicles, computers, required software/ tools, etc.)
Most of the existing infrastructures like Office vehicles, IT equipments, etc. will be utilized during the project period.

g) Whether Executing Entity (EE) was blacklisted, barred from implementation of projects, faced any charges / legal cases related to mismanagement of project and funds. (please list any such incidences and reasons) : **No**

1.4 : Project / Programme Components and Financing

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (Rs Crore)
1. Sustainable management of land-water and forest through an eco-system approach	Treatment and conservation activities in the upstream of village Phayeng	Improved capacity of forest dependant community in the village to address soil degradation, biodiversity conservation and stream vulnerability.	2.07
2. Structural measures to climate proof the canal irrigation and enhanced command	Enhanced irrigation command and water security for crops	Enhanced food security for the community	0.93 (core components to be leveraged from PMKSY)
3. Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)	1200 no of households planted saplings around homestead and forest of the selected species	Increased ecosystem resilience in response to climate change and variability-induced stress and resilient livelihood	0.56 (to leverage additional fund from RKVY)
4. Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.	500 no of farmers trained on best practices in SRI, IPM/INM and scientific piggery	Small and marginal farmers, with the support of local authorities, enhance their knowledge to diversify and strengthen their livelihoods and sources of income in targeted area	0.62 (additional amount will be met from the earmarked plan budget of Environment Dept., detail at footnote) SRI investment component not included
5. Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)	500 no of households are covered under financial inclusion and skill development programmes	Strengthened aware-ness of the house-holds and ownership of adaptation and climate risk reduction processes at local level	0.50
6. Renewable energy (solar) street lighting integration in village	Main streets of the area community house and resort have functional street light	Reduction of fossil fuel and with mitigation co-benefit	0.92

Supplementary Note on Sl. No. 4 :
The nodal agency i.e. Directorate of Environment has also already earmarked some lump sum amount from the plan money for this project. The same will be its share as convergence in that specific work. It is a novel project and not conventional farm intervention, it has strong elements of activity planning and tracking of adaptation outcome and documentation to get carbon positive tag.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (Rs Crore)
7. Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood	A fully functional village resource centre established with facilities and trained local resource persons	Strengthened knowledge, norms and practices t better adapt to climate in the ecosystem with conservation of bio-diversity	0.50
8. Development of an eco- health resort in 10 ha community land for yoga, natural living and treated safe drinking water supply	An eco-resort is established with temporary yoga camps for the relevant period of the year in public-private community participation process	Multi-sectoral benefits with livelihood diversification achieved through responsible nature tourism and treated safe drinking water supply in the village as first time	2.73 maximum Viability gap Funding to be provided to the operator
		Sub Total Cost (A)	8.83
9. Project/Programme Execution cost (including formulation cost of Rs 10 lakh and third party monitoring and carbon neutrality plan) (B)			0.88
Total Project/Programme Cost			**9.71**
10. Project/Programme Cycle Management Fee charged by the Implementing Entity			0.29
Amount of Financing Requested			**10.00**

1.5 Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme (projects which have four or more than four years of implementation period would require to have mid-term review after two years of implementation).

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2016
Project evaluation & monitoring	Quarterly
Mid-term Review (if planned)	August 2017
Project/Programme Closing	December 2019
Terminal Evaluation	August 2020

Chapter 2:

Project / Programme Justification

2 PROJECT / PROGRAMME JUSTIFICATION

2.1 Component wise details and justification of the project component

i. What is the business-as-usual development for the targeted sector?

The 65 year old retired female school teacher summarised her experience from the memory of her childhood and the current situation as follows:

"The Himalaya has its own mind and own body, it produces a distinctive climate of its ownand has influences on the climate of the region where we live. We see higher temperature, unknown diseases and more mortality of crop and our livestock. Wedo get rain but timing is uncertain. It is the wrath of the mountain king for the loot we caused to it." This has also been corroborated in scientific literature. Variations in topographical features along three dimensionalframeworks (i.e. latitudinal: South-North; longitudinal: East-West; altitudinal: Low-High) cause diversity inclimate and habitat conditions within the region, resultingin richness, representativeness and uniqueness of itsbiodiversity elements ranging from genes to ecosystems.All this has contributed to a whole range of diversity in itsindigenous human habitations, cultures and knowledgesystems.

The most vulnerable areas are the whole stretch of theBrahmaputra valley, segments of the lower Gangeticplain falling with the precinct of the Eastern Himalayas,the vicinity of Loktaklake in Manipur, and especiallythe Terai-Duar tract from southeast Nepal to eastern Bhutan. Population pressure and thedevastation of natural biodiversity are the main factorsthat make these places highly sensitive to climatechange; other factors include low socioeconomicservices and productive livelihood assets, poor healthand chronic disease outbreaks, land degradation, anddeforestation.

The region has the following character:

Table 2.1 : Manipur as part of Easter Himalayan Ecosystem		
Geographical Area (GA) in (km2)	:	22327
Per-cent contribution to the total population of IHR & (India)	:	6.03(0.23)
Sex ratio	:	978
Literacy rate (+7yr) (%)	:	68.87
Forest cover km2 (% of GA) as per FSI	:	17086 (76.53)

The climatic factors have induced some irreversible changes in this eco-system and it is important to address these issues urgently. Conservation as religion was being practiced in this area and these socio-cultural and ecological values are getting eroded fast. The project attempts to demonstrate on an ambitious pilot eco-village having major scope for replication.

2.2 Current climate scenario :

Manipur has a sub-tropical climate in the valley and semi-temperate to temperate climate in the higher altitudes. The average rainfall of the state is about 1246 mm with heavy precipitation during June and July. Since the water for cultivation of the crops is restricted to monsoon, most of the farmers predominantly take up paddy cultivation and the lands are left fallow in the rabi season.

The current precipitation and temperature of last fifty years have been presented in the figures below:

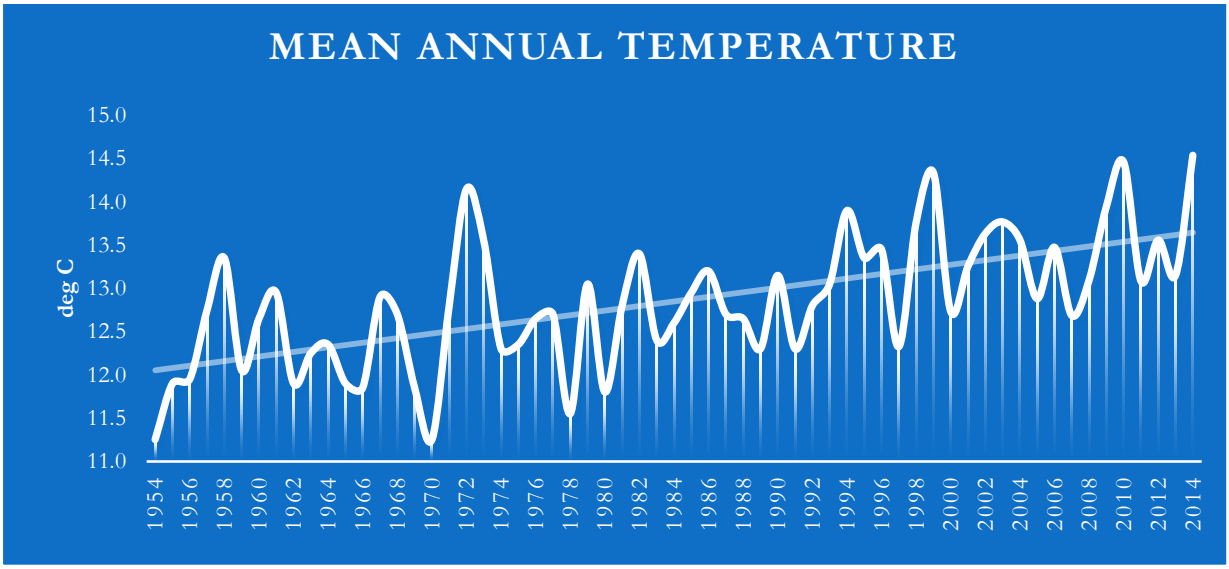


Figure 2.1 : Mean Annual Temperature, Manipur, last 50 years

The graph at Fig. 2.1 shows the increasing trend of temperature (mean annual temperature over the years). As per the past 50 years data the maximum average temperature in the state was 30.3 deg C and the maximum temperature 38.9 deg C was recorded in September 2014. Similarly minimum average temperature was 4 deg C and the minimum temperature in past 50 years was 1.2 deg C recorded in January 1970.

The 100 year average total precipitation (Fig. 2.2) in the state is 1963.5 mm. maximum total rainfall of 1684.2 mm was recorded in 1987. The percentage departure of precipitation from normal has been shown in the figure below:

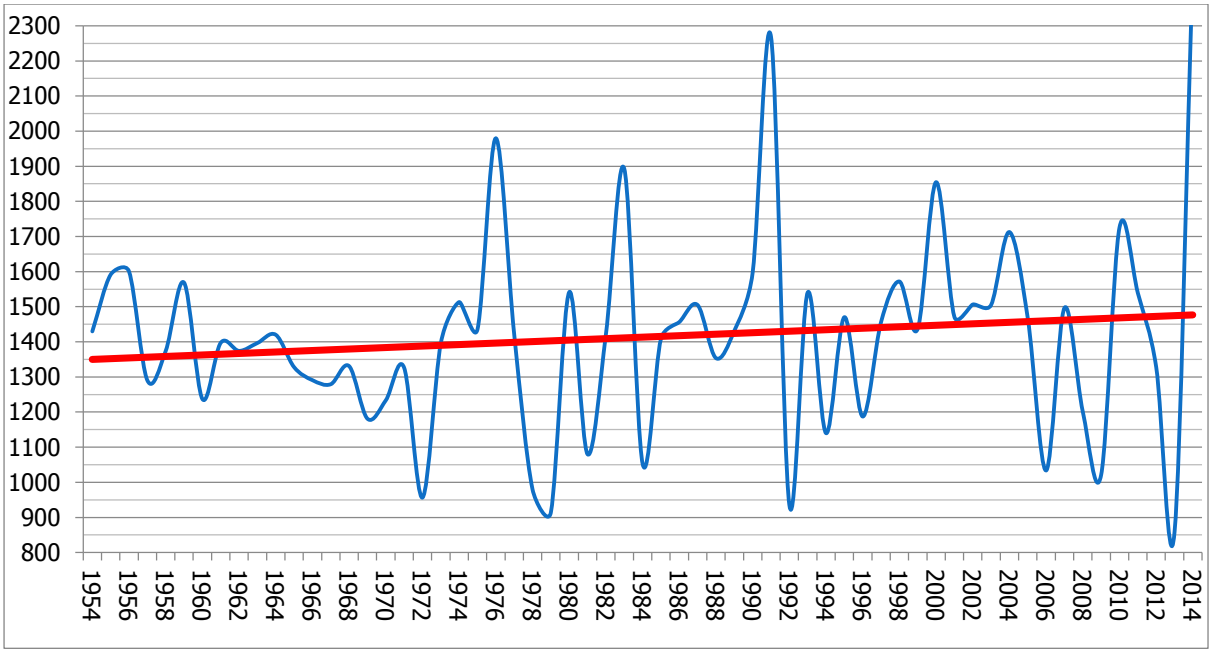


Figure 2.2 : Percentage departure in rainfall

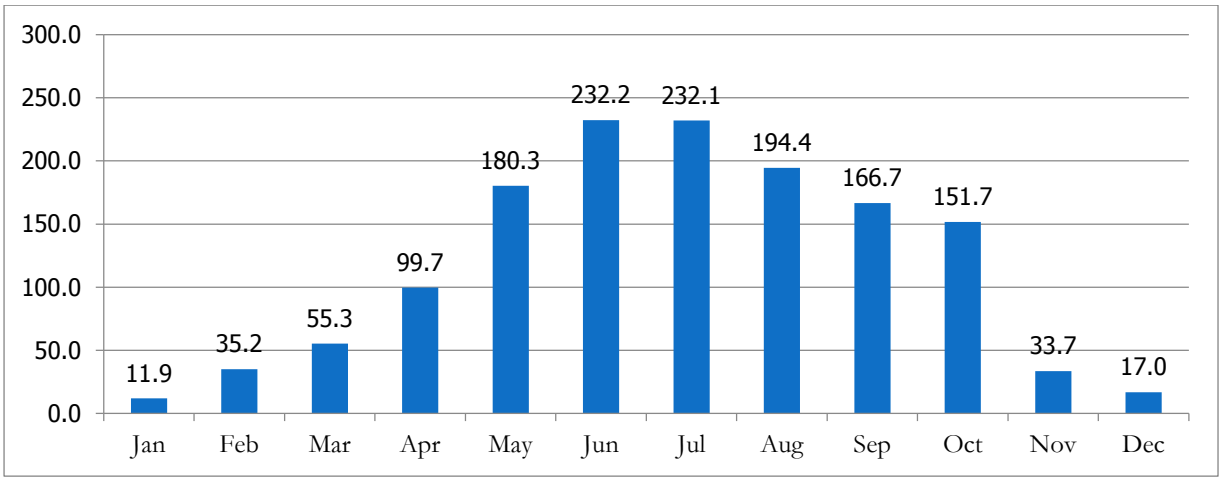


Figure 2.3 : Monthly distribution of rainfall

The departure of rainfall from normal (Fig. 2.3) is almost even distributed in the state. The high variability of monsoon is also visualized.

2.3 Future climate scenario :

Analysis based on PRECIS tool for the state shows the following:By the turn of the century (by 2100): barring major part of Churachandpur and Chandel, most of the other districts in the state are expected to have 30-40 percent more precipitation. (implication for a Himalayan state may manifest in form of landslide, soil erosion, flooding,etc. Churachandpur and Chandel are expected to even have 40-50% more precipitation in some blocks and 30-40% in some other areas. This has been shown in figure below:

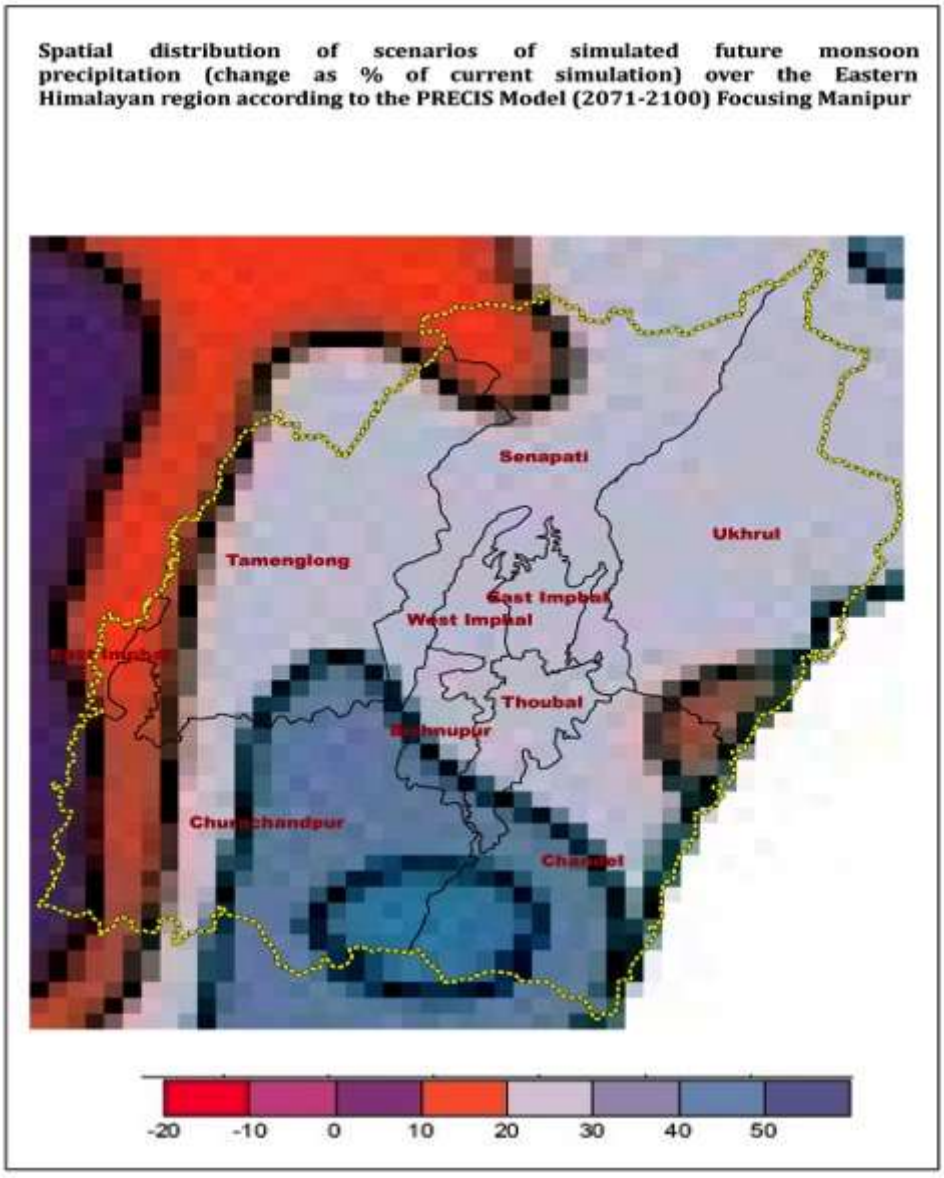


Figure 2.4 : Future precipitation projection using PRECIS tool (2071-2100)

The annual mean temperature rise by 2017is 1.5-2 degree C in almost all regions.The villagers in Phayeng village have a strong societal norm on conservation. The zealously guard the forest to prevent any damage. There is a natural stream which is lifeline not only to the village but also help in ground water recharge of the Imphal city. However, some other adjacent villages due to pressure on their land (irrigation does not reach that part properly) depend on the forest for their livelihood and one could see the devastation in that part. This has created a situation of high soil erosion and deterioration of water quality.

In Manipur, the aromatic plants have strong cultural significance. They are associated with religious ceremony and cultural activities and also therapeutically used asdiuretic, antiseptic, anti-helmintic, anti-rheumatic, stimulant, carminative, analgesics and counter irritant by the

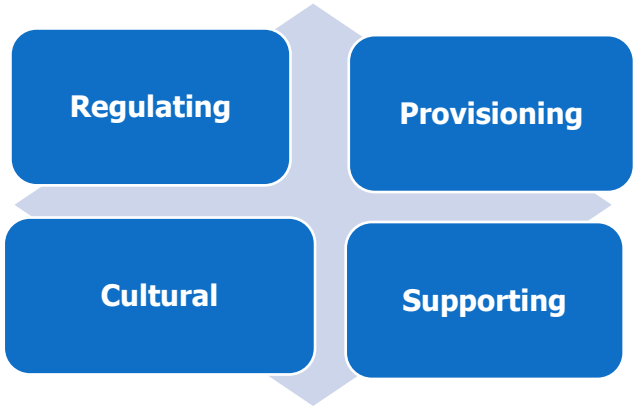
local medicinal practices called Maiba (male) and Maibi (female) from time immemorial. The aromatic plant species like orange, lemon, lime, mints, cedar, citronella, lemongrass, basil, Eucalyptus, geranium, lavender, Litseacubeba, Osmanthusfragrans, patchouli, rose, tuberose, jasmine, sandalwood, bergamot, coriander, etc. were used for commercial production of essential oils. Manipur has about 1200 plants (FRLHT Database) are used by Maibas-Maibis in traditional remedies (Tombi, 2011). Rapid destruction of forests and terrestrilisation of wetlands for human settlement and urbanization make most of medicinal and aromatic plants (MAPs) were threatening. It is important to restore some such species those are getting extinct very fast. The village has experienced long dry spells after heavy precipitation concentrated in a few days. This has affected some late sown traditional varieties of paddy and the vegetable cultivation too has declined.

The deterioration in water quality has resulted in several water borne diseases especially the ones by enter pathogens and coliforms. Water qualities especially those of rivers have been deteriorating due to disposal of garbage,religious offerings, sewage (both human and animal fecal matters), recreational andconstructional activities in the catchments areas.While many pollution problems affecting waterquality are the direct result of human activity, someare less easily isolated (Cooper and Night, 1989).Contaminated water provides shelter to a variety ofdiverse micro-organisms (Khulbe et al., 1989),which many cause various water borne diseases. There are several vector borne diseases due to stagnant water in derelict ponds and ditches.

2.4 : Component-wise Justification

What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the business-as-usual situation?

The adaptation activities proposed in this village follows strong conceptual framework used for eco-system adaptation in the Himalayan region.



In other words many of these activities in the region are largely concrete adaptation measures. The activities have been detailed below:

C1. Sustainable management of land-water and forest

There will be treatment measures in the upper catchments. The future climate scenario that shows higher 20-30% precipitation would be taken into account for climate proofing activities.

Sustainable Land Management

Increased Plantation and conservation of existing and proposed plantation in forest as well as the community land is proposed under the sustainable land-forest management practice. Artificial regeneration will be considered as part of the plantation initiatives.

The sub-activity will include:

i. Creation of nursery
ii. Raising of seedling in the nursery
iii. Preparation of soil for plantation activity
iv. Transportation of seedling and facilitation of plantation
v. Protection of plantation through timely weeding, creation of fire line and removal of grass at periodic interval
vi. Construction of watershed
vii. Engagement of resource person for maintenance and protection

Table 2.2 : Intervention and climate resilience

Existing /Projected Stress	Intervention	Climate Resilience
Increased temperature and precipitation including extreme events, increased runoff, increase soil erosion and loss of biodiversity Streams are drying up	Increased plantation	Increase tree cover will reduce the runoff velocity and lower soil erosion during increased precipitation / extremes. The retention of water will also result in ground water recharge. Increase plantation / tree cover will improve the micro-climatic condition of the region. Increased ground water recharge and creation of water shed might rejuvenate streams Conservation /protection initiatives will also result in conservation of biodiversity in the region.

Sustainable Water Management

Protection of stream is proposed under sustainable water management intervention. This will include development of

1. Two boulder sausage dam
2. Two Rubble masonry weirs. Protection wall using rubble masonry is provided along the eastern bank and western bank by stone pitching at the mild slope
3. Irrigation facilities are also provided at the upstream side of the weirs constructed trough outlets
4. Water treatment for first time safe drinking water supply in the Phayeng village at the upper catchment will also be provided

Existing /Projected Stress	**Intervention**	**Climate Resilience**
Heavy soil erosion during runoff which are like to exacerbate in the projected increased precipitation scenario	Constriction of dam and protection wall	Dam and protection wall will reduce soil erosion and will provide soil stabilization of the bank during the event of excessive precipitation or increased run off.
Lack of irrigation facilities	Construction of rubble masonry weirs	The construction of masonry weirs will improve the irrigation facility in the command area.
Flood scenario during rainy season and lack of availability of water during dry season	Silt removal	The removal of silt from river bed will help in increased accumulation of water during rainy season and lower the impact in flood scenario. Since the stream acts as main source of drinking water for the village therefore it restoration will improve the supplied water quality.
No safe treated drinking water facilities in the village except one open well	Convectional treatment facilities at upper catchment	Diverting some portion, the Maklang river water will be reserve / harvest and the catchment area treatment will be taken care before it dries up due to climate factor

More details are also at Chapter 4.

Resilience: Bio-diversity, soil stabilization, Micro-climate regulation, Carbon sequestration

C2. Structural measures to climate proof the canal irrigation and enhanced command

The climate proofing of canal would include structural measures to enhance the command so that the risks to crops during dry spell are minimized; additional crops can be taken to improve food and livelihood security.The current command is about 2000 ha. It will be enhanced by 500 ha. The structural measure proposed first of all is intended to achieve two concrete adaptation benefit (a) two accommodate enhanced stream flow for short duration heavy precipitation in the catchment and arresting the run-off (b) the enhanced command providing higher recharge and residual moisture for crops in critical stages and also promote almost extinct vegetable cultivation in the Rabi.

Additional command would not change the cropping system it will only reduce the risk of paddy crop, allow people to take cabbage, cauliflower and tomatoes in Rabi. By developing the proposed canal, it will provide for good rainwater harvesting through the season. Accordingly, not only the extension of additional command, double, even triple, cropping also may occur within that command area with that canal facilities. Utilization of the existing cropland of the village throughout the years with multiple crops and improvement of the livelihood of the community (those are also conserving the forest) is one of the prime objectives of the project, and also in the State Action on climate Change. Moreover, since the proposed project is a model for developing of an eco-village i.e. carbon positive, it will be a showcase adaptation project with strong mitigation co-benefit that can be scaled up.

The cropping pattern for the enhanced command shall be paddy as the lead crop followed by peas/cole and seasonal crops. Once the command enhanced and land reasonably levelled the proposed area can have the following cropping. Paddy, mustard, pea, beans, Cauliflower, Onion, etc. area as a multiplier. Alternately, plants of good for nitogn fixation like maize, soyabean or gram as intercrop. Brinjal (local), chillies are also possible with minimum moisture regime in the tail end of the command. PMKSY component costs have been excluded (climate proofing of canal is not part of PMKSY)

Resilience: Water flow regulation, water and nutrient recycling, food provisioning, fresh water provisioning

C3. Integrated mountain farming and use-wise practice introducing horticultural species (Conservation of indigenous species of medicinal and aromatic plants) in the homestead

The village has homesteads with reasonable cover of wild species. Some of the endangered species need to be protected and based on the bio-diversity registrar more species can be added. Majority of the aromatic plants of the district were found growing in the wild. Commercial exploitation, unsustainable use, cultural changes and lack of institutional support have threatened resources and local traditional knowledge. The main constraints in commercial exploitation of aromatic plants are due to the fact that the people of the region lack of post-harvest treatment practices, lack of proper domestication, lack of research and development on product and process development and lack of latest technologies and market information.

The survey of aromatic plants will be attempted in the village by involving 1200 No. of households in the village / volunteers for selecting few plants, which has aromatic value, rich bio-resource and sustainability as the criteria for selection. This activity will be useful in the exploration of aromatic plant wealth in a place where no scientific botanical exploration prevails (concrete adaptation). Out of the total aromatic plant species *Aquilariamalaccenesis, a critically endangered species,Artabotryshexapetalous*, *Curcuma caesia*(yaimu), *Elshotizablanda, Pandanusfoetidus, Plectranthusternifolius*and *Ocimumbasilicum*, Oak Hidak (*Acoruscalamus*), *Hedychiumspicatum* (spiked gingerlily), *Rauwolfiaserpentina*(Sarpagandha), have been identified during the consultation. The schedule would be drawn up systematically with taxonomists and experts. The villagers will be trained by reputed companies on domestication, post-harvest preservation methods.

Since the field distillation units are complex and have failed in Karbianglong (Assam) and elsewhere in this region. Therefore the community would be part of the supply chain where the sourcing of preserved items such as dry ginger, organic turmeric, herbs (semi processed) will be made by the private partners from common interest groups. The private partners (such as Dabur, Himalaya, etc.) would also train the community on sourcing requirement.

The farmer producer organizations will prepare the detailed business plan assisted by the technical support agency. There will be intermediaries supplying to organized retailers like Reliance, pantaloons and also Ayurvedic companies like Dabur. This has been detailed out. Beneficiaries will be selected based on social mapping and the most vulnerable ones to be given direct linkage (input & training) from the project. Approach is total saturation of the village, only quantum of assistance will be retained by the community.

Resilience: Cultural heritage, bio-diversity, ornamental resources, genetic resources

C4. Sustainable agriculture with introduction of SRI, scientific piggery and integrated pest and nutrient management

SRI is not widely practiced in the low sloping areas of the district and need to be encouraged with special emphasis. With flow regulation and land levelling possible through the structural measure stated above, it would be conducive. SRI cost includes only training and demonstration not proposed under existing programme of the district. So there is no duplication.

RKVY plan already takes into account some of the activities mapped as convergent e.g. horticulture, piggery, etc. PMKSY is not yet fully planned but it can be linked from the water sector. The activities wherever it is not part of RKVY cost have been asked for on-farm demonstration (including material and training); therefore it shows some of the cost parameters to be on the higher side. Moreover, the nodal agency i.e. Directorate of Environment has also already earmarked some lump sum amount from the plan money for this project. The same will be its share as convergence in that specific work. There will not be any question on delivering the proposed outcomes due to non availability of fund. It is a novel project and not conventional farm intervention, it has strong elements of activity planning and tracking of adaptation outcome and documentation to get carbon positive tag and therefore, it shows some of the cost parameters to be on the higher side.

In addition to the paddy based cropping system the ginger and turmeric (var. Megha and Lakadong) will be intercropped. These will be done fully organic and premium branding. The entire system would ensure traceability, even the

pest control measures would avoid chemical pesticides and herbicides with additional investments. The piggery is a prominent livelihood option but they are reared in most unhygienic manner. The fecal matters are released to the water streams and that results in higher disease burden. A manual in local language for scientific piggery will be developed through the project. The Farmer Progressive Organization (FPOs), specially for marketing network, will be formed within the existing community farmer groups since the village itself has existing village development committee under the supervision of different customary local institutes like *Singlup* (local institute), Panchayete Raj, etc. This will support by the project implementation committee by giving capacity building, HRD, skill development, etc.

Resilience: Methane management, emission reduction co-benefit; provision of food, nutrient recycling

C5. Sustainable energy use through integration of the solar system

The village has a main street and some branch roads. There is a community center and two schools. There is no functional street light in the village. It is important demonstrate the use of street light using solar energy. Later the village resource centre can be fully integrated with solar lighting and heating. The eco-resort temporary cottages will be fitted with solar light (though back-up generator shall too remain).

Resilience: Emission reduction co-benefit, CO2 reduction

C6. Capacity building and Institutional Development (micro-finance, micro-insurance, skill development, etc.

Capacity of the community level institutions will be assessed. Common interest groups will be formed. These groups will be linked to Jandhan system. Necessary linkage will be established for skill development in solar installation and assembling, green skills for horticultural and aromatic plant propagation, domestication and preservation. The village will also be linked to micro-insurance.

Bio gas production per kg of cow dung is 0.023-0.04 m^3/kg, with around 9-15 kg of dung per cow. On the basis of PRA it was concluded that each of the household possesson an average three to four numbers of cow per households (as many as 50 household has more than 10 cow) the minimum cumulative biogas potential is between 1.8 m^3/household. On an average with four –six numbers of pigs the biogas potential is in the range of 0.2 - 0.22 m^3 , in addition there are human excreta and kitchen waste that will be dumped in the biogas the 2m^3 biogas units turns out to be feasible.

Resilience: high adaptive capacity, risk transfer

C7. Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood

Village knowledge centre is not just a community building. It will be a repository of all the learning materials, documentation of audio-visual case studies on conservation, uses wise framing of horticultural crops; integrated pest and nutrient management, SRI cultivation and several other best practices that enhance adaptive capacity of the community. The process that to be followed to develop the centre is given below:

- Identification of hot-spot communities and key local resource persons to be developed as trainers
- Facilitation of participatory community level vulnerability assessment
- Co-creation of Community Resilience Plan
- Work with Authorities and adapt the development plan (rural and urban local bodies, line departments such as agriculture, horticulture, forestry, Command Area Development Dept. etc.)
- Discuss and document norms/policies to implement changes in behavior, norms and infrastructure
- Draw lessons learned and document - disseminate best solutions to visitors to resource centre
- Build community of practice and multi-stakeholder alliances
- Integrate policy adjustment inputs for adaptive governance
- Adapt policies for resilient communities and sustainable development
- Regularly review policies/norms and budgets from time to time

The local resource person thus trained would serve as guide for visitors and they would demonstrate best practices adopted in the village for conservation and management of bio-diversity.

C8. Development of an eco-health resort in 10 ha community lad for yoga, natural living and safe treated drinking water supply

This is a unique proposition that emerged during the stakeholder consultation. The community owns more than 40 ha land facing the mountain along a natural stream. They propose to convert 25 ha of this land to an eco-health resort where temporary camps will be held for yoga and meditation. The project will be executed in public-private-community partnership (PPCP) mode. The conceptual model for this has been given below.

Figure 2.5 : Conceptual layout of eco-resort site, Phayeng

The state will provide requisite publicity and a viability gap funding to the operator if required . This will be semiannual event adjusting to the most convenient months. The private operator will have to bring in sustainable temporary camps and norms that will be clearly outlined in the concession

agreement. From the main entry point to the resort only electric/battery operated vehicles will be permitted. The community is vulnerable because the agriculture and horticulture are getting adversely impacted. The future water source is at risk. The community has (one or two hamlets) undertaken conservation measures and social fencing effectively. This patch of the forest is well protected. However other part of this ecosystem where the stream command is impaired other villagers destroy the forest and depletion can be seen. The idea is to replicate the best practice through an eco-system approach. The project concept is very well structured so that people would not put pressure on the forest. Therefore, medicinal plant and horticultural activities were conceptualized so that the bio-diversity is preserved and livelihood is diversified.

