ANNEXURE 1

Sl.No	Feature	Definition
1	Citizen participation	A smart city constantly adapts its strategies incorporating views of its citizens to bring maximum benefit for all (Guideline 3.1.6)
2	Identity and culture	A Smart City has a unique identity, which distinguishes it from all other cities, based on some key aspect. Its location or climate; its leading industry, its cultural heritage, its local culture or cuisine, or other factors. This identity allows an easy answer to the question "why in this city and not somewhere else?" A Smart City celebrates and promotes its unique identity and culture (Guideline 3.1.7)
3	Economy and employment	A Smart City has a robust and resilient economic base and growth strategy that creates large-scale employment and increased opportunities for the majority of its citizens. (Guideline 2.6&3.1.7 & 6.2)
4	Health	A Smart City provides access to healthcare for all its citizens. (Guideline 2.5.10)
5	Education	A Smart City offers schooling and educational opportunities for all children in the city (Guideline 2.5.10)
6	Mixed use	A Smart City has sufficient kinds of land uses in the same places; such as offices, housing and shops, clustered together. (Guidelines 3.1.2 and 3.1.2)
7	Compactness	A Smart City encourages development to be compact and dense, where buildings are ideally within a 10-minutes walk of public transportation and are located close together to form concentrated neighbourhoods and centers of activity around commerce and services (Guidelines 2.3 and 5.2)
8	Open spaces	A Smart City has sufficient and usable public open spaces, many of which are green, that promote exercise and outdoor recreation for all age groups. Public open spaces of a range of sizes are dispersed throughout the City so all citizens can have access(Guidelines 3.1.4 & 6.2)
9	Housing and inclusiveness	A Smart City has sufficient housing for all income groups and promotes integration among social groups (Guidelines 3.1.2)
10	Transportation & Mobility	A Smart City does not required an automobile to get around; distances are short, buildings are accessible from the sidewalk, and transit options are plentiful and attractive to people of

		all income levels (Guidelines 3.1.5 & 6.2)
11	Walkable	A Smart City's roads are designed equally for pedestrians, cyclists and vehicles: and road safety and sidewalks are paramount to street design. Traffic signals are sufficient and traffic rules are enforced. Shops, restaurants, building entrances and trees line the sidewalk to encourage walking and there is ample lighting so the pedestrian feels safe day and night (Guidelines 3.1.3 and 6.2)
12	IT Connectivity	A Smart City has a robust internet network allowing high-speed connections to all offices and dwellings as desired (Guideline 6.2)
13	Intelligent government services	A Smart City enables easy interaction (including through online and telephone services) with its citizens, eliminating delays and frustrations in interactions with government(Guidelines 2.4.7 & 3.1.6 & 5.1.4 & 6.2)
14	Energy supply	A Smart City has reliable, 24/7 electricity supply with no delays in requests hook ups (Guideline 2.4)
15	Energy source	A Smart City has at least 10% of its electricity generated by renewable (Guideline 6.2)
16	Water Supply	A Smart City has reliable, 24/7 supply of water that meets national and global health standards (Guidelines 2.4 & 6.2)
17	Waste Water Management	A Smart City has advanced water management programs, including wastewater recycling, smart meters, rainwater harvesting, and green infrastructure to manage storm water runoff (Guideline 6.2)
18	Water quality	A Smart City treats all of its sewage to prevent the polluting of water bodies and aquifers (Guideline 2.4)
19	Air quality	A Smart City has air quality that always meets international safety standards (Guideline 2.4.8)
20	Energy efficiency	A Smart City promotes state-of-the-art energy efficiency practices in buildings, street lights, and transit systems (Guideline 6.2)
21	Underground electric wiring	A Smart City has an underground electric wiring system to reduce blackouts due to storms and eliminate unsightliness (Guideline 6.2)
22	Sanitation	A Smart City has no open defecation, and a full supply of toilets based on the population (Guidelines 2.4.3 & 6.2)

23	Waste management	A Smart City has a waste management system that removes household and commercial garbage, and disposes of it in an environmentally and economically sound manner (Guidelines 2.4.3 & 6.2)
24	Safety	A Smart City has high levels of public safety, especially focused on women, children and the elderly men and women of all ages feel safe on the streets at all hours (Guideline 6.2)

Annexure 2
Self Assessment Baseline
Self Assessment-Aspirations and Imperatives

Sl.No.	A	B	C	D	E	F	G	H	I	J	K
	Feature	**Definition**	**Scenario 1 (BASE)**	**Scenario 2**	**Scenario 3**	**Scenario 4 (ADVANCED)**	**Self Assessment of the city (for Pan-City) Solution with regard to each feature**	**Qualitative Self-assessment of the city Relative to smart city Characterstics**	**Explanation and quantitative indicators(optional only data exists)**	**Qualitative self assessment of the current situation of the area relative to smart city characteristics**	**Describe the biggest single initiative that would get the area of focus to achieve advanced characteristics of a smart city**
1	Citizen participation	A smart city constantly shapes and changes course of its strategies incorporating views of its citizen to bring maximum benefit for all. (Guideline 3.1.6)	The City begins identifies priorities and projects to pursue without consulting citizens.	City undertakes citizen participation with some select stakeholders. The findings are compiled and incorporated in some projects or programs. Very few major decisions are shared with -citizens until final projects are unveiled.	City conducts citizen engagement at city level and local area level with most stakeholders and in most areas. The findings are compiled and incorporated in projects or programs.	City constantly conducts citizen engagement with people at each Ward level to incorporate their views, and these shape priorities and development projects in the city. Multiple means of communication and getting feedback such, both face-to-face and online are utilised. The effectiveness of city governance and service delivery is constantly enhanced on the basis of feedback from citizens.	Scenario 3	The literacy rate is high in Kavaratti and the citizens are proactive. There is a healthy response to the initiatives towards citizen engagement in any government program.	As per data available 1910 questionnaires have been returned by the citizens. Citizen participation in the Essay writing competition was also very healthy. A good number of suggestions have been received through the facebook page.	To provide ample opportunities to the citizens for expressing their views and opinion.	Increasing IT connectivity by augmenting bandwidth from existing 32 mbps to 100 mbps in the Kavaratti.
2	Identity and culture	A Smart City has a unique identity, which distinguishes it from all other cities, based on some key aspect: its location or climate; its leading industry, its cultural heritage, its local culture or cuisine, or other factors. This identity allows an easy answer to the question "why in this city and not somewhere else?" A Smart City celebrates and promotes its unique identity and culture. (Guideline 3.1.7)	There are few architectural monuments, symbols, and festivals that emphasise the unique character of the city. Built, natural and cultural heritage is not preserved and utilised or enhanced through physical, management and policy structures.	Historic and cultural resources are preserved and utilised to some extent but limited resources exist to manage and maintain the immediate surroundings of the heritage monuments. New buildinds and areas are created without much thought to how they reflect the identity and culture of the city.	Historic and cultural heritage resources are preserved and utilised and their surroundings are well-maintained. Public spaces, public buildings and amenities reflect the cultural identity of the city	Built, natural and intangible heritage are preserved and utilised as anchors of the city. Historical and cultural resources are enhanced through various mediums of expression. Public spaces, open spaces, amenities and public buildings reflect local identity and are widely used by the public through festivals, events and activities.	Scenario 1	It is well known for Corals and beautiful blue lagoons. Only few historical monuments are available. Juma Masjid located in central part of Kavaratti was constructed in 1700 AD. Clean environment and fragile nature is to be maintained	Data available on Lakshadweep Tourism website.	Promote Kavaratti as world class water sports and dive destination.	Will provide innovative tourist accomodation facilities like state of art hotel facility, beach front development to view the natural Coral and beautiful Blue Lagoons
3	Economy and employment	A smart city has a robust and resilient economic base and growth strategy that creates large-scale employment and increases opportunities for the majority of its citizens. (Guideline 2.6 & 3.1.7 & 6.2)	There are some job opportiunities in the city but they do not reach all sections of the population. There are a high number of jobs in the informal sector without sufficient facilities.	There is a range of job opportunities in the city for many sections of the population. The city attemps to integrate informal economic activities with formal parts of the city and its economy.	There are adequate job opportunities for all sections of society. But skill availability among residents can sometimes be a challenge.	There are adequate opportunities for jobs for all sections of income groups and skill levels. Job-oriented skill training supported by the city and by industry. Economic activities are suited to and build on locational and other advantages of the city.	Scenario 3	There are some job opportiunities in the city. There are a high number of jobs in the formal sector. Few jobs are available in informal sectors without sufficient facilities.	No data available.	Adequate employment opportunities at Kavaratti for all qualified youth	Will establish 10 units of various processing and small scale industries promoting the use of local resources such as fish and coconut, which will help the local economic development and employment opportunities
4	Education	A Smart City offers schooling and educational opportunities for all children in the city (Guideline 2.5.10)	The city provides very limited educational facilities for its residents. There are some schools but very limited compared to the demand. Many schools are in poor condition.	City provides adequate primary education facilities within easily reachable distance of 15 minutes walking for most residential areas of the city. The city also provides some secondary education facilities.	City provides adequate primary and secondary education facilities within easily reachable distance for most residential areas of the city. Education facilities are regularly assessed through - databases of schools including number of students, attendance, teacher - student ratio, facilities available and other factors.	City provides adequate and high-quality education facilities within easily reachable distance of 10 minutes walking for all the residential areas of the city and provides multiple options of connecting with specialised teaching and multi media enabled education. Education facilities are regularly assessed through database of schools including number of students, attendance, teacher-student ratio, facilities available and other factors.	Scenario 3	City provides adequate primary and secondary education facilities within easily reachable distance of 15 minutes walking for most residential areas of the city. The city also provides limited higher education facilities.	As per the results of citizen survey, education sector is doing well with respect to coverage. During interaction meetings with citizens they stressed for improvement in higher education infrastructure. There is an ITI, TTI, B.Ed. College.	To provide a smart classroom in each preprimary, primary, secondary and senior secondary schools in Kavaratti.	Establishing an institution of international excellence, smart schools, skill development program along with IT connectivity