The place is not very far from Imphal and the tourists do come for trek and that often attracts adverse opinion from courts. The alternatives are two, i.e.

(a) an eco-health resort and traditional crafts and herbs in the foothills. Show case the conservation, yoga and ancient martial art traditions as exposition, and

(b) Youngsters would go out of the village to far off cities and living old and infirm who would largely live on NTFP and gradually the area would either have social strife and other forms of eco-system loss.

Therefore local livelihood and conservation centric livelihood rooted in traditional systems of medicine, yoga and marital arts would build resilience.

The eco-health resort concept is core to this proposal. Main objective is to retain the migrating youngsters and reduce the social tension which has a huge cost (vs. working in low value added service sector elsewhere). This would help them in-situ alternative livelihood with a boost to community handicraft, local cuisine, transport (almost like a replica of Chokhidhani in this region). The actual cost of the resort is few times more. A typical resort cost is in the range of 8 crores elsewhere. With land being available,

the amount will be used as a viability gap funding. Since the resort will be in a PPCP (public-private community partnership mode), Rs 20 lakhs (details at Annexure 1/O) is the maximum capped amount. However, the components shall include land development (25% of Rs 8 crore); temporary shelter (20%), temporary stalls (15%), amenities (15%), training (10%), Revolving fund (15%).

Adaptation Co-benefit:

Offsetting Migration: based on the rapid assessment almost 50-60% of the literate people in the age-group of 16-35 migrate to other cities in addition to marginal workers and people displaced from agriculture. This is estimated to be around 1221 and accounts for 45% of the population (on a increasing trend basis).

The resort will retain most of the cultivators and a large part of the marginal work force and the household craft workers would double. The in-situ employment thus would be about 959. This would directly and indirectly serving the local and inbound tourists and would account for 35% of the population in the village. On an increasing trend it would offset the migration in 4 years. Likely social unrest and conflict (can not be valued but is a co-benefit; care of the old and infirm who live in the village attended by especially the nonmigratory females also a co-benefit but cant not be valued. The other co-benefit includes value of indigenous knowledge on conservation getting replicated and building resilience

The project concept follow ecosystem based adaptation from conservation in upstream to ground water recharge and livelihood resilience by diversifying crop. The eco – health resort demonstrates this value integrating the medicinal plants in homestead to enhance bio diversity, organic food, solar integration. This creates livelihood through sustainable tourism reduces migration. The mitigation co-benefit makes it carbon positive. This is also based on public private community partnership.

Mitigation co-benefit

Solar and methane management co-benefit already makes it carbon positive and that has been given in the report.

VGF issue

Based on average spend of 740 USD and 7.9 days spend (data based on north-eastern region) the maximum VGF is fixed at 2.73 crore (based on bid basis, who ever demands lowest VGF will win the eco-health resort contract. The detailed cannot be given at this stage. It will be based ont he EOI.). The domestic spent suitably adjusted. This may be even lower upon the private bidder being aggressive or conservative in any case it would not exceed this Cap. Now the annual expected revenue is about Rs. 72 lakh. Viability gap fund (VGF) is only for eco-health resort. Whatever is the revenue gap the private developer would have based on his investment plan (land is equity from village).

In this project is targeted to generate safe treated drinking water facilities in the upper catchment area of the Maklang river, which is the only source of water for drinking and irrigation. This will be the first time in the village for safe treated drinking water supply. As discussed in the vulnerability of hill and water resource (Chapter 1, sub section 1.1), from the study based on remote sensing and GIS technique as at Fig. 1.2 and 1.3, it has been reported that most of the stream heads in the hill area of the village has been dried up except the Maklang River. This river is also drying up slowly and decreasing its yield. Therefore, the Maklang River in Phayeng village of Imphal West District is also one of the most vulnerable water sources. With these observations, the project targets to conserve, protect and restore the river ecosystem through catchment area treatment, enhancing its recharge and de-siltation.

As a byproduct of these activities, some portion of the Maklang river water will be diverted in a settling tank and the same will be treated conventionally for supply to the villagers. This will be help in reducing the expenditure from buying drinking water from the commercial distributers, Moreover, excess amount of treated water may be sell out and revenue may be collected by the villagers from this source.

Water treatment process will be targeted in eco-friendly process by using slow sand filtration and solar pumping system by installing of three numbers of 5hp pumps. The pump proposed here will be solar operated as alternate option (also electric facilities alternate use) and additional cost includes the cost of solar panel and controller. Considering 1200 Wp panel requirement per hp total capacity of solar panel required is 6000 Wp and an amount of Rs. 9.9 lakhs will be involved as given below.

Cost component	**No of unit**	**Unit Cost**	**Total cost**	**Reference**
Cost of Panel	3 number of 6000 Wp unit	Rs 60/Wp	10,80,000.00	Per unit cost and panel capacity reference from http://www.agricoop.nic.in/imagedefault/Nrm/SolarPumpsetModel.pdf
Cost of Controller		36000	89,701.00	
Total additional cost			9,90,299.00	

Freshwater-related risks of climate change increase significantly with increasing greenhouse gas (GHG) concentrations. For each degree of global warming, approximately 7% of the global population is projected to be exposed to a decrease of renewable water resources of at least 20% (multi-model mean) (IPCC). This will intensify competition for water among agriculture, ecosystems and settlements.

Currently the village does not possess safe drinking water supply and is totally dependent upon the spring. Moreover the unavailability of proper drainage facilities, livestock management practice the water is mostly subjected to contamination increasing the incidence of water borne diseases. The increased concentration of rainfall across fewer numbers of days, increased runoff and flood scenario due to weather variability in the region further exacerbates the stress.

The creation of water management structure is proposed to retain water for dryer period and also to purify and provide safe drinking water to the village population. Justification for the proposed activities in this component in terms of

- selection of component
- climate change related

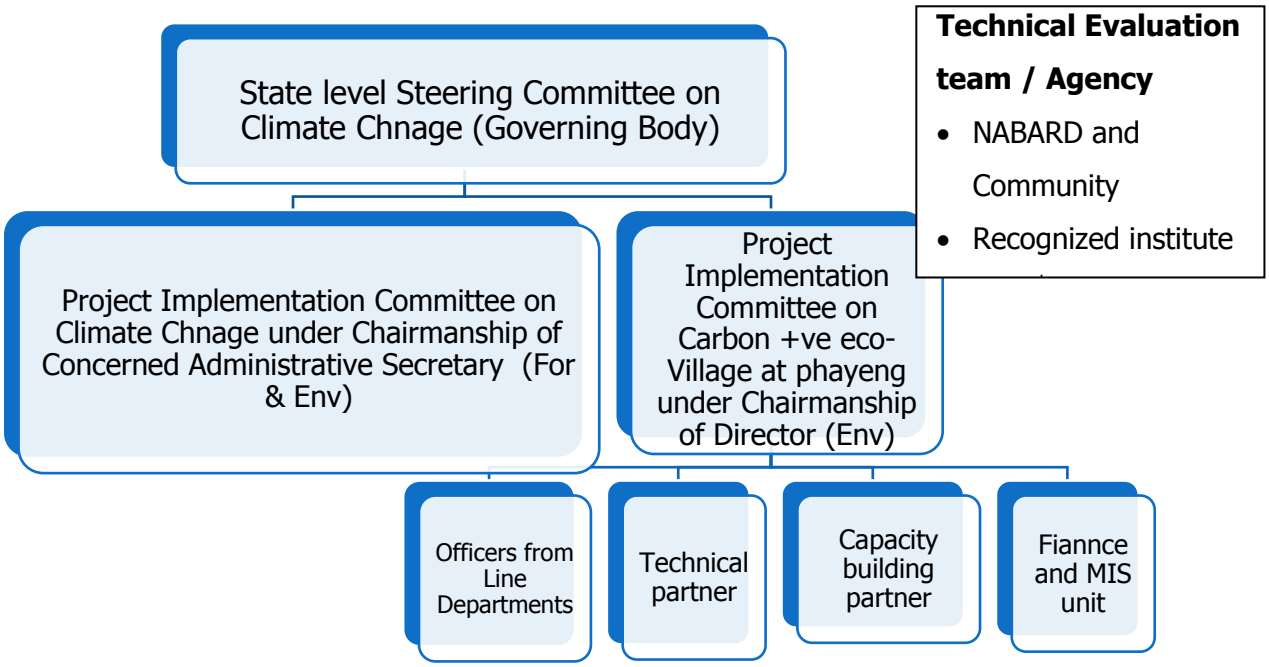
The component is selected to reduce the existing social stress and health impact of the communities/household in the village. As implied the village lack safe drinking water and is dependent upon the spring. The same water is used for maintaining household hygiene. The climate projection is likely to exacerbate the existing ecological stress of the unavailability of water during the dry season/ spring drying up in the region and environmental stress of water contamination during the monsoon enhancing the incidence of water borne diseases. The infrastructure will help in both storage and supply of quality water for drinking throughout the year.

O & M after project period :

The operators will be provided hand on training over the operation and maintenance practice and will be provided with an Operation and Maintenance Manual, in English and the local language. The Manual will have information about solar energy, photovoltaic, modules, solar based motor pump set, tracking system, mounting structures, electronics and switches. It will also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Name and address of the person or Centre to be contacted in case of failure or complaint will also be provided to the operator. A warranty card for the modules and the motor pump set should also be provided to the Panchayat.

C 9. Project management and monitoring system to get the carbon positive tag for this model village

The project will be housed in directorate environment and it will be the coordinating point for all activities and shall be the executing entity. Officers will be drawn from the relevant line departments for execution of project components. In addition technical partners and capacity building partners will provide support. The project management arrangement has been given below:

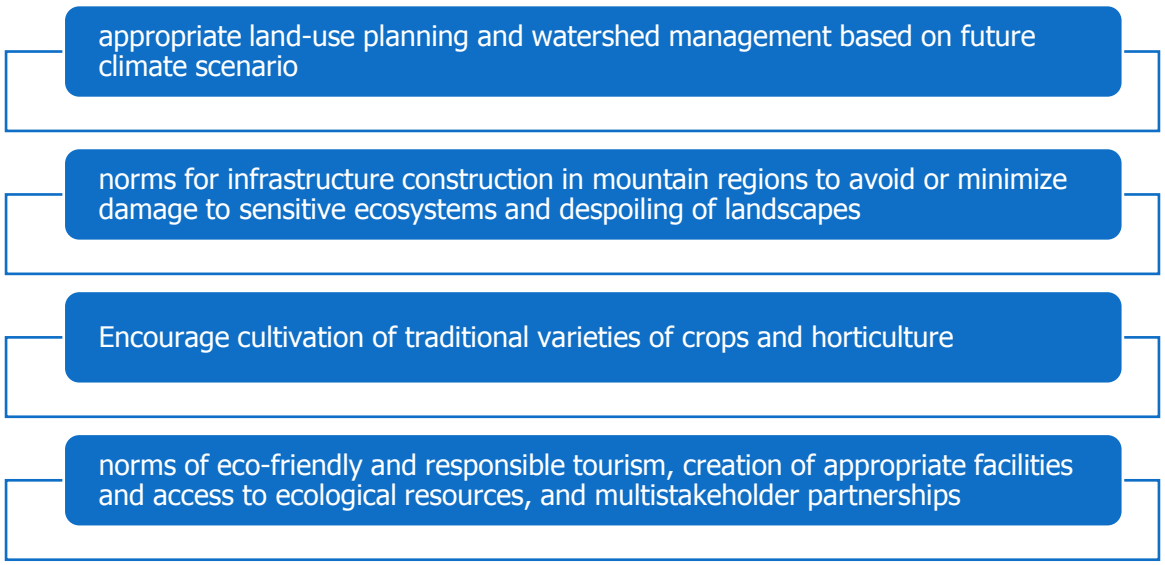


The PMU upon the sanction of the governing body of annual work plan and budget will form an expenditure sub-committee and use the funds. The MIS unit will maintain project MIS, work with concurrent monitoring agency and others on matters related to project and manage the correspondence.

Two critical components the management aspects of carbon-positive tag to the village and transaction management to mobilise the private sector for eco-resort will be handheld by technical partners (CTRAN).Capacity building components will be handle by identified NGOs and they in turn work with community in the Phayeng village. The funds will be audited by chartered accountant and NIE will manage the disbursement schedule.

2.5 : Justification of components on adaptation activities & climate resilience

The concrete adaptation activities of the project are largely follows the guidance of best practices for ecosystem based adaptation that enhances livelihood.



i. Land use planning :

It is keeping in the future climate scenario is a concreteadaptation activity. It improves in soil stabilisation and erosion control, carbon sequestration though plantation in eco-sensitive areas and conservation of bio-diversity. There were numerous hill streams in the region and now only one perennial stream is available. The protection of this stream is extremely important for the region and several treatment measures in the upper catchment.

ii. Norms for infrastructure construction and conservation:

The business as-usual norms on construction would not hold good for future climate scenario. The infrastructure design has to be future climate ready. This would include soil stabilisation and treatment measures that can withstand the pattern of climate in next 50 years. The climate proofing of the canal would include measure to adjust variable silt load, enhanced command.

The concrete adaptation measure for bio-diversity conservation will be linked to traditional practices and herbs that are of religious/cultural significance apart from the health benefit. This will involve preparation of village bio-diversity registrar and mapping with endangered species to try the domestication process. This will also be applicable for certain horticultural and aromatic crops discontinued hence.

One of the key element in this programme to create a village resource centre to promote the traditional conservation value by local resource persons. The design for the resort also conforms to address ecological balance and not business-as-usual construction.Attention to watersheds and following the contours andslopes of the landscape is a distinctive characteristic of this design. These are supplemented by other concrete adaptation measures proposed under different components such as considerations are used for the placement and methods of food productionactivities, renewable energy production, wastewater treatment facilities, recycling ofwaste, compost toilets and green businesses. Restoration of natural habitats and diversityof nature are key guiding principles.

2.6 Details on Economic, social and Environment Benefits of the project / programme

(Reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations)

Table 2.3 : EE to present the key benefits

Components/Activities	Key Benefits (Direct)		
	Social	**Economic**	**Environmental**
C1. Sustainable management of land-water and forest	The village has high percentage of forest dependent communities and some conservation norms do exist already. Scientific management of the upper catchment and sensitization of the neighbouring village by enhancing stream flow will give equitable access to all.	The intervention will look at the economic well being for the targeting purpose, small and marginal farmers, agricultural labourers and women members will be specifically targeted	One of the key elements of this exercise is to maintain the environment flow and soil stabilisation.
C2. Structural measures to climate proof the canal irrigation and enhanced	The enhanced command would help additional beneficiaries from all social groups to access water and this would	It will also reduce the risk of failure of some of the crops and enhance productivity and	The run off management and sil degradation will be addressed. It will also use the stream water

Components/Activities	Key Benefits (Direct)		
	Social	Economic	Environmental
command	ensure food security for all.	allow people to cultivate vegetables thus enhancing income.	for treatment and drinking water quality will improve
C3. Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead	There will be common interest groups conserving medicinal and aromatic plants. The network will enhance democratic functioning and help in better social capital formation. The groups too will be linked to established players like Dabur, Himalayas, etc. and they will negotiate better.	Will help in efficiency in through aggregation, ensure input cost reduction through bulk buying of inputs. Rare herb cultivation too will fetch premium.	Will help in maintain bio-diversity and preserve some species facing extinction and would create ecological balance.
C4. Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.	Enhancing food security and addressing health issues of households involved in piggery.	Diversification of income through mixed farming and higher productivity through SRI	Better methane management and water quality improvement and reduction in disease burden
C5. Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)	Reduces risk for vulnerable groups	Protects the investment made and transfer he economic cost with reduced risk of failure	Helps in avoiding negative environmental externality by enhancing adaptive capacity

Components/Activities	Key Benefits (Direct)		
	Social	Economic	Environmental
C6. Renewable energy (solar) street lighting integration in village	Reduces energy poverty for all in a sustainable manner. Spurs social activity and safety in the night. Aids old and infirm in a positive way.	Enhances economic activity in the village and aid household industries	Avoids fossil fuel based generation and reduces CO2 emission
C7. Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood	Enhances peer learning, helps in up-scaling traditional conservation value and eco-system adaptation and mainstreaming climate change agenda in the village network	The network would spur eco-tourism, sustainable harvest of rare herbs and provide wider market linkages, create additional livelihood options	Will propagate the value of conservation, ecosystem resilience and help in avoidance of extinction of species.
C8. Development of an eco-health resort in 10 ha community land for yoga and natural living	Enhance the reputation of the village as a unique destination, ensure health for all.	This will provide additional livelihood options for the villagers will spur local trade, craft, cuisine and skills	Conservation based tourism aligned with cultural sensitivity and strong safeguard laid out in the policy and contract with the operators

Table 2.4 : Financial, Environmental and social Risk Screening

Risk	Rating (High / Medium / Low, etc.)	Mitigation Measure
Financial management	Medium	The project encompasses multi component with defined implementation time frame and the budget allocated separately for each of the component. Since the implementation of the project is time pressed the completion of the each of the component will depend upon the timely approval and availability of budget on as and when required basis/within limited time frame. Moreover it is to be considered that at DPR stage the capital cost envisioned for any of the activity is based on the current schedule rates. Cost overrun due to economic inflation or other extrinsic factor is not considered and might impose financial constraint to the project in case of delay as contingency fund is not provisioned under the budgetary approval. It is also understood that the approval of the budget will be done on phased manner and as against the submission of utilization certificate of earlier installments. This may hamper timeline of the implementation of the multi component project activity and is considered under financial risk regime. ***Financial Risk mitigation measures*** 1. It is proposed to have a yearly review of the project implementation status by the NIE and provision be made for submission of utilization certificate by the implementing agency to the NIE and subsequent clearance of installments on a yearly basis to the project implementing agency. 2. Since the project encompasses multiple component so implementation of any of the lower budget component planned at subsequent phase of the project activity be

		constrained because of the partial implementation of a higher budget component approved to be implemented initially as subsequent installments is only provisioned to be approved on utilization of 75% of previous installment. So situational analysis should be considered by the project steering committee while approving for the installments. 3. The idea of creation of corpus fund with the project implementing agency after initial financial allocation may thought of to meet up the operating cost of PMU/Weather station/Soil testing lab. 4. Provision should be created by the NIE to absorb the negative implication of taxation changes
Project management	Low	The implementing agency has prior experience of handling and implementing project and will be supplemented by a strong governing body, dedicated PMU with the support of technical partner CTRAN. The other project management risk and mitigation measures are outlined below: 1. Technology, construction and operational risk: This is the risk that the project might not be completed/operated in line with the performance standard. As a part of the risk mitigation measures following measures will be taken up a. The terms of construction contract should be categorically reviewed to avoid time or cost over run b. Guarantees and conditions to cover incompleteness of the project or delays in implementation (performance bond, penalty covenants etc.) c. The design should be confirmed by an independent engineer 2. The operator is one of the principal counterparties involved in the achievement and successful operation of the project. So while selection of the operator the

		ability and motivation of the operators to carry out its obligation should be undertaken.
Social Risk	Low	The social risk of the project is due to its location at a less economically developed region, one with unreliable infrastructure(including inadequate utilities, transportation optionsand social factors), is likely pose greater risks than a projectlocated in a more economically developed region and might impose risk to the project. There may be minor conflict that can be moderated through strong community mobilization. It was also planned that participatory approach will be adopted to design the implementation framework with the objective of developing a kind of ownership amongst the community for the project. Activities planned to mitigate social risk of the project 1. The participation of the community is essential from project conceptualization to implementation to ensure the ownership of the community in the project. 2. Awareness and sensitization activity will be undertaken at the community level immediately after the budgetary/project approval so that the communities understand the objective, utility and benefit of the project towards enhancing ecological and social sustainability of the community and prevent any act of sabotage, civil commotion or malicious damage.
Environmental	No	The project is configured with the objective of ensuring environmental sustainability. However before implementation of the infrastructural project an environmental and social impact assessment will be carried out and environmental management plan will be followed if suggested by the project approval committee. 1. EMP will be prepared for all the implementation activity to ensure environmental sustainability

2.7 Sustainability of intervention

How will the project assure that the benefits achieved through its investments are sustained beyond the lifetime of the project?

C1. Sustainable management of land-water and forest: The community is already having strong social norms to preserve the forest in baseline scenario. The project is strengthening this. The new norms take into building on the community initiative and make them aware of future climate risk to prepare them better. The strong principles ingrained by rotation watch and ward institutionalised by the village committee is highly sustainable.

C2. Structural measures to climate proof the canal irrigation: This measure even though one time investment activity, the ongoing maintenance has to be done by creating small corpus through community contribution and topped up with one time grant and linkages established through MNREGA. This will help in O&M activities and this would be sustainable. The community can collect water tax too.

C3. Integrated mountain farming and use-wise practice introducing horticultural species: The area has many rare herbs with excellent medicinal value, domestication and scaling up of these initiatives in association with private sector would transform the economy of the area.

C4. Sustainable agriculture and allied activities: The yield in SRI is almost double than that of the conventional method of paddy cultivation in the area. Scientific piggery once introduced also would reduce disease burden and enhance productivity. These activities are not new but more scientific and has low adaptation risk and highly sustainable.

C5. Capacity building and Institutional Development: The modules will be developed in association with the communities. Typically this will be audio-visual and leaflets in local language. The local resource persons will be trained through a robust training of trainer programme and there will be no external dependency. The financial inclusion linkage will be with JandhanYojana and with ICT platform. This will sustain as it is indigenous initiative and localised.

C6. Renewable energy (solar street light): It is one of the public service provision. The operators (resort operator) and community would share the battery replacement cost in the course of the intervention.

C7. Village resource center: Apart from the one time grant to set up the centre. Its operation will be sustained by charging the visitors a fee; making the facility available for meeting and seminars on conservation, sale of souvenirs to visitors. This will be clearly displayed in the charter of the resource centre.

C8. Development of an eco-health resort in 10 ha community land for yoga and natural living: The one time viability grant has been proposed- the operational cost and revenue is to be estimated when the project is grounded. The bid parameters would include lowest VGF and highest share to communities for the private operator; hence this would be a viable business for the community and the operator would like to maximise revenue fully agreeing to the well laid out safeguards.

2.8: Analysis of the cost – effectiveness pf the proposed project / programme

(i) Cost effectiveness

Activity	Proposed Alternatives	Benefits
Sustainable management of land-water and forest:	The other alliterative is to go far away from the village and replenish and tap the reservoir and lay pipeline to the village. To allow bore wells in the area. While the former is a much costlier alternative, the condition of ground water would be critical with many people digging bore well and eco-system cost is much higher.	Small scale soil water conservation management would help in restoration of the only available hill stream, soil stabilization and water quality improvement would reduce disease burden
Integrated mountain farming and use-wise practice introducing horticultural species	Other alternative is to discontinue traditional herbals system of medicine and enhance the usage of other medicines, apart from the ecosystem loss, the medicines are costly and age old tradition would be lost, many species will be extinct.	Revival of alternate medicine, natural living through yoga is a clear benefit
Agriculture and allied intervention	Alternative is to continue business as usual, which has low productivity vs SRI, the animal health is poor and mortality is higher	SRI method is proven to be profitable elsewhere in the area and scientific piggery would help in reducing mortality and would have reduced diseases burden

Activity	Proposed Alternatives	Benefits
Risk Transfer and financial inclusion	Standard approach is to waive existing loans. The insurers shy away or enhance premium loading. This is a systemic risk	The bank linkage will help in direct benefit transfer and also help in savings mobilization, insurance will reduce risk to life and livelihood
Eco-health resort	This is a new activity – however, it is getting compared where the educated youngsters move out to other parts of the country working in low value added service sector (restaurant, BPO), etc. This is a sensitive issue and has high social cost.	There will be lot of local employment opportunity and diversification of livelihood

(ii) Weighting of project activities:

HOW MUCH FUNDING WILL BE ALLOCATED TO 'INVESTMENT ACTIVITIES', 'CAPACITY BUILDING ACTIVITIES' AND 'PROJECT MANAGEMENT ACTIVITIES' RESPECTIVELY?

Sl No	Project component	Funding required (Rs in Crore)	Type of Activities	Complementarity from other sources
1	Sustainable management of land-water and forest	2.07	investment	
2	Structural measures to climate proof the canal irrigation and enhanced command	0.93	investment	PMKSY linkage
3	Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)	0.56	Investment + Capacity Building	
4	Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.	0.62	capacity building	leverage RKBY and the contribution from earmarked plan budget. No budget provision has been given for SRI.
5	Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)	0.50	capacity building	
6	Renewable energy (solar) street lighting integration in village	0.92	investment	

7	Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood	0.50	capacity building	
8	Development of an eco-health resort in 10 ha community land for yoga and natural living	2.73	investment	Viability gap funding only for PPCP
9	Project/Programme Execution cost (including formulation cost of Rs 10 lakh)	0.88		
	Total Project/Programme Cost	***9.71***		
10	Project/Programme Cycle Management Fee charged by the Implementing Entity	0.29		
	Total	**10.00**		

2.9: Alignment with the National and State Action Plans of Climate Change and other policies / programmes

(DESCRIBE HOW THE PROJECT / PROGRAMME IS CONSISTENT WITH NATIONAL OR SUB-NATIONAL SUSTAINABLE DEVELOPMENT STRATEGIES, INCLUDING, WHERE APPROPRIATE, NATIONAL OR SUB-NATIONAL DEVELOPMENT PLANS, POVERTY REDUCTION STRATEGIES, NATIONAL COMMUNICATIONS, OR NATIONAL ADAPTATION PROGRAMS OF ACTION, OR OTHER RELEVANT INSTRUMENTS, WHERE THEY EXIST)

The proposed project is tightly linked to Sustainable Himalayan Mission (one of the eight mission under National Action Plan on Climate Change). The project has been formulated based on the best practice guidance of the mission published by MoEFCC. It also has linkages to water mission, national mission on sustainable agriculture as well as solar mission.The proposed activities have been prioritized clearly under the State Action Plan on Climate Change under Ecosystem, Bio-diversity and Livelihood sustainability. The project links up all four strategies under the mission prioritised under SAPCC [Table 4.1 of the SAPCC].It also follows the NAFCC guideline and state guidance on poverty reduction strategy.

2.10 : Component wise technical standards

(DESCRIBE HOW THE PROJECT / PROGRAMME MEETS RELEVANT NATIONAL TECHNICAL STANDARDS, WHERE APPLICABLE, SUCH AS STANDARDS FOR ENVIRONMENTAL

ASSESSMENT, BUILDING CODES, STANDARDS RELATED TO POLLUTION CONTROL, ETC. THE DETAILS NEED TO BE PROVIDED FOR EACH OF THE INTERVENTIONS PROPOSED)

Activity	**Applicable Standard**	**Application to project**
Soil water conservation	As per the guideline of the state	Same
Canal work	As per the scheduled rate	same
Construction work	As per the scheduled rate	As per design approval – cost norm to be ratified by the technical sub-committee of the project.
Eco-resort	As per global conservation standard (there will be no permanent structure)	Global standard with additional safeguard to be incorporated in the concession contract

To be determined in consultation with partner departments. There is no structural measures requiring EIA. Most of the activities proposed are environment friendly.

2.11 Duplication Check:

(DESCRIBE IF THERE IS DUPLICATION OF PROJECT / PROGRAMME WITH OTHER FUNDING SOURCES, IF ANY)

Project	**Objectives**	**Complementarity**	**Geographical Coverage/Agency**
Lokatak Conservation	Lake restoration, wetland management	The proposed project is not part of this plan	Different approach
North East Region Community Resources Management Project for Upland Areas-II	Livelihood promotion, environment conservation	The proposed project is not part of this plan	Regional project, proposed project location is not part of it
RKBY	Agricultural development	Some convergence, that has been shown in the budget and only additional activities for this project has been budgeted	No duplication (SRI related activity is not budgeted, IPM/INM not budgeted); only training and capacity building component budgeted

2.12 Details on Stake-holder consultation:

(DESCRIBE THE CONSULTATIVE PROCESS, INCLUDING THE LIST OF STAKEHOLDERS CONSULTED, UNDERTAKEN DURING PROJECT PREPARATION, WITH PARTICULAR REFERENCE TO VULNERABLE GROUPS, INCLUDING GENDER CONSIDERATIONS).

Consultation	Date/ Place	Participation	Objective	Outcome
1. Interaction with community with Pradhan	8 July 2015	52 villagers	Sensitization and identification of pro-problems	Fruitful & very cooperative
2. Interaction with educated youths with Pradhan	12 July 2015	16 persons	Sensitization and identification of pro-problems	Fruitful & very cooperative
3. Interaction with farmers	19 Aug 2015	35 farmers	Sensitization and identification of pro-problems	Fruitful & very cooperative
4. Door to door survey at Phayeng	13 July – 15 September 2015	115 Households	Village information	Fruitful & very cooperative

Figure 2.6 : Intercation Programme with villagers

Figure 2.7 : Door – to – Door survey at Phayeng

2.13 Learning and knowledge management component to capture and disseminate lessons learned for the proposed project

Capacity building and knowledge management are key elements of this programme:

The modules will have the following focus:

- Guidance formulated under the assumption that good adaptation considers all available options in a holistic manner from a systems perspective: a total system (ecosystem approach)
- Key design elements infomed through indigenous technical knowledge (systematic documnetation) and local resource person training (Training of Trainers' programme)
- Participatory vulnerability assessment methods and response actvities training
- Sectotal training modules in partnership with partner agencies and department
- Module on ICT, audio-vidsual documentation, Monitoring and Learning

A full set of activities have been marked for generating audio-visual case studies to document the experience. In addition the policy brief and monitoring report will provide good insight to the programme.

2.14 Sustainability of the project/programme outcomes has been taken into account when designing the project / programme

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Sustainability mechanism	Responsible Parties* (Officers to be drawn)
1. Sustainable management of land-water and forest through an eco-system approach	Treatment and conservation activities in the upstream of village Phayeng	Improved capacity of forest dependant community in the village to address soil degradation, biodiversity conservation and stream vulnerability.	Soil stabilisation and rejuvenation is the key goal and long term water security	Forest department

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Sustainability mechanism	Responsible Parties* (Officers to be drawn)
2. Structural measures to climate proof the canal irrigation and enhanced command	Enhanced irrigation command and water security for crops	Enhanced food security for the community	Additional command would reduce risk of crop failure, enhance scope for additional crop and ensure food security	Command Area Development Dept.
3. Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)	1200 no of households planted saplings around homestead and forest of the selected species	Increased ecosystem resilience in response to climate change and variability-induced stress and resilient livelihood	Conservation of endangered species, propagation of medicinal and aromatic plants would ensure preservation of culture and bio-diversity, increase income at the household level and reduce disease burden	Directorate of environment in association with Department of Horticulture and Ayush)
4. Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.	500 no of farmers trained on best practices in SRI, IPM/INM and scientific	Small and marginal farmers, with the support of local authorities, enhance their knowledge to	The bets practices sharing will help farmers better adapt to methods and processes	Capacity building partners with RKBY and Department of Agriculture and Animal

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Sustainability mechanism	Responsible Parties* (Officers to be drawn)
	piggery	diversify andstrengthen their livelihoods and sources of income in targeted areas	those are climate resilient	Husbandry
5. Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)	660 no of households are covered under financial inclusion and skill development programmes	Strengthened awareness of the households and ownership of adaptation and climate risk reduction processes at local level	Financial inclusion and micro-insurance will help in better adaptive capacity and skill development would ensure employability	PMU with capacity building agencies
6. Renewable energy (solar) street lighting integration in village	Main streets of the area community house and resort have functional street light	Reduction of fossil fuel and with mitigation co-benefit	Local installers would handle O&M on a fee basis	PMU with Village Committee
7. Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood	A fully functional village resource centre established with facilities	Strengthened knowledge, norms and practices t better adapt to climate in the ecosystem with conservation	Development of monitoring and learning document and getting carbon positive and eco-village	PMU with technical partner CTRAN

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Sustainability mechanism	Responsible Parties* (Officers to be drawn)
	and trained local resource persons	of bio-diversity	certification will ensure replicability and sustainability	
8. Development of an eco-resort in 10 ha community land for yoga and natural living	An eco-resort is established with temporary yoga camps for the relevant period of the year in public-private community participation process	Multi-sectoral benefits with livelihood diversification achieved through responsible nature tourism	The project will be developed in public-private community partnership mode. Adequate safeguards	The private operator with village committee transaction facilitation through PMU and technical partner

2.15 Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	Local norms will be validated with the community	May be required and would be completed during inception and will be ratified by village committee

Access and Equity	Ensured	Ex post monitoring of village committee meeting agenda and registers
Marginalized and Vulnerable Groups	Ensured	Ex-ante required
Human Rights	Ensured	Ensured (it is a purely community based project)
Gender Equity and Women's Empowerment	Ensured	Ensured
Core Labour Rights	Will be ensured	Ex-post, concurrent
Indigenous Peoples	protected	Ex-post, concurrent
Involuntary Resettlement	Not envisaged	Not envisaged
Protection of Natural Habitats	Ensured	Integral to this project and ensured
Conservation of Biological Diversity	Ensured	Integral to this project and ensured (but validate through ex-post monitoring)
Climate Change	Addressed	Will be assessed
Pollution Prevention and Resource Efficiency	Will be done if required	Will be done
Public Health	Will be done	Will be done
Physical and Cultural Heritage	Ensured	Integral to this project (ensured)
Lands and Soil Conservation	Ensured	Ex post monitoring

Chapter 3 :

Implementation Arrangement

3.1 Implementation arrangements

A) DESCRIBE THE ARRANGEMENTS FOR PROJECT / PROGRAMME IMPLEMENTATION.