5	Health	A Smart City provides access to healthcare for all its citizens. (Guideline 2.5.10)	Healthcare is difficult for citizens to access - demand for healthcare often exceeds hospitals' ability to meet citizen needs.	The city provides some access to healthcare for its residents but healthcare facilities are overburdened and far from many residents. Access to preventive health care is only easily available for some residents.	City provides adequate health facilities within easily reachable distance for all the residential areas and job centers of the city. It has an emergency response system that connects with ambulance services.	City provides adequate health facilities at easily accessible distance and individual health monitoring systems for elderly and vulnerable citizens which are directly connected to hospitals to prevent emergency health risks and to acquire specialised health advice with maximum convenience. The city is able to foresee likely potential disasters and develop response systems and preventive care.	Scenario 1	The City has only one hospital with limited speciality facilities and 50 beds. The residents are dependant on mainland for speciality health services.	As per the records there is only one hospital of secondary level existing. The Indira Gandhi hospital is the only referral hospital in the area. The citizen survey indicates the need of speciality treatment facilities in the hospital.	Improvement in the hospital facilities for specialized treatment and emergency treatment.	Improvement of health facilities by providing super specialty facilities in the existing Indira Gandhi hospital with necessary expert manpower acquired through PPP model and Mobile Diagnostic Unit
6	Mixed use	A Smart City has different kinds of land uses in the same places; such as offices, housing, and shops, clustered together. (Guidelines 3.1.2 and 3.1.2)	The city has mostly separated uses and areas are focused either on residential, commercial, or industrial, with little co-existence of uses. The average resident cannot walk to the closest market or shops near his or her home. For almost everyone, going to work or going shopping for basic needs requires a journey by automobile or bus of more than 15 minutes. Land use regulations prevent putting commercial or office locations in residential neighborhoods and vice versa.	In some parts of the city , there is a mixture of land uses that would allow someone to live, work, and shop in close proximity. However, in most areas, there are only small retail stores with basic supplies near housing. Most residents must drive or use public transportation to access a shop for food and basic daily needs. Land use rules support segregating housing, retail, and office uses, but exceptions are made when requested.	Most parts of the city have housing, retail, and office buildings in close proximity. Some neighborhoods have light industrial uses within them (e.g., auto repair, craft production). Land use rules allow for mixed uses.	Every part of the city has a mix of uses. Everyone lives within a 15-minute trip of office buildings, markets and shops, and even some industrial uses. Land use rules require or encourage developers to incorporate a mixture of uses in their projects.	Scenario 2	No building regulations laws are existing in Kavaratti.	No data available.	The future developments to be made strictly in accordance to the guidelines for mixed use through out the city. The transportation system to be streamlined in order to make all areas accessible within 15-20 minutes of trip time.	Land and Revenue data would be collected through most modern tools like remote sensing and GIS and a Geospatial database for the island will be generated which can be used for planning , zonation,revenue generation and project management purposes
7	Compact	A Smart City encourages development to be compact and dense, where buildings are located close to one another and are ideally within a 10-minute walk of public transportation, forming concentrated neighborhoods. (Guidelines 2.3 and 5.2)	The city is expanding rapidly at its periphery into undeveloped land, rural or natural areas, or along industrial corridors - both formally and informally. Formal new development is occuring in a way that is "sprawling," meaning that the buildings spread across a wide area and are far from one another. Residents or tenants find it easier or safer to travel by automobile because it takes a long time to walk between destinations and there are busy roads separating buildings. Large pockets of land in the inner-city are vacant. New developments at the periphery tend to be large-scale residential developments, often enclosed with a gate and oriented to the automobile.	The city has one or two high density areas - such as the city center, or historic areas, where buildings are concentrated together and where people can walk easily from building to building and feel as though they are in center of activity. Most of the city consists of areas where buildings are spread out and difficult to walk between, sometimes with low-density per hectare. Regulations tend to favor buildings that are separated from one another, with lots of parking at the base and set-back from the streets. The city likely has some pockets of under-utilized land in the center. New formal developments at the periphery tend to be large-scale residential developments, often enclosed with a gate and oriented to the automobile.	The city has multiple high density clusters that are easy to walk around where buildings are close together. However, the city actively encourages development to occur on under-utilized parcels of land into high-density, walkable areas. When new formal large-scale development projects happen at the periphery, they are encouraged to be dense and compact, with buildings that are close together and line the streets. The city actively encourages or incentivizes re-development of under-utilized parcels in the inner-city, especially those located close to public transportation.	The city is highly compact and dense, making most of land within the city. Buildings are clustered together, forming walkable and inviting activity centers and neighborhoods. Regulations encourage or incentivize re-development of under-utilized land parcels in the city center. Buildings are oriented to the street and parking is kept to a minimum, located below ground or at the back of buildings. Public transport and walking connects residences to most jobs and amenities. Residential density is at an optimal with affordable housing available in most areas.	Scenario 2	The Town is not compact. Citizen preference is for independent houses due to which compactness is not very visible.	As per data furnished in the draft building bye laws compact development is not favored.	The new offices and residential buildings of government are to be developed for compactness	Area Based development will bring services within the immediate reach of the community
8	Public open spaces	A Smart City has sufficient and usable public open spaces, many of which are green, that promote exercise and outdoor recreation for all age groups. Public open spaces of a range of sizes are dispersed throughout the City so all citizens can have access. (Guidelines 3.1.4 & 6.2)	The city has very few usable public open spaces and very few usable green spaces. Available recreational spaces are located far away and are dispersed at long distances around the city. The few available public open spaces offer a limited variety of experiences for all sections of population and age groups such as places for sport, places for rest, and places for play.	A variety of public open spaces are available in some neighborhoods, but are not available in all the areas of the city or are located far away from residential areas -Many of the open spaces have access restrictions, or are not well-maintained. A variety of types of public open spaces may be lacking, such as natural areas, green areas, parks, plazas, or recreation areas.	Most areas of the city have some sort of public open space. There is some variety in the types of public spaces in the city. However, public spaces are sometimes not within easy reach or access of more vulnerable populations and are more restricted in poorer neighbourhoods.	Public open spaces are well dispersed throughout the city. Every residential area and work space has access to open space within 10 minutes walking distance. Open spaces are of various types - natural, green, plazas, parks, or recreation areas - which serve various sections of people. Public spaces tend to truly reflect the natural and cultural identity of the city.	Scenario 1	There is need to improve availability of open spaces and public parks for recreation use by the citizens.	There are 3 parks in the city and main recreation point of citizens is lagoon front.	More open spaces and parks to be created in order to ensure that they are easily accessible to the citizens across the city.	Existing parks will be developed with amenities to ensure service value to the citizens. Vacant spaces will be developed into small parks and open spaces. The beach front and the sides of the arterial road will also be developed into green areas.

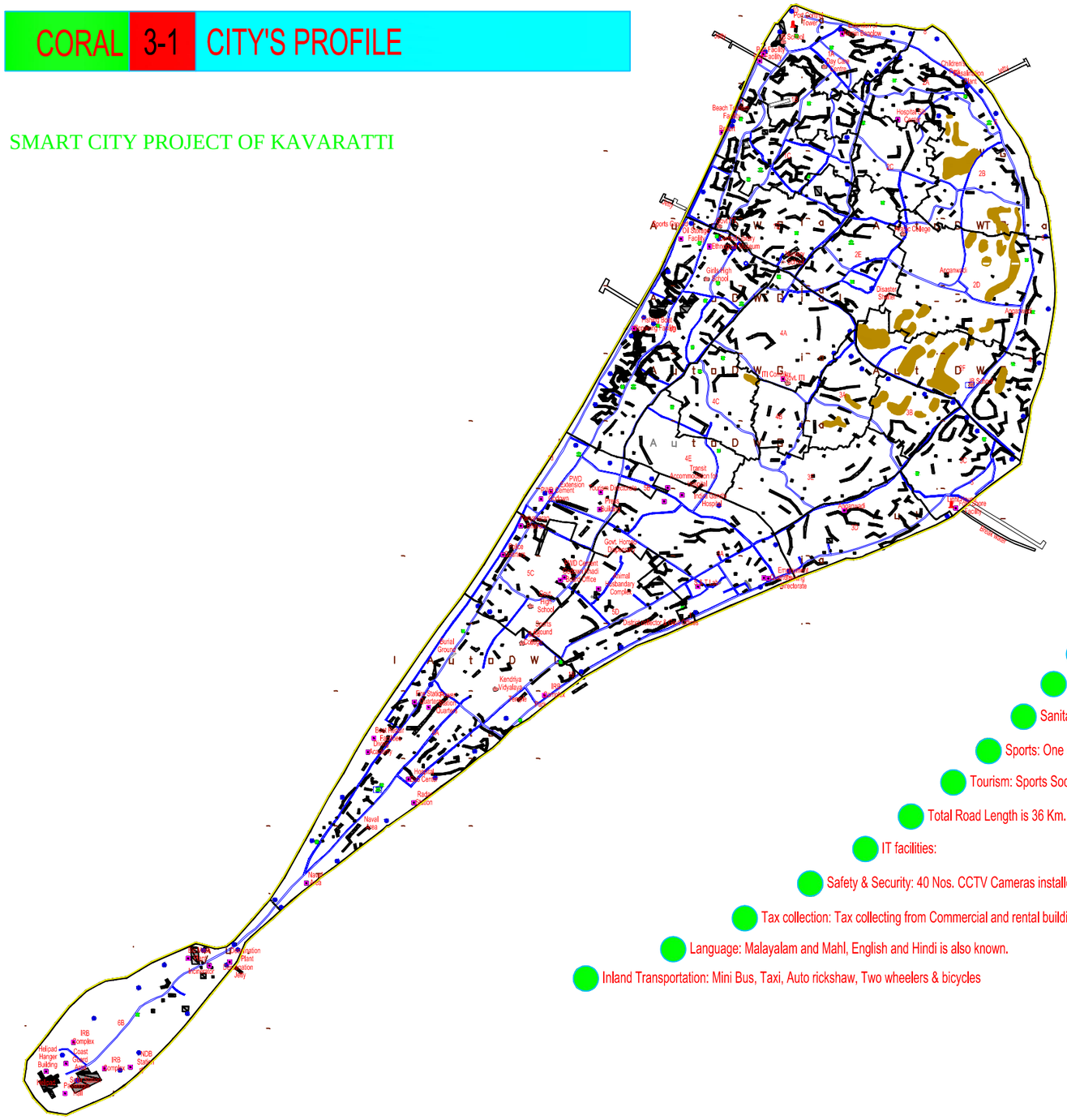
9	Housing and inclusiveness	A Smart City has sufficient housing for all income groups and promotes integration among social groups. (Guidelines 3.1.2)	Housing is very limited and highly segregated across income levels. Population growth far exceeds the creation of new housing. The poor live in informal settlements with limited to no access to basic services, and are concentrated in a few areas. The wealthy live in separate enclaves. Those in the middle have few , if any options.	Housing is available at most income levels but is highly segregated across income levels. Population growth slightly exceeds the creation of new housing. The wealthy and the middle class have housing that meets their needs at costs appropriate to their income. The poor live in informal settlements.	Housing is available at all income levels, but is segregated across income levels. The growth of supply of housing almost meets the rate of population growth. Increasingly, lower and middle-income people can find housing in areas that are conveniently located.	A wide range of housing is available at all cost levels. The supply of housing is growing at pace with population. Afforable, moderate, and luxury housing are found clustered together in many areas of the city	Scenario 3	Housing sector is satisfactory in Kavaratti. Most of the citizens have own houses and there are very few tenants. Government provided housing for the employees.	As per data furnished 95% of the local population is living in their own houses. Only 5% of the households are in rental houses	Steps are required to regulate the housing as per building bye-laws which is under process of approval.	Building byelaws will be formulated. Cost effective housing technology following the green habitat concept (GRIHA) will be implemented.
10	Transport	A Smart City does not require an automobile to get around; distances are short, buildings are accessible from the sidewalk, and transit options are plentiful and attractive to people of all income levels. (Guidelines 3.1.5 & 6.2)	Personal automobile centric city with very few modal options. Long trip lengths for daily commute to work and education. Accessing various areas by walking or cycling is difficult. Women and vulnerable sections find it very difficult to move independently in the city. There is limited public transport. Vehicles cause high air and noise pollution levels in the city. Vehicles dominate public spaces and affect their effective functioning.	The street network system is elaborate but public transport choices are restricted. Public transport can be too expensive or unaffordable for the poor. Pedestrian infrastructure is only available in select areas. The majority of investments focus on reducing traffic congestion through the creation of more roads.	Network of streets are fairly complete. Public transport covers most areas of the city. However last mile connectivity remains incomplete -and affects transport options-. Foot paths are accessible in most areas, whereas-concerns of safe crossings and security throughout the day remain. Parking zones are demarcated but absence of pricing increases over utilization of parking lots.	Street network is complete and follows a clear structure. Public transportation network covers the entire city and intensity of connection relates with the demand. Plenty of options of public transport are available and affordable for all sections of the society. There is multi-modal integration at all mass transit stations and organized-priced on street and off street parking. Walking and cycling is prevalent.	Scenario 2	Limited public transport facilities are available in the form of auto Rikshaws. Walking and cycling is prevalent. However no separate footpaths and cycle paths are available. Street network is available elaborately however due to land constraints, average road width is 3m only.	As per Citizen survey about 70% people feels that road transport in kavaratti should be improved. Another 75% citizen feels that connectivity to mainland should be improved and available on daily basis	To provide daily connectivity from kavaratti to mainland	An arterial road will be developed along with Jetty improvements and night embarkment facilities.
11	Walkable	A Smart City's roads are designed equally for pedestrians, cyclists and vehicles; and road safety and sidewalks are paramount to street design. Traffic signals are sufficient and traffic rules are enforced. Shops, restaurants, building entrances and trees line the sidewalk to encourage walking and there is ample lighting so the pedestrian feels safe day and night. (Guidelines 3.1.3 & 6.2)	The city is designed mainly for the automobile Daily life without a car requires long bus rides. Walking is difficult and often dangerous; there are few pavements, existing pavements need repair and lack trees to provide shade for pedestrians, and marked pedestrian crossings are rare. New buildings have their main entrances set-back from the street, sometimes with large driveways or parking lots separating them from the street, and sometimes are enclosed by gates. Traffic signals are often disobeyed	Older areas of the city see a mix of pedestrians, cyclists, and vehicles but newer areas are focused mainly on the automobile. In the new areas, there are few pavements and main entrances to new buildings are not accessible from the front of the street. large driveways or parking lots often separating them from the street, and sometimes are enclosed by gates. In these areas, traffic signals are disobeyed.	The city has a good network of pavements and bike lanes. Buildings in most areas of the city are easily accessible from the pavement. However, traffic signals are sometimes disobeyed and it can feel difficult to cross the street.	The city is highly walkable. Pavements exist on every street and are maintained Trees line many sidewalks to provide shade for pedestrians. Buildings in most areas of the city are easily accessible from the sidewalk. Traffic signals control the flow of automobiles and are enforced. A network of bike lanes exists to promote cycling as a means of transport. Traffic rules are followed and enforced with great seriousness.	Scenario 2	The city at present don't have footpaths making walkability difficult.There are no vehicle free zones in the city. The city has limited number of vehicles therefore majority of citizens prefer walking and cycling. Due to limited vehicles there is no concern of safety of pedestrians	As per the reconnaissance survey there are no sidewalks for the pedestrians.	It is proposed to improve walkability in the city by constructing footpaths.	Continuous foot path to be provided in selected roads for area development.
12	IT connectivity	A Smart City has a robust internet network allowing high-speed connections to all offices and dwellings as desired. (Guideline 6.2)	City has no major plans to bring increased high speed internet connectivity to the public.	The city has made plans to provide high speed internet connectivity through the existing framework.	The city makes has high speed internet connectivity available in most parts of the city.	The city offers free wifi services to provide opportunity for all the citizens to connect with high speed internet across the city.	Scenario 2	IT connectivity and mobile connectivity is the major problem faced by the city due to remoteness from mainland. The satellite link for IT service provide very low speed and unreliable connections to the citizens.	Based upon the citizen survey it is ascertained that about 75% people feels to improve IT connectivity and e-Governance in the city.About 75% people are dissatisfied with the mobile connectivity.	To provide broadbands on demand to the citizen.	Increasing IT connectivity by augmenting bandwidth from existing 32 mbps to 100 mbps in the Kavaratti.
13	ICT-enabled government services	A Smart City enables easy interaction (including through online and telephone services) with its citizens, eliminating delays and frustrations in interactions with government. (Guidelines 2.4.7 & 3.1.6 & 5.1.4 & 6.2)	Essential Government services are not linked with online platforms. Paper intensive interactions with the local Government continues. Receiving services and response to citizen complaints take a long time. There is limited availability of data to monitor service delivery.	Some of the public services are provided online and infrastructure for total digitalization is not in place. Service delays occur regularly in some sectors. Responses to citizen inquiries or complaints are often delayed. No integration between services and billing.	Most of the services are provided online and offline. Data transparency helps monitoring System and processes to better coordinate between various Government agencies are being developed.	All major services are provided through online and offline platforms. Citizens and officials can access information on accounting and monitor status of projects and programs through data available on online system. Robust data infrastructure system shares information and enhances internal governmental coordination.	Scenario 2	Due to non availability of high speed internet connection ICT enabled government services have not be developed adequately. Some services are available through the official website of UT and LSWAN.	The data is available in Lakshadweep website www.lakshadweep.nic.in. And dashboard developed by nic on LSWAN.	To provide all public utility services through ICT based applications.	Increasing IT connectivity by augmenting bandwidth from existing 32 mbps to 100 mbps in the Kavaratti.