I. WHO WILL IMPLEMENT THE PROJECT AND WHAT ARE THEIR COMPARATIVE ADVANTAGES AND CAPACITY COMPARED TO OTHER POTENTIAL IMPLEMENTING INSTITUTIONS?

II. HOW WILL THE PROJECT BE COORDINATED WITH (AND/OR MAINSTREAMED INTO) RELATED DEVELOPMENT ACTIVITIES OF THE TARGETED SECTOR?

Department of environment has been involved as nodal agency and coordinated with 21 line departments/agencies in the climate change action planning process and are fully familiar with the vulnerability, adaptation strategy and mainstreaming agenda. The agency will work with three sets of institutions: (a) academic and scientific institutions from scientific assessment point of view (b) capacity building partners will be some identified NGOs (c) line-departments for technical interventions especially the structural ones (d) PMU will work with techno-managerial partners like CTRAN, experienced in climate change project formulation to ground the project, advise in transactions and activities related to adaptation monitoring and carbon positive formulations, concurrent monitoring, etc. (e) PMU will work with NIE (NABARD) for fund management, disbursal and project cycle guidance and ex-post review.

B) DESCRIBE THE MEASURES FOR FINANCIAL AND PROJECT / PROGRAMME RISK MANAGEMENT (ALSO INCLUDE ENVIRONMENTAL AND SOCIAL RISK, IF ANY).

Risk	**Rating (High / Medium / Low, etc.)**	**Mitigation Measure**
Financial management	Medium	Guidance from NiE, experienced officer posted in PMU knowing fund management
Project management	Low	Has prior experience and will be supplemented by a strong governing body, dedicated PMU with the support of technical partner CTRAN
Social Risk	Low	There may be minor conflict to be moderated through strong mobilsation
Environmental	Low	No risk envisaged, if any adequate safeguard will be taken

C) DESCRIBE THE MONITORING AND EVALUATION ARRANGEMENTS AND PROVIDE A BUDGETED M&E PLAN. (MONITORING AND EVALUATION COST NEED TO BE INCLUDED IN EXECUTING ENTITY MANAGEMENT COST).

Monitoring and evaluation plan Activity	Responsible person	Yr. I	Yr. II	Yr. III	Total	Timefra me
Baseline (ex-ante)	PMU and technical partner and social partner					30 days
Capacity building Plan and module development	PMU with Social Partner					
Fund Management and Operating Manual	NIE and PMU					
Concurrent Monitoring	PMU with partners					
Mid Term Assessment	NIE					15 days
Ex post assessment	NIE with PMU					30 days

ALSO INCLUDE NOTES SUPPORTING ABOVE PROPOSED ACTIVITIES.

INCLUDE NOTES ON REPORTING MECHANISM FOR MONITORING AND EVALUATION.

There will be a quarterly progress report to be furnished by the PMU to NIE. There will be an annual report every year duly approved by the governing body. Policy briefs to be produced after due approval from the governing body. The Mid Term Assessment and concurrent monitoring report will be forwarded to NIE and MoEFCC. Ex-post assessment will be shared in a larger forum and future replication plan will be developed. If required a third party monitoring agency will be required for Ex-post review to compare against the baseline.

D) INCLUDE A RESULTS FRAMEWORK FOR THE PROJECT PROPOSAL, INCLUDING MILESTONES, TARGETS AND INDICATORS WITH GENDER DISAGGREGATED DATA (AS PER THE FORMAT IN ANNEXURE1).

Enclosed in **Appendix - 1**

E) INCLUDE A DETAILED BUDGET WITH BUDGET NOTES, A BUDGET ON THE IMPLEMENTING ENTITY MANAGEMENT FEE USE, AND AN EXPLANATION AND A BREAKDOWN OF THE EXECUTION COSTS.

The PMU upon the sanction of the governing body of annual work plan and budget will form an expenditure sub-committee and use the funds.The MIS unit will maintain project MIS, work with concurrent monitoring agency and others on matters related to project and manage the correspondence.Two critical components the management aspects of carbon-positive tag to the village and transaction management to mobilise the private sector for eco-resort will be handheld by technical partners (CTRAN).Capacity building components will be handle by identified NGOs and they in turn work with community in the Phayeng village.The funds will be audited by chartered accountant and NIE will manage the disbursement schedule.

3 (three) layer system of Project Management cum Financial Institutional Mechanism under the umbrella of State level steering Committee on Climate Change as

Climate Change Project Implementation Committee (PIC – Climate Change):

- Concerned Administrative Secretary (Forests & Environment) as Chairman
- Panning Director as Member
- Concerned Line Department as Member
- State Nodal Officer on Climate Change as Convener

Project Implementation Committee (PIC) of Carbon Village at Phayeng

- Director, Directorate of Environment, Manipur (State Nodal Officer) as Chairman
- Concerned Line Department as Member
- Phayeng Development Committee as Member
- GrammePanchayet, Phayeng as Member
- Joint Director, Directorate of Environment, as Convener

Technical Evaluation team / Agency

- NABARD and Community
- Recognized institute as 3rd Monitoring Group

3.2 Goal and vision of the project outcomes in linkages with Climate Change Adaptation

Greater dependence of the rural population on agriculture and natural resources coupled with high prevalence of pover+ty, isolation, and marginality makes them highly sensitive to climate variability,extreme climate events, and climate change.The overall objective of the project is to enhance the climate resilience of the community and enhance their adaptive or coping capacity. The few outcomes envisaged are

1. Improve economic sustainability of the economically challenged population through diversification of agricultural and non-agricultural livelihood strategies by integrating institutional support, training and access to resources.
2. Provide alternate source of livelihood through introduction of horticulture, medicinal plant and other means
3. Promotion of tourism based livelihood opportunity
4. Prevent urban migration
5. Prevention of soil erosion and enhance ground water recharge
6. Improve microclimatic condition
7. Enhance rural energy access
8. Provide safe drinking water
9. Improve irrigation
10. Improve agricultural productivity and sectoral sustainability through training and capacity building of farmers and promoting IPM and INM
11. Conservation and rejuvenation of spring
12. Promote natural resource management
13. Introduction of flood protection measures
14. Introduction of facilities for early warning system to be benefit agricultural productivity
15. Some points which can help in both climate change adaptation and mitigation as

Construction of bio-gas	Both adaptation and mitigation	Mitigation – Controlled management of waste will reduce the emission of methane Adaptation - Controlled management of waste will reduce the chances of contamination of waste with spring water during the rainy

		season/ flood scenario preventing the incidence of water bourne diseases
Plantation , Forest conservation , Promoting artificial/natural regeneration	Both adaptation and mitigation	Mitigation – Plant acts as carbon sink Adaptation –Regulates microclimatic condition of the region, manages runoff and erosion and provides alternate source of livelihood. Forest resources have beenshown to play a role in enabling livelihood adaptation during extreme events
SRI	Both adaptation and mitigation	Mitigation – Reduce methane emission Adaptation – Improve yield , mange water stress and improve economic stability

Chapter 4 :

Component and Budget

Table 4.1 : Proposed Budget

Sl No	Project component	Item wise funding (Rs. In Lakhs0	Total Rs. in Crore	Remarks
1	**Sustainable management of land-water and forest : Introduction of forest mangement practice**		**2.07**	investment
1.1	Catchment Area Treatment - Artificial Regeneration (nursery raising)	676,000.00		Annexure 1/A
1.2	Catchment Area Treatment - Artificial Regeneration - Creation	983,500.00		Annexure 1/B
1.3	Command area Development	19,020,000.00		Annexure 1/C
2	**Structural measures to climate proof the canal irrigation for water body hervesting, enhanced command area and treated drinking water supply**		**0.93**	investment
2.1	Construction of Masonry Dam of 15m span	2,302,814.00		Annexure 1/D
2.2	Construction of Boulder Sausage Dam of 20 m span	290,990.00		Annexure 1/E
2.3	Stone pitching at erroded zone 600 mtr	1,026,348.00		Annexure 1/F
2.4	Construction of Random rubble masonary at Eastern Bank of Maklang River (most low laying & hazard zone) for about 800 mtr	5,689,548.00		Annexure 1/G
3	**Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)**		**0.56**	Investment+ Capacity Building
3.1	Introduction of horticulture speices (pilot)	1,466,500.00		Annexure 1/H
3.2	Training / Orientation of target farmers on climate resilient agriculture / horticulture;	500,000.00		Target group are both male & female
3.3	Organising dissemination workshops on project learnings	500,000.00		both male & female
3.4	Introduction of medicinal plant speices (pilot - CITRONELLA)	2,587,500.00		Annexure 1/I
3.5	Capacity building of the marginal farmers and forest infringe community	500,000.00		both male & female
4	**Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.**		**0.62**	capacity building No budget provision for SRI
4.1	Setting up of soil testing and soil-moisture management unit	2,223,200.00		Annexure 1/J Ref.: NABARD
4.2	Micro-nutrient application as per soil test findings for specific crop types;	642,000.00		
4.3	Nutrition Management Plan for each crop in project locations;	200,000.00		
4.4	Pest Management Plan for each crop in project locations	200,000.00		

Sl No	Project component	Item wise funding (Rs. In Lakhs0	Total Rs. in Crore	Remarks
4.5	Assessment of feasibility of inter-cropping / mixed cropping and its promotion and introduction of climate adaptive cropping system as per the assessment findings;	300,000.00		
4.7	Modern piggery	2,649,000.00		Annexure 1/K
5	**Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)**		**0.50**	capacity building
6	**Renewable energy integration in village**		**0.92**	investment
6.1	Introduction of Street light	6,480,000.00		Annexure 1/L
6.2	Construction of Bio gas	2,450,000.00		Annexure 1/M
6.3	Dissemination of improved cook stoves	300,000.00		Annexure 1/N
7	**Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood**		**0.50**	capacity building
8	**Development of an eco-health resort with water treatment unit in 10 ha community land for yoga & natural living**		**2.70**	investment Viability gap funding only for PPCP
8.1	Development of Eco-health resort, research centre room and climate observatory room	2,000,000.00		Annexure 1/O
8.2	Setting up and operation of climate studies	8,700,000.00		Annexure 1/P
8.3	Development of water treatment unit at Maklang River and supply system	16,570,000.00		Annexure 1/Q
	Total Project / Programme Cost (A)		**8.83**	
9	**Project/Programme Execution cost i.e. 10% of the project cost as per Govt. of India nors (including formulation cost of Rs 10 lakh) (B)**		**0.88**	Annexure 1/R
	Total Project/Programme Cost $(A)_+$ (B)		**9.71**	
10	Project/Programme Cycle Management Fee charged by the Implementing Entity/NABARD		**0.29**	
	Total		**10.00**	

Annexure - A

TABLE 4.2 : DETAILS OF BUDGET AND WORK COMPONENT

Sl No	Project component		Unit Cost (Rs. In Lakhs)	Unit	Qnty	Unit	Item wise funding (Rs. In Lakhs0	Funding require Rs. in Crore	Type of Activities and Remarks
1	**Sustainable management of land-water and forest : Introduction of forest mangement practice**							**2.07**	investment
1.1	Catchment Area Treatment - Artificial Regeneration (nursery raising)	Annexure 1/A	13,520.00	Ha	50	Ha	676,000.00		
1.2	Catchment Area Treatment - Artificial Regeneration - Creation	Annexure 1/B	19,670.00	Ha	50	Ha	983,500.00		
1.3	Command area Development	Annexure 1/C	38,040.00	Ha	500	Ha	19,020,000.00		
2	**Structural measures to climate proof the canal irrigation for water body hervesting and enhanced command area**							**0.93**	investment
2.1	Construction of Masonry Dam of 15m span	Annexure 1/D	1,151,407.00	No	2	No	2,302,814.00		
2.2	Construction of Boulder Sausage Dam of 20 m span	Annexure 1/E	145,495.00	No	2	No	290,990.00		
2.3	Stone pitching at erroded zone 600 mtr	Annexure 1/F	1,026,348.00	cum	1	Unit	1,026,348.00		
2.4	Construction of Random rubble masonary at Eastern Bank of Maklang River (most low laying & hazard zone) for about 800 mtr	Annexure 1/G	5,689,548.00	cum	1	Unit	5,689,548.00		
3	**Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in**							**0.56**	Investment+ Capacity Building

Sl No	Project component		Unit Cost (Rs. In Lakhs)	Unit	Qnty	Unit	Item wise funding (Rs. In Lakhs0	Funding require Rs. in Crore	Type of Activities and Remarks
	the homestead)								
3.1	Introduction of horticulture speices (pilot)	Annexure 1/H	73,325.00	ha	20	Ha	1,466,500.00		
3.2	Training / Orientation of target farmers on climate resilient agriculture / horticulture;		1,000.00	Tana -tive	500	Farm ers	500,000.00		Both male & female
3.3	Organising dissemination workshops on project learnings		50,000.00	Tana -tive	10	works hop	500,000.00		both male & female
3.4	Introduction of medicinal plant speices (pilot - CITRONELLA)	Annexure 1/I	51,750.00	ha	50	Ha	2,587,500.00		
3.5	Capacity building of the marginal farmers and forest infringe community		1,000.00	Tana -tive	500	Farm ers	500,000.00		both male & female
4	**Sustainable agriculture and allied activities like introd-uction of SRI, integrated pest and nutrient management, scientific piggery, etc.**							**0.62**	capacity building, No budget prov-ision for SRI.
4.1	Setting up of soil testing and soil-moisture management unit	Annexure 1/J	2,223,200.00	Unit	1	unit	2,223,200.00		Ref.: NABARD
4.2	Micro-nutrient application as per soil test findings for specific crop types;		1,500.00	ha	428	Ha	642,000.00		
4.3	Nutrition Management Plan for each crop in project locations;		200,000.00	Tana -tive	1		200,000.00		
4.4	Pest Management Plan for each crop in project locations		200,000.00	Tana -tive	1		200,000.00		

Sl No	Project component		Unit Cost (Rs. In Lakhs)	Unit	Qnty	Unit	Item wise funding (Rs. In Lakhs0	Funding require Rs. in Crore	Type of Activities and Remarks
4.5	Assessment of feasibility of inter-cropping / mixed cropping and its promotion and introduction of climate adaptive cropping system as per the assessment findings;		300,000.00	Tana -tive	1		300,000.00		
4.7	Modern piggery	Annexure 1/K	88,300.00	No	30	No	2,649,000.00		
5	**Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)**							**0.50**	capacity building
6	**Renewable energy integration in village**							**0.92**	investment
6.1	Introduction of Street light	Annexure 1/L	1,08,000.00	Unit	600	No	6,480,000.00		
6.2	Construction of Bio gas * (Footnote)	Annexure 1/M	7,000.00	Unit	350	No	2,450,000.00		
6.3	Dissemination of improved cook stoves	Annexure 1/N	1,200.00	Unit	250	No	300,000.00		
7	**Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood**							**0.50**	capacity building
8	**Development of an eco-health resort with water treatment unit in 10 ha community land for yoga & natural living**							**2.70**	investment Viability gap funding only for PPCP
8.1	Development of Eco-health resort, research centre room and climate observatory room	Annexure 1/O	2,000,000.00		1		2,000,000.00		
8.2	Setting up and operation of climate studies	Annexure 1/P	8,700,000.00		1		8,700,000.00		

Sl No	Project component		Unit Cost (Rs. In Lakhs)	Unit	Qnty	Unit	Item wise funding (Rs. In Lakhs0	Funding require Rs. in Crore	Type of Activities and Remarks
8.3	Development of water treatment unit at Maklang River and supply system	Annexure 1/Q	16,570,000.00		1		16,570,000.00		
	Total Project / Programme Cost (A)							**8.83**	
9	**Project/Programme Execution cost i.e. 10% of the project cost as per Govt. of India nors (including formulation cost of Rs 10 lakh) (B)**	Annexure 1/R						**0.88**	
	Total Project/Programme Cost $(A)_{+}$ (B)							**9.71**	
10	Project/Programme Cycle Management Fee charged by the Implementing Entity/NABARD							**0.29**	
	Total							**10.00**	

Note : * Half burn bio-mass in conventional cooking results in indoor air pollution and respiratory problems. Bio-gas has proven to be a healthy alternative. Sustained use of biogas for cooking may protect against cardiovascular disease by lowering the risk of high blood pressure, especially DBP, among older female cooks.[ref: Neupane, Maniraj et al. "Sustained Use of Biogas Fuel and Blood Pressure among Women in Rural Nepal." Environmental Research 136 (2015): 343–351. PMC. Web. 21 Sept. 2015.]

Gas production per kg of cow dung is 0.023-0.04 m^3/kg, with around 9-15 kg of dung per cow and average with three to four numbers of cow per households (as many as 50 household has more than 10 cow) the minimum cumulative biogas potential is between 1.8 m^3/household. On an average with four –six numbers of pigs the biogas potential is in the range of 0.2 -0.22 m3 , in addition there are human excreta and kitchen waste that will be dumped in the biogas the 2m3 biogas units turns out to be feasible. The main objective of putting in the biogas unit is managing the animal and human waste as there is no waste disposal facility / drainage system in palace in the village. This create problem with hygiene and result in incremental incidence of vector and water borne diseases.

Annexure – 1/A

DETAILED ESTIMATE FOR
ARTIFICIAL REGENERATION- NURSERY RAISING

Division:
Centre:

Nursery area (sqm) (65x65)=	3600	Area of plantation:(ha)	**100**
Perimeter of Nursery:(Rm)	350	Seedlings for field plantation:	200000
Pit Spacing: 2.50 m x 2.50 m.		Seedlings for Beating Up (40%)	60000
		Total seedlings to raise	260000
		No of polybag beds	217
		No of mother beds	30
		Total no of beds:	247

Species: *Pinuskesiya, Gmelinaarborea,Terminaliaspp.,Quercus spp. Alnusnepalensis, Schimawallichi, Phoebe hainesiana, Michelia spp. Castonopsishystrix, Juglansregia etc.*

SN	Items of works	Qnty	Unit	Rate	Amount	Remarks
	A. Nursery Creation					
1	Site clearance i/c uprooting of rank vegetation,grass, brushwood,etc removal and heaping of rubbish inside the nurseryarea cleared and controlled burning @22 mdy/ha	8	mdys	122.10	976.80	MFSR'91
2	Laying out of mother-beds of size 12m x1.2m,soil working up to a depth not exceeding 30cm weathering,breaking of clods removing unwanted materials and proper levelling @ 3mdys/bed	90	mdys	122.10	10989.00	MFSR'91
3	Mixing of soil, sand and FYM at the correct proportion 3:2:1: top soil: alluvial soil:FYM filling up the polybags and staking @170 polybags/mdy.	1530	mdys	122.10	186813.00	MFSR'91
4	Edging & shaping of raised nursery beds with splited bamboo/ brushwood to a height not less than 15cm. i/c splitting of bamboo/collection of brushwood wherever possible @ 3beds/mdy.	72	mdys	122.10	8791.20	MFSR 91
5	Dibbling of pre treatedseeds(2-3) nos to the filled polybags and watering for 50% seedlings @ 1000 polybags/mdy.	260	mdys	122.10	31746.00	MFSR'91
6	Pricking out of seedlings from mother beds to the filled polybags by making roots straight and vertical and light pressing for 50% of seedlings @250 polybags/mdy.	1040	mdys	122.10	126984.00	MFSR'91
7	Construction of bed sheds of size 12 m x 1.35m in bamboo frameworks with thatch grass roofing @ 1mdy/2 beds;8moubi bamboo and 1 bundle of thatch grass/ bed.	124	mdys	122.10	15140.40	MFSR 91
			SubTotal:		**381440.40**	
	B. Material Components:					
8	Collection of soil for filling up polybags of size 6"x 9"x250gauge in the ratio 3:2:1(Top soil:Alluvialsoil:F.Y.M). Quantity of soil for fillingup polybags	273	cum			MFSR 91
	(a) Collection of top soil 13 cu m@ 2 cum/mdy	68.5	mdys	122.10	8363.85	-do-
	(b) Procurement of alluvial soil i/c transportation	91	cum	400.00	36400.00	-do-
	(c) Procurement of FYM i/c transportation	46	cum	500.00	23000.00	-do-
			Sub Total:		**67763.85**	-do-
9	a) Quantity of moubi bamboo for bed shed construction @ 8 bamboo/bed	1976	nos	15.00	29640.00	Market Rate
	b) Quantity of thatch grass for bed shed construction @ 1 bdl of thatch grass /bed	247	bdl	50.00	12350.00	-do-
					41990.00	

Annexure – 1/A

SN	Items of works	Qnty	Unit	Rate	Amount	Remarks
10	Quantity of bamboo for fencing post of 2m long ;@ 4 post per bamboo and bamboo for 2 strands	260	nos	66.00	17160.00	-do-
11	Quantity of bamboo for edging & shaping N/beds	1736	nos	15.00	26040.00	-do-
12	Procurement of polybags of size 6"x9"x250 gauge	260000	1000	210.00	76230.00	-do-
	(a) 8% VAT/Sale Tax				6098.00	-do-
13	Procurement of Organic Pesticides + Organic Fertilizers/Vermicompost etc.				10000.00	-do-
14	Procurement of seeds	LS			50000.00	-do-
			SubTotal:		**227518.00**	
	Total:				**676722.25**	
15	Mazdoor for Watch and Ward (5 mali)	1790	mdy	122.10	218,559	
	Add .contingency				26718.75	
				Total	**922000.00**	
	Construction of Shade House	2		**215000**	**430000.00**	
				Grand Total	**1352000.00**	

(Rupees thirteen lakh fifty two thousand only)

Unit Cost/ha.	**₹ 13,520.00**

Annexure – 1/B

Model estimate for
ARTIFICIAL REGENERATION
CREATION

Area: 100 ha No. of plants per ha: 2000

Species: *Quercusspp, Gmelinaarborea, Alnusnepalensis, Terminaliaspp, Phoebe hainesiana, Micheliaspp, Pinuskesiya, Schimawallichi, Castanopsishystrix, Juglansregia, Tectonagrandis*etc

Rate & amount in Rupees

Sl no	Particulars	Unit	Qnty	Rate	Amount	Rem
1	**2**		**4**	**5**	**6**	**7**
1	Transportation of pobybag raised seedlings from centrallised nursery to the foothills		LS		20000.00	
	Procurement of fertilizer for mixing with soil in refilling of planting pits	Pits	200000	0.2	40000.00	
2	Transportation of pobybag raised seedlings from foothills to the planting pits	Mdays	1000	122.10	122100.00	
3	Planting out of polythene raised seedlings by removing the polybag without disturbing the root system	Mdays	3077	122.10	375701.70	
4	Mulching with dry leaves/straw to a thickness of 15cm and to a radius of 40cm around the plant i/c collection of mulch	Mdays	2223	122.10	271428.30	
5	First weeding operation to a width of 0.5m all around the plant i/c hoeing	Mdays	1600	122.10	195360.00	
6	Transportation of pobybag raised seedlings for 20% beating up of casualties	Mdays	200	122.10	24420.00	
7	Beating up of casualities	Mdays	616	122.10	75213.60	
8	Second weeding operation to a width of 0.5m all around the plant	Mdays	800	122.10	97680.00	
9	Fireline cutting to a width of 5 m by removing grasses and weed	Mdays	220	122.10	26862.00	
10	Chiloing i.e. cutting of grass in whole plantation area at the start of dry season	Mdays	3600	122.10	439560.00	
11	Engagement of 2 nos plantation watcher for watch & ward	Mdays	476	122.10	58119.60	
12	Construction of a watcher shed	Mdays				
	a) Total mdays for construction	Mdays	5	122.10	610.50	
	b) Bamboo for post plate, rafter etc	Nos	2	50.00	100.00	
	c) Thatch grass for roofing	Bndls	3	60.00	180.00	
	d) Mouli bamboo for purlin and chattaietc	Nos	8	12.00	96.00	
	Sub-Total		3	986.00	2958.00	
13	Construction & erection of one sign board 5' x 4' size (2 nos)	Nos	2	10000	20000.00	
14	Third weeding operation to a width of 0.5m all around the plant	Mdays	800	153.00	122400.00	
15	1.2m high fencing i/c fixing of bamboo post at the spacing of 1.5m and 5 strands of half bamboo i/c preparation of b/post and strands		1% of plantation cost		18518.00	
16	General contingency				56678.80	
	Total				**1967000.00**	

(Rupees nineteen lakh sixty seven thousand only)

	Unit Cost	**₹ 19,670**	**per ha**			

BUDGET FOR DEVELOPMENT OF WATER BODY

As a programme for creation of water body at Maklang River, two boulder sausage dam are constructed at certain intervals to reduce the velocity of flow and check siltation of the stream.

Two Rubble masonry weirs are constructed to create a water body for a span of about 500m. A protection wall using rubble masonry is provided along the eastern bank and western bank is given protection by stone pitching at the mild slope.

Irrigation facilities are also provided at the upstream side of the weirs constructed trough outlets and water are carried through lined field channels up to the fields

Development of Water Body

1. Construction of Masonry Dam of 15m span.
   Unit cost per Dam = Rs.11,51,407/-
   No. of Dam = 2
   Total cost =2x Rs.11,51,407 = Rs. 23,02,814/- **Annexure – 1/D**

2. Construction of Boulder Sausage Dam of 20m span.
   Unit cost per Dam = Rs. 1,45,495 /-
   No. of Dam = 2
   Total cost = 2x Rs.1,45,495 = Rs. 2,90,990 /- **Annexure – 1/E**

3. Stone pitching 600m span
   Unit cost =Rs. 10,26,348/-
   No. 1
   Total cost = Rs. 10,26,348/- **Annexure – 1/F**

Annexure – 1/D

ABSTRACT OF COST

Name of Work : Constn. of Masonry Dam across Maklang River at Phayeng

Sl.No.	Item of work	Qnty.	Unit	Rate	Amount	Remarks
1	E/W in excavation in foundation trenches or drains including dressing of sides and remaining of bottom lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed within a lad of 50 metres. ii) Hard/dense soil.	183.75	Cum	Rs. 102.10	Rs. 18,760.88	Based on MSR,2013 P-2(1.10.2)
2	Polygonal rubble masonry/RR masonry (uncoursed/ brought to courses)// squad rubble masonry (uncoursed/brought to course) with hard stone of approved quality in flundation & plinth in cement mortar 1:6 (1 cement : 6 fine sand) i/e leveling up with cement concrete 1:6:12 (1 cement : 6 fine sand : 12 stone aggregate 20 mm nominal size at plinth level)	240.00	Cum	Rs. 3,474.50	Rs. 8,33,880.00	P-29(6.10)

	Rs. 8,52,640.88
(+) 10% cost index	Rs. 85,264.09
	Rs. 9,37,904.96
(+) 5.6% MST	Rs. 52,522.68
	Rs. 9,90,427.64
(+) 1% Labour Cess	Rs. 9,904.28
	Rs. 10,00,331.92
(+) 11.75 Department charge	Rs. 1,17,539.00
	Rs. 11,17,870.92
(+) 3% Contingency charge	Rs. 33,536..13
	Rs. 11,51,407.04
Say	Rs. 11,51,407.00

Say : Rs. 11,51,407/- (Rupees Eleven lakh fifty one thousand and four hundred seven) only

Details of Measurement

Name of Work : Constn. of Masonry Dam across Maklang River at Phayeng Village.

Sl.No.	Items			Qunty.
1.	E/W in excavation trench or drains			
	i) Foundation	20.5 x 15.00 x 0.50	=	153.75 Cu.m.
	ii) Cut off wall	2 x 0.50 x 15.00 x 2.00	=	183.75 Cu.m.
2.	P/L cement concrete 1:2:4			
	Cut off wall	2 x 0.50 x 1.500 x 2.00	=	30.00 Cu.m.
3.	Polygonal rubble masonry			
	i)	1 x 15.00 x ½ (2.00 + 4.00) x 2.00	=	90.00 Cu.m.
	ii)	1 x 15.00 x ½ (1.2 + 1.2) x 1.50	=	27.00 Cu.m.
	iii)	1 X 15.00 X ½ (1.2 + 1.2) X 1.00	=	18.00 Cu.m.
	iv)	15.00 x (10.0 + 4.0) x 0.50	=	105.00 Cu.m.
				240.00 Cu.m.

Annexure – 1/E

ABSTRACT OF COST

Name of Work :Constn. of boulder sausage dam across Maklang River at Phayeng Village.

Sl.No.	Item of work	Qnty.	Unit	Rate	Amount	Remarks
1	E/W in excavation in foundation trenches or drains including dressing of sides and remaining of bottom lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed within a lad of 50 metres. ii) Hard/dense soil.	20	Cum	Rs. 102.10	Rs. 2,042.00	Based on MSR,2013 P-2(1.10.2)
2	Construction of boulder sausage wall with broken or angular boulder 1.50 m at top and 1.4 slope i/c cost of 3mm G.I wire netting 10 cm square diagonal mesh with overlapping of 0.6 m i/c earth work in excavation in foundation trenchsetc and fixing 20 cm diameter sahi-kuhi post or equivalent of 2.70 m long and driven 1.20 m inside the ground level and 1.50 m above ground level at interval of 1.5 m c/c complete.	20	Rm	Rs. 5,285.00	Rs. 1,05,700.00	P-131(23.2)

	Rs.	1,07,742.00
(+) 10% cost index	Rs.	10,774.00
	Rs.	1,18,516.00
(+) 5.6% MST	Rs.	6,636.90
	Rs.	1,25,152.90
(+) 1% LabourCess	Rs.	1,251.53
	Rs.	1,26,404.43
(+) 11.75 Department charge	Rs.	14,852.53
	Rs.	1,41,256.96
(+) 3% Contingency charge	Rs.	4,237.71
	Rs.	1,45,494.67

Say :Rs. 1,45,495/- (Rupees one lakh forty five thousand four hundred ninety five) only

Details of Measurement

Name of Work : Constn. of boulder sausage dam across Maklang River at Phayeng Village.

Sl.No.	Items		Qunty.
1.	E/W in excavation trench or drains ……..		
	20 x 2.0 x 0.5	=	20 Cu.m.
2.	Constn. of boulder sausage ……		
		=	20 Rm.

Annexure – 1/F

ABSTRACT OF COST

Name of Work : Boulder pitching at the wester n side of Maklang River at Phayeng Village.

Sl.No.	Item of work	Qnty.	Unit	Rate	Amount	Remarks
1	Boulder filling dry hard packed tightly as in pitching & slush etc. complete wire crates apron bunds (wire crates to be measured separately)	720.00	Cum	Rs. 1055.60	Rs. 7,60,032.00	Based on MSR,2013 P-2(1.10.2)

	Rs. 7,60,032.00
(+) 10% cost index	Rs. 76,003.20
	Rs. 8,36,035.20
(+) 5.6% MST	Rs. 46,817.97
	Rs. 8,82,853.17
(+) 1% Labour Cess	Rs. 8,828.53
	Rs. 8,91,681.70
(+) 11.75 Department charge `	Rs. 1,04,772.59
	Rs. 9,96,454.29
(+) 3% Contingency charge	Rs. 29,893.62
	Rs. 10,26,347.91

Say : Rs. 10,26,348/- (Rupees ten lakh twenty six thousand three hundred forty eight) only

Details of Measurement

Name of Work : Boulder pitching at the western side of Maklang River at Phayeng Village.

Sl.No.	Items	Qunty.
1.	Boulder filling dry	
	i) 1 x 600 x 6.0 x 0.20 =	720.00 Cu.m.