14	Energy supply	A Smart City has reliable, 24/7 electricity supply with no delays in requested hookups. (Guildeline 2.4)	There is only intermittent electricity supply with regular power shedding. Many residents have to plan their days around when power is available.	Electricity supply and loads are managed as per demand and priority for various functions with clear scheduling, with electricity being available in many areas for most hours of the day.	Electricity is available in most parts of the city for most hours of the day but some areas are not so well-served. Smart metering exists in some parts of the city but not all.	Electricity is available 24 x 7 in all parts of the city with smart metering linked to online platforms for monitoring and transparency.	Scenario 4	24x7 electricity available to all the households in the city. However no smart metering linked to online platform. There are no outages in any part of the city. 100% under ground cabling is achieved.	As per information furnished by the Electricity Department of UTLA there are no outages in the city. As per citizen survey, 52% citizens are favoring renewable energy like solar power and are willing to install roof top systems. Online billing is existing.	To promote conservation of energy.	Introduction of Smart AMR meters in all households.
15	Energy source	A Smart City has at least 10% of its electricity generated by renewable. (Guideline 6.2)	The city does not have any renewable sources of energy and there is no commitment to promote this for the foreseeable future.	The city is preparing plans for ensuring that it gets more energy from renewable sources and is in the process of making commitments in this regard.	Some energy consumed in the city is produced through renewable sources. There are long term targets for higher renewable energy capacities and the city is making plans to achieve these.	At least 10% of the energy used in the city is generated through renewable sources. The city is undertaking long-term strategic projects to tap renewable sources of energy in its region/beyond to increase the percentage of renewable energy sources.	Scenario 2	.Kavaratti being an island the generation is now diesel based which is expensive and non-environment friendly. The city is using renewable source to some extent(760kW).	As per data furnished by the Electricity Department a 760kW solar power plant is in use. Another 1.5 MW solar energy project is proposed.	Meeting all power supply requirement through renewable energy.	Expansion of existing solar power plant from existing 760kW to 2.26 MW. Waste To Energy program, reducing the use of diesel generators.
16	Water supply	A Smart City has a reliable, 24 x 7 supply of water that meets national and global health standards. (Guidelines 2.4 & 6.2)	The city has a poor water supply system with limited water availability. There are no clear targets to achieve higher quality and optimal quantity standards. Unaccounted water loss is above 40%	The city has intermittent water supply and availability. However it is setting targets and processes in place to try to improve its water supply. Unaccounted water loss is less than 30%.	The city has 24 x 7 water supply in most areas but the quality of water does not meet international health standards. Unaccounted water loss is less than 20%.	The city has 24 x 7 treated water supply which follows national and global standards and also available in sufficient quantity and affordable across all sections of the society. Unaccounted loss less than 15%.	Scenario 1	.The city presently supply 9 lpcd through desalination plant.	The assessment is based upon the citizen survey and Water supply department inputs. Water quality is reported to be good but the quantity is inadequate. The duration of supply is also reported to be insufficient and supplies are irregular.	To augment water supply from existing 9 lpcd to 36 lpcd.	Expanding the water supply system through provision of 3 Lakh litres capacity desalination plant.
17	Water management	A Smart City has advanced water management programs, including smart meters, rain water harvesting, and green infrastructure to manage storm water runoff. (Guideline 6.2)	The city does not measure all its supply. It does not recycle waste water to meet its requirements and rain water harvesting is not prevalent. Flooding often occurs due to storm water run-off.	The city has meters for all its water supply but lacks mechanisms to monitor. Water wastage is very high. Some, but not much, rainwater harvesting exists.	The city has meters for all its water supply with some smart mechanisms to monitor. Rainwater harvesting systems are installed and storm water is collected and stored in water bodies. However, recycling of waste water and reusing of storm water is limited.	The city has meters for all its water supply. It includes smart mechanisms to monitor remotely. Rainwater harvesting systems are installed and utilized through the city and storm water is collected and stored in water bodies and treated for usage. Recycled waste water is supplied for secondary uses.	Scenario 1	There is no metering of water supply.Since there is no waste water treatment facility, no recycling is practiced. Rain water harvesting is prevalent at a nominal scale.	The assessment is based on the information furnished LPWD. No statistical information is available.	To conserve rain water	Installing rainwater system in all public buildings and households.
18	Waste water management	A Smart City treats all of its sewage to prevent the polluting of water bodies and aquifers. (Guideline 2.4)	The city is unable to treat all its sewage. Many local sewer lines open on to water bodies and open ground and pollute the environment.	Most waste water is collected and treated before disposal. However the treated water does not meet standards and is not recycled for secondary uses.	All the waste water is collected and treated before disposal. It is also treated to a high standard and some is recycled.	The city has zero waste water because all the waste water is collected, treated and recycled. It meets standards and reduces the need for fresh water.	Scenario 1	Presently the city is not having underground sewerage system. Individual and community septic tanks are in use. Septage is discarded through bio digesters. Sullage and storm water is discharged through septic tanks.	The assessment is based on the information furnished by LPWD.	To replace all the existing conventional toilets by ecofriendly biotiolets.	Bio-toilets will be provided to all households, septage management system and recycling of waste water
19	Air quality	A Smart City has air quality that always meets international safety standards. (Guideline 2.4.8)	City does not have plans, policies or programs to improve the air quality. Systems to monitor air quality are absent.	City has programs and projects to monitor air quality to ascertain reasons for degrees of pollution in the air. A few strategies to decrease air pollution have been implemented.	City has programs and projects to monitor air quality to ascertain reasons for degrees of pollution in the air.	The city has clean air by international standards. Live Air quality monitoring cover the entire city and data of air quality are mapped.	Scenario 1	There are no air quality monitoring systems in the city. Due to small area of island and no industries and pollution sources the air quality is good in Kavaratti.	No data is available on air quality in the city.	To provide clean air as per standard.	Replacing diesel based energy production by solar power and other renewable energy sources.

20	Energy efficiency	A Smart City government uses state-of-the-art energy efficiency practices in buildings, street lights, and transit systems. (Guideline 6.2)	City has no programs or controls or incentive mechanisms to promote or support energy efficiency in buildings	The city promotes energy efficiency and some new buildings install energy efficiency systems that track and monitor energy use and savings.	Most new public buildings install energy efficiency systems and some older buildings are also retrofitted to be more energy efficient. Local government conducts counselling and outreach with developer, businesses and residents to adopt energy efficiency strategies	All the existing old and new public buildings employ energy efficiency principles in development and operation and apply for energy rating by national and international forums. Many non-public buildings are also energy efficient because the government promotes energy efficiency through incentives and regulations.	Scenario 2	LED streetlights are provided along the roads in most of the areas. There is no incentive to the common citizens or institutions for encouraging the practice of using energy efficient devices in their respective areas.	No data is available.	All the public building including the existing ones will be made complainance to the energy saving criteria through installation of rated devices and automation for switching off the appliances when not in use. Incentives to be given to citizens for installing rated energy efficient devices including lighting systems.	Smart meters and LED lights. Building construction with GRIHA concept.
21	Underground electric wiring	A Smart City has an underground electric wiring system to reduce blackouts due to storms and eliminate unsightliness. (Guideline 6.2)	City does not have plans for underground electric wiring system.	More than 40% of the city has underground electric wiring system.	More than 75% of the city has underground electric wiring system.	More than 90% of the city has underground electric wiring system.	Scenario 4	Town is having 100% under ground electric cabling system.	The basis of assessment is the information furnished by the Electricity Department .	. Town is having 100% under ground electric cabling system.	A separate service channel for easy repair and maintenance along all the roads in the city will be development.
22	Sanitation	A Smart City has no open defecation, and a full supply of toilets based on the population. (Guidelines 2.4.3 & 6.2)	Many parts of the city do not have access to sanitation infrastructure and facilities.	Sanitation facilities are available to 70% of the city's population.	Sanitation facilities are available to 90% of the city's population.	Sanitation facilities are available to 100% of the city's population.	Scenario 2	The self assessment corresponds to scenario 4. .	Self assessment is based on the inputs from LPWD.	To protect pollution of ground water from waste from house.	To provide biotoilets to all the households in Kavaratti and septage management
23	Waste management	A Smart City has a waste management system that removes household and commercial garbage, and disposes of it in an environmentally and economically sound manner. (Guidelines 2.4.3 & 6.2)	Waste collection systems do not pick up waste on a frequent basis and waste often enters into water bodies.	Waste generated is usually collected but not segregated. Recycling is attempted by difficult to implement.	Waste is segregated, collected, recycled and disposed in an environmentally sound manner.	The city reduces land fill caused by waste so that it is minimal. All the solid waste generated is segregated at source and sent for recycling. Organic waste is sent for composting to be used for gardening in the city. Energy creation through waste is considered.	Scenario 2	Door to door collection is practiced in most parts of the city. The collected waste is dumped at the dumping site. The bio-degradable waste is utilized for composting and one incinerator is in operation for non-degradable waste.	Department of Environment and Forest maintains all the data about waste management.	100% door to door collection from households, multiple clearance trips in commercial and market areas, separate collection of biological waste from hospitals, chicken waste from shops. Safe transportation to transit station, recycling followed by composting. RDF and manure production will be the end products.	2.5 metric tons per day solid waste treatment process to be installed with all connected systems like primary collection, secondary collection, transit station, recycling plant, composting yard and RDF plant. Decentralized compact composting plants which produce compost in 24 hours to be installed. Automation of various activities related to SWM.
24	Safety and security	A Smart City has high levels of public safety, especially focused on women, children and the elderly; men and women of all ages feel safe on the streets at all hours. (Guideline 6.2)	The city has low levels of public safety - most groups of residents feel insecure during most parts of the day in many parts of the city.	The city has medium levels of public safety - some more vulnerable groups feel insecure during some points of the day and in some parts of the city	The city has high levels of public safety - all citizens including women, children and the elderly ~~f~~eel secure in most parts of the city during most time in the day.	The city has very high levels of public safety - all residents feel safe in all parts of the city during all hours of the day.	Scenario 4	The city is perceived to be safe for the public, women, children, elderly. The citizens feel safe during odd hours and there is a quick response in registration of cases by police.	The basis of assessment is FIR record of the Police department.	100% of the citizens should feel safe in public places at all hours of the day. .	Awareness about cyber crime is to be created so that the citizens will be safe in the virtual environment. Necessary disaster warning system has to introduced.