Annexure – 1/G

ABSTRACT OF COST

Name of Work : Constn. of Random Rubble masonry at Eastern bank of Maklang river at Phayeng village (at most low laying and hazard zone) for about 800 mtr

Sl. No	Item of work	Qnty.	Unit	Rate	Amount	Remarks
1	E/W in excavation in foundation trenches or drains including dressing of sides and remaining of bottom lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed within a lad of 50 metres. ii) Hard/dense soil.	400	Cum	Rs. 102.10	Rs. 40,840.00	Based on MSR,2013 P-2(1.10.2)
2	Polygonal rubble masonry/RR masonry (uncoursed/ brought to courses)// squad rubble masonry (uncoursed/brought to course) with hard stone of approved quality in flundation& plinth in cement mortar 1:6 (1 cement : 6 fine sand) i/e leveling up with cement concrete 1:6:12 (1 cement : 6 fine sand : 12 stone aggregate 20 mm nominal size at plinth level)	1200	Cum	Rs. 3,474.50	Rs. 41,69,400.00	P-29(6.10)
3	Filling available excavated earth (excludingrodk) in trenches, plinth sides of foundation etc in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre.	37.5	Cum	Rs. 79.70	Rs. 2,988.75	P-4(1.15)

	Rs. 42,13,228.75
(+) 10% cost index	Rs. 4,21,322,87
	Rs. 46,34,551.62
(+) 5.6% MST	Rs. 2,59,534.89
	Rs. 48,94,086.51
(+) 1% LabourCess	Rs. 48,940.86
	Rs. 19,43,027.37
(+) 11.75 Department charge	Rs. 5,80,805.71
	Rs. 55,23,833.08
(+) 3% Contingency charge	Rs. 1,65,714.99
	Rs. 56,89,548.07

Say :Rs. 56,89,548/- (Rupees fifty six lakh eighty nine thousand five hundred forty eight) only

Details of Measurement

Name of Work : Constn. of Random Rubble masonry at Eastern bank of Maklang river at Phayeng village.

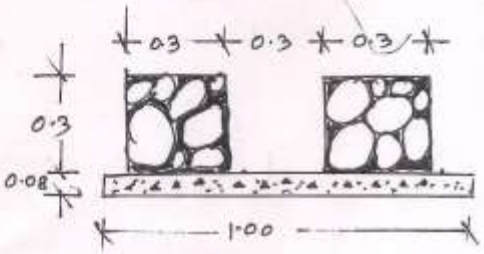
Sl.No.	Items		Qunty.
1.	E/W in excavation trench or drains ……..		
	800 x 0.50 x 1.0	=	400 Cu.m.
2.	Polygonal rubble masonry ……		
	Volume of work = 800 x ½ (1.0 + 0.5) x 2.0		
	= 800 x 1.50	=	1200 Cu.m.
3.	Abutment …….		
	1 x 15.0 x ½ (0.5 + 2.) x 2.0 = 2.5 x 15	=	37.5 Cu.m.

DRAWINGS

SECTIONAL VIEW OF MASONRY DAM

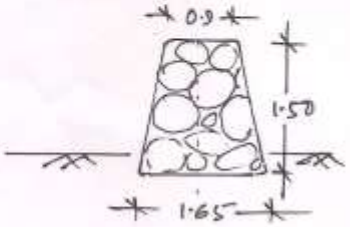
DRAWING

A. SECTIONAL VIEW OF LINED FIELD CHANNEL

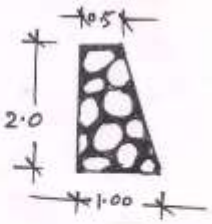


(measurements in metre.) not to scale

B. SECTIONAL VIEW OF BOULDER SAUSAGE



C. RANDOM RUBBLE MASONRY



Annexure – 1/H

Cost for Horticulture speices - Pineapple /National horticulture Board

Cost of planting material	13,000.00
Manures and fertilizers	10,000.00
Insecticides & pesticides	2,000.00
Cost of labour	4,730.00
Unit Cost (1 Year)/acre	29,730.00
Unit Cost (1 Year)/ha	73,325.00

Source :
http://nhb.gov.in/model-project-reports/Horticulture%20Crops/Pineapple/Pineapple1.htm

Annexure – 1/I

COST OF ESTABLISHMENT AND MAINTENANCE OF CITRONELLA
(Cymbopogon winterianus)

Unit Size : 1 Acre (0.4 Hectare) **Crop cycle: Perennial**

(Amount in Rs.)

SN	PARTI-CULARS	YEARS				
		1	**2**	**3**	**4**	**5**
A.	**MATERIAL**					
1	Planting material (10% extra)	6512				
2	Provision for multiplication of plant material at field *	750				
3	FYM	2400	2400	2400	2400	2400
4	Vermi Compost	1500	1500	1500	1500	1500
5	Irrigation	1000	1000	1000	1000	1000
6	Plant Protection	500	500	500	500	500
7	Fencing (live hedge)	1000				
	Sub Total	**13662**	**5400**	**5400**	**5400**	**5400**
B.	**OPERATION & LABOUR**	6400	4800	4800	4800	4800
C.	**Distillation Charges**	600	1350	1500	1200	900
	Grand Total	**20662**	**11550**	**11700**	**11400**	**11100**
	Unit Cost (1 Year)/acre	**20700**				
	Unit Cost (1 Year)/ha	**51750**				

Source :
https://www.nabard.org/xls/Citronella.XLS

Annexure – 1/J

Budget for setting up of soil testing and soil moisture management unit

Sl. No.	Item / Particulars	Rate	Remarks
1.	Capital cost for Establishment of soil testing laboratory and soil health counseling facility	8,60,000.00	**Annexure – 1/K(i)** As per guidelines of NABARD
2.	Operational Cost for Establishment of soil testing laboratory and soil health counseling facility (for 3 years)	13,63,200.00	**Annexure – 1/K(ii)** As per guidelines of NABARD
		22,23,200.00	

Source : https://www.nabard.org/english/soil_testing2.aspx

Annexure – 1/J (i)

Capital Costs for Establishment of Soil Testing Laboratory and Soil Health Counseling Facility

1	**Laboratory Equipment**	**(Amount ₹)**
i)	pH meter	20,000.00
ii)	Electrical Conductivity Meter	20,000.00
iii)	Kjeldahl unit for Nitrogen distillation (Automatic)	200,000.00
iv)	Spectro photometer	50,000.00
v)	Flame photometer	50,000.00
vi)	Nephlometer for sulphur analysis	10,000.00
vii)	Analytical balance (Electronic)	40,000.00
viii)	Top loading single pan balance	20,000.00
ix)	Mini Rotary Shaker	35,000.00
x)	Gas Connection	10,000.00
xi)	Drying oven	30,000.00
xiii)	Furniture for lab including wooden cabinets for storing soil samples	50,000.00
xiii)	Generator and Stabilizers	65,000.00
2	**Office equipment**	
i)	Motor cycle	50,000.00
ii)	Office furniture	10,000.00
iii)	Computer with accessories	30,000.00
iv)	Telephone connection	5,000.00
3	**Chemical & glassware (initial stock)**	115,000.00
4	**Miscellaneous and contingencies**	50,000.00
	Total cost	**860,000.00**

Source : https://www.nabard.org/english/soil_testing2.aspx

Annexure – 1/J (ii)

Operational Costs for Establishment of Soil Testing Laboratory and Soil Health Counseling Facility for 3 (three) years

(Amount ₹)

Sl No.	Item	Year 1	Year 2	Year 3
1	Power, Water @ 1000 per month	12,000.00	12000.00	12,000.00
2	Manpower – Soil scientist @ ₹12,000/ pm and two Semi-skilled @₹ 5000/ pm	264,000.00	264000.00	264,000.00
3	Chemical and Glassware @ ₹30/ per sample	84,000.00	120000.00	180,000.00
4	L.P.G ₹500/ per month	6,000.00	6000.00	6,000.00
5	Stationery @ ₹500 per month	6,000.00	6000.00	6,000.00
6	Repair & maintenance	7,200.00	7200.00	7,200.00
7	Telephone @ ₹1000 per month	12,000.00	12000.00	12,000.00
8	Travel for canvassing and collection of samples @ ₹1000 per month	12,000.00	12000.00	12,000.00
9	Misc. expenses like Printing of literature etc. @ ₹600 per month	7,200.00	7200.00	7,200.00
	Total	**410,400.00**	**446400.00**	**506,400.00**

Source : https://www.nabard.org/english/soil_testing2.aspx

Annexure – 1/K

Cost for Piggery

Investment cost (10 Sows + 1 Boar)					
Sr. No.	**Particulars**	**Specifications**	**Physical Units**	**Unit cost (Rs./ unit)**	**Total cost (Rs.)**
1	Sheds and other structures				
	a) Farrowing pens (4) for lactating sow	100 sft per	400 sft	70	28,000.00
	b) Boar cum service pen	70 sft. per boar	70 sft	70	4,900.00
	c) Dry sow pens(6)	20 sft per fattener	120 sft		8,400.00
	d) Fattener shed -I	10 sft per fattener	200 sft		14,000.00
	e) Fattener shed -II	15 sft per fattener	300 sft		21,000.00
	f) Store room		100 sft	120	12,000.00
6	**Total financial out lay (TFO)**				**88,300.00**

Annexure – 1/L

Cost of Street Light

Cost of 1 nos of 40 W street light	Rs. 18,000.00
Subsidy	(-) Rs. 7,200.00
Net of Cost	Rs. 10,800.00
Total cost of 600 units	**Rs. 64,80,000.00**

Source :

https://www.nabard.org/uploads/Solar%20-%20Modified%20Scheme.PDF

Annexure – 1/M

Cost of Biogas

Cost of 2 m^3 biogas	Rs. 24,000.00
Subsidy for NE region	(-) Rs. 17,000.00
Net cost	Rs. 7,000.00
Total cost for 350 nos. of proposed Bio gas	**Rs. 24,50,000.00**

Source : http://mnre.gov.in/schemes/decentralized-systems/schems-2/

ESTIMATE FOR CONSTRUCTION OF BIO GAS PLANT (DEENABANDHU MODEL)

SL NO.	Item	Unit	Rate(Rs)	1cum		2cum		3cum	
				quantity	amount	quantity	amount	quantity	amount
1	Cement	bags(50kg)	320	10	3200	14	4480	16	5120
2	Sand	tracter load	600	1	600	2	1200	3	1800
3	1/2' Stone Chips	cft	50	30	1500	40	2000	50	2500
4	A class Kiln Bricks	nos	7	700	4900	1000	7000	1300	9100
5	6mm MS rod	kg	50	22	1100	30	1500	40	2000
5	Asbestos Cement pipe	piece	150	1	150	1	150	1	150
6	Dome pipe	piece	60	1	60	1	60	1	60
7	Gate Valve	piece	200	1	200	1	200	1	200
8	Gas pipe	piece (50 ft avg)	12	50	650	50	650	50	650
9	Biogas Stove	piece	900	1	900	1	900	1	900
10	Epoxy Paint	liter	180	1	180	2	360	2.5	450
11	Pipe Fittings	LS	300	LS	300	LS	300	LS	300
12	Mason.	LS	LS	LS	1500	LS	2000	LS	2500
13	Labour	LS	LS	LS	2700	LS	3000	LS	3500
14	Transportation & Misc exp	LS	LS	LS	250	LS	350	LS	500
	Total				18190		24150		29730
	Say				**18000**		**24000**		**30000**

Deputy Director(Tech)
RE,Division.

Annexure – 1/N

Cost of Improved cook stove

Cost of improved cook stoves	
Portable	1600
Fixed	800
Average	1200

Source :

http://www.mnre.gov.in/file-manager/advertisement/eoi_biomass_cookstoves_092012.pdf

Annexure – 1/O

BUDGET DETAIL FOR THE ECO-HEALTH RESORT IN 10 HA COMMUNITY LAND AT PHAYENG

Sl. No.	Item of Works	Amount	Remarks
1	Eco Health Centre (Octagonal shaped) 30' dia with thatch Roofing	506,209.00	**Annexure – 1/O (i)**
2	Walking Track at the foot hill (1500 meter @Rs. 650 per meter)	975,000.00	Lump Sum
3	View Watching point (6 Nos @ Rs. 15,000)	90,000.00	Lump Sum
4	Plantation and beautification	360,000.00	Lump Sum
	Sub Total	***1,931,209.00***	
	Chargeable Taxes like 5.6% MST, 1 % labour CESS, 11.75 % Departmental Charge, 3% Contingency, others, etc.	68,791.00	
	Total	**2,000,000.00**	

Annexure – 1/O(i)

ABSTRACT OF COST

Name of work: Construction of Eco Health Centre (Octagonal shaped) 30' dia with thatch Roofing

Sl. No	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
1	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres					
b)	Hard/Dense Soil.	18.70	Rs. 102.10	cum	1909.00	MSR'13
2	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre	6.23	Rs. 79.70	cum	497.00	MSR'13
3	Filling in plinth with sandy soil under floors including watering ramming, consolidating and dressing complete.	36.90	Rs. 206.50	cum	7620.00	MSR'13
4	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering					
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	17.68	Rs. 4,161.90	cum	73582.00	MSR'13
b)	1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	0.45	Rs. 6,277.70	cum	2825.00	MSR'13
5	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in					
a)	Foundation, footings, bases of columns etc. and mass concrete.	1.49	Rs. 264.30	sqm	394.00	MSR'13

Sl. No	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
6	Polygonal rubble masonry / R.R. masonry (uncoursed / brought to course) / squared rubble masonry (uncoursed brought to course) with hard stone of approved quality in foundation and plinth in c.m. 1:3 (1 cem : 3 fine sand) including levelling up with cement concrete 1:6:12 (1 cem : 6 c/sand12 stone aggt. 20 mm nominal size) at plinth level	15.34	Rs. 4,379.10	sqm	67175.00	MSR'13
7	Flushed or ruled pointing on brick work with cement mortar 1:3 (1 cem : 3 fine sand).	15.62	Rs. 105.90	cum	1654.00	MSR'13
8	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.					
	Electric Resistant Welded tube (Conforming to IS:1611-1979)	1616.73	Rs. 148.40	Kg	239923.00	MSR'13
9	Providing thatch roofing 15 cm thick in two layers each 75 mm thick with Tumnou, half split bamboos (fillet and tying strings complete.	104.10	Rs. 376.80	Kg	39225.00	MSR'13
10	Providing and laying split bamboo (Saneibi 1st class) Jaffree 150 mm mesh including tying to the purlins and rafters with paya complete.	83.28	Rs. 239.80	sqm	19971.00	MSR'13
11	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.	83.28	Rs. 525.20	Sqm	43739.00	MSR'13
12	Painting (two or more coats) with synthetic enamel paint of approved quality of black or chocolate colour on wood work to give an even shade.	8.67	Rs. 82.00	Sqm	711.00	MSR'13
13	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.	15.62	Rs. 270.30	Sqm	4222.00	MSR'13
14	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground	15.62	Rs. 176.80	Sqm	2762.00	MSR'13
				Rs	**5,06,209.00**	

Details of Measurement
Name of work: Eco Health Resort

Sl. no	Description	No	Length	Breadth	Heihght/ Depth	Quantity	Units
1.00	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres						
b)	Hard/Dense Soil.	8.00	13.00	2.00	3.00	624.00	cuft
	Deduct post	-8.00	12.00	1.00	1.50	-144.00	cuft
	Central post	1.00	2.00	2.00	3.00	12.00	cuft
	Plinth protection	8.00	14.00	1.50	1.00	168.00	cuft
						660.00	
						18.70	cum
2.00	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre					**6.23**	cum
3.00	Filling in plinth with sandy soil under floors including watering ramming, consolidating and dressing complete.	4.00	14.00	15.50	1.50	1302.00	cuft
						36.90	cum
4.00	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering						
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)						
		8.00	13.00	2.00	0.50	104.00	cuft
		1.00	2.00	2.00	0.50	2.00	cuft
		8.00	14.00	1.50	0.50	84.00	cuft

Sl. no	Description	No	Length	Breadth	Heihght/ Depth	Quantity	Units
	Flooring	4.00	14.00	15.50	0.50	434.00	cuft
						624.00	cuft
						17.68	cum
b)	1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)						
	Post	8.00	1.00	1.00	1.50	12.00	cuft
	Central post	1.00	1.50	1.50	1.00	2.25	cuft
		1.00	1.00	1.00	1.50	1.50	cuft
						15.75	cuft
						0.45	cum
5.00	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in						
a)	Foundation, footings, bases of columns etc. and mass concrete.						
		4.00	2.00	1.00	0.50	4.00	
		4.00	1.50	1.00	1.00	6.00	
		4.00	1.00	1.00	1.50	6.00	
						16.00	sqft
						1.49	sqm
6.00	Polygonal rubble masonry / R.R. masonry (uncoursed / brought to course) / squared rubble masonry (uncoursed brought to course) with hard stone of approved quality in foundation and plinth in c.m. 1:3 (1 cem : 3 fine sand) including levelling up with cement concrete 1:6:12 (1 cem : 6 c/sand12 stone aggt. 20 mm nominal size) at plinth level						

Sl. no	Description	No	Length	Breadth	Heihght/ Depth	Quantity	Units
		8.00	13.00	1.67	1.00	173.68	cuft
		8.00	13.00	1.25	1.50	195.00	cuft
		8.00	13.00	0.83	2.00	172.64	cuft
						541.32	cuft
						15.34	cum
7.00	Flushed or ruled pointing on brick work with cement mortar 1:3 (1 cem : 3 fine sand).	6.00	14.00	1.00	2.00	168.00	sqft
						15.62	sqm
8.00	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.						
	Electric Resistant Welded tube (Conforming to IS:1611-1979)						
	Steel truss outer member 100mm	8.00	12.00	1.00	1.00	96.00	
	Central post	1.00	20.00	1.00	1.00	20.00	
				1.00	1.00	116.00	ft
				1.00	1.00	35.37	m
	100mm dia @9.97 kg/m					352.64	kg
	Truss hor. Member 50mm	8.00	12.00	1.00	1.00	96.00	
	Inclined bar 50mm	8.00	24.00	1.00	1.00	192.00	
						288.00	
						87.80	m
	50mm dia @4.58 kg/m					402.12	kg
	Intermediate bracing bar 40mm	8.00	12.00	1.00	6.00	576.00	ft
						175.61	m
						784.98	kg
						1539.74	kg
	Add 5% wastage					76.99	kg
						1616.73	kg

Sl. no	Description	No	Length	Breadth	Heihght/ Depth	Quantity	Units
9.00	Providing thatch roofing 15 cm thick in two layers each 75 mm thick with Tumnou, half split bamboos (fillet and tying strings complete.	0.50	8.00	14.00	20.00	1120.00	
						104.10	sqm
10.00	Providing and laying split bamboo (Saneibi 1st class) Jaffree 150 mm mesh including tying to the purlins and rafters with paya complete.	0.50	8.00	14.00	16.00	896.00	
						83.28	sqm
11.00	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.	0.50	8.00	14.00	16.00	896.00	
						83.28	sqm
12.00	Painting (two or more coats) with synthetic enamel paint of approved quality of black or chocolate colour on wood work to give an even shade.	9.00	3.14	0.33	10.00	93.26	sqft
						8.67	sqm
13.00	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.						
		8.00	14.00	1.00	1.50	168.00	sqft
						15.62	sqm
14.00	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground					**15.62**	sqm

Annexure 1/P

Budget for Setting up and Operation of Climate Studies

Sl. No.	Item		Qnty	amount	
1	Research Centre Room (20'x30') with verandah 11'x 7' CGI Roofing			973,996.00	Annexure - 1/P(i)
2	Climate Change observatory Room (12'x12') CGI Roofing			472,238.00	Annexure - 1/P(ii)
3	Automated weather station	135,000.00	3	405,000.00	
5	Ultra violet Sensor	35,000.00	6	210,000.00	
6	Soil Moisture Sensor	10,000.00	6	60,000.00	
7	Soil Temperature Sensor	12,000.00	6	72,000.00	
8	Leaf Wetness Sensor	15,000.00	6	90,000.00	
9	Evaporation Sensor	40,000.00	6	240,000.00	
10	Infra Red (IR) Temperature Sensor	25,000.00	6	150,000.00	
11	Automatic Water Level Recorder	55,000.00	3	165,000.00	
12	Ground Water Recharge level Recorder	95,000.00	3	285,000.00	
13	Silt (Suspended Solid) Measuring Indicator	165,000.00	3	495,000.00	
14	Remote sensing images for 3 different year	200,000.00	3	600,000.00	
15	Work Station for GIS & Remotesensing	180,000.00	1	180,000.00	
16	Manpower 2 JRF for 3 years (@ Rs. 36,000 per month i.e. 72,000)	72,000.00	36	2,592,000.00	
17	Consumables like chemicals & glassware, Capacity building, trainings, meeting, survey, etc. For 3 years	300,000.00	3	900,000.00	
18	Chargeable Taxes like 5.6% MST, 1 % labour CESS, 11.75 % Departmental Charge, 3% Contingency, others i.e. 30 % , CST for procurement, transportaion, installation, etc. approximately			809,766.00	
	Total			**8,700,000.00**	

Annexure 1/P (i)

ABSTRACT OF COST
Name of work: Research Centre Room (20'x30') with verandah 11'x 7' CGI Roofing

Sl. No.	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
1	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres					
b)	Hard/Dense Soil.	35.42	Rs. 102.10	cum	3616.00	MSR'13
2	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre	11.81	Rs. 79.70	cum	941.00	MSR'13
3	Filling in plinth with sandy soil under floors including watering ramming, consolidating and dressing complete.	34.01	Rs. 206.50	cum	7023.00	MSR'13
4	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering					
g)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	13.60	Rs. 4,161.90	cum	56602.00	MSR'13
5	Reinforced cement concrete work in foundation footings, bases of columns etc. and mass concrete, excluding cost of centering, shuttering and reinforcement,					
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	11.34	Rs. 4,635.82	cum	52570.00	MSR'13
6	Reinforced cement concrete work in columns, pillars, piers, abutments, post and struts upto floor two level i/c plastering the exposed surface with cement 1:3 (1 cement:3 fine sand) of thickness not exceeding 6 mm thickness to give a smooth and even surface but excluding the cost of centering-shuttering &					

Sl. No.	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
	reinforcement					
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	2.55	Rs. 7,128.30	cum	18177.00	MSR'13
7	Reinforced cement concrete work in suspended floors, roofs landing, shelves & their supports balconies, lintels, beams, plinth beams, girders, bressumers and cantilevers upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cement:3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding cost of centering, shuttering and reinforcement.					
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	6.21	Rs. 7,054.70	cum	43810.00	MSR'13
8	Reinforcement for RCC work i/c bending binding and placing in position and placing in position complete.					
b)	Tor-steel bars	1679.99	Rs. 89.10	kg	149687.00	MSR'13
9	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in					
a)	Foundation, footings, bases of columns etc. & mass concrete.	50.19	Rs. 264.30	sqm	13265.00	MSR'13
b)	sides or soffits of beams, beam haunchings, cantilevers, girders, brussumers and lintels not exceeding 1m in depth.	57.26	Rs. 289.20	sqm	16560.00	MSR'13
c)	Columns, pillars, posts and struts (square, rectangular or polygon in plan).	33.46	Rs. 411.60	sqm	13772.00	MSR'13
10	Providing and laying damp-proof course 50 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	8.49	Rs. 424.50	sqm	3604.00	MSR'13

Sl. No.	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
11	2nd class (local first class) brick work in foundation and plinth in cement mortar 1:4 (1 cement: 4 fine sand)	4.42	Rs. 8,667.90	cum	38312.00	MSR'13
12	Half brick masonry 2nd class (local 1st class) in cement mortar 1:4 (1 cement: 4 coarse sand) in superstructure.	60.38	Rs. 978.70	sqm	59094.00	MSR'13
13	12 mm cement plaster 1:4 (1 cement: 4 fine sand)	104.53	Rs. 175.00	Sqm	18293.00	MSR'13
14	15 mm cement plaster 1:4 (1 cement: 4 fine sand)	85.03	Rs. 215.20	Sqm	18298.00	MSR'13
15	Finishing walls with water-proofing cement paint of approved quality on new work (three or more coats) to given shade.	104.53	Rs. 187.20	Sqm	19568.00	MSR'13
16	Distempering (two or more coats) with oil bound washable distemper of approved quality on new work i/c priming coat to hive an even shade.	85.03	Rs. 89.60	Sqm	7619.00	MSR'13
17	20 mm thick cement plaster skirting (upto 30cm height) with cement mortar 1:3 (1 cement:3 coarse sand) finished with a floating coat of neat cement i/c. rounding of junctions with floors.	12.34	Rs. 369.20	Sqm	4556.00	MSR'13
18	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.	65.99	Rs. 525.20	Sqm	34658.00	MSR'13
19	Providing and fixing aluminium works for doors windows, ventilators and partions with extruded built up standard tubular sections/appropriate Z sections and other sections of approed make conforming to IS:733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up gaps at junctions, at top, bottom and side with required EPDM rubber/Neoprene gasket etc. Aluminium snap beading for glazing/panelling, C.P, brass/Stainless steel screws, all complete as per architectural					

Sl. No.	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
	drawing and the directions of Engineer-in-charge (Glazing and panelling to be paid for separately) . For shutters of doors, windows & ventilators including, providing and fixing hinges/pivots and making provision for fixing of fitting wherever required including the cost of EPDM rubber/neoprene gasket required (Fittings shall be paid for separately).					
20	Annodised aluminium (anodised transparent or dyed to required shade according to IS : 1868, Minimum anodic coating of grade AC15)	432.50	Rs. 319.50	cum	138184.00	MSR'13
21	Providing and fixing glazing in aluminium door, windows, ventilator shutters and partitions etc. with EPDM rudder/neoprene gasket etc. complete as per the architectural drawing and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):					
	With float glass panes of 4mm thickness	27.46	Rs. 609.20	Sqm	16729.00	MSR'13
22	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.					
	Electric Resistant Welded tube (Conforming to IS:1611-1979)	872.54	Rs. 148.40	Kg	129484.00	MSR'13
23	Corrugated G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. limpet & bitumen washer complete, excluding the coat of purlins rafter & trusses.	106.34	Rs. 879.40	Sqm	93515.00	MSR'13

Sl. No.	Description	Qnty	Rate,Rs	Unit	Amount,Rs	Remarks
24	Ridges or hips 610 mm over all in plain G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. Limpet & bitumen washers complete.	12.80	Rs. 631.10	Rm	8078.00	MSR'13
25	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.	17.85	Rs. 270.30	Sqm	4825.00	MSR'13
26	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground	17.85	Rs. 176.80	Sqm	3156.00	MSR'13
				Rs	**9,73,996.00**	

Details of Measurement
Name of work: Research Centre Room

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
1	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres						
b)	Hard/Dense Soil.	10	5	5	5	1250.00	cuft
						35.42	cum
2	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre					**11.81**	cum
3	Filling in plinth with sandy soil under floors including watering ramming, consolidating and dressing complete.	1	20	30	2	1200.00	cuft
						34.01	cum
4	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering						
g)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)						
	Found …..	10	5	5	0.5	125.00	
	Flooring…	1	20	30	0.5	300.00	
	Verandah….	1	10	11	0.5	55.00	
						480.00	cft
						13.60	cum
5	Reinforced cement concrete work in foundation footings, bases of columns etc. and mass concrete, excluding cost of centering, shuttering and reinforcement,						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggreg-ate 20 mm nominal size).						
	Footing	10	4	4	1	160.00	
		10	2	2	6	240.00	

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
						400.00	cuft
						11.34	cum
6	Reinforced cement concrete work in columns, pillars, piers, abutments, post and struts upto floor two level i/c plastering the exposed surface with cement 1:3 (1 cement:3 fine sand) of thickness not exceeding 6 mm thickness to give a smooth and even surface but excluding the cost of centering-shuttering & reinforcement						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).						
	Column	10	1	1	9	90.00	cuft
						2.55	cum
7	Reinforced cement concrete work in suspended floors, roofs landing, shelves & their supports balconies, lintels, beams, plinth beams, girders, bressumers and cantilevers upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cement:3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding cost of centering, shuttering and reinforcement.						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).						
	Grade beam	2	30	0.83	1.5	74.70	
		2	20	0.83	1.5	49.80	
		2	27	0.83	1.5	67.23	
		2	11	0.83	1.5	27.39	
						219.12	cuft
						6.21	cum
8	Reinforcement for RCC work i/c bending binding and placing in position and placing in position complete.						
b)	Tor-steel bars						

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
	Footing 0.8%					712.15	Kg
	Column 2%					400.35	Kg
	Beams 1%					487.49	Kg
						1599.99	Kg
	Add 5% wastage					80.00	Kg
						1679.99	**kg**
9	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in						
a)	Foundation, footings, bases of columns etc. and mass concrete.						
		10	4	5	0.5	100.00	
		10	4	4	1	160.00	
		10	4	2	3.5	280.00	
						540.00	sqft
						50.19	sqm
b)	sides or soffits of beams, beam haunchings, cantilevers, girders, brussumers and lintels not exceeding 1m in depth.						
		2	30	3.5	1	210.00	
		2	20	3.5	1	140.00	
		2	27	3.5	1	189.00	
		2	11	3.5	1	77.00	
						616.00	sqft
						57.26	sqm
C)	Columns, pillars, posts and struts (square, rectangular or polygon in plan).	10	4	1	9	360.00	sqft
						33.46	sqm
10	Providing and laying damp-proof course 50 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)						
		2	30	0.83	1	49.80	
		2	20	0.83	1	33.20	
		1	10	0.83	1	8.30	

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
						91.30	sqft
						8.49	sqm
11	2nd class (local first class) brick work in foundation and plinth in cement mortar 1:4 (1 cement: 4 fine sand)						
		2	28	0.83	2	92.96	
		2	19	0.83	2	63.08	
						156.04	cuft
						4.42	cum
12	Half brick masonry 2nd class (local 1st class) in cement mortar 1:4 (1 cement: 4 coarse sand) in superstructure.						
		2	28	1	9	504.00	
		2	19	1	9	342.00	
		1	11	1	9	99.00	
						945.00	sqft
						87.84	sqm
	Deduct opening W	-8	6	1	4	-192.00	
	D1	-2	3	1	4	-24.00	
	W1	-1	4	1	7	-28.00	
	D2	-2	3.67	1	7	-51.38	
						-295.38	sqft
						-27.46	sqm
					Net	**60.38**	sqm
13	12 mm cement plaster 1:4 (1 cement: 4 fine sand)						
		2	30	1	11.5	690.00	
		2	20	1	11.5	460.00	
		1	20	1	9	180.00	
		1	10	1	9	90.00	
						1420.00	sqft
						131.99	sqm
	Deduct opening					**-27.46**	sqm
					Net	**104.53**	sqm
14	15 mm cement plaster 1:4 (1 cement: 4 fine sand)	2	30	1	9.67	580.20	
		3	20	1	9	540.00	
		1	10	1	9	90.00	
						1210.20	sqft
						112.49	sqm
	Deduct opening					**-27.46**	sqm
					Net	**85.03**	sqm

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
16	Finishing walls with water-proofing cement paint of approved quality on new work (three or more coats) to given shade.					104.53	sqm
17	Distempering (two or more coats) with oil bound washable distemper of approved quality on new work i/c priming coat to hive an even shade.					85.03	sqm
18	20 mm thick cement plaster skirting (upto 30cm height) with cement mortar 1:3 (1 cement:3 coarse sand) finished with a floating coat of neat cement i/c. rounding of junctions with floors.						
		2	30	0.83	1	49.80	
		4	20	0.83	1	66.40	
		2	10	0.83	1	16.60	
						132.80	sqft
						12.34	sqm
19	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.						
	Room	1	20	1	30	600.00	
		1	10	1	11	110.00	
						710.00	sqft
						65.99	sqm

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
20	Providing and fixing aluminium works for doors windows, ventilators and partions with extruded built up standard tubular sections/appropriate Z sections and other sections of approed make conforming to IS:733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up gaps at junctions, at top, bottom and side with required EPDM rubber/Neoprene gasket etc. Aluminium snap beading for glazing/panelling, C.P, brass/Stainless steel screws, all complete as per architectural drawing and the directions of Engineer-in-charge (Glazing and panelling to be paid for separately) . For shutters of doors, windows & ventilators including, providing and fixing hinges/pivots and making provision for fixing of fitting wherever required including the cost of EPDM rubber/neoprene gasket required (Fittings shall be paid for separately).						
	Annodised aluminium (anodised transparent or dyed to required shade according to IS : 1868, Minimum anodic coating of grade AC15)						
	W	8	6	1	4	192.00	
	D1	2	3	1	4	24.00	
	W1	1	4	1	7	28.00	
	D2	2	3.67	1	7	51.38	
						295.38	sqft
						27.46	sqm
	15 kg/sqm					**411.90**	Kg
	add 5%					**20.60**	Kg
						432.50	kg