CORAL 3-1 CITY'S PROFILE

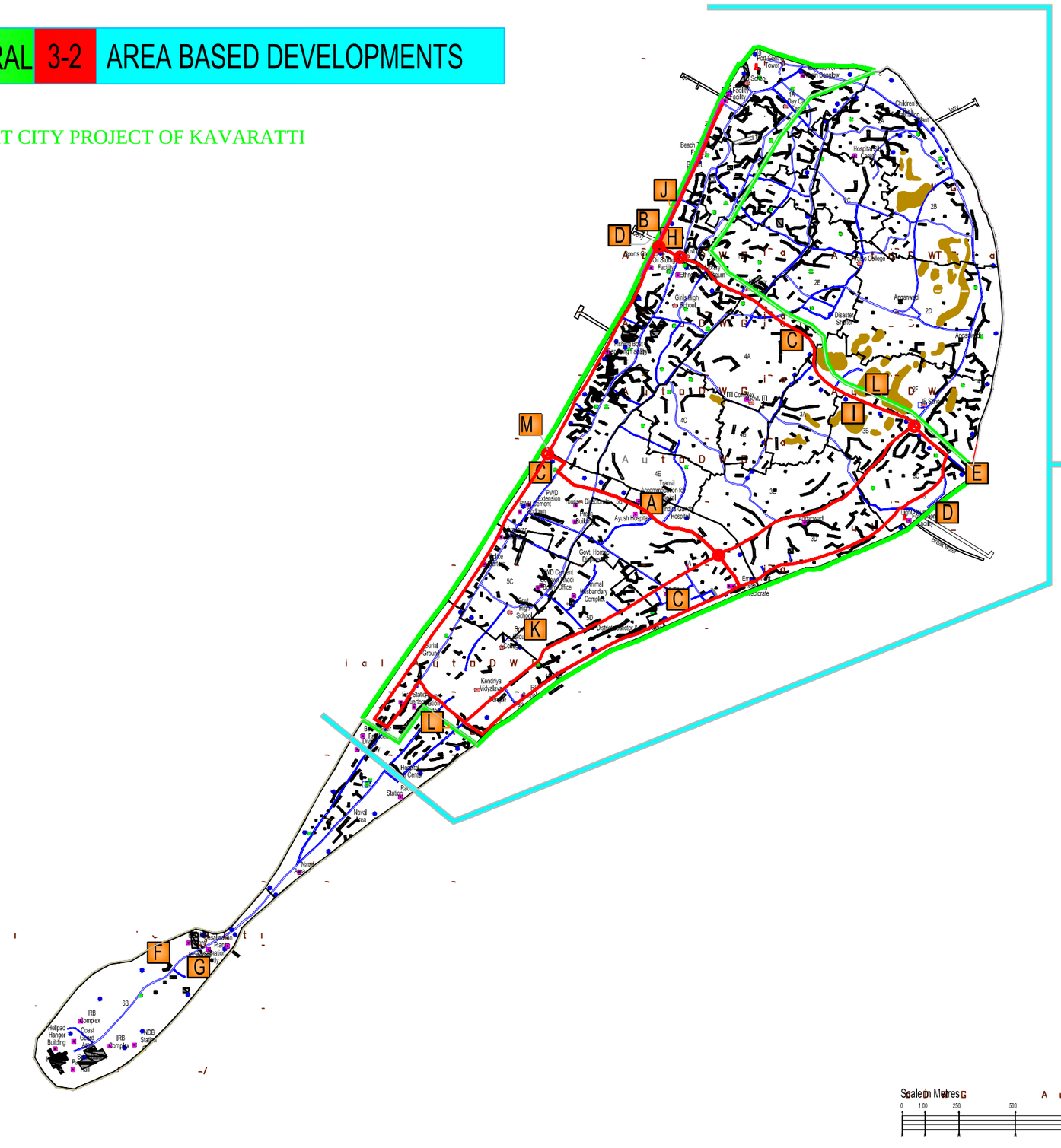
SMART CITY PROJECT OF KAVARATTI



- Latitude 10°33' N, Longitude 72°38' E
- Total Area 4.22 Sq.Km (900 acres)
- Total Population 11,221
- Sex ratio Male:Female 100:95
- Literacy 95.5%
- House Holdrts 2244
- Housing states 95% haveing won House
- Administration Union Territory
- Sector prioritization SCP
- Distance from Main Land 400 Km.
- Inter land and Main Land transportation: 2 Ships, 4 Boats and one flight 6 days in a week to Agatti
- Attraction: 1.5Km width beautiful Blue Lagoon with Coral on West side of the Islamd
- Costal Line 14Km.
- Health: One 50 beaded Indira Gandi Hospital
- Water: 1,00,000 Litter/day capacity Desalination Plant
- Energy: One 3200 KW Diesel Generator and 760 KW Solar Energy
- Income activities: Coconut and Fishing
- Education: One higher Secondary School, 4 other schools, One Bed College & one ITI under construction
- Industries: 22 small industries in different locations
- Waste management: Door to Door collection and one Incinerator
- Sanitation: House Hold Septic Tanks.
- Sports: One stadium and training to Sports, Games, Aqua sports
- Tourism: Sports Society is promoting the tourism with several packages.
- Total Road Length is 36 Km.
- IT facilities:
- Safety & Security: 40 Nos. CCTV Cameras installed at different locations
- Tax collection: Tax collecting from Commercial and rental buildings
- Language: Malayalam and Mahl, English and Hindi is also known.
- Inland Transportation: Mini Bus, Taxi, Auto rickshaw, Two wheelers & bicycles

CORAL 3-2 AREA BASED DEVELOPMENTS

SMART CITY PROJECT OF KAVARATTI



N

Location of the main Components

- A Additional Facilities to Indira Gandi Hospital
- B Western Jetty Improvement
- C Development of 10 KM Arterial Road
- D Solar Paneling to Jetty area Beach front
- E New 3 Lakhs Capacity Desalination Plant
- F Solid Waste Plant
- G STP 1.5 MLD
- H Open Space Development
- I International School Hawai Centre as PPP
- J Tourism- Beach Front Development
- K Sports- Establishment of Dedicated High end Sport Facilities
- L Boundary of Smart City Area "CORAL"
- M Junction Improvement

LEGEND

- Island Boundaries
- Roads
- Light House
- Sand Areas
- Residential
- Govt Buildings