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
21	Providing and fixing glazing in aluminium door, windows, ventilator shutters and partitions etc. with EPDM rudder/neoprene gasket etc. complete as per the architectural drawing and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):						
	With float glass panes of 4mm thickness						
	W	8	6	1	4	192.00	
	D1	2	3	1	4	24.00	
	W1	1	4	1	7	28.00	
	D2	2	3.67	1	7	51.38	
						295.38	sqft
						27.46	sqm
22	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.						
	Electric Resistant Welded tube (Conforming to IS:1611-1979)						
	Steel truss outer member 50mm	2	14	1	1	28.00	
	Bottom	1	20	1	1	20.00	
				1	1	48.00	ft
				1	1	14.63	m
	50mm dia @4.58 kg/m					67.01	kg
	Itermediate member 40mm dia	1	12	1	1	12.00	
	Inclined intermediate member	1	12	1	1	12.00	
						24.00	
						7.32	m
	40mm dia @4.47 kg/m					32.72	kg
	Total					99.73	
	Add 5%					4.99	
						104.72	kg
	For 4 nos of truss					418.86	kg
	Purlin 50 mm dia	2	3	1	34	204.00	

Sl. No	Description	No	Length	Breadth	Heihght/ Depth	Qnty	Units
						62.20	m
	50mm dia @4.58 kg/m					284.88	kg
	Add 5%					14.24	kg
						299.12	kg
	Verandah steel truss						
	40mm dia	2	30	1	1	60.00	
	Purlin	2	3	8	1	48.00	
						108.00	ft
						32.93	m
						147.20	kg
						7.36	kg
						154.56	kg
					Total steel	**872.54**	kg
23	Corrugated G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. limpet & bitumen washer complete, excluding the coat of purlins rafter & trusses.						
	Room	2	14	1	34	952.00	
	Verandah	2	12	1	8	192.00	
						1144.00	sft
						106.34	sqm
24	Ridges or hips 610 mm over all in plain G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. Limpet & bitumen washers complete.	1	42	1	1	42.00	ft
						12.80	**m**
25	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.						
		2	33	1	1.5	99.00	
		2	23	1	1.5	69.00	
		2	8	1	1.5	24.00	
						192.00	sft
						17.85	sqm
26	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground					**17.85**	sqm

Annexure – 1/P (ii)

Name of work: Climate Change Observatory (12'x12') CGI Roofing

Sl. No.	Description	Quantity	Rate,Rs	Unit	Amount,Rs	Remarks
1	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres					
b)	Hard/Dense Soil.	14.17	Rs. 102.10	cum	1447.00	MSR'13
2	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre	4.72	Rs. 79.70	cum	376.00	MSR'13
3	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering					
g)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggr-egate 40 mm nominal size)	1.42	Rs. 4,161.90	cum	5910.00	MSR'13
4	Reinforced cement concrete work in foundation footings, bases of columns etc. and mass concrete, excluding cost of centering, shuttering and reinforcement,					
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggre-gate 20 mm nominal size).	4.53	Rs. 4,635.82	cum	21000.00	MSR'13
5	Reinforced cement concrete work in columns, pillars, piers, abutments, post and struts upto floor two level i/c plastering the exposed surface with cement 1:3 (1 cement:3 fine sand) of thickness not exceeding 6 mm thickness to give a smooth and even surface but excluding the cost of centering-shuttering & reinforcement					

Sl. No.	Description	Quantity	Rate,Rs	Unit	Amount,Rs	Remarks
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	4.08	Rs. 7,128.30	cum	29083.00	MSR'13
6	Reinforced cement concrete work in suspended floors, roofs landing, shelves & their supports balconies, lintels, beams, plinth beams, girders, bressumers and cantilevers upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cement:3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding cost of centering, shuttering and reinforcement.					
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	3.66	Rs. 7,054.70	cum	25820.00	MSR'13
7	Reinforcement for RCC work i/c bending binding and placing in position and placing in position complete.					
b)	Tor-steel bars	1,272.97	Rs. 89.10	kg	113422.00	MSR'13
8	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in					
a)	Foundation, footings, bases of columns etc. and mass concrete.	27.51	Rs. 264.30	sqm	7271.00	MSR'13
b)	sides or soffits of beams, beam haunchings, cantilevers, girders, brussumers and lintels not exceeding 1m in depth.	38.06	Rs. 289.20	sqm	11007.00	MSR'13
c)	Columns, pillars, posts and struts (square, rectangular or polygon in plan).	13.38	Rs. 411.60	sqm	5507.00	MSR'13

Sl. No.	Description	Quantity	Rate,Rs	Unit	Amount,Rs	Remarks
9	Providing and laying damp-proof course 50 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	4.01	Rs. 424.50	sqm	1702.00	MSR'13
10	2nd class (local first class) brick work in foundation and plinth in cement mortar 1:4 (1 cement: 4 fine sand)	2.26	Rs. 8,667.90	cum	19589.00	MSR'13
11	Half brick masonry 2nd class (local 1st class) in cement mortar 1:4 (1 cement: 4 coarse sand) in superstructure.	12.27	Rs. 978.70	sqm	12009.00	MSR'13
12	12 mm cement plaster 1:4 (1 cement: 4 fine sand)	22.31	Rs. 175.00	Sqm	3904.00	MSR'13
13	15 mm cement plaster 1:4 (1 cement: 4 fine sand)	13.38	Rs. 215.20	Sqm	2879.00	MSR'13
14	Finishing walls with water-proofing cement paint of approved quality on new work (three or more coats) to given shade.	22.31	Rs. 187.20	Sqm	4176.00	MSR'13
15	Distempering (two or more coats) with oil bound washable distemper of approved quality on new work i/c priming coat to hive an even shade.	13.38	Rs. 89.60	Sqm	1199.00	MSR'13
16	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.	13.38	Rs. 525.20	Sqm	7027.00	MSR'13

Sl. No.	Description	Quantity	Rate,Rs	Unit	Amount,Rs	Remarks
17	Providing and fixing aluminium works for doors windows, ventilators and partions with extruded built up standard tubular sections/appropriate Z sections and other sections of approed make conforming to IS:733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up gaps at junctions, at top, bottom and side with required EPDM rubber/Neoprene gasket etc. Aluminium snap beading for glazing/panelling, C.P, brass/Stainless steel screws, all complete as per architectural drawing and the directions of Engineer-in-charge (Glazing and panelling to be paid for separately) . For shutters of doors, windows & ventilators including, providing and fixing hinges/pivots and making provision for fixing of fitting wherever required including the cost of EPDM rubber/neoprene gasket required (Fittings shall be paid for separately).					
	Annodised aluminium (anodised transparent or dyed to required shade according to IS : 1868, Minimum anodic coating of grade AC15)	401.55	Rs. 319.50	cum	128295.00	MSR'13
18	Providing and fixing glazing in aluminium door, windows, ventilator shutters and partitions etc. with EPDM rudder/neoprene gasket etc. complete as per the architectural drawing and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):					
	With float glass panes of 4mm thickness	26.77	Rs. 609.20	Sqm	16308.00	MSR'13

Sl. No.	Description	Quantity	Rate,Rs	Unit	Amount,Rs	Remarks
19	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.					
	Electric Resistant Welded tube (Conforming to IS:1611-1979)	197.46	Rs. 148.40	Kg	29302.00	MSR'13
20	Corrugated G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. limpet & bitumen washer complete, excluding the coat of purlins rafter & trusses.	20.82	Rs. 879.40	Sqm	18309.00	MSR'13
21	Ridges or hips 610 mm over all in plain G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. Limpet & bitumen washers complete.	4.88	Rs. 631.10	Rm	3079.00	MSR'13
22	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.	8.09	Rs. 270.30	Sqm	2187.00	MSR'13
23	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground	8.09	Rs. 176.80	Sqm	1430.00	MSR'13
				Rs	**4,72,238.00**	

Details of Measurement
Name of work: Climate Change Observatory

Sl. No	Description	No	Length	Breadth	Height/ Depth	Qnty	Units
1	Earth work in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres						
b)	Hard/Dense Soil.	4	5	5	5	500.00	cuft
						14.17	cum
2	Filling available excavated earth (excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering lead upto 50 metres lift upto 1.5 metre					**4.72**	cum
3	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering						
g)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	4	5	5	0.5	50.00	cuft
						1.42	cum
4	Reinforced cement concrete work in foundation footings, bases of columns etc. and mass concrete, excluding cost of centering, shuttering and reinforcement,						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).						
		10	5	5	0.5	125.00	
	Footing	4	4	4	1	64.00	
	Upto plinth	4	2	2	6	96.00	
						160.00	cuft
						4.53	cum
5	Reinforced cement concrete work in columns, pillars, piers, abutments, post and struts upto floor two level i/c plastering the exposed surface with cement 1:3 (1 cement:3 fine sand) of thickness not exceeding 6 mm thickness to give a smooth and even surface but excluding the cost of centering-shuttering & reinforcement						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).						
	Column	1	4	4	9	144.00	cuft
						4.08	cum

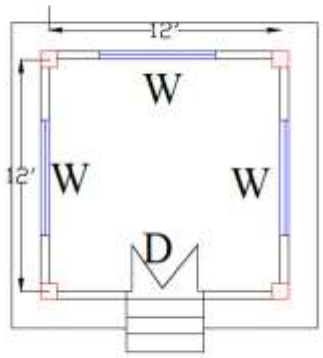
6	Reinforced cement concrete work in suspended floors, roofs landing, shelves & their supports balconies, lintels, beams, plinth beams, girders, bressumers and cantilevers upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cement:3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding cost of centering, shuttering and reinforcement.						
b)	1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size).	4	13	0.83	1.33	57.40	
	Grade beam	5	13	0.83	1.33	71.75	cft
						129.15	cft
						3.66	cum
7	Reinforcement for RCC work i/c bending binding and placing in position and placing in position complete.						
b)	Tor-steel bars						
	Footing 0.8%					284.48	Kg
	Column 2%					640.56	Kg
	Beams 1%					287.31	Kg
						1212.35	Kg
	Add 5% wastage					60.62	Kg
						1272.97	**kg**
8	Providing form works i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in						
a)	Foundation, footings, bases of columns etc. and mass concrete.						
		4	4	5	0.5	40.00	
		4	4	4	1	64.00	
		4	4	2	6	192.00	
						296.00	sqft
						27.51	sqm
b)	sides or soffits of beams, beam haunchings, cantilevers, girders, brussumers and lintels not exceeding 1m in depth.						
	Grade beam	1	5	13	3.5	227.50	
	Gable beam	1	4	13	3.5	182.00	
						409.50	sqft
						38.06	sqm
c)	Columns, pillars, posts and struts (square, rectangular or polygon in plan).	1	4	4	9	144.00	sqft
						13.38	sqm

9	Providing and laying damp-proof course 50 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	4	13	0.83	1	43.16	sqft
						4.01	sqm
10	2nd class (local first class) brick work in foundation and plinth in cement mortar 1:4 (1 cement: 4 fine sand)						
	upto plinth level	4	12	0.83	2	79.68	cuft
						2.26	cum
11	Half brick masonry 2nd class (local 1st class) in cement mortar 1:4 (1 cement: 4 coarse sand) in superstructure.						
	wall	4	12	1	3	144.00	
	deduct	-1	4	1	3	-12.00	
						132.00	sqft
						12.27	sqm
12	12 mm cement plaster 1:4 (1 cement: 4 fine sand)	4	12	1	5	240.00	sqft
						22.31	sqm
13	15 mm cement plaster 1:4 (1 cement: 4 fine sand)	4	12	1	3	144.00	sqft
						13.38	sqm
14	Finishing walls with water-proofing cement paint of approved quality on new work (three or more coats) to given shade.					**22.31**	sqm
15	Distempering (two or more coats) with oil bound washable distemper of approved quality on new work i/c priming coat to hive an even shade.					13.38	sqm
16	40 mm cement concrete flooring 1:2:4 (1 cement: 2 coarse sand:4 stone aggregate 20 mm & down gauge) finished with a floating coat of neat cement.						
	flooring	1	12	1	12	144.00	sqft
						13.38	sqm

17	Providing and fixing aluminium works for doors windows, ventilators and partions with extruded built up standard tubular sections/appropriate Z sections and other sections of approed make conforming to IS:733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up gaps at junctions, at top, bottom and side with required EPDM rubber/Neoprene gasket etc. Aluminium snap beading for glazing/panelling, C.P, brass/Stainless steel screws, all complete as per architectural drawing and the directions of Engineer-in-charge (Glazing and panelling to be paid for separately) . For shutters of doors, windows & ventilators including, providing and fixing hinges/pivots and making provision for fixing of fitting wherever required including the cost of EPDM rubber/neoprene gasket required (Fittings shall be paid for separately).						
	Annodised aluminium (anodised transparent or dyed to required shade according to IS : 1868, Minimum anodic coating of grade AC15)						
	Frame	4	12	1	6	288.00	sqft
						26.77	sqm
	15kg/ sqm					**401.55**	kg
18	Providing and fixing glazing in aluminium door, windows, ventilator shutters and partitions etc. with EPDM rudder / neoprene gasket etc. complete as per the architectural drawing and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):	4	12	1	6	288.00	sqft
	With float glass panes of 4mm thickness					**26.77**	sqm
19	Steel work in built up tubular trusses including cutting, hoisting, fixing in position and applying a coat of approved steel primer red oxide zinc chrome primer conforming to IS: 2074 1979) welded and bolted including special shape washer complete.						
	Electric Resistant Welded tube (Conforming to IS:1611-1979)						
	Steel truss outer member 40mm	1	26	1	1	26.00	
	Intermediate	1	11	1	1	11.00	
				1	1	37.00	
	For 2 nos			1	1	74.00	
	Purlin 40mm	2	2	1	16	64.00	
						138.00	
						42.07	Rm
	40mm 4.47kg/m					188.05	kg

	Add 5%					9.40	kg
						197.46	kg
20	Corrugated G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. limpet & bitumen washer complete, excluding the coat of purlins rafter & trusses.	2	16	1	7	224.00	sqft
						20.82	sqm
21	Ridges or hips 610 mm over all in plain G.I. sheet 24 B.G. fixed with galvanised iron J or L hooks 8 mm dia G.I. Limpet & bitumen washers complete.	1	16	1	1	16.00	rft
						4.88	m
22	Providing plinth protection 50 mm thick in cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate of 20 mm nominal size) i/c finishing the top surface of concrete smooth.						
		2	16	1	1.5	48.00	
		2	13	1	1.5	39.00	
						87.00	sqft
						8.09	sqm
23	Providing under layer for plinth protection of 75 mm thick rammed & consolidated & grouted with fine sand including preparation of ground					8.09	sqm

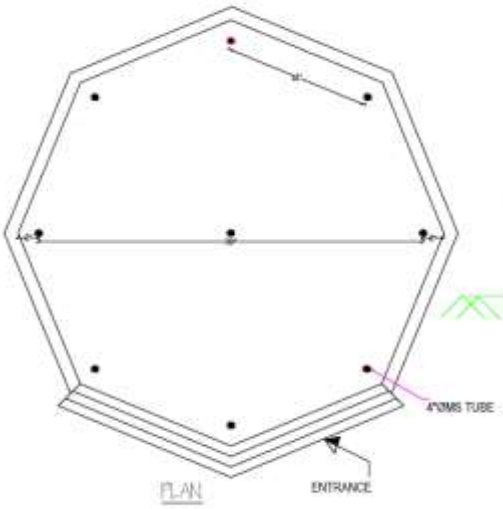
CLIMATE CHANGE OBSERVATORY ROOM



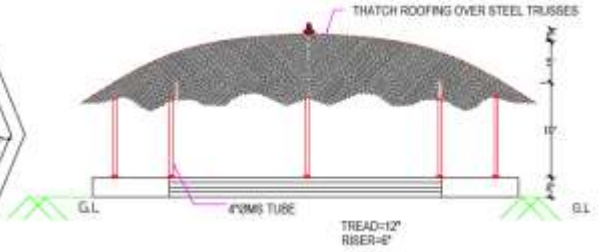
PLAN

ELEVATION

ECO HEALTH RESORT

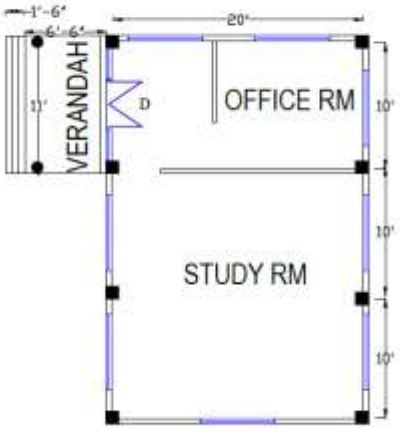


PLAN

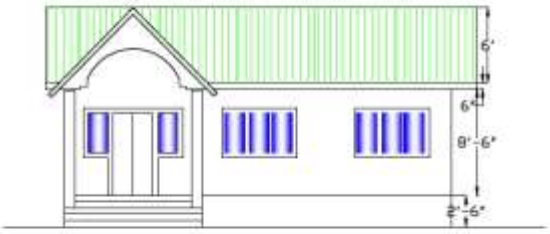


ELEVATION

RESEARCH CENTRE ROOM



CGI ROOFING OVER STEEL TRUSS



ELEVATION

Annexure – 1/Q

General Abstract of Cost for Development of water treatment unit at Maklang River and supply system

Sl. No.	Sub Head / Items of Wiork	Qty	Rate (Rs.)	Unit	Amount	Remarks
1	Construction of Intake Collection Well	1	393,741.00	Each	393,741.00	Annexure – I
2	Construction of pump house	1	615,551.00	Each	615,551.00	Annexure – II
3	Construction of Settling Tank	1	761,507.00	Each	761,507.00	Annexure – III
4	Construction of Distribution Reservoir	1	1,114,552.00	Each	1,114,552.00	Annexure – IV
5	Construction of slow sand filter	1	2,265,908.00	Each	2,265,908.00	Annexure – V
6	Providing & laying G.I. Raw & Distribution pipeline	1	7,356,368.40	Each	7,356,368.40	Annexure – VI
7	Solar pump	1	667,304.00	Each	9,90,299.00	Annexure – VII
				Total	13,497,926.40	
				Add 5.6% VAT	755,883.88	
					14,253,810.28	
				Add 1% Labour Cess	142,538.10	
					14,396,348.38	
				Add 3% contingencies charge	431,890.45	
					14,828,238.83	
				Add 11.75% Deptt. Charge	1,742,318.06	
				Grand Total	**16,570,556.90**	
				Say,	**16,570,000.00**	

Annexure – 1/Q (I)

ABSTRACT COST

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Intake COllection Well)

S/No	Sub Heads/Items of work	Quantity	Rate	Unit	Amount in Rs.	Remarks
1	E/W in excavation in foundation for superstructure complete as per drawing & technical specification. Hard soil - (a) Depth 3 m to 6 m	62.86	564.20	m^3	35,465.61	MSR' 13
2	Reinforcement in RCC work including bending and binding and placing in position complete a) Tor Steel	784.98	89.10	Kgs	69,941.72	MSR' 13
3	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain (a) Cylindrical shells of radius more than 3 m (only the area of the underside shall be measured for payment)	62.86	1301.60	m^2	81,818.58	MSR' 13
4	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement ; 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	19.99	7048.10	m^3	1,40,891.52	MSR' 13
				Rs	3,28,117.43	
			Add 20% cost index	Rs	65,623.49	
				Rs	3,93,740.92	

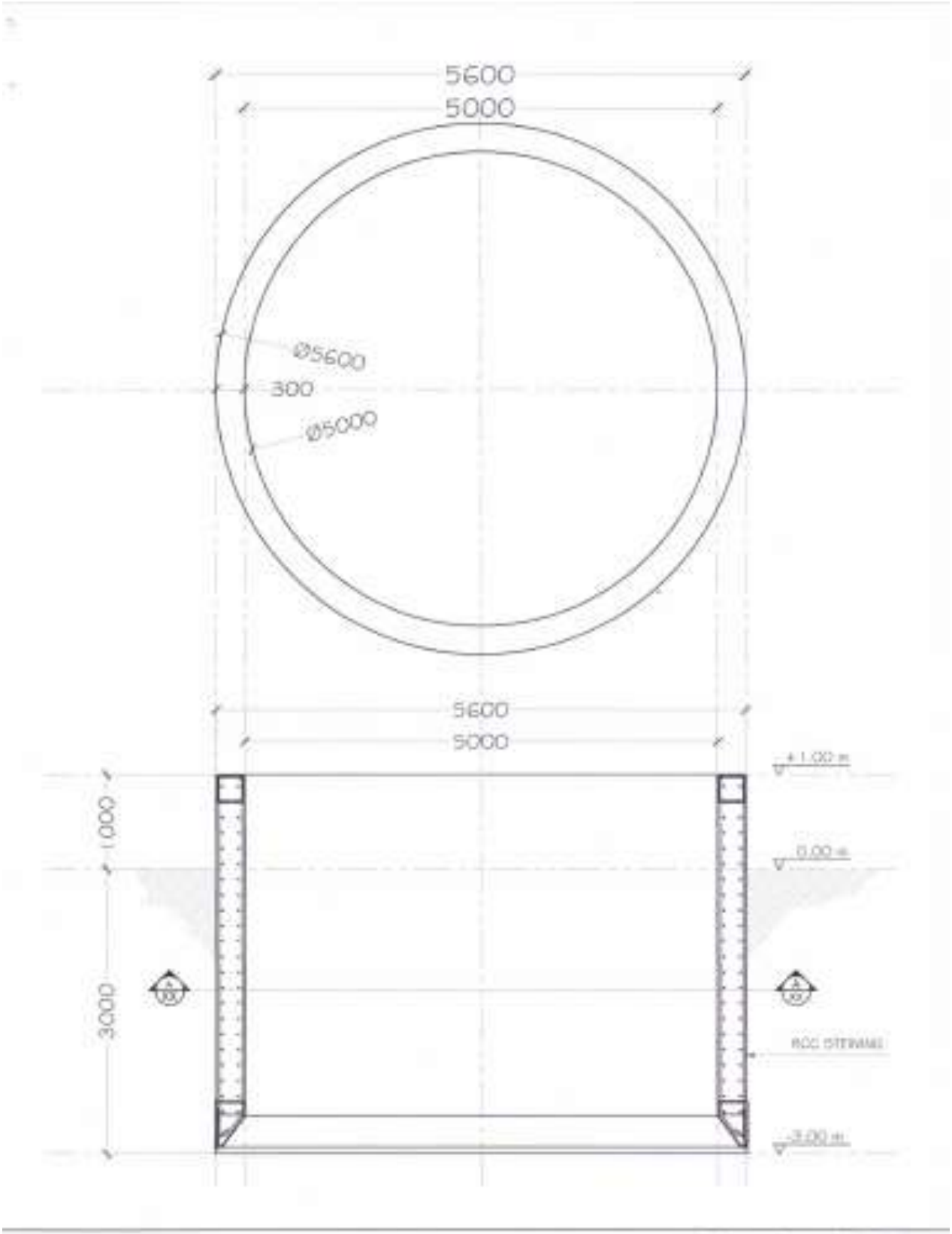
Say Rs 3,93,741/-

(Rupees three lakhs ninety three thousand seven hundred & forty one) only

DETAILS OF MEASUREMENT

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Intake COllection Well)

S/No	Sub Heads/Items of work	No.	Length	Breadth	Depth.	Quantity
1	E/W in excavation in foundation for superstructure complete as per drawing & technical specification. Hard soil - (a) Depth 3 m to 6 m					
			3.14x5.00x5.00x3.20/4			62.86 Cum
2	Reinforcement in RCC work including bending and binding and placing in position complete	12mm dia @ 30cm c/c double layer & both ways				
	a) Tor Steel	2x55x4.00x0.89 + 1x13x13.00x0.89 +1x13x16.00x.89				784.98 Kg
3	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain					
	(a) Cylindrical shells of radius more than 3 m (only the area of the underside shall be measured for payment)		3.14x5.00x4.00			62.86 Sqm
4	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement ; 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement					
	a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).		3.14x5.30x0.30x4.00			19.99 Cum



all dimensions are in millimeters

PLAN AND SECTIONAL ELEVATION OF INTAKE WELL
WATER SUPPLY SCHEME FOR PHAYENG

Annexure – 1/Q (II)

ABSTRACT COST

Name of work:- Water Supply scheme for Phayeng (Sh: - Construction of Pump House)

S/No	Sub Heads/Items of work	Quantity	Rate (Rs)	Unit	Amount (Rs)	Remarks
1	E/W in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms lift upto 1.5 metres including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres. Hard / Dense Soil	58.88	102.10	cum	3,369.65	MSR '13
2	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering in 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	12.96	4,672.90	cum	60,560.78	MSR '13
3	Providing form seks i/c centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in (a) Foundation, footings, bases of columns etc. and mass concrete	17.77	356.90	sqm	4,566.46	MSR '13
	(b) Flat surface such as suspended floor, roofs landings and the like floors etc. upto 200 mm in thickness	44.49	379.60	sqm	16,888.40	MSR '13
	(c) Vertical surface such as walls (any thickness), partition and like i/c attached pilasters, buttresses, plinth and the string courses and the like	31.50	333.00	sqm	10,489.50	MSR '13
4	Reinforcement for R.C.C. work i/c bending, binding and placing in position complete. For Steel bars	1067.57	88.10	Kg	1,77,002.49	MSR '13
5	Reinforced cement concrete work in foundation footings, bases of columns etc. and mass concrete, excluding the cost of centering, shuttering, finishing and reinforcement in 1:1:2 (1 cement: 1 coarse sand: 2 graded stone aggregate 20 mm nominal size 1:1.5:3 (1 cement:1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	5.26	7034.80	cum	36,845.25	MSR '13
6	Reinforced cement concrete work in walls (any thickness) i/c attached pilasters, buttresses, plinth and string courses, fillets etc. upto floor two level excluding the cost of centering, shuttering, finishing and reinforcement in 1:1.5:3 (1 cement:1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	2.09	7048.10	cum	14,307.64	MSR '13
7	Reinforced cement concrete work in suspended floors, roofs landing, shelves & their supports balconies, lintels, beams, plinth beams, girders, bressumers and cantilevers upto floor two level excluding the cost of centering, shuttering, finishing and enforcement in 1:1.5:3 (1 cement:1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	5.26	7064.70	cum	37,107.72	MSR '13

8	Providing & fixing 2 mm thick M.S. sheet garage door, with frame of 40x40x6 mm, angle iron 3.15 mm M.S. gusset plate at the junction of corners with handles, troppers of locking arrangement etc /c applying a priming coat of red lead paint. Using M.S. angles 40x40x6mm for diagonal braces	8.00	4194.60	sqm	33,556.80	MSR'13
9	Half Brick masonry (2nd class) in cement mortar 1:4 (1cement: 4 coarse sand) in superstructure.	22.00	1012.00	sqm	22,264.00	MSR'13
10	20 mm cement plaster 1:3 (1 cement : 3 fine sand)	194.03	254.50	sqm	49,380.64	MSR'13
11	Applying one coat of cement primer of approval quality on wall surface	194.03	35.60	sqm	6,907.47	MSR'13
12	Finishing walls with water proofing cement paint of approved quality on new work (three or more coats) to given shade	194.03	187.20	sqm	36,322.42	MSR'13
13	Painting two coats (excluding priming coat) with chocolate, red, grey of buff paint approved quality on new steel or wood work.	16.00	104.30	sqm	1,668.80	MSR'13
14	filling available excavated earth	12.96	79.70	cum	1,032.91	MSR'13

Rs. 5,12,958.93

Add 20% cost index Rs. 1,02,591.79

Rs. 6,15,550.72

Say Rs.6,15,551/-

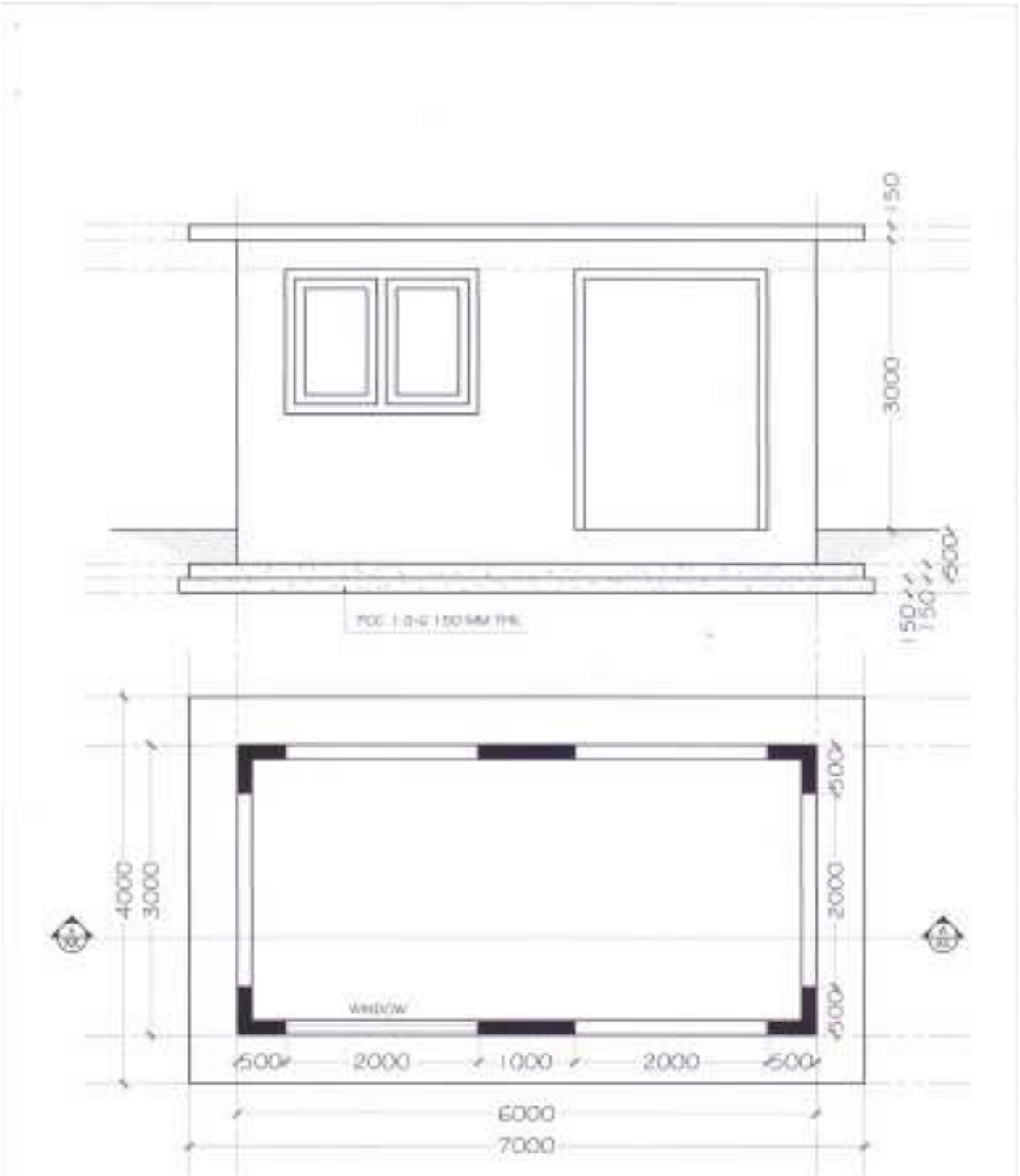
(Rupees six lakhs fifteen thousand five hundred & fifty one) only

DETAILS OF MEASUREMENT.

Name of work:- Water Supply scheme for Phayeng (Sh. :- Construction of Pump House)

1	E/W in excavation.....	7.20x7.20x0.75	=	38.88 cum
2	Providing & laying	7.20x7.20x0.25	=	12.96 cum
3	Providing frame work i/c.....			
	(a) Foundation, footings.....	2x7.00x0.15	=	2.10 sqm
		2x4.00x0.15	=	1.20 sqm
		2x6.00x0.35	=	4.20 sqm
		2x3.00x0.35	=	2.10 sqm
		4x2.78x0.35	=	3.89 sqm
		4x2.70x0.35	=	3.78 sqm
		Total	=	**17.27 sqm**
	(b) Flat surface such as.....	2x7.00x0.15	=	2.10 sqm
		2x4.00x0.15	=	1.20 sqm
		2x7.00x0.50	=	7.00 sqm
		2x3.00x0.50	=	3.00 sqm
		2x2.78x1.70	=	15.01 sqm
		1x2.70x0.15	=	0.41 sqm
		6x2.00x0.15	=	1.80 sqm
		2x6.00x0.35	=	4.20 sqm
		2x3.00x0.35	=	2.10 sqm
		4x2.78x0.35	=	3.89 sqm
		4x2.70x0.35	=	3.78 sqm
		Total	=	**44.49 sqm**
	(c) Vertical surface.....	4x2.00x2.50	=	20.00 sqm
		2x2.30x2.50	=	11.50 sqm
		Total	=	**31.50 sqm**
4	Reinforcement for RCC.....	Slab 12 mm dia @ 15cm c/c		
		4x10x7.00x0.89	=	747.60 kg
		4x50x4.00x0.89	=	712.00 kg
		Column 12 mm dia 12 No. each		
		6x12x3.50x0.89	=	224.28 kg
		Laterals / Stirrups 8mm @ 15 cm c/c		
		1x200x1.30x0.39	=	101.40 kg
		6x10x2.30x0.39	=	107.64 kg
		Total	=	**1892.92 kg**
		Add 5% wastage	=	94.65 kg
				1987.57 kg

5	Reinforced cement concrete.....	Foundation		
		7.00x4.00x0.15	=	4.20 cum
		2x6.00x0.35x0.15	=	0.63 cum
		3x2.70x0.035x0.15	=	0.43 cum
		Total	=	**5.26 cum**
6	Reinforced cement concrete..... Wall			
		2x2.50x1.00x0.15	=	0.75 cum
		4x2.50x0.50x0.15	=	0.75 cum
		4x2.50x0.85x0.15	=	0.53 cum
		Total	=	**2.03 cum**
7	Reinforced cement concrete..... In superided floors			
		7.00x4.00x0.15	=	4.20 cum
		2x6.00x0.35x0.15	=	0.63 cum
		3x2.70x0.035x0.15	=	0.43 cum
		Total	=	**5.26 cum**
8	Providing & fixing M.S. Sheet.....			
		2x2.50	=	5.00 sqm
		2x1.50	=	3.00 sqm
		Total	=	**8.00 sqm**
9	Half brick masonry 2nd class			
		4x2.00x2.50		20.00 sqm
		1x2.00x1.00		2.00 sqm
		Total	=	22.00 sqm
10	20 mm cement plaster 1:3.....			
		4x2.78x2.70	=	30.02 sqm
		2x0.85x2.70	=	4.59 sqm
		4x2.78x3.50	=	38.92 sqm
		1x2.00x2.50	=	5.00 sqm
		1x2.00x1.50	=	3.00 sqm
		2x2.70x3.50	=	18.90 sqm
		4x7.00x0.50	=	14.00 sqm
		4x3.00x0.50	=	6.00 sqm
		4x7.00x4.00	=	4.20 sqm
		4x4.00x0.15	=	2.40 sqm
		1x7.00x4.00	=	28.00 sqm
		2x6.00x3.50	=	42.00 sqm
		2x3.00x3.50	=	21.00 sqm
		1x2.00x2.50	=	5.00 sqm
		1x2.00x1.50	=	3.00 sqm
		Total	=	**94.03 sqm**
11	Applying one coat of			
		Same as Item No. 10	=	194.03 sqm
12	Finishing walls with water proofing.....			
		Same as Item No. 10	=	194.03 sqm
13	Painting tow coat.....			
		2x2.00x2.50	=	10.00 sqm
		2x2.00x1.50	=	6.00 sqm
14	Filling available excavated.....			
		1/3 of Item No. 1		



all dimensions are in millimeters

PLAN AND SECTIONAL ELEVATION OF PUMP HOUSE
WATER SUPPLY SCHEME FOR PHAYENG

Annexure – 1/Q (III)

ABSTRACT COST

Name of work :- Water Supply scheme for Phayeng (Sh:- Construction of Settling Tank)

Sl No	Sub-Head/Items of work	Qnty	Rate	Unit	Amount	Remarks
1	2	3	4	5	6	7
1	Earthwork in excavation over areas exceeding 30 cm in depth 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth lead upto 50 m lift upto 1.5 m disposed earth to be levelled and neatly dressed in					
b)	Hard / dense soil	87.12	100.10	Cum	Rs. 8,721.00	MSR '13
2	Extra for every addl lift of 1.5 ms or part thereof in					
a)	loose / soft soil or hard / dense soil	21.78	12.00	Cum	Rs. 261.00	MSR '13
3	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering in					
f)	1:3:6 (1 cem :3 c/sand :6 graded stone aggregate 40 mm nom size)	6.11	4,672.90	Cum	Rs. 28,551.00	MSR '13
4	Reinforced cement concrete work in walls (any thickness) including attached pilasters, buttresses, plinth and string courses fillets etc. upto floor two level including finishing and plastering the exposed surface with cement mortar 1:3 (1 cem : 3 fine sand) of thickness not exceeding 6 mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement					
b)	1:1.5:3 (1 cem : 1.5 c/sand : 3 graded stone aggregate 20 mm nom size)	22.31	7,048.10	Cum	Rs. 1,57,243.00	MSR '13
5	Reinforced cement concrete work in foundation footings, bases of columns etc.and mass concrete, excluding cost of centering, shuttering and reinforcement					
b)	1:1.5:3 (1 cem : 1.5 c/sand : 3 graded stone aggregate 20 mm nom size)	8.15	7,004.80	Cum	Rs. 57,089.00	MSR '13
6	Reinforcement for R.C.C. work including bending, binding and placing in position complete					
b)	Tor steel bars	2,702.86	89.10	Cum	Rs. 2,40,825.00	MSR '13

Sl. No.	Sub-Head/Items of work	Qnty	Rate	Unit	Amount	Remarks
1	2	3	4	5	6	7
7	Providing form works including centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the samefor in-situ reinforced concrete and plain concrete work in					
a)	Foundation footings, bases of columns etc. and mass concrete	13.90	264.30	Sqm	Rs. 3,674.00	MSR '13
c)	Vertical surfaces such as walls (any thickness) partition and the like including attached pilasters, buttresses, plinth and string courses and the like	210.72	333.00	Sqm	Rs. 70,170.00	MSR '13
8	12 mm cement plaster 1:3 (1 cem : 3 f /sand)	247.38	228.80	Sqm	Rs. 56,601.00	MSR '13
9	Neat cement punning	247.38	46.30	Sqm	Rs. 11,454.00	MSR '13
					Rs. 6,34,589.00	
		Add 20% Cost Index			Rs. 1,26,917.80	
				-	Rs. 7,61,506.80	
				Say,	**7,61,507/-**	

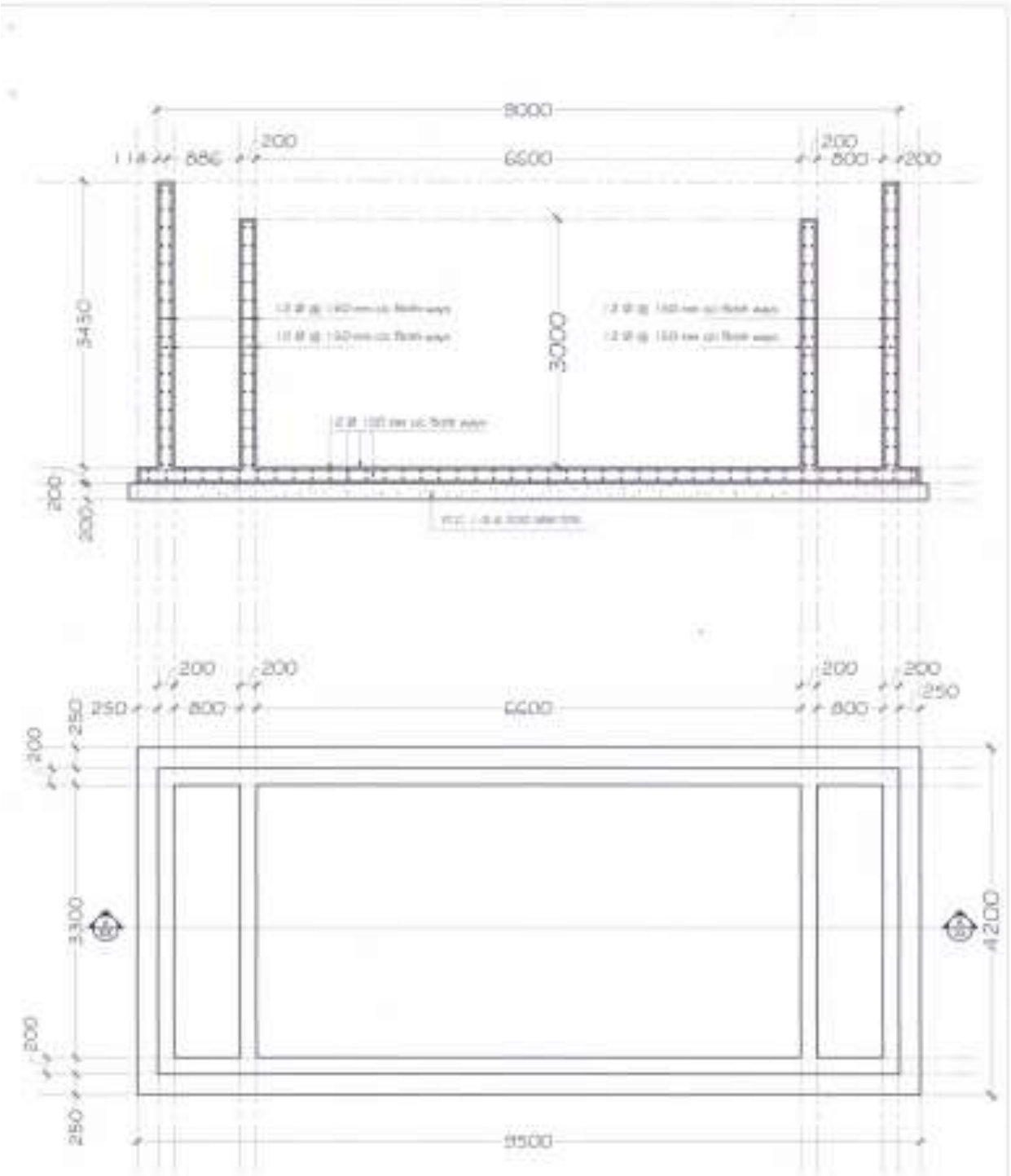
(Rupees seven lakhs sixty one thousand five hundred and seven) only

DETAILS OF MEASUREMENT

Name of work :- Water Supply scheme for Phayeng (Sh:-Construction of Settling Tank)

Sl. No.	Sub-Head/Items of work	Measurements No.	L	B	D	Contents
1	Earthwork in excavation over areas exceeding 30 cm in depth 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth lead upto 50 m lift upto 1.5 m disposed earth to be levelled and neatly dressed in					
b)	Hard / dense soil	1	9.90	4.40	2.00 =	***87.12 Cum***
2	Extra for every addl lift of 1.5 ms or part thereof in					
a)	loose / soft soil or hard / dense soil	1	9.90	4.40	0.50 =	***21.78 Cum***
3	Providing and laying cement concrete in foundation and plinth excluding the cost of centering and shuttering in					
f)	1:3:6 (1 cem :3 c/sand :6 graded stone aggregate 40 mm nom size)	1	9.70	4.20	0.15 =	***6.11 Cum***
4	Reinforced cement concrete work in walls (any thickness) including attached plasters, buttresses, plinth and string courses fillets etc. upto floor two level including finishing and plastering the exposed surface with cement mortar 1:3 (1 cem : 3 fine sand) of thickness not exceeding 6 mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement					
b)	1:1.5:3 (1 cem : 1.5 c/sand : 3 graded stone aggregate 20 mm nom size)					
		1	25.60	0.20	3.45 =	18.35 Cum
		1	6.60	0.20	3.00 =	3.96 Cum
						22.31 Cum
5	Reinforced cement concrete work in foundation footings, bases of columns etc.and mass concrete, excluding cost of centering, shuttering and reinforcement.					
b)	1:1.5:3 (1 cem : 1.5 c/sand : 3 graded stone aggregate 20 mm nom size)	1	9.70	4.20	0.20 =	***8.15 Cum***
6	Reinforcement for R.C.C. work including bending, binding and placing in position complete					
b)	Tor steel bars					
	12 mm ϕ @ 150 mm c/c :					
	Base slab -	1	66	4.20	0.89 =	246.71 Kg
		1	28	9.70	0.89 =	250.38 Kg
	Wall - horizontal bar -	1	35	26.60	0.89 =	828.59 Kg
		1	30	7.80	0.89 =	208.26 Kg

Sl. No.	Sub-Head/Items of work	Measurements					Contents
		No.	L	B	D		
	Wall - vertical bar @ 100 mm c/c -	1	266	3.60	0.89	=	852.26 Kg
		1	66	3.20	0.89	=	187.97 Kg
							2,574.15 Kg
			Add 5% wastage and lapping			-	128.71 Kg
							2,702.86 Kg
7	Providing form works including centering and shuttering so as to give a rough finish, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the samefor in-situ reinforced concrete and plain concrete work in						
a)	Foundation footings, bases of columns etc; and mass concrete	1	27.80	0.50		=	***13.90 Sqm***
c)	Vertical surfaces such as walls (any thickness) partition and the like including attached pilasters, buttresses, plinth and string courses and the like						
		1	26.60	3.45		=	91.77 Sqm
		1	13.20	3.00		=	39.60 Sqm
		1	23.00	3.45		=	79.35 Sqm
							210.72 Sqm
8	12 mm cement plaster 1:3 (1 cem : 3 f /sand)						
	Floor -	1	8.20	3.30		=	27.06 Sqm
	I/W -	1	23.00	3.45		=	79.35 Sqm
		1	13.20	3.00		=	39.60 Sqm
	O/W -	1	26.60	3.45		=	91.77 Sqm
	Top -	1	32.00	0.30		=	9.60 Sqm
							247.38 Sqm
9	Neat cement punning	Quantity same as item № 8 above				=	***247.38 Sqm***



all dimensions are in millimeters

PLAN AND SECTIONAL ELEVATION OF SETTLING TANK

WATER SUPPLY SCHEME FOR PHAYENG

Annexure – 1/Q (IV)

ABSTRACT COST

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Distribution Reservoir)

S/No	Sub Heads/Items of work	Quantity	Rate	Unit	Amount in Rs.	Remarks
1	E/W in excavation in foundation treoches or drain including dressing of sides and ramming of bottom depth upto 1.5 m i/c getting out of excavated soil and disposal of surplus soil as directed within a lead of 50m a) H/Dense soil	91.26	100.10	m^3	9,135.13	MSR' 13
2	P/L Cement concrete in foundation and plinth excluding the cost of centering and shuttering in b) 1:5:10 (1cem : 5 coarse sand:10stone aggt. 40mm nominal size)	9.33	3821.30	m^3	34,888.47	MSR' 13
3	Reinforcement in RCC work including bending and binding and placing in position complete a) Tor Steel	4920.68	89.10	Kgs	4,38,432.59	MSR' 13
4	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain (a) Flat surface such as suspended floors, roofs landing and like i)floor etc upto 200 mm thickness.	48.16	379.60	m^2	18,281.54	MSR' 13
	(b) Vertical surface such as walls (any thickness) partition & the like i/c attached pilasters, buttresses,plinth & string courses & the like.	212	333.00	m^2	70,596.00	MSR' 13
	(c) Column, pillars, posts and struts (square, rectangular or polygon in plan)	4.44	411.60	m^3	1,827.50	MSR' 13
5	RCC work in foundation footings, bases of column etc. & mass concrete i/c the cost of centering, shuttering and reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	12.17	7004.80	m^3	85,248.42	MSR' 13
6	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement : 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	28.3	7048.10	m^3	1,99,461.23	MSR' 13

S/No	Sub Heads/Items of work	Quantity	Rate	Unit	Amount	Remarks
7	RCC work in suspender floor, roof, landing, shelves and their supports balconies, lintels, beams, plinth beams, girders bressumers and cantilever upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cem : 3 f/sand) of thickness not exceeding 6mm thick to give a smooth and even surface but e/c the cost of centering, shuttering and reinforcement in 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm	9.74	7054.70	m^3	68,712.78	MSR' 13
8	RCC work in coulumn, pillars, piers abutments posts and sturts upto floor two level i/c the exposed surface with cement mortar 1:3 (1cem :3 fine sand) of thickness not exceeding 6mm thick to give a smooth and even surface but e/c the cost of centering, shuttering & reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	0.31	7128.30	m^3	2,209.77	MSR' 13
					5,28,793.42	
	Add 20% cost index				1,85,758.68	
					11,14,552.10	

Say **Rs. 11,14,552/-**

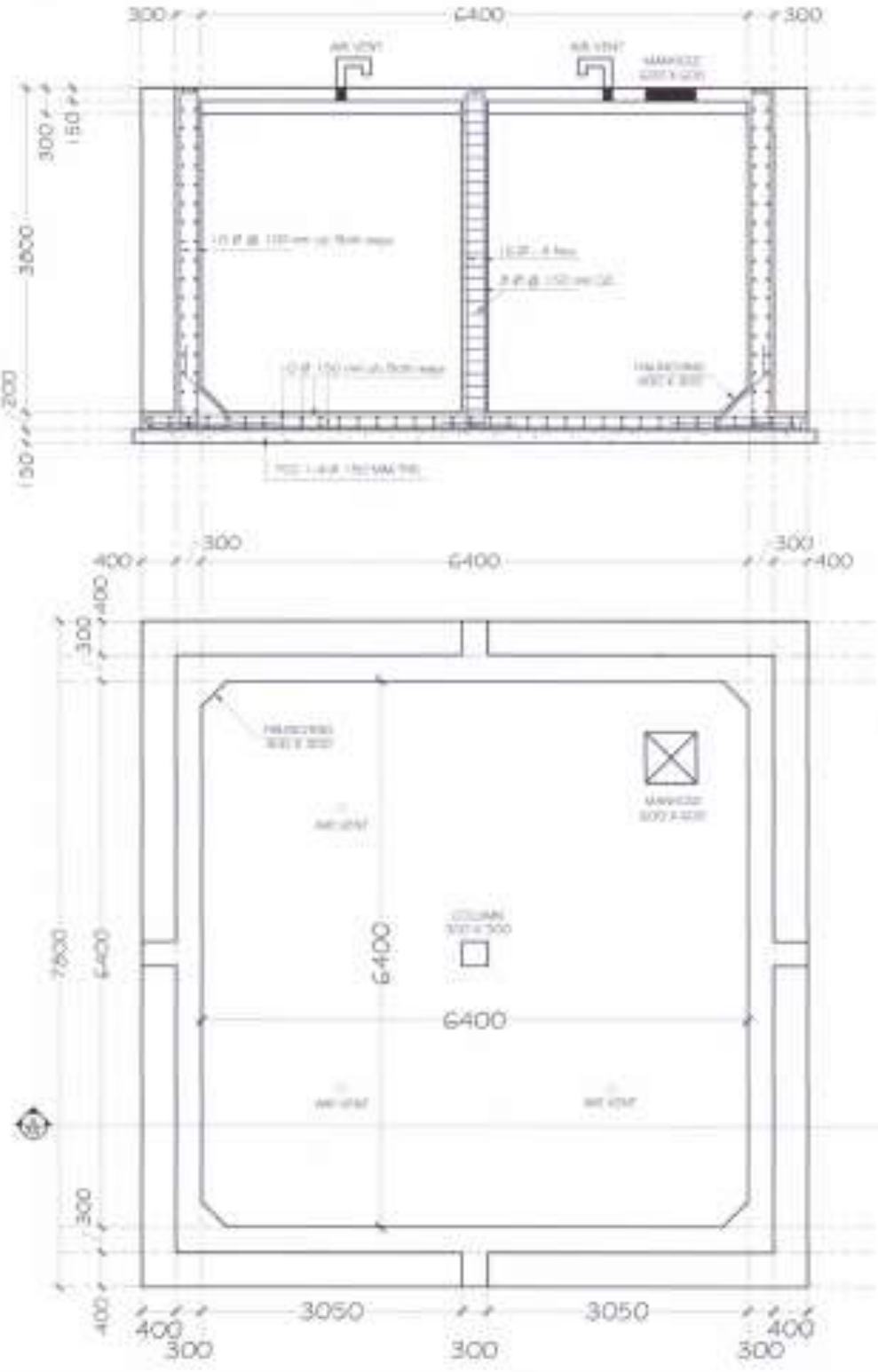
(Rupees eleven lakhs fourteen thousand five hundred & fifty two) only

DETAILS OF MEASUREMENT

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Distribution Reservoir)

S/No	Sub Heads/Items of work			No	L	B	H	Quantity
1	E/W in excavation in foundation trenches or drain including dressing of sides and ramming of bottom depth upto 1.5 m i/c getting out of excavated soil and disposal of surplus soil as directed within a lead of 50m a) H/Dense soil			1	7.80	7.80	1.50	**91.26 Cum**
2	P/L Cement concrete in foundation and plinth excluding the cost of centering and shuttering in b) 1:3:6 (1cem ; 3 coarse sand; 6stone aggt. 20mm nominal size)			1	7.80	7.80	0.15	**9.13 Cum**
3	Reinforcement in RCC work including bending and binding and placing in position complete							
	a) Tor Steel	10mm dia	Base	4	50	7.80	0.62	967.20
			Vert	8	65	4.30	0.62	1,386.32
			Hori	2	35	30.00	0.62	1,302.00
			Haunch	4	40	1.00	0.62	99.20
			Slab	4	40	7.00	0.62	694.40
		16mm dia	C/F	4	6	4.50	1.58	170.64
			Col	1	4	4.50	1.58	28.44
			Beams	2	4	7.50	1.58	94.80
		8mm dia	Col	4	30	1.20	0.39	56.16
				1	38	1.00	0.39	14.82
			C/F	4	38	1.80	0.39	106.70
								4920.68 Kg
4	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain concrete in							
	(a) Flat surface such as suspended floors, roofs landing and like i)floor etc upto 200 mm thickness.			1	6.40	6.40		40.96
				2	4	3.00	0.30	7.20
								48.16 Sqm
	(b) Vertical surface such as walls (any thickness) partition & the like i/c attached pilasters, buttresses,plinth & string courses & the like.			4	7.00	3.80		106.40
				4	6.40	3.65		93.44
				2	4	0.40	3.80	12.16
								212.00 Sqm
	(c) Column, pillars, posts and struts (square, rectangular or polygon in plan)			4	0.30	3.80		**4.44 Sqm**

S/No	Sub Heads/Items of work	No	L	B	H	Quantity
5	RCC work in foundation footings, bases of column etc. & mass concrete i/c the cost of centering, shuttering and reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	1	7.80	7.80	0.20	**12.17 Cum**
6	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement ; 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	2	7.00	3.80	0.26	13.83
		2	6.40	3.80	0.26	12.65
		4	0.40	3.80	0.3	1.82
						28.30 Cum
7	RCC work in suspender floor, roof, landing, shelves and their supports balconies, lintels, beams, plinth beams, girders bressumers and cantilever upto floor two level i/c finishing and plastering the exposed surface with cement mortar 1:3 (1 cem : 3 f/sand) of thickness not exceeding 6mm thick to give a smooth and even surface but e/c the cost of centering, shuttering and reinforcement in 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	1	6.40	6.40	6.40	6.14
		1	4.00	3.00	0.30	3.60
						9.74 Cum
8	RCC work in coulumn, pillars, piers abutments posts and sturts upto floor two level i/c the exposed surface with cement mortar 1:3 (1cem :3 fine sand) of thickness not exceeding 6mm thick to give a smooth and even surface but e/c the cost of centering, shuttering & reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	1	3.40	0.30	0.30	**0.31 Cum**



all dimensions are in millimeters

PLAN AND SECTIONAL ELEVATION OF DISTRIBUTION RESERVOIR

WATER SUPPLY SCHEME FOR PHAYENG

Annexure – 1/Q (V)

ABSTRACT COST

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Slow Sand Filter)

S/No	Sub Heads/Items of work	Quantity	Rate	Unit	Amount in Rs.	Remarks
1	E/W in excavation in foundation trenches or drain including dressing of sides and ramming of bottom depth upto 1.5 m i/c getting out of excavated soil and disposel of surplus soil as directed within a lead of 50m a) H/Dense soil	198.36	100.10	m^3	19,855.84	MSR' 13
2	P/L Cement concrete in foundation and plinth excluding the cost of centering and shuttering in b) 1:3:6 (1cem : 3 coarse sand: 6stone aggt. 20mm nominal size)	21.15	4672.90	m^3	98,831.84	MSR' 13
3	Reinforcement in RCC work including bending and binding and placing in position complete a) Tor Steel	6586.34	89.10	Kgs	5,86,842.89	MSR' 13
4	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain concrete in (b) Vertical surface such as walls (any thickness) partition & the like i/c attached pilasters, buttresses,plinth & string courses & the like.	294.4	333.00	m^3	98,035.20	MSR' 13
5	RCC work in foundation footings, bases of column etc. & mass concrete i/c the cost of centering, shuttering and reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	32.97	7004.80	m^3	2,30,948.26	MSR' 13
6	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement : 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	41.95	7048.10	m^3	2,95,667.80	MSR' 13
7	Providing & laying filter media for slow sand filter	100	5580.75	Sqm	5,58,075.00	App. Rate
					18,88,256.82	
			Add 20% cost index		3,77,651.36	
					Rs 22,65,908.18	

Say Rs 22,65,908/-

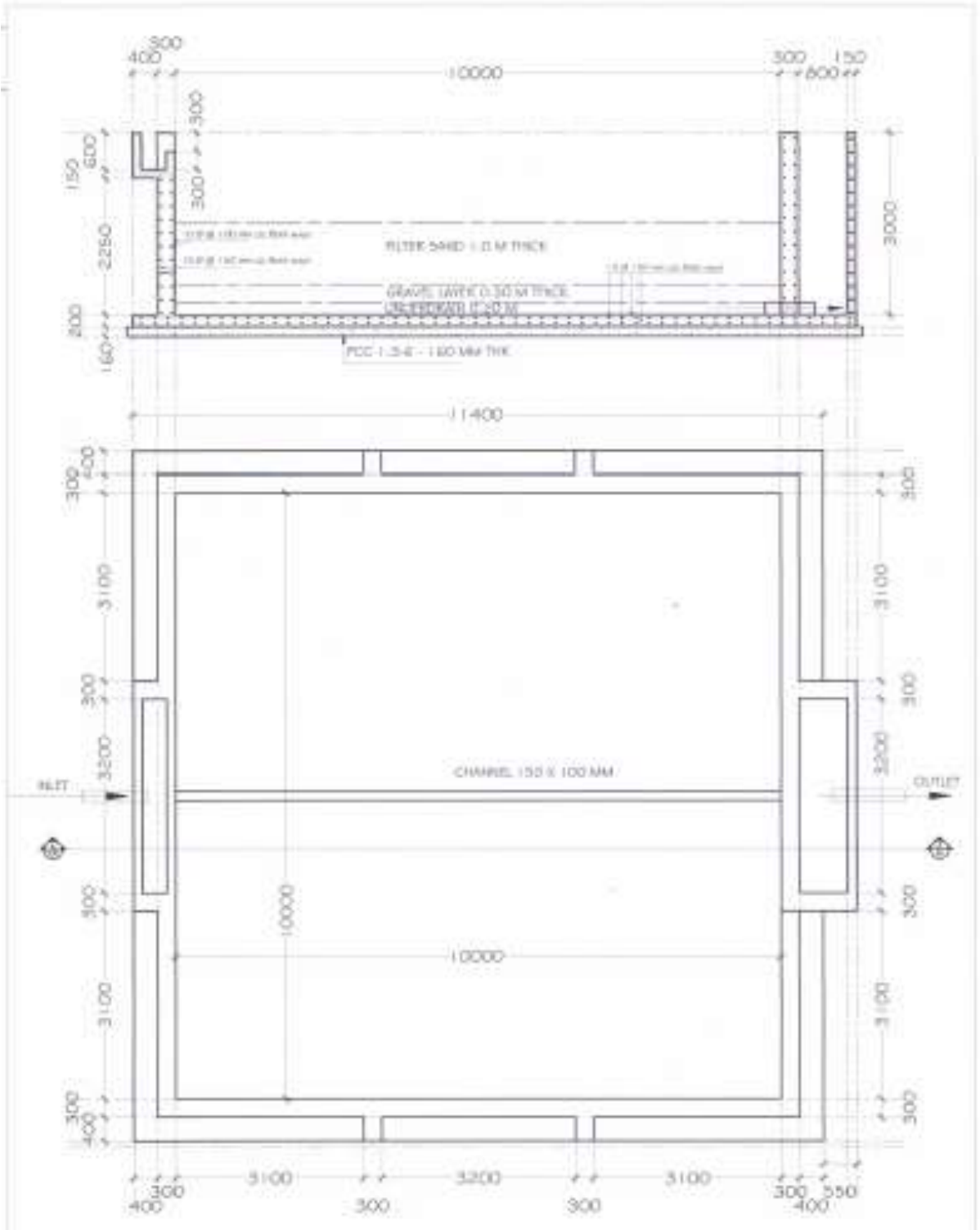
(Rupees twenty two lakhs sixtyfive thousand nine hundred & eight) only

DETAILS OF MEASUREMENT

Name of work :- Water Supply scheme for Phayeng(Sh:-Construction of Slow Sand Filter)

S/No	Sub Heads/Items of work			No.	L	B	H	Quantity
1	E/W in excavation in foundation trenches or drain including dressing of sides and ramming of bottom depth upto 1.5 m i/c getting out of excavated soil and disposal of surplus soil as directed within a lead of 50m a) H/Dense soil			1	11.40	11.40	1.50	194.94
				1	3.80	0.60	1.50	3.42
								198.36 Cum
2	P/L Cement concrete in foundation and plinth excluding the cost of centering and shuttering in b) 1:3:6 (1cem : 3 coarse sand; 6stone aggt. 20mm nominal size)			1	11.40	11.40	0.16	20.79
				1	3.80	0.60	0.16	0.36
								21.15 Cum
3	Reinforcement in RCC work including bending and binding and placing in position complete							
	a) Tor Steel	10mm dia	Base	4	75	11.40	0.62	2,120.40
				2	4	4.00	0.62	19.84
				2	25	0.80	0.62	24.80
			Wall Vert.	8	100	3.50	0.62	1,736.00
			Wall Horiz.	2	30	45.00	0.62	1,674.00
			Outlet	4	26	3.80	0.62	245.02
		16mm dia	C/F	8	6	3.50	1.58	265.44
		8mm dia	Column	8	30	2.00	0.39	187.20
								6,272.70
						Add 5% wastage		313.64
								6586.34 Kg
4	P/F work i/c centering & shuttering so as to give a rought finish strutting, propping & centering below supporting floor to ceiling not e/c 4mm and removal of the same for insitu RC and plain concrete in (b) Vertical surface such as walls (any thickness) partition & the like i/c attached pilesters, buttresses,plinth & string courses & the like.			4	10.00	3.00		120.00
				2	8	0.4	3.00	19.20
				4	10.60	3.00		127.20
				2	4.00	3.00		24.00
				2	1.60	0.80		2.56
				1	3.60	0.40		1.44
								294.40 Sqm

S/No	Sub Heads/Items of work	No.	L	B	H	Quantity
5	RCC work in foundation footings, bases of column etc. & mass concrete i/c the cost of centering, shuttering and reinforcement in a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt.	1	11.40	11.40	0.25	32.49
		1	4.00	0.80	0.15	0.48
						32.97 Cm
6	RCC works in walls (any thickness) i/c attached plaster, buttresses plinth and string courses fillets etc upto floor two level including finishing and plastering the exposed surface with c.m 1:3 (1 cement ; 3 fine sand) of thickness not exceeding 6mm to give a smooth and even surface but excluding the cost of centering, shuttering and reinforcement a) 1:1.5:3 (1 cement : 1.5 c/sand : 3 stone aggrt. 20mm nominal guage).	2	10.60	3.00	4.00	4.00
		2	10.00	3.00	0.30	3.00
		1	4.00	3.00	0.15	1.80
		8	0.40	3.00	0.30	2.88
		1	1.60	0.80	0.15	0.19
						41.95 Cum
7	Providing & laying filter media for slow sand filter	1	10.00	10.00		**100.00 Sqm**



all dimensions are in millimeters

PLAN AND SECTIONAL ELEVATION OF SLOW SAND FILTER

WATER SUPPLY SCHEME FOR PHAYENG

Annexure – 1/Q (VI)

ABSTRACT OF COST

Name of work : - Water Supply scheme for Phayeng (Sh: :- Providing & Laying G.I. Raw & Distribution pipeline)

Sl. No.	sub-Head / Items of Work	Qnty	Rate (Rs.)	Unit	Amount	Remarks
1	Providing & fixing GI Pipes complete with GI fittings i/c trenching & refilling etc. (external work)					
	i. 80 mm dia	1600	1,080.90	Rm	1,729,440.00	MSR'13
	ii. 50 mm dia	3800	694.30	Rm	2,638,340.00	MSR'13
	iii. 32 mm dia	3354	525.50	Rm	1,762,527.00	MSR'13
	Sub Total			Rs.	6,130,307.00	
	Add 20 % cost index			Rs.	1,226,061.40	
	Total			**Rs.**	**7,356,368.40**	