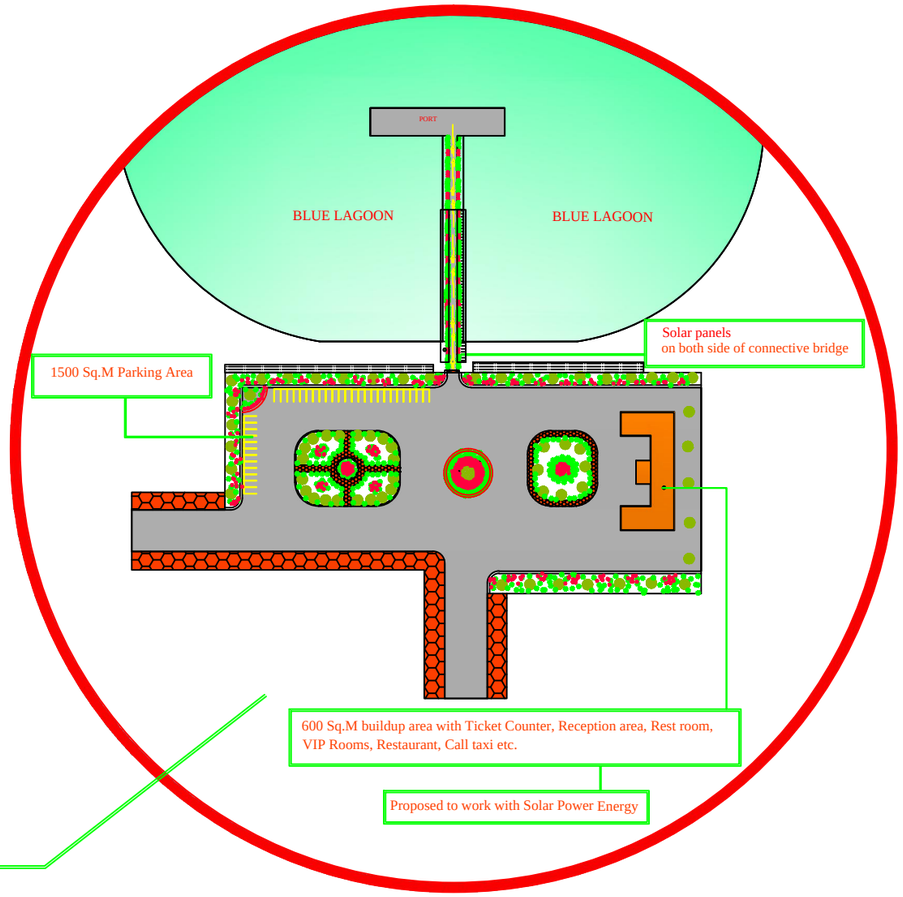
Scale in Metres

0 100 250 500 750

CORAL 3-3 IMPROVEMENT- WESTERN JETTY

- Improvement of Western Jetty with , 600 Sq.M Built-up area for Reception, Ticket counter, resting place, VIP Rooms, Restaurant, Parking and green areas.

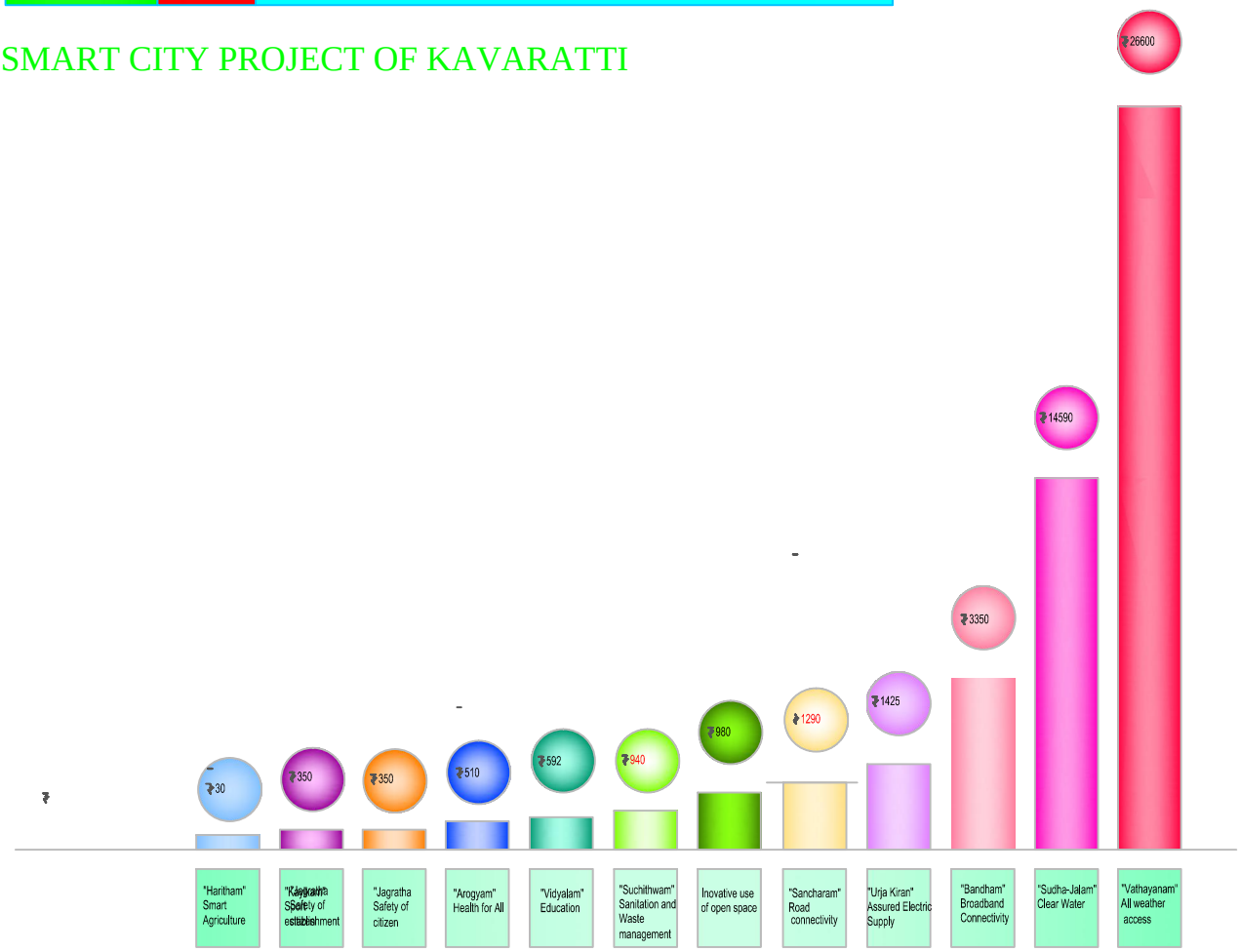
Existing Western Jetty



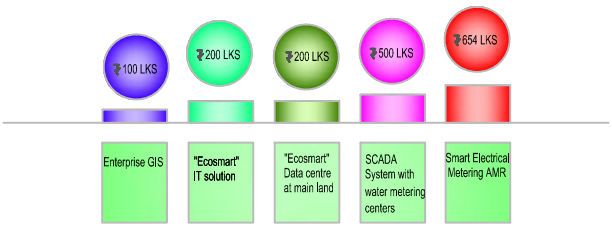
Proposed Western Jetty improvements

CORAL 3-4 IMPLEMENTATION PLAN

SMART CITY PROJECT OF KAVARATTI



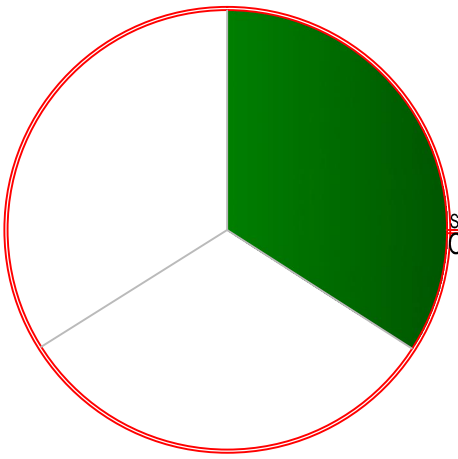
AREA BASED DEVELOPMENT



PAN CITY SOLUTION

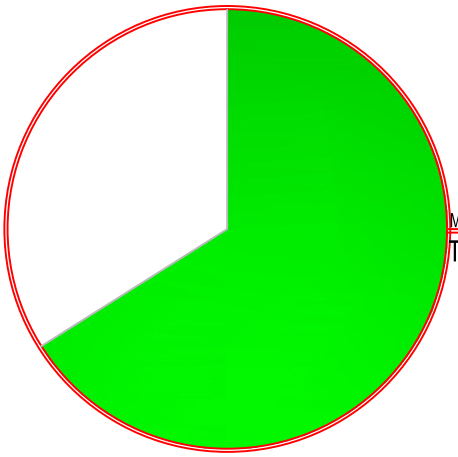
CORAL 3-5 SCENARIOS

SMART CITY PROJECT OF KAVARATTI



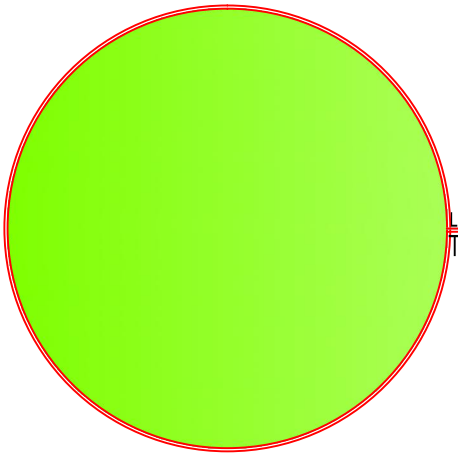
Short term Milestone
One year

- "Urja Kiran"- Assured electric supply- Establishment of 2.0 MW Solar Roof Top system, Conversion of ordinary lamps to LED
- "Sudha jalam"- Clear water - Roof top Rain Water Harvesting
- "Suchithwam"- Sanitation and Solid Waste Management- Modernization of Solid Waste Processing Plant
- Development of open space
- "Jagratha"- Safty of citizens - Monthly disaster management drill, AV based disaster management training kits
- Haritham - Smart Agriculture
- "Vidyalayam" - Education - Providing digital classrooms to all existing schools
- "Aarogyam" - Smart Health Card for citizen
  Providing Dialysis unit and Cancer care unit