DETAILS OF MEASUREMENT

Name of work :- Water Supply scheme for Phayeng (Sh: :- Providing & Laying G.I. Raw & Distribution pipeline)

Sl. No.	Items of work	Qnty
1	Providing & fixing GI pipe	
	i. 80 mm dia	1600 Rm
	ii. 50 mm dia	3800 Rm
	iii. 32 mm dia	3354 Rm

Annexure – 1/Q (VII)

ABSTRACT OF COST

Budget estimate for the solar pump

Cost component	**No of unit**	**Unit Cost**	**Total cost**	**Reference**
Cost of Panel	3 number of 6000 Wp unit	Rs 60/Wp	10,80,000.00	Per unit cost and panel capacity reference from http://www.agricoop.nic.in/imagedefault/Nrm/SolarPumpsetModel.pdf
Cost of Controller		36000	89,701.00	
Total additional cost			9,90,299.00	

Annexure – 1/R

Budget for Project / Programme Execution Cost

Sl. No.	Particulrs	Year -1	Year- 2	Year-3
1	Preparation of DPR	1,000,000.00		
2	Monitoring Weather Data	1,000,000.00		
3	Achieving of data information (Server cost)	500,000.00		
4	Toposheet, satellite image , cadestral sheet	500,000.00		
5	Books, Software and Periodicals	20,000.00	20,000.00	15,000.00
6	Laptop (3numbers, server), projector , camera , GPS system	500,000.00		
7	Manpower cost : 2 JRF at PMU @ 30,000/person/month	720,000.00	720,000.00	720,000.00
8	Trainning of staff	500,000.00	500,000.00	500,000.00
9	Printing cost (Quaterly report) & stationary cost	15,000.00	15,000.00	15,000.00
10	Other costs/Contingency costs like honorarium to the local experts for documentation, consultancy charge, preparation of sectoral document, thematic research activities, etc.	200,000.00	200,000.00	200,000.00
11	Travel including field works	140,000.00	150,000.00	150,000.00
12	Periodic monitoring and evaluation		100,000.00	100,000.00
13	Office Overhead of the weather station, staff transport and other cost	100,000.00	100,000.00	100,000.00
	Sub Total	***5,195,000.00***	***1,805,000.00***	***1,800,000.00***
	Grand total			**8,800,000.00**

Annexure – 2

Table 4.2 : Disbursement Schedule

Sl No	Project component	Physical Unit	Unit Financial Cost	Itemised funding	Total Funding Rs Crore	FY 1			FY 2			FY 3		
						Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ment 2
1	**Sustainable management of land-water and forest**				**2.07**									
1.1	Introduction of forest mangement practice													
	Catchment Area Treatment - Artificial Regeneration (nursery raising)	50 ha	Rs 13520/ha	676000		25 ha	169000	169000	25 ha	169000	169000			
	Catchment Area Treatment - Artificial Regeneration - Creation	50 ha	Rs 19670 / ha	983500		25 ha	245875	245875	25 ha	245875	245875			
1.2	Command area Development	500 ha	Rs 38040 /ha	19020000		200 ha	3804000	3804000	200 ha	3804000	3804000	100 ha	1902000	1902000
2	**Structural measures to climate proof the canal irrigation and enhanced command**				**0.93**									
2.1	Construction of Masonry Dam of 15m span	2 Nos	Rs 1151407 / masonry dam	2302814		2 Nos	1381688	921126						
2.2.	Construction of Boulder Sausage Dam of 20m span	2 Nos	Rs 145495 / boulder sausage dam	290990		2 Nos	174594	116396						
2.3	Random Rubble masonry	800 metre	Rs 7112/ metre of rubble masonry	5689548		800 metre	3413729	2275819						
2.4	Stone pitching	600 metre	Rs 1711/metre of stone pitching	1026348		600 metre	615809	410539						
3	**Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)**				**0.56**									
3.1	Introduction of horticulture speices (pilot)	20 ha	Rs 73325 /ha	1466500		20 ha	733250	733250						
3.2	Training / Orientation of target farmers on climate resilient agriculture / horticulture;	500 farmers	Tentative	500000					500 farmers	250000	250000			

Sl No	Project component	Physical Unit	Unit Financial Cost	Itemised funding	Total Funding Rs Crore	FY 1			FY 2			FY 3		
						Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ment 2
3.3	Organising dissemination workshops on project learnings	10 workshop	Tentative	500000					10 workshop	250000	250000			
3.4	Introduction of medicinal plant speices (pilot - CITRONELLA (Cymbopogon winterianus))	50 ha	Rs 51750/ ha	2587500		50 ha	1293750	1293750						
3.5	Capacity building of the marginal farmers and forest infringe community		Tentative	500000						250000	250000			
4	**Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.**				**0.62**									
4.1	Setting up of Soil testing and soil-moisture management unit			2223200			2223200							
4.2	Micro-nutrient application as per soil test findings for specific crop types; application of lime and application of plant protection chemical and bio agents	428	1500	642000		214		321000	214	321000				
4.3	Nutrition Management Plan for each crop in project locations;			200000			200000							
4.4	Pest Management Plan for each crop in project locations			200000			200000							
4.5	Assessment of feasibility of inter-cropping / mixed cropping and its promotion; and Introduction of climate adaptive cropping system as per the assessment findings;			300000				300000						
4.7	Modern piggery	30 numbers	Rs 88300/ piggery	2649000		20 numbers	883000	883000	10 numbers	441500	441500			
5	**Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)**			**5000000**	**0.50**		2500000	2500000						
6	Renewable energy integration in village				**1.A.1.1.**									

Sl No	Project component	Physical Unit	Unit Financial Cost	Itemised funding	Total Funding Rs Crore	FY 1			FY 2			FY 3		
						Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ament 2	Annual Milestone	Inatall-ment 1	Install-ment 2
6.1	Introduction of Street light	600 Nos @ 10800	Rs 10800 / street light net of subsidy	6480000		300	1620000	1620000	200	1080000	1080000	100	540000	540000
6.2	Construction of biogas	350 numbers	Rs 7000 / biogas net of subsidy	2450000		150	525000	525000	100	350000	350000	100	350000	350000
6.3	Dissimination of improved cook stoves	250 number		300000		100	75000	75000	100	75000	75000			
7	Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood			5000000	**1.A.1.1.**		2500000	2500000						
8	**Development of an eco-resort in 10 ha community land for yoga and natural living**				**2.70**									
8.1	Development of Ecoresort	1 no		2000000			1000000	1000000						
8.2	Setting up and operation of Weather station			8700000			4350000	4350000						
8.3	Development of water treatment unit			16570000						4142500	4142500		4142500	4142500
9	Project/Programme Execution cost				**1.A.1.1.**		1100000	1100000		1100000	1100000		1100000	1100000
	Total Project/Programme Cost				**9.71**									
10	Project/Programme Cycle Management Fee charged by the Implementing Entity/NABARD				**1.A.1.1.**									
	Total				**10.00**									

Appendix

Appendix - 1

RESULT FRAMEWORK

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
Component 1: Sustainable management of land-water and forest through an eco-system approach					
Outcome 1: Improved capacity of forest dependant community in the village to address soil degradation, biodiversity conservation and stream vulnerability.	Scientific treatment measures and operational for the upstream is prepared	The current hill stream is only surviving stream and is straying; it is highly vulnerable	By the end of the project the planning process would have reflected vulnerability based targeting	Interviews and PRA reports	The district level bio-physical data availability
Output 1.1 Treatment and conservation activities in the upstream of village Phayem 1.1.1 Participatory research management plan 1.1.2 Treatment operational manual 1.1.3 Upstream treatment	Resource user groups develop a participatory resource management plan			Community Vulnerability report Operational manual Treatment schedule	Sensitization of the departmental staff to develop operational manual taking into future climate scenario and community level assessment

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
Component 2: Structural measures to climate proof the canal irrigation and enhanced command					
Outcome 2: Enhanced food security for the community	80% of marginal and small vulnerable to climate variability in terms of availability of food during the year	Cropping practices adopted are sensitive to monsoon variability and yield loss. Number of targeted small scale farmers (cooperating farmers) that are cultivating only one crop due to un-availability of residual moistures and heavily dependant on forest	By the end of the programme at least 75% of the targeted beneficiaries would have grown more than one crop due to enhanced command and have less dependency on the forest	Field verification, monitoring report	Sensitization of the departmental staff to take up structural measures based on future climate scenario Timely input for additional crops Support of extension machinery
Output 2.1 Enhanced irrigation command 2.1.1 Climate proofed design 2.1.2 Technical sanction 2.1.3. Linkages with MNREGA 2.1.4 Formation of user group	Structural measures of climate proofing the canal & stream implemented and command area increased		Better moisture regime at the lower ends of the command area, command area increased	Hydrological investigation Monitoring report	Sensitization of line departments
Output 2.2 Enhanced crop production due to availability of adequate moisture	Yield per ha increased		Crop plan for the block reflects additional crop and results	District agricultural plan	Timely inputs

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
Component 3: **Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead)**					
Outcome 3*: Increased ecosystem resilience in response to climate change and variability-induced stress and resilient livelihood*	About 20 no of endangered species (saplings) are planted by HH around homestead and forest				
Output 3.1 households planted saplings around homestead and forest of the selected species 3.1.1 Bio-diversity register preparation 3.1.2 Scientific propagation and preservation protocol defined in association with technical agency, institutions and pharma companies 3.1.3 Use-wise crop calendar 3.1.3 Horticultural plan		Low species diversity	Bio-diversity would have enriched with the survival and propagation of some of the endangered species and specials with medicinal aromatic value	Village Bio-diversity register Monitoring report	Complicated domestication process Non adherence to the protocol
Output 3.2 Common interest groups are formed and village committee linkages established with Pharma companies 3.2.1 the standard agreement and engagement process developed with pharma companies 3.2.2 sustainable harvest framework and safeguard document prepared 3.2.3 Involvement of traditional knowledge providers for diseases prevention and control	at least 3 - 4 nos. of CIG sign agreement with companies after getting trained	Unscientific planting or no planting	about 15-20 nos of endangered species abundance is visible	Manuals Training Material Transaction Record	Exploitative pricing Unsustainable practices by itinerant traders

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
Component 4: Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.					
Outcome 4: Small and marginal farmers, with the support of local authorities, enhance their knowledge to diversify and strengthen their livelihoods and sources of income in targeted areas	50 nos of farmers trained on best practices in SRI, IPM/INM and scientific piggery	No systematic evidence of adoption of modern practices of climate smart farming. Conventional method of pig rearing		Training manual Audio-Visuals Monitoring report	
Output 4.1 Capacity building programme on climate smart approaches in agriculture and allied activities	4 no of programmes annual covering 50 no of participants from among different kinds of stakeholders	No such training module existed	Yr 1 x 4 of programmes Yr 2 4 no of programmes Yr 3 4 no of programes Yr 4 refresher Yr 5 consolidation	Crop stats Animal mortality Disease burdn (water borne)	Resistance to adoption Poor extension
Output 4.2 Policy briefs and knowledge products, videos produced capturing the lesson	Some possible policy briefs produced, AV documentation				
Component 5: Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)					
Outcome 5: Strengthened awareness of the households and ownership of adaptation and	60 % covered (increase) under weather insurance	Existing coverage under financial	60 % coverage with annual	Database Monitoring	Claim settlement failure

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
climate risk reduction processes at local level	and financial inclusion programmes	inclusion and weather insurance in the districts	increment	report	
Output 5.1 Coverage of targeted beneficiaries in financial inclusion programme			100 % coverage with annual increment	Database Monitoring report	High premium, delayed procedure in claim settlement
Output 5.2 Coverage of targeted beneficiary under micro insurance programme (weather, health, livestock)			100 % coverage with annual increment	Database Monitoring report	
Component 6 : Renewable energy (solar) street lighting integration in village					
Outcome 6: Reduction of fossil fuel and with mitigation co-benefit	Solar street lighting system introduced and some pilot scale HH level bio-gasifiers introduced	No functional streetlight or bio-gas system in the village	At least the main village street has functional solar street light	Monitoring report	Poor irradiation and maintenance problem
Output 6.1 Village main street and eco-resort fitted with solar lights					
Output 6.2 pilot households use 1-2 m3 bio-gasifier units for cooking and water heating					
Component 7: Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood					
Outcome 7: Strengthened knowledge, norms and practices to better adapt to climate in the					

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
ecosystem with conservation of bio-diversity					
Output 7.1 Resource centre master plan 7.1.1 co-development of design 7.1.2 vetting	Local Conservation unit developed, with requisite infrastructure				
Output 7.2 Community Resource persons mobilisation 7.2.1 selection criteria 7.2.2 ToT	Local communities exchange resource use information and methods				
Output 7.3 material and processes , toolkits m av-vi documentation 7.3.1 concept plan 7.3.2 tool kit preparation 7.3.2 audio-visual documentation (local language and English sub-title)	Models, Methods, Programme audio-visual materials on the values and threats to the area developed	No such model exists in the target village	Fully functional eco-village resource centre	Documentation Policy brief Monitoring Report Carbon positive tag	Migration, conflict
C8. Development of an eco-resort in 10 ha community land for yoga and natural living					
Outcome 8: Multi-sectoral benefits with livelihood diversification achieved through					

Outcome/Output	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
responsible nature tourism					
Output 8.1 Eco-village plan and sustainable design developed and enlisted in network	250 no of footfall observed per month	No eco-village or carbon positive tag	It will get requisite certification	Documentation Report	Timely vetting of design
Output 8.2 Transaction process for eco-resort in PPCP mode with safeguard checklist	Resort developed in a PPCP mode	No such evidence exists	Private operator signs agreement with Village Committee	Agreement	Rights and obligation under the contract Timely payment of VGF
Output 8.3 Nature tourism and yoga calendar for Phayeng	Programme on yoga and natural living advertised with strict environmental and conservation guidelines for the tourists/operators	No such programme	At least 3 programmes per year	Programme brochure Monitoring report A-V documentation	Poor response Local conflict Law and order
Output 8.4 Programs on yoga and natural lining and conservation organised	At least 3 programmes and with 100 foot fall/day				

Appendix - 2

LIST OF OBSERVATIONS TO BE CLARIFIED BY EXECUTING ENTITY ON PROPOSAL UNDER NAFCC

Project: Model Carbon Positive Eco-village in Phayeng of Manipur

Sl. No.	Observations made by NABARD	Clarification / Justification made by the Directorate of Environment
1	1200 no of households planted saplings around homestead and forest of the selected species but no. of household as per the report on demography of the village is 660.	660 Nos. Of house hold is reported at the Census 2011, whereas as per records of the local community based institutes like Singlup, total household is recorded as 1200 nos. as on August 2015. Besides of that, Census Report 2011 was for assessment of 2001 -2010 and reported at 2011, therefore, population projection as per increasing trends has to be done for the project period i.e. January 2016 – December 2019.
2	Budget provided in table 1.4 on various activities is not matching with Details of Budget & Work Component in page 60.	Corrected in Table 1.4
3	Farmers trained on best practices in SRI, IPM/INM and scientific piggery in row no. 4 of table 1.4 is 500 but Total no. of cultivator as per *Socio-economic and demographic context* is 494.	Main cultivator is 490 , and over and above there are 128 numbers of Agricultural labour (Census 2011), proposing is 500 by making round figure for easy to estimation and monitoring
4	Target set for Capacity building and Institutional Development (micro-finance, micro-insurance, skill development) is 500 households where as total household in the village is 660 as per the report on demography of the village and household selected for various activities is 1200 in the DPR. This variation may	Since the nature of the project is a model, target group for some important activities like institutional development (micro-finance, micro-insurance, skill development)

Sl. No.	Observations made by NABARD		Clarification / Justification made by the Directorate of Environment
	be corrected or may be justified.		has to be selective groups based on their existing knowledge & capabilities.
5	Under Sustainable management of land-water and forest, 46 ha of (nursery rising) is proposed for creation of only 18 ha of Artificial Regeneration – Creation.		Nursery rising has to be always in large scale with provisions of replacements, for other alternate sites, etc. Creation is only transplantation from nursery. The proposed 18 ha for creation is only for the totally hazard zones of the forest, as per budget available.
6	Under Structural measures to climate proof the canal irrigation and enhanced command:		
	a.	Construction of Masonry Dam of 15m span- unit cost indicated mismatch with the provided abstract of cost.	Corrected and replaced
	b	Command area to be irrigated by the proposed 4 dams may be indicated.	Total targeted command area is 500 Ha CCA
	c	Stone pitching - unit cost not enclosed.	At Annexure 1/F, page No. 85
	d	De-siltation and convectional treatment of raw water for drinking: unit cost not enclosed and technical specification not indicated.	Enclosed as **Annexure – 1/Q** (page 145-177)
	e	Repeated / Duplicate Project Component-1. (C2.3). De-siltation and convectional treatment of raw water for drinking. And 2. (C8.2) Development of Water Treatment Unit. Also include the appropriate Unit cost.	No any duplicate activities
7	Integrated mountain farming and use-wise practice introducing horticultural species (including aromatic and medicinal plants in the homestead):		
	a	Introduction of horticulture species (pilot) - unit cost not enclosed and type of specific horticulture species not specified in any part of DPR.	Indicated unit cost in the budget summary table at Chapter 4
	b	Training / Orientation of target farmers on climate resilient agriculture / horticulture – details breakup	Only tentative budget is proposing however will produce

Sl. No.	Observations made by NABARD			Clarification / Justification made by the Directorate of Environment
		may be provided in support of the cost.		prior to expenditure sanction
	c	Organising dissemination workshops on project learning's at State level– details breakup may be provided in support of the cost.		Now, proposing as tentative budget. During the technical sanction & expenditure sanction for fund release, detail budget will produce within that provision as per ground reality of the period.
	d	Introduction of medicinal plant species (pilot) - unit cost not enclosed.		Already enclosed at Abstract Cost Table for Nursery creation
	e	Capacity building of the marginal farmers and forest infringe community– details breakup may be provided in support of the cost.		Now, proposed as tentative budget. During the technical sanction & expenditure sanction for fund release, detail budget will produce within that provision as per ground reality of the period.
8	Sustainable agriculture and allied activities like introduction of SRI, integrated pest and nutrient management, scientific piggery, etc.			
	a.	Unit cost of the following Project component not enclosed:		
		i.	Soil testing and soil-moisture management system.	Unit cost is Rs. 3,750/- per Ha
		ii.	Micro-nutrient application as per soil test findings for specific crop types	Unit cost is Rs. 70,000/- per Ha
		iii.	Nutrition Management Plan for each crop in project locations	Unit cost is Rs. 3500/-per Ha
		iv.	Pest Management Plan for each crop in project locations	Unit cost is Rs. 4,000/- per Ha
		v.	Introduction of climate adaptive cropping system as per the assessment findings	Unit cost is Rs. 18,000/- per Ha
		vi.	Assessment of feasibility of inter-cropping / mixed cropping and its promotion	Unit cost is Rs. 6,250/- per Ha
		vii.	Modern piggery	Unit cost is Rs. 25,000/- per numbers
	b.	Climate Adaptive Cropping System - activities to		Will take care in the outcomes

Sl. No.	Observations made by NABARD			Clarification / Justification made by the Directorate of Environment
		be undertaken not specified in the DPR		
9	Capacity building and Institutional Development (micro-finance, micro-insurance, skill development)			
	a	Unit Cost not provided:		
		i	Introduction of Street light	Already included in the budget tale at Chapter 4
		ii	Construction of biogas plant/structures	Already included in the budget tale at Chapter 4
		iii	Dissemination of improved cook stoves	Already included in the budget tale at Chapter 4
		iv	Development of a village knowledge centre for indigenous conservation practices and using eco-system for sustainable livelihood	This is tentative budget and expenditure sanction will be made against the detailed budget requirement
10	Development of an eco-resort in 10 ha community land for yoga and natural living			
	a	Development of Eco-resort- unit cost not enclosed		Enclosed at **Annexure –1/O** page 107-144
	b	Please include adaptation logic of this eco-resort		Page 41-42
11	Project/Programme Execution cost (including formulation cost of Rs. 10 lakh) amounting to Rs.1.8 Cr need to elaborated.			Enclosed at **Annexure – 1/R,** page 179
12	The Executing Entity may submit an implementation plans (activity wise) for half yearly interval			Enclosed at **Annexure – 2,** page 181-184
13	Fund Release Schedule as per implementation plan for half yearly interval			Enclosed at **Annexure – 2,** page 181-184
	The Executing Entity may mention the details of project coordinator and field level technical as per the NAFCC guideline. (NAFCC Guidelines Para 8.v)			

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All the Unit cost should be as per approved State Govt norms and may be counter verified by the concerned Department

Appendix – 3

Model Carbon Positive Eco-village in Phayeng
Scrutiny and Appraisal Note made by NABARD on the 17th October 2015

The state of Manipur is part of the vulnerable Himalayan Ecosystem and inhabitants have high natural resource dependency. The state is rich is biodiversity and has unique ecology. As per the estimates, the state has witnessed increase in temperature (both maximum and minimum) and annual rainfall has been erratic. In INCCA's report, the climate change impacts and vulnerability in Manipur have been highlighted over 4 sectors viz water resources, forests, health and agriculture and allied sectors.

The project is submitted by Directorate of Environment, Govt of Manipur and is having outlay of Rs. 10.0 crore. The proposed project is proposed to be implemented in on a pilot scale in Phayeng village situated in Imphal West, near foothill of Kangchup hill ranges at a distance of 14 km from the Imphal city. The project documents is well prepared and includes good presentation on map of the area, details on various cost parameters etc. However, we wish to seek following clarifications and additional details with regard to the proposal for consideration under NAFCC.

1. Project background

a. Background and Context (page 13 to 22)

1. *The exposure parameters indicated under 1.2 (page 20) are mainly socio-economic parameters under climate change projects we need to focus on climate change exposure such as temperature and rainfall changes being experienced in the given area and projected for mid-term scenario (2030 or 2050).*

   Incorporated some of the climate change exposure at section 1.2 (page 22). Major exposure of climate change in the state are increasing of night & day temperature, increasing of weather events like erratic rainfall, high rainfall intensity, decrease of rainy days, etc., degradation of forests, depletion of wetlands/streams, depletion of endangered flora and fauna native to the village, rapid urbanization and potential land use change. Moreover, the Page

27-31 of the report is entirely based on exposure parameters (precipitation and temperature under current and future scenarios).

2. *The vulnerability context is well attempted however, the proposed objectives need to be directly linked to climate change stress being faced by the community and agriculture production system. Please identify specific impact of climate change on sectors (agriculture - crops, livestock, etc.; water – decreased availability; livelihood – impact due to climate change, etc.) the interventions proposed need to be linked to address these stress factors.*

The key vulnerability is the eco-system risk. Fig. 2 and 3 at page 16 & 17 of the report is based on satellite data which is clearly showing only one surviving stream. One part depletion and other part greenery is showing divergent conservation. There are about 1500 ha of non irrigated agri land in the village. Since there is no any irrigation facility, they are practicing only mono-cropping in a year. If once such model for integrated approach like carbon positive eco-model village is being introduced by facilitating proper irrigation facilities, rain water harvesting practices, modernization of agriculture with new techniques with changing of cropping pattern, etc. the villager will improve their livelihood along with conservation of the eco-system. The proposed widening of the water body and earthen dam will help in better recharge and enhance climate resilience with improvement of livelihood. They can 2-3 different types of seasonal crops besides on paddy (discussed in the report). Moreover, the same may be replicated at many vulnerable places as clearly focused in the Manipur State Action Plan on Climate Change report. The proposed **model village** is to be **carbon positive** village which requires all that it takes SRI, methane management, creation of carbon sink, discourage critical ground water depletion through pumping, solar street lights, etc. all in an eco-system adaptation approach.

Sl. No.	**Proposed Project Objective**	**Existing/Projected climate Stress**	**How proposed project will address the existing stress?**
1	Protect the forest and natural streams near the village to reduce the	Variability of precipitation level and projected increase in annual average temperature	Protection/ conservation of forest including promotion of artificial and/or natural regeneration of the forest will improve the

	climate variability	are likely impact crop yield and increased incidence of pest and diseases Streams in the proposed village are drying out reflecting the groundwater/ aquifer stress. This might impact the agriculture which is totally rain fed and dependent upon the water in the stream.	microclimatic condition and maintain the temperature and humidity locally. Increased plantation will prevent soil degradation / erosion in case of projected increased runoff; enhance water retention and additional ground water recharge.
2	To undertake structural measures to widen the canal for enhancing the command area	Streams in the proposed village are drying out reflecting the groundwater/ aquifer stress. This might impact the agriculture which is totally rain fed and dependent upon the water in the stream. Increased runoff due to projected increase in the precipitation quantum and extremes concentrated in fewer numbers of days.	Undertaking of structural measures will regulate water flow and water quality of the stream. The creation of structural measures including widening of canal and construction of water retention structure will help in storing of water which can be used for the purpose of irrigation including increase of the existing command area. The structural measures will also prevent soil erosion and stabilization in case of increased runoff. The conservation of stream will reduce the water stress and improve hygiene. The stream acts as lifeline/ source of drinking water for human and livestock population of the village.
3	To diversify livelihood from paddy	The agricultural productivity is likely to be impacted along	Inclusion of horticulture species will enhance the livelihood security of the

	monoculture and introduce horticultural activity in the village and medicinal plants in homestead and forest areas to improve livelihood security	with increased incidence of pest and diseases and increased soil erosion. This is most likely in the projected scenario of increased rainfall and increased annual temperature.	farmer which in turn is less impacted to climate variability as proposed in the region.
4	To introduce scientific piggery, poultry and fishery in the village for enhancing the household income	The agricultural productivity is likely to be impacted along with increased incidence of pest and diseases and increased soil erosion. This is most likely in the projected scenario of increased rainfall and increased annual temperature.	Poultry, piggery and fishery will act as an alternate source of livelihood for the village in case of crop failure. This will also acts for food security in the village. Introduction of modern piggery or fishery will also reduce the likely incidence of water contamination and water borne diseases in case of excess precipitation/ flood scenario.
5	To introduce bio-gas, solar energy in the village to reduce dependence on fossil fuel	Likely hood of climate extremes	The availability of alternate source of energy for lighting and cooking will help in sustaining in case of climate extreme events
6	To develop a traditional knowledge centre on conservation and sustainability to act as a model for peers and large scale dissemination in the state and similar Himalayan states	There has been an observed variability of the weather profile of the region and is likely to be exacerbated under the projected scenarios of climate extreme events.	Improve in the microclimatic condition through forest conservation, addressing water stress through stream restoration and prevention of soil erosion might motivate other villages with evident climate stress to take up similar measure and increase resilience.
7	To have an eco-resort in 10 ha of community land	Existing livelihood interventions are likely to be impacted	The projected infrastructure will act for alternate source of

	for natural living and yoga	under the projected climate extreme events scenario.	livelihood and also prevent urban migration.

3. *Under table 1.4 (page 25) it has been indicated that additional funds would be leveraged under RKVY and PMKSY. It should be made clear whether the allocation for the projects activities indicated as convergence has already been made under RKVY and PMKVY. The project should not suffer to deliver the proposed outcome due to non availability of such funding from other sources.*

   In the table 1.4 (page 23), RKVY plan already takes into account some of the activities mapped as convergent e.g. horticulture, piggery, etc. PMKSY is not yet fully planned but it can be linked from the water sector. The activities wherever it is not part of RKVY cost have been asked for on-farm demonstration (including material and training); therefore it shows some of the cost parameters to be on the higher side. Moreover, the nodal agency i.e. Directorate of Environment has also already earmarked some lump sum amount from the plan money for this project. The same will be its share as convergence in that specific work. There will not be any question on delivering the proposed outcomes due to non availability of fund. It is a novel project and not conventional farm intervention, it has strong elements of activity planning and tracking of adaptation outcome and documentation to get carbon positive tag and therefore, it shows some of the cost parameters to be on the higher side.

4. *Since many of the activities are related to agriculture interventions please indicate information on total cropped area, irrigated area, dryland area, crop-wise area under cultivation, this would help in justification of interventions planned. The same may be indicated as part of outline of social and economic status or vulnerability context (page 15 or 16).*

   The total cropland area of the proposed village is estimated about 1500 ha, which are non-irrigated and with mono cropping pattern i.e. 95% of paddy, others 5%, etc. The village totally depends on rain, simply no rain no cultivation. The main cropping system is pre-kharif paddy and kharif paddy, followed by pulses and some fruit crops like pineapple, orange and lemon at less percentage where individual irrigation facilities like ponds, etc. are available. Due to non availability of the

irrigated water facilities, farmers are fully dependent on the rain. Since, farming is seasonal (i.e. rain fed agriculture), most of the farmers have been converted to fish farming, animal husbandry (like piggery, livestock/poultry, etc.). But there is still a need for skill development and modernization of the practices for hygienic and better environment.

The economy of Manipur state is primarily dependent on agriculture and its allied sector. The agriculture sector contributes a major share to the total statedomestic product and provides employment to about 57.04 % of the total workers in Manipur. Agriculture in the state is confined to 10.48% of the total geographical area with 47% of the land in valley districts and 53% of the land in hill districts. The cropping intensity of the state is 149%. Productivity of the state is recorded as Rice: 4358 Kg/ha, Maize: 2158.3 kg/ha (kharif), Pulses: 1100 Kg/ha. Rabi productivity is about half of Kharif productivity. Cabbage, Cauliflower, Peas, Tomatoes, Pine apple, Banana are grown in rabi and are sensitive to moisture. The cultivation of horticulture crops is by and large practiced as non-commercial enterprise by farmers in their homestead and orchard, it hardly helps in development of proper market of horticultural crops. The learning from the project can address some of the issues faced by the state agriculture and eco-system conservation.

2. Project/programme justification (Part II): Component wise justification (page 33 to 39)

i. It is indicated in the proposal that the structural measures to climate proof the canal would benefit a command area of 500 ha. Indicate the cropping pattern in the existing command area and how project would undertake measures to improve the irrigation efficiency. The project does not link the agriculture with the proposed interventions. This aspect is to be clearly delineated in the proposal.

Additional command would not change the cropping system it will only reduce the risk of paddy crop, allow people to take cabbage, cauliflower and tomatoes in Rabi. By developing the proposed canal, it will provide for good rainwater harvesting through the season. Accordingly, not only the extension of additional command, double, even triple, cropping also may occur within that command area with that

canal facilities. Utilization of the existing cropland of the village throughout the years with multiple crops and improvement of the livelihood of the community (those are also conserving the forest) is one of the prime objectives of the project, and also in the State Action on climate Change.

Moreover, since the proposed project is a model for developing of an eco-village i.e. carbon positive, it will be a showcase adaptation project with strong mitigation co-benefit that can be scaled up.

ii. *Development of a health eco- resort in 10 ha community land for yoga and natural living: Under which, the major cost i.e. Rs 1.66 Cr. It requires detail justification, detailing and its feasibility. Alternate options may be explored.*
[please see the comments below in section viii]

iii. *Under interventions C1: sustainable management of land and water: please briefly indicate the proposed interventions and how they would built the climate change resilience.*

Sustainable Land Management

Increased Plantation and conservation of existing and proposed plantation in forest as well as the community land is proposed under the sustainable land-forest management practice. Artificial regeneration will be considered as part of the plantation initiatives.

The sub-activity will include:

viii. Creation of nursery
ix. Raising of seedling in the nursery
x. Preparation of soil for plantation activity
xi. Transportation of seedling and facilitation of plantation
xii. Protection of plantation through timely weeding, creation of fire line and removal of grass at periodic interval
xiii. Construction of watershed
xiv. Engagement of resource person for maintenance and protection

Intervention and climate resilience

Existing /Projected Stress	Intervention	Climate Resilience
Increased temperature and precipitation including extreme events, increased runoff, increase soil erosion and loss of biodiversity Streams are drying up	Increased plantation	• Increase tree cover will reduce the runoff velocity and lower soil erosion during increased precipitation / extremes. The retention of water will also result in ground water recharge. • Increase plantation / tree cover will improve the micro-climatic condition of the region. • Increased ground water recharge and creation of water shed might rejuvenate streams • Conservation /protection initiatives will also result in conservation of biodiversity in the region.

Sustainable Water Management

Protection of stream is proposed under sustainable water management intervention. This will include development of

5. Two boulder sausage dam
6. Two Rubble masonry weirs. Protection wall using rubble masonry is provided along the eastern bank and western bank by stone pitching at the mild slope
7. Irrigation facilities are also provided at the upstream side of the weirs constructed trough outlets

Existing /Projected Stress	Intervention	Climate Resilience
Heavy soil erosion during runoff which are like to	Constriction of dam and	Dam and protection wall will reduce soil erosion and will

exacerbate in the projected increased precipitation scenario	protection wall	provide soil stabilization of the bank during the event of excessive precipitation or increased run off.
Lack of irrigation facilities	Construction of rubble masonry weirs	The construction of masonry weirs will improve the irrigation facility in the command area.
Flood scenario during rainy season and lack of availability of water during dry season	Silt removal	The removal of silt from river bed will help in increased accumulation of water during rainy season and lower the impact in flood scenario. Since the stream acts as main source of drinking water for the village therefore it restoration will improve the supplied water quality.