Medium term Milestone
Two years

- "Aarogyam" - Health of All - Construction of additional 200 sq.m area to Indira Gandi Hospital Health care upgradation, mobile diagnostic and health care unit, medical equipments
- "Bandham" - IT enabled service and application, Implement Integrated Enterprise IT Enabled service with high speed connectivity
- "Suchithwam" - Sanitation- Centralized STP and Public Bio-Tolets
- Beach front Development
- "Sudha-jalam"- Clear water- One 3 Lakhs/day capacity new desalination plant, One 500KL ESR and pipe water supply to the houses.
- "Kayikam" - Sports - Modernization of the existing stadium, water sport institute, multi Gymnasium etc



Long term Milestone
Three years

- "Vathayanam"- All weather access to main land and inter island connectivity
- "Sancharam"- Road connectivity - Development of an arterial road of 16 Km
- "Urja-Kiran" - Assurance electric supply - Waste to Energy plant (Biomass Plant)
- "Vidyalam" - Education - International Speciality Institute on the land of Hawai Centre on PPP International Diving Centre

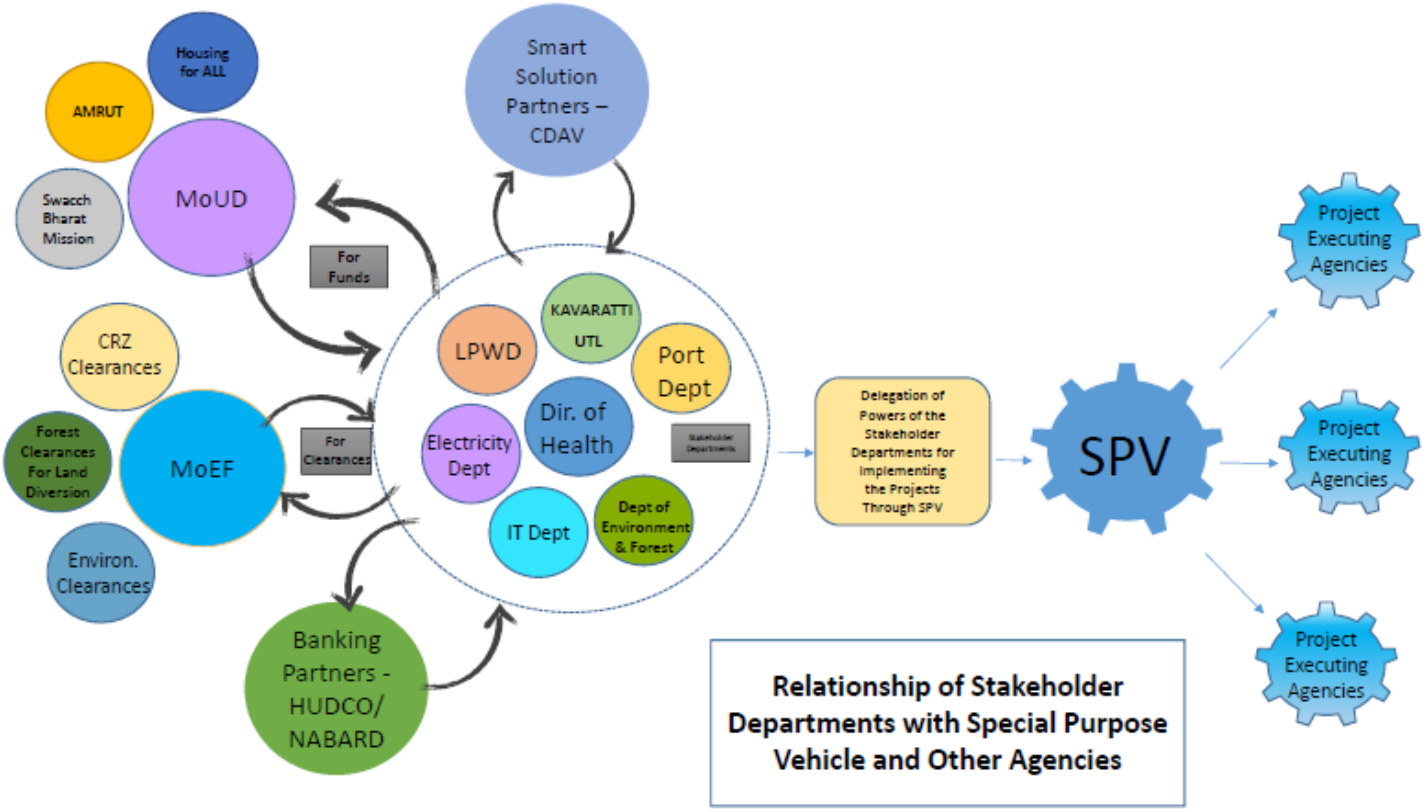
CORAL 3-6 INOVATIVE USE OF BEACH FRONT

Dumped coconut waste

Beach front development with environment friendly botanical garden, walk way, children's park, coral museum, sound and light show, etc.

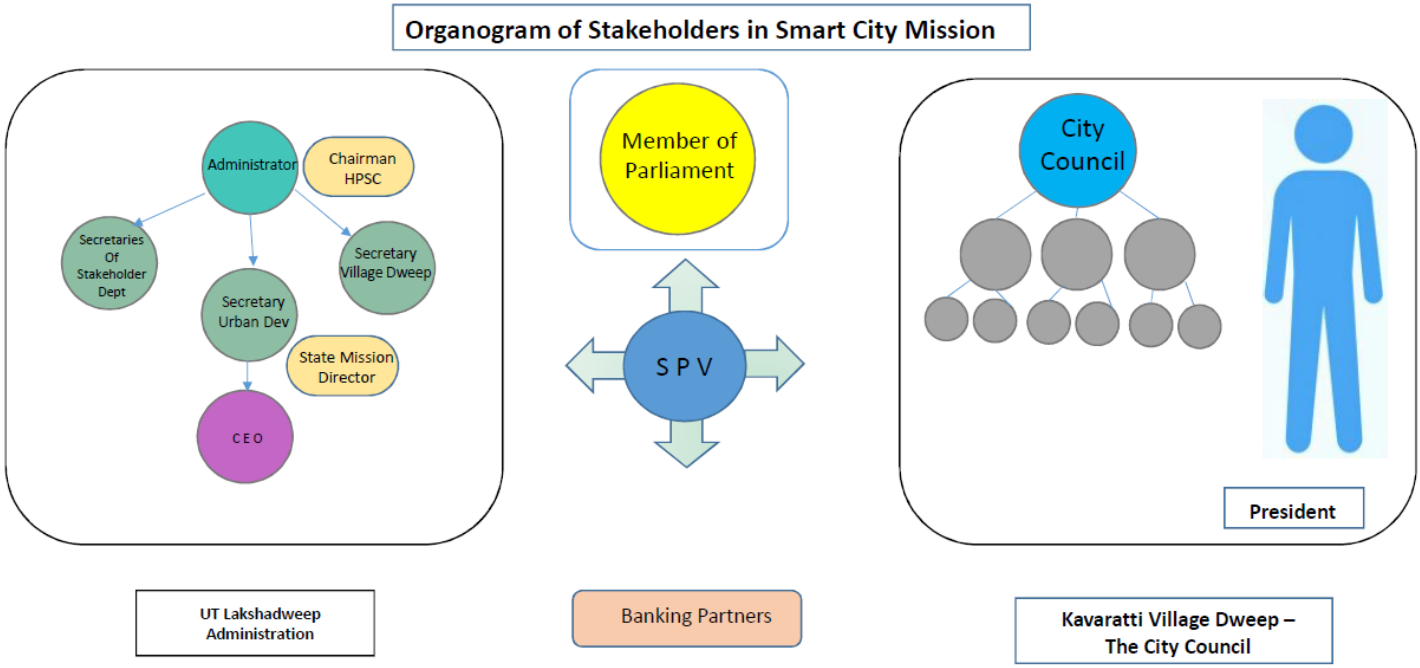
CORAL 3-7 SPV Vs DEPARTMENTS

RELATIONSHIP OF SPV WITH STAKEHOLDERS



Relationship of Stakeholder Departments with Special Purpose Vehicle and Other Agencies

CORAL 3-8 ORGANOGRAM



CORAL 3-9 MEETING WITH STAKEHOLDERS

Consultation of Project mentoring team with CEO was held at Kavaratti. A SWOT analysis of the first Smart City proposal submitted was done and the evaluator's comments were discussed in detail.

Consultation Project mentoring team with CEO was held at Kavaratti. Evaluator's comments were discussed in detail.

Consultation of Project mentoring team with Administrator was held at Kavaratti. Various smart city options developed with community participation were presented and discussed.

Consultation of Project mentoring team with Member of Parliament was held at Kavaratti. Various smart city options developed with community participation were presented and opinion sought.

CORAL 3-9 MEETING WITH CITIZEN

An extensive participatory citizen engagement was initiated to reach out to citizens through various outreach programs to get informed about Smart City Project and documenting opinions especially from youth and women.