More details are also at Chapter 4

iv. *Under interventions C3 and C4 various agriculture interventions are planned. It is not clear how many ha of area (and farmers) would be would be involved for the same. It is seen that, under C3 interventions (mountain farming) on page 25 it is indicated that 1200 no of households planted saplings around homestead and forest of the selected species whereas under page 53 it is indicated that 660 no of households planted saplings around homestead and forest of the selected species. Please indicated clearly how many households/ area would be involved in the various interventions proposed.*

There should be 1200 No. of households involved in plant saplings around homestead and forests of some selected species.

v. *Under interventions C3: integrated mountain farming: please indicate the market linkage for the proposed horticulture produce. Also indicate selection criteria for the beneficiaries and how the vulnerable community would be represented in the same.*

The farmer producer organizations will prepare the detailed business plan assisted by the technical support agency. There will be intermediaries supplying to organized retailers like Reliance, pantaloons and also Ayurvedic companies like Dabur. This has been detailed out.

Beneficiaries will be selected based on social mapping and the most vulnerable ones to be given direct linkage (input and training) from the project. Approach is total saturation of the village, only quantum of assistance will be retained by the community.

vi. *Under intervention C4: Sustainable agriculture and allied activities like introduction of SRI, Integrated Pest and nutrient management, scientific piggery: Costs proposed on a very much on a higher side and justification is to be provided. For example, per ha cost for Micro nutrient application works out Rs 70000 per ha. Some of the components are overlapping, for e.g. Introduction of climate adaptive cropping system as per the assessment findings and assessment of feasibility of inter-cropping/mixed cropping and its promotion both can be combined.*

The budget under micro nutrient management is revised and includes two phase

1. Soil protection management @ 1500/ ha (as per approved rates of NFSM)
2. Procurement of 1 set of machineries of total costing Rs 2,76,00. The total budget is revised accordingly. The detailed budget of machinery as per NFSM is provided.

vii. *Construction of bio gas: it is proposed to 350 numbers would be constructed. Pl justify the number with technical inputs (availability of raw materials etc.)*

Gas production per kg of cow dung is 0.023-0.04 m^3/kg, with around 9-15 kg of dung per cow. On the basis of PRA it was concluded that each of the household possesson an average three to four numbers of cow per households (as many as 50 household has more than 10 cow) the minimum cumulative biogas potential is between 1.8 m^3/household. On an average with four –six numbers of pigs the biogas potential is in the range of 0.2 -0.22 m^3 , in addition there are human excreta and

kitchen waste that will be dumped in the biogas the $2m^3$ biogas units turns out to be feasible.

The main objective of putting in the biogas unit is managing the animal and human waste, as there is no waste disposal facility / drainage system in palace in the village. This creates problem with hygiene and results in incremental incidence of vector and water borne diseases.

viii. *Development of an eco- resort in 10 ha community land for yoga and natural living: Under which, the major cost i.e. Rs 1.66 Cr. It requires detail justification and its feasibility. Please indicate adaptation logic and how the resort would help in building overall resilience of the community to climate change. The same need to be promoted as eco-tourism services provider. Kindly indicate since the project would be on private –public and community partnership, we need to clearly indicate how the village community would be involved in regular management of the same, how the shelters would be auctioned, how the benefits/ revenue would be shared with the community at large or with panchayats.*

The community is vulnerable because the agriculture and horticulture are getting adversely impacted. The future water source is at risk. The community has (one or two hamlets) undertaken conservation measures and social fencing effectively. This patch of the forest is well protected. However other part of this ecosystem where the stream command is impaired other villagers destroy the forest and depletion can be seen. The idea is to replicate the best practice through an eco-system approach.

The project concept is very well structured so that people would not put pressure on the forest. Therefore, medicinal plant and horticultural activities were conceptualized so that the bio-diversity is preserved and livelihood is diversified.

The place is not very far from Imphal and the tourists do come for trek and that often attracts adverse opinion from courts. The alternatives are two (a) an eco-resort and traditional crafts and herbs in the foothills. Show case the conservation, yoga and ancient martial art traditions as exposition. (b) Youngsters would go out of the village to far off cities and living old and infirm who would largely live on NTFP and gradually the area would either have social strife and other forms of eco-system loss.

Therefore local livelihood and conservation centric livelihood rooted in traditional systems of medicine, yoga and marital arts would build resilience.

ix. *It is seen that the major investment activity under eco-resort intervention is the water treatment plant (Rs.1.65 Crore out of Rs. 1.9 crore proposed) please indicate justification of the same.*

The VGF is about 1.9 crores, the private partner who is selected for eco-village development will quote below 1.65 crore balance amount will be mobiised from the plan schemes for the water treatment plant. This can only be estimated when the PPP structuring is done and the concerned bidders provide the concept plan and after the cost (in their proposal). However, this would be within the limit.

3. Socio Economic and Environmental Benefits (page 41):

Under economic benefits please indicate likely average (minimum) income realization under various agriculture interventions (mountain farming and sustainable agriculture, etc.) cropping pattern proposed under the project for the farmers (per ha or per acre depending on the average land holding).

The yield in agriculture and allied sector is likely to be more than 15%. The income from Rabi crop would be doubled. Paddy with mustard, other seasonal vegetables like, pea, cabbage, tomato,

4. Analysis of the cost effectiveness of the project:

i. Cost effectiveness will have to be demonstrated either by way of working out financial ratios like BC ratio, IRR/ERR or by comparing with the alternative options available.

   The alternative of creating a dam based system for water supply is much higher; so also regeneration of forest.

ii. Justification may also include how the interventions are better than the alternative approach of intensive agriculture or cropping pattern change and addresses socio-economic barriers generally encountered for such interventions.

iii. Large water storage structures are costly alternative as compared to small scale decentralized soil-water conservation cost.

iv. Restoration of streams and eco-system unattended under business-as-usual is prohibitively costly than the proposed investment.

v. It may also be indicated that, how the proposed interventions related to agriculture production would be designed in a cost effective manner and use local inputs / organic input, etc.

vi. (Conversion to 75% field into organic over the project period both for agricultural and horticultural crops). Initially the cost may be higher however over the years it would achieve a premium brand status and command higher price.

5. Sustainability of interventions (page 43): please indicate role of panchayat in the post project sustainability of interventions such as climate / village resource centre and eco-resort in- terms of sustainability of the operations.

The approach is community driven, the panchayat has been recognized as a model panchayat and there is strong ownership of the project.

6. Technical standards (page 48): The same may include additional details on the technology partners who would provide the technologies (responsible department/ institution) and the standards and how they would be part of implementation mechanism.

7 Details on stakeholder consultation including beneficiaries (page 50): Please indicate about outcome of each meeting in terms how the meeting was able to capture views and expectations of vulnerable section of communities. It has now been indicated that the meeting was very fruitful and cooperative.

8. **Learning and knowledge management component to capture and disseminate lessons learned for the proposed project (page 52):** What are the expected learnings from the proposed project, how is to going to be captured and **disseminated** and what is the **mechanism for such dissemination**. Please indicate how the interventions such as eco-tourism services (eco-resort) would be mainstreamed in other areas.

(Given at p37 gives the details however, local resource persons would be the change makers, the audio-visual documentation om indigenous practices and culture,

conservation norms would be documented in local languages and English with technical partner and preserved.)

9. **Environmental & Social Risk Screening (page 53):** below the table on E&S risk screening (page 55) the following details may please be indicated:

1. Please indicate requirement of any regulatory clearances related to construction of masonry dam, boulder dam, etc. whether any of these and other interventions would result in involuntary settlements, land acquisition, displacement of livelihoods, etc. Whether any natural habitats and biodiversity would be affected due to these interventions.
   (not envisaged any resettlement or livelihood loss, resolution passed by the community is the only requirement)

2. How the equity issues related to selection of beneficiaries for various interventions.
   (social mapping and selection to be done by the community, the village already has a reasonable norm)

3. How the marginalized community would be part of the project and the benefits accrued out of the same.
   (social mapping and selection to be done by the community, the village already has a reasonable norm)

4. Please indicate role of women in various intervention, decision making, and representation in various committees under the project.
   (women will involved in the medicinal plant caring, agricultural practices, etc.)
5. Please indicate how the land for eco-resort would be sourced.
   (The proposed land totally belongs to the community)

10 **Implementation arrangements (page 58):**

i. Please given implementation and reporting mechanism under the proposed project and role of each stakeholder. If possible please give organogram for the implementation of the project.
   (Role of stakeholders will be finalized by the State Steering Committee for climate change before it implement)

ii. Since implementation of the project activities involves various departments such as irrigation, PWD, agriculture, environment, renewable energy, panchayat raj, tourism, etc., please indicate how the same would be coordinated for timely and smooth implementation of the interventions including fund flow.

(This is responsibility for the State Steering Committee for climate change, headed by the Chief Secretary)

iii. The details provided under page 39 (C11) i.e. implementation diagram etc., may be shifted under the implementation arrangement.

(Details at page 42)

11 **Financial and project/programme risk management (also include environmental and social risk, if any) (page 59):**

Financial risk is indicated it be at medium level, please indicate the specific risk factors envisaged and mitigation mechanism in terms of implementation arrangement,, monitoring and review mechanism, fund release procedure. If any of the risks indicated above under para 9 above, please give specific mitigation measures.

(There will no any risk)

12 **Result frame work:** The result framework is well presented (page 83). However, please indicate details on the various outcomes for each of the intervention clearly at each sub-activity level indicated under budget notes table. Some of the places the indicators / targets are indicated as "X" please indicate actual number in terms of target. (Integrated)

13. **Budget notes**:

i. Costs for some of the interventions under component 4 (page 66) such as soil testing (Rs. 3750 per ha), micro nutrient application (Rs.70,000 per ha), nutrient planning (Rs. 3500 per ha) pest plan (Rs. 4000 per ha), cropping system (Rs 18000 per ha), assessment of flexibility of inter-cropping / mixed cropping and its promotion (Rs. 18000). Also medicinal plants under component 3 is proposed at Rs.50000/-.

(Revised the budget)

ii. Please indicate the details on cost parameters on piggery unit (in terms no. of animals cost related to other facilities for the unit) which is indicated to be Rs. 25000 per unit.

iii. With regard to cost details on eco-resort it has been indicated that (page 96) it has been indicated that "Detailed abstract and design will submit before National Steering Committee Meeting" please clarify. It is seen that the major investment activity under the same is water treatment plant (Rs.1.65 Crore) please indicate cost justification of the same. Discussed above. It is only during PPP formulation stage the concept plan can be made available. (nowhere it is mentioned that detailed feasibility report of the resort will be given at this stage when even the project is at a conceptual stage; it takes 3-4 months and money to prepare that and the private partner would do that)

iv. The eco-resort is proposing the viability gap funding. [discussed above]

v. Project Management Cost and Administrative costs is on a higher side (page 108). As we understand that the as per GoI norms, Executing Entities are entitled for 10% of the project outlay as Project Management cost and hence the above cost needs rationalization.

vi. It is appreciated that the project aims to use advanced tools for monitoring and evaluation such as Remote Sensing and GIS. Under management cost one of the cost component indicated is GIS software, server, toposheets, remote sensing imageries, etc. please indicate justification of the same under monitoring and evaluation (page 60). Please justify purchase of new licensed software and server cost for the proposed project alone. Please justify cost related to monitoring of weather related data (page 108 sl no. 2 of the table), rational and purpose of the same.

Appendix – 4

Financial, Environmental and social Risk Screening

Risk	Rating (High / Medium / Low, etc.)	Mitigation Measure
Financial management	Medium	The project is multi component activity with defined implementation time frame and the budget allocated for each of the component. Since the implementation of the project is time pressed the completion of the each of the component will depend upon the timely approval and availability of budget on as and when required basis/within limited defined time frame. It is understood that the approval of the budget will be done on phased manner and as against some milestone. This may hamper the implementation of the project and is considered under financial risk regime. The financial risk can be mitigated through creation of corpus fund with the implementing agency and facilitate advance approval of budget rather than approval upon utilization.
Project management	Low	The implementing agency has prior experience of handling and implementing project and will be supplemented by a strong governing body, dedicated PMU with the support of technical partner CTRAN
Social Risk	Low	There may be minor conflict to be moderated through strong community mobilization. It was also planned that participatory approach will be adopted to design the implementation framework with the objective of developing a kind of ownership amongst the community for the project.
Environmental	No	The project is configured with the objective of ensuring environmental sustainability. However before implementation of the infrastructural project an environmental and social impact assessment will be carried out and environmental management plan will be followed if suggested by the project approval committee.

Appendix – 5

Scrutiny and Appraisal Note made by NABARD on the 30th October 2015

Proposal: Model Carbon Positive Eco-village in Phayeng Agency: Directorate of Environment, Govt of Manipur

Outlay: Rs. 10.0 Cr

Sl No	HO Comments	Agency reply (as per scrutiny note provided)	HO Review Comments (30.10.15)
	a. Background and Context (page 13 to 22)		
1	*The exposure parameters indicated under 1.2 (page 20) are mainly socio-economic parameters under climate change projects we need to focus on climate change exposure such as temperature and rainfall changes being experienced in the given area and projected for mid-term scenario (2030 or 2050).*	Incorporated some of the climate change exposure at section 1.2 (page 22). Major exposure of climate change in the state are increasing of night & day temperature, increasing of weather events like erratic rainfall, high rainfall intensity, decrease of rainy days, etc., degradation of forests, depletion of wetlands/streams, depletion of endangered flora and fauna native to the village, rapid urbanization and potential land use change. Moreover, the Page Chapter 2, page 36-39 of the report is entirely based on exposure parameters (precipitation and temperature under current and future scenarios).	Addressed
2	*The vulnerability context is well attempted however, the proposed objectives need to be directly linked to climate change stress being faced by the community and agriculture production system. Please identify specific impact of climate change on sectors (agriculture - crops, livestock, etc.; water – decreased availability; livelihood – impact due to climate change, etc.) the interventions proposed need to be linked to address these stress factors.*	Explanation in the project document at page 21-23. More detail of climate vulnerability has been reported at Chapter 2 (page 36 – 39) of the report. Fig. 2 and 3 at page 22 of the report is based on satellite data which is clearly showing only one surviving stream. (other details provided by the agency under scrutiny note document)	Addressed Please include the explanation in the project document.

3	*Under table 1.4 (page 25) it has been indicated that additional funds would be leveraged under RKVY and PMKSY. It should be made clear whether the allocation for the projects activities indicated as convergence has already been made under RKVY and PMKVY. The project should not suffer to deliver the proposed outcome due to non availability of such funding from other sources.*	The nodal agency i.e. Directorate of Environment has also already earmarked some lump sum amount from the plan money for this project. The same will be its share as convergence in that specific work. There will not be any question on delivering the proposed outcomes due to non availability of fund. It is a novel project and not conventional farm intervention, it has strong elements of activity planning and tracking of adaptation outcome and documentation to get carbon positive tag and therefore, it shows some of the cost parameters to be on the higher side. (Same has been integrated in the report at page 44)	Addressed Please include the explanation in the project document.
4	*Since many of the activities are related to agriculture interventions please indicate information on total cropped area, irrigated area, dryland area, crop-wise area under cultivation, this would help in justification of interventions planned. The same may be indicated as part of outline of social and economic status or vulnerability context (page 15 or 16).*	The total cropland area of the proposed village is estimated about 1500 ha, which are non-irrigated and with mono cropping pattern i.e. 95% of paddy, others 5%, etc. The village totally depends on rain, simply no rain no cultivation. The main cropping system is pre-kharif paddy and kharif paddy, followed by pulses and some fruit crops like pineapple, orange and lemon at less percentage where individual irrigation facilities like ponds, etc. are available…… (Integrated in the report at page 19-20)	Addressed Please include the explanation in the project document.
	Project/programme justification (Part II): Component wise justification (page 35 to 74)		
5	*It is indicated in the proposal that the structural measures to climate proof the canal would benefit a command area of 500 ha. Indicate the cropping pattern in the existing command area and how project would undertake measures to improve the irrigation efficiency. The project does not link the agriculture with the proposed interventions. This aspect is to be clearly delineated in the proposal.*	Additional command would not change the cropping system it will only reduce the risk of paddy crop, allow people to take cabbage, cauliflower and tomatoes in Rabi. By developing the proposed canal, it will provide for good rainwater harvesting through the season. Accordingly, not only the extension of additional command, double, even triple, cropping also may occur within that command area with that canal facilities. Utilization of the existing cropland of the village throughout the years with multiple crops and improvement of the livelihood of the community (those are also conserving the forest) is one of the prime objectives of the project, and also in the State Action on climate Change. Moreover, since the proposed project is a model	Addressed Please include the explanation in the project document.

		for developing of an eco-village i.e. carbon positive, it will be a showcase adaptation project with strong mitigation co-benefit that can be scaled up. (Integrated at page 42 of the report)	
6	*Development of a health eco- resort in 10 ha community land for yoga and natural living: Under which, the major cost i.e. Rs 1.66 Cr. It requires detail justification, detailing and its feasibility. Alternate options may be explored.*	Integrated at C8, page 47-52 (enclosed at Annexure 1/O)	
7	*Under interventions C1: sustainable management of land and water: please briefly indicate the proposed interventions and how they would built the climate change resilience.*	Information provided in Scrutiny note document (Integrated at page 40-41 of the report)	Addressed Please include the explanation in the project document.
8	*Under interventions C3 and C4 various agriculture interventions are planned. It is not clear how many ha of area (and farmers) would be would be involved for the same. It is seen that, under C3 interventions (mountain farming) on page 25 it is indicated that 1200 no of households planted saplings around homestead and forest of the selected species whereas under page 53 it is indicated that 660 no of households planted saplings around homestead and forest of the selected species. Please indicated clearly how many households/ area would be involved in the various interventions proposed.*	There should be 1200 No. of households involved in plant saplings around homestead and forests of some selected species. (Corrected at page 43)	Addressed (please change similarly on page 122)
9	*Under interventions C3: integrated mountain farming: please indicate the*	The farmer producer organizations will prepare the detailed business plan assisted by the technical support agency. There will be	Addressed

	market linkage for the proposed horticulture produce. Also indicate selection criteria for the beneficiaries and how the vulnerable community would be represented in the same.	intermediaries supplying to organized retailers like Reliance, pantaloons and also Ayurvedic companies like Dabur. This has been detailed out. Beneficiaries will be selected based on social mapping and the most vulnerable ones to be given direct linkage (input and training) from the project. Approach is total saturation of the village, only quantum of assistance will be retained by the community. It will be formed within the existing community farmer groups and will support by the project implementation committee by giving capacity building, HRD, skill development, etc. (page 44)	Are there any Common interest group/FPOs already in existence /or they will be formed?
10	*Under intervention C4: Sustainable agriculture and allied activities like introduction of SRI, Integrated Pest and nutrient management, scientific piggery: Costs proposed on a very much on a higher side and justification is to be provided. For example, per ha cost for Micro nutrient application works out Rs 70000 per ha. Some of the components are overlapping, for e.g. Introduction of climate adaptive cropping system as per the assessment findings and assessment of feasibility of inter-cropping/mixed cropping and its promotion both can be combined.*	The budget under micro nutrient management is revised and includes two phase 1. Soil protection management @ 1500/ ha (as per approved rates of NFSM) 2. Procurement of 1 set of machineries of total costing Rs 2,76,00. The total budget is revised accordingly. The detailed budget of machinery as per NFSM is provided. The proposed budget is adapted from NABARD enclosed at Annexure 1/J, page 111 Source : https://www.nabard.org/english/soil_testing2.aspx	Addressed Please include the details under project document. Please include budget for INR 27600/-
11	*Construction of bio gas: it is proposed to 350 numbers would be constructed. Pl justify the number with technical inputs (availability of raw materials etc.)*	Gas production per kg of cow dung is 0.023-0.04 m^3/kg, with around 9-15 kg of dung per cow. On the basis of PRA it was concluded that each of the household possesson an average three to four numbers of cow per households (as many as 50 household has more than 10 cow) the minimum cumulative biogas potential is between 1.8 m^3/household. On an average with four –six numbers of pigs the biogas potential is in the range of 0.2 -0.22 m^3 , in addition there are human excreta and kitchen waste that will be dumped in the biogas	

		the $2m^3$ biogas units turns out to be feasible. (page 46)	
12	*Development of an eco- resort in 10 ha community land for yoga and natural living: Under which, the major cost i.e. Rs 1.66 Cr. It requires detail justification and its feasibility. Please indicate adaptation logic and how the resort would help in building overall resilience of the community to climate change. The same need to be promoted as eco-tourism services provider. Kindly indicate since the project would be on private –public and community partnership, we need to clearly indicate how the village community would be involved in regular management of the same, how the shelters would be auctioned, how the benefits/ revenue would be shared with the community at large or with panchayats.*	The community is vulnerable because the agriculture and horticulture are getting adversely impacted. The future water source is at risk. The community has (one or two hamlet) undertaken conservation measures and social fencing effectively. This patch of the forest is well protected. However other part of this ecosystem where the stream command is impaired other villagers destroy the forest and depletion can be seen. The idea is to replicate the best practice through an eco-system approach. The project concept is very well structured so that people would not put pressure on the forest. Therefore, medicinal plant and horticultural activities were conceptualized so that the bio-diversity is preserved and livelihood is diversified. The place is not very far from Imphal and the tourists do come for trek and that often attracts adverse opinion from courts. The alternatives are two (a) an eco-resort and traditional crafts and herbs in the foothills. Show case the conservation, yoga and ancient martial art traditions as exposition. (b) Youngsters would go out of the village to far off cities and living old and infirm who would largely live on NTFP and gradually the area would either have social strife and other forms of eco-system loss. Therefore local livelihood and conservation centric livelihood rooted in traditional systems of medicine, yoga and marital arts would build resilience. ***Adaptation Co-benefit:*** Offsetting Migration: based on the rapid assessment almost 50-60% of the literate people in the age-group of 16-35 migrate to other cities in addition to marginal workers and people displaced from agriculture. This is estimated to be around 1221 and accounts for 45% of the population (on a increasing trend basis).	Please give the justification as adaptation intervention by furnishing potential employment generation and other co-benefits, potential benefits to stop migration of youth. Please provide component wise cost estimation and time schedule for completion, revenue earning potential. How the viability funding gap has been accessed. It appears that now the cost component has been increased to Rs. 2.73 cr.

		The resort will retain most of the cultivators and a large part of the marginal work force and the household craft workers would double. The in-situ employment thus would be about 959. This would directly and indirectly serving the local and inbound tourists and would account for 35% of the population in the village. On an increasing trend it would offset the migration in 4 years. Likely social unrest and conflict (can not be valued but is a co-benefit; care of the old and infirm who live in the village attended by especially the nonmigratory females also a co-benefit but cant not be valued. The other co-benefit includes value of indigenous knowledge on conservation getting replicated and building resilience ***Mitigation co-benefit*** Solar and methane management co-benefit already makes it carbon positive and that has been given in the report. ***VGF issue*** Based on average spend of 740 USD and 7.9 days spend (data based on north-eastern region) the maximum VGF is fixed at 2.73 crore. The domestic spent suitably adjusted. This may be even lower upon the private bidder being aggressive or conservative in any case it would not exceed this Cap. Now the annual expected revenue is about Rs 72 lakh. (integrated in the project document, page 47-52)	

13	*It is seen that the major investment activity under eco-resort intervention is the water treatment plant (Rs.1.65 Crore out of Rs. 1.9 crore proposed) please indicate justification of the same.*	The VGF is about 1.9 crores, the private partner who is selected for eco-village development will quote below 1.65 crore balance amount will be mobiised from the plan schemes for the water treatment plant. This can only be estimated when the PPP structuring is done and the concerned bidders provide the concept plan and after the cost (in their proposal). However, this would be within the limit.	As above
	Socio Economic and Environmental Benefits (page 41):		
14	*Under economic benefits please indicate likely average (minimum) income realization under various agriculture interventions (mountain farming and sustainable agriculture, etc.) cropping pattern proposed under the project for the farmers (per ha or per acre depending on the average land holding).*	The yield in agriculture and allied sector is likely to be more than 15%. The income from Rabi crop would be doubled. Paddy with mustard, other seasonal vegetables like, pea, cabbage, tomato,	ok
	Analysis of the cost effectiveness of the project:		
15	Cost effectiveness will have to be demonstrated either by way of working out financial ratios like BC ratio, IRR/ERR or by comparing with the alternative options available.	The alternative of creating a dam based system for water supply is much higher; so also regeneration of forest.	ok
16	Justification may also include how the interventions are better than the alternative approach of intensive agriculture or cropping pattern change and addresses socio-economic barriers generally encountered for such interventions.	Large water storage structures are costly alternative as compared to small scale decentralized soil-water conservation cost. Restoration of streams and eco-system unattended under business-as-usual is prohibitively costly than the proposed investment.	Ok
17	It may also be indicated that, how the proposed interventions related to agriculture production would be	(Conversion to 75% field into organic over the project period both for agricultural and horticultural crops). Initially the cost may be higher however over the years it would achieve a premium brand status and	Ok

	designed in a cost effective manner and use local inputs / organic input, etc.	command higher price.	
18	**Sustainability of interventions (page 43):** please indicate role of panchayat in the post project sustainability of interventions such as climate / village resource centre and eco-resort in- terms of sustainability of the operations.	The approach is community driven, the panchayat has been recognized as a model panchayat and there is strong ownership of the project. Sure, water user association or sub-committee may be created within the community development committee and technical support will be extended by the Nodal Agency	Can we have water user association to ensure sustainability through community contribution, water cess etc.?
19	**Technical standards (page 48):** The same may include additional details on the technology partners who would provide the technologies (responsible department/ institution) and the standards and how they would be part of implementation mechanism.	Under the direction of State Steering Committee on Climate Change, headed by the Chief Secretary, the project implementation committee will finalized the standards and responsibilities after obtaining technical sanction from the funding agency.	
20	**Details on stakeholder consultation including beneficiaries (page 50):** Please indicate about outcome of each meeting in terms how the meeting was able to capture views and expectations of vulnerable section of communities. It has now been indicated that the meeting was very fruitful and cooperative.	Meetings / interaction programme at different level was very fruitful and cooperative. Details has been reported at page 66-67 of the report	
21	**Learning and knowledge management component to capture and disseminate lessons learned for the proposed project (page 52):** What are the expected learnings from the proposed project, how is to going to be captured and	(Given at p37 gives the details however, local resource persons would be the change makers, the audio-visual documentation on indigenous practices and culture, conservation norms would be documented in local languages and English with technical partner and preserved.)	ok

	disseminated and what is the **mechanism for such dissemination**. Please indicate how the interventions such as eco-tourism services (eco-resort) would be mainstreamed in other areas.		
	Environmental & Social Risk Screening (page 53): ok (please indicate these justification in project document ESS table) Enclosed at page 58-60 and also at Appendix – 4 page 231		
22	Please indicate requirement of any regulatory clearances related to whether any of these and other interventions would result in involuntary settlements, land acquisition, displacement of livelihoods, etc. Whether any natural habitats and biodiversity would be affected due to these interventions.	(not envisaged any resettlement or livelihood loss, resolution passed by the community is the only requirement) Construction of masonry dam, boulder dam, etc. is very small in size, therefore no requirement for any regulatory clearances. Since the land belongs to community and the project will be implemented in collaboration with the community, no land acquisition, there will no any intervention / question for involuntary settlements, land acquisition, displacement of livelihoods, etc. Since he project nature is conservation of natural resources, no issue for affect / impact on natural habitats and biodiversity.	
23	How the equity issues related to selection of beneficiaries for various interventions.	(social mapping and selection to be done by the community, the village already has a reasonable norm)	
24	How the marginalized community would be part of the project and the benefits accrued out of the same.	(social mapping and selection to be done by the community, the village already has a reasonable norm)	
25	Please indicate role of women in various intervention, decision making, and representation in various committees under the project.	(women will involved in the medicinal plant caring, agricultural practices, etc.)	
26	Please indicate how the land for eco-resort would be sourced.	(The proposed land totally belongs to the community)	
	Implementation arrangements (page 58):		

27	Please given implementation and reporting mechanism under the proposed project and role of each stakeholder. If possible please give organogram for the implementation of the project.	(Role of stakeholders will be finalized by the State Steering Committee for climate change before it implement)	
28	Since implementation of the project activities involves various departments such as irrigation, PWD, agriculture, environment, renewable energy, panchayat raj, tourism, etc., please indicate how the same would be coordinated for timely and smooth implementation of the interventions including fund flow.	(This is responsibility for the State Steering Committee for climate change, headed by the Chief Secretary)	
29	The details provided under page 39 (C11) i.e. implementation diagram etc., may be shifted under the implementation arrangement.	Chapter 3, page 73-80, explains about Institutional & Implementation arrangement	
30	Financial and project/programme risk management (also include environmental and social risk, if any) (page 59): Financial risk is indicated it be at medium level, please indicate the specific risk factors envisaged and mitigation mechanism in terms of implementation arrangement,, monitoring and review mechanism, fund release procedure. If any of the risks indicated above under para 9 above, please give specific mitigation measures.	(There will no any risk) **Financial risk** : The project is multi component activity with defined implementation time frame and the budget. There will no any risk, however, the completion of the each of the component will depend upon the timely approval and availability of budget on as and when required basis/defined time frame. It is understood that the approval of the budget will be done on phased manner and as against some milestone. This may hamper the implementation of the project and is considered under financial risk regime. The financial risk, if occurred, can be mitigated through creation of corpus fund.	Please indicate risk management plan.

31	**Result frame work:** The result framework is well presented (page 83). However, please indicate details on the various outcomes for each of the intervention clearly at each sub-activity level indicated under budget notes table. Some of the places the indicators / targets are indicated as "X" please indicate actual number in terms of target.	Addressed at Appendix-4, page 231	Not addressed
	Budget notes:		
32	Costs for some of the interventions under component 4 (page 66) such as soil testing (Rs. 3750 per ha), micro nutrient application (Rs.70,000 per ha), nutrient planning (Rs. 3500 per ha) pest plan (Rs. 4000 per ha), cropping system (Rs 18000 per ha), assessment of flexibility of inter-cropping / mixed cropping and its promotion (Rs. 18000). Also medicinal plants under component 3 is proposed at Rs.50000/-.	(Revised the budget)	
33	Please indicate the details on cost parameters on piggery unit (in terms no. of animals cost related to other facilities for the unit) which is indicated to be Rs. 25000 per unit.	Enclosed at Annexure 1/K, page 117	Not addressed
34	With regard to cost details on eco-resort it has been indicated that (page 96) it has been indicated that "Detailed abstract and design will submit before National Steering Committee Meeting" please clarify. It is seen that the major investment activity under the same is water treatment plant	Discussed above. It is only during PPP formulation stage the concept plan can be made available. (nowhere it is mentioned that detailed feasibility report of the resort will be given at this stage when even the project is at a conceptual stage; it takes 3-4 months and money to prepare that and the private partner would do that)	

	(Rs.1.65 Crore) please indicate cost justification of the same		
35	Project Management Cost and Administrative costs is on a higher side (page 108). As we understand that the as per GoI norms, Executing Entities are entitled for 10% of the project outlay as Project Management cost and hence the above cost needs rationalization.	~~Suvra can you please re-adjust the cost to 10%] add the balance to eco-resort.~~ Corrected	Please explain
36	It is appreciated that the project aims to use advanced tools for monitoring and evaluation such as Remote Sensing and GIS. Under management cost one of the cost component indicated is GIS software, server, topo-sheets, remote sensing imageries, etc. please indicate justification of the same under monitoring and evaluation (page 60). Please justify purchase of new licensed software and server cost for the proposed project alone. Please justify cost related to monitoring of weather related data (page 108 sl no. 2 of the table), rational and purpose of the same.	Some o the basic instruments are i. Automated weather station ii. Silt monitoring instrument iii. Ultra violet Sensor iv. Soil Moisture Sensor v. Soil Temperature Sensor vi. Leaf Wetness Sensor vii. Evaporation Sensor viii. Infra Red (IR) Temperature Sensor ix. Automatic Water Level Recorder x. Ground Water Recharge level Recorder xi. Silt (Suspended Solid) Measuring Indicator xii. Remote sensing images xiii. Work Station for GIS & Remotesensing Details at Annexure 1/P, page 133	Not addressed
37.			Budget notes for many components are not available please provide the same.