Outreach programs to get informed about Smart City Project and documenting opinions especially from officials.

Outreach programs to get informed about Smart City Project and documenting opinions especially from School children.

Outreach programs to get informed about Smart City Project and documenting opinions especially from youth.

CORAL 3-9 MEETING WITH CITIZEN

Outreach programs to get informed about Smart City Project and documenting opinions especially from women SHGs.

People's voices to make Kavaratti Smart – People's suggestions and priorities collected by putting a number of suggestion boxes in prominent places/ location such as IG Hospital, Secretariat, Panchayat, Bank, Market, Jetty, etc.

Outreach programs to get informed about Smart City Project and documenting opinions especially from women SHGs.

CORAL 3-9 MEETING WITH CITIZEN

Project team interacting with general public and documenting their opinions on proposed Smart City Program.

Outreach programs to get informed about Smart City Project and documenting opinions especially from elected representatives

Finalisation of revised Smart City Project Proposal in Presence of Administrator and other senior officials. March 2017

Finalisation of revised Smart City Project Proposal in Presence of Adviser of Administrator and other senior officials. November 2017

CORAL 3-10 PROJECT HIGHLIGHTS

AREA BASED DEVELOPMENT

i. **Arogyam** - Health for All, by strengthening of specialty medical facility

ii. **Bandham** – High speed internet connectivity, ITES to stimulate e-governance

iii. **Vathayanam** - All weather access to main land and Inter island connectivity

iv. **Sancharam** – Road network in the form of 'spine and spur' pattern with arterial road having footpath on either side, proper signages and road markings

v. **Urja Kiran**: Assured Electric Supply; 100% renewable source of energy through solar and biomass, replacing diesel based generation reducing carbon foot print

vi. **Sudha-jalam** - Clean Water; Additional desalination plant

vii. **Suchithwam** – Sanitation and Solid Waste Management ; Modernization of SWM, sewerage and septage management

viii. Innovative use of Open/Public space

ix. **Jagratha** - Safety of Citizens; An integrated and efficient disaster alert and guidance system

x. **Vidyalayam** – Education; International Centre for Diving on the lines of Hawai centre

xi. **Kayikam** - Envisaging dedicated high end sports facilities

PAN – CITY Proposal

i. **ECOSMART -** Establishment of integrated IT solutions including Geospatial database, Enterprise GIS, data and disaster recovery centre in mainland

ii. **Enterprise level utility service solutions -** Smart electric metering, SCADA system with water metering

CORAL 3-11 PROJECTS AT A GLANCE

PROJECT COMPONENT DETAILS

S. No	Components	Amount in Lakhs	Details
Area Based Proposal			
i	**Arogyam**- Health for All, by strengthening of specialty medical facility	**510**	Construction of 200 sq.m.; Procurement of MRI Scanner, Mini Cathlab Equipments, Neuro Clinic Equipments, Opthonomology; One Dialysis unit and Cancer care unit
ii	**Bandham**– High speed internet connectivity, ITES to stimulate e-governance	**3350**	Setting up of digital base framework for IT enablement of services and applications; Develop and implement integrated enterprise IT enabled services; Setup access nodes for achieving high speed connectivity
iii	**Vathayanam**- All weather access to main land and Inter island connectivity	**26600**	Procurement of one All Weather Ship 500 passenger capacity, Jetty improvement project at western jetty
iv	**Sancharam**– Road network in the form of 'spine and spur' pattern with arterial road having footpath on either side, proper signages and road markings	**1290**	Development of Beach front road 700M, 10 km arterial road with proper signages and road marking and beautification; Junction improvements and Smart Parking
v	**Urja Kiran**: Assured Electric Supply; 100% renewable source of energy through solar and biomass, replacing diesel based	**1425**	Establishing 2.0 MW solar roof top system; Conversion of ordinary bulbs/ tube lights to LED lights
vi	**Sudha-jalam**- Clean Water; Additional desalination plant	**14590**	Establishing 2 new desalination plant of 1 lakh litres per day each; Piped water supply to all houses and establishments; Implementation of rooftop rainwater harvesting systems to tap 10 lakh litres per year.
vii	**Suchithwam**– Sanitation and Solid Waste Management; Modernization of SWM, sewerage and septage management	**940**	Popularization of 4R concept; Modernization of MSW processing unit, 1.5 ton capacity; Smart collection, transportation & monitoring framework for entire MSW collection; Interconnected alerting systems between administration, hospitals and MSW facilities; Establishment of centralized STP/Septage Processing - 1.5 MLD; Public bio toilets
viii	**Innovative use of Open/Public space**	**980**	Beach front development, corridor beautification, circuit with native handicrafts, cultural facilities and coral museum; Developing open spaces as destinations for nature walks, Construction of a community Hall 1000 m2
ix	**Jagratha**- Safety of Citizens; An integrated and efficient disaster alert and guidance system	**350**	An integrated and efficient alert and guidance system; Monthly disaster management drills; AV based disaster management training kits
x	**Haritham- Smart Agriculture**-	**30**	Introduction of Hydroponic Cultivation

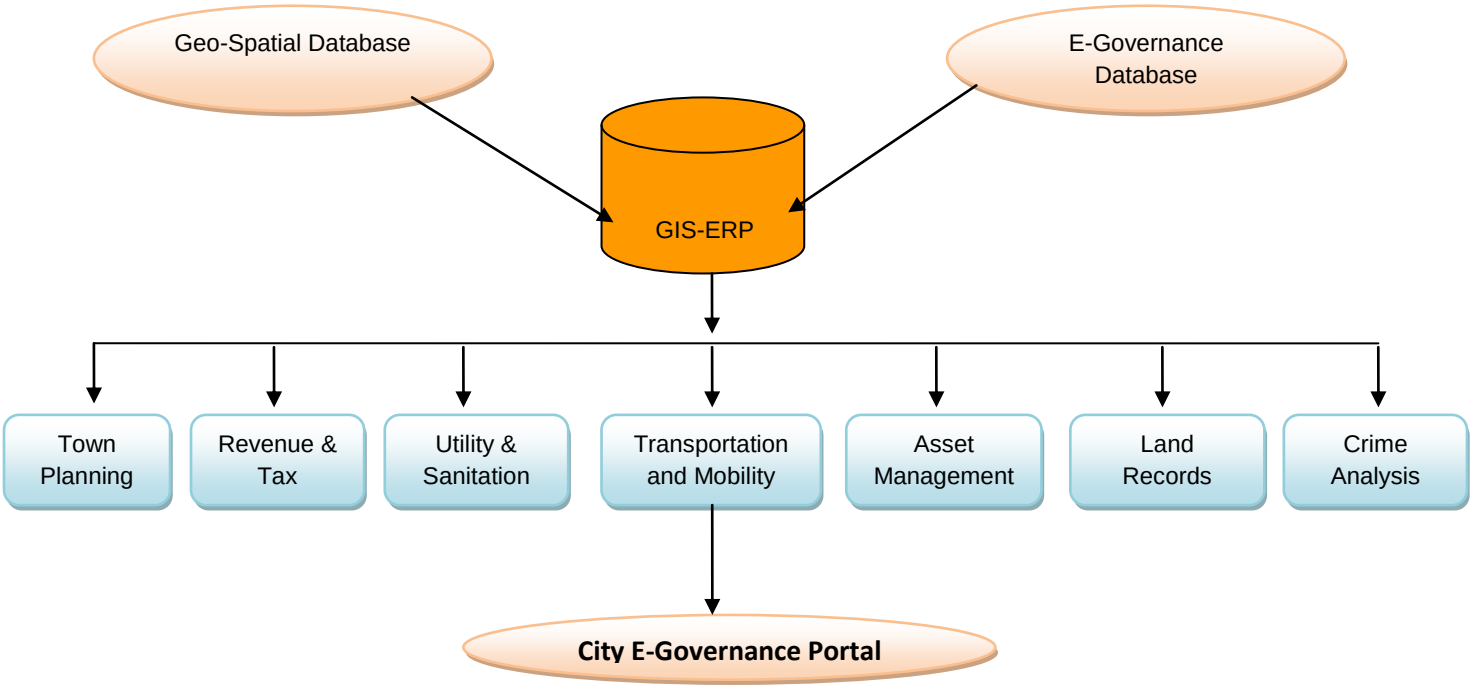
xi	**Vidyalayam**– Education; International Centre for Diving	**592**	Specialty institute to conduct specialized studies and impart international training- International Centre for Diving Studies. Smart class rooms for all schools, Language Lab, E-Library etc.
xii	**Kayikam**- Envisaging dedicated high end sports facilities	**350**	Modernization of the existing stadium Water Sports, sports hall with multi gymnasium
	Sub Total	**51007**	
Pan City Proposal			
i	**ECOSMART-** Establishment of integrated IT solutions including Geospatial database, Enterprise GIS, data and disaster recovery centre in mainland	**500**	Establishment of Integrated IT solution include Geospatial databases and powered by DoT implemented high speed network; Data centre and disaster recovery centre; Enterprise GIS along with a client side remotely monitored hardware and server side software tools, mobile apps etc.
ii	**Enterprise level utility service solutions-** Smart electric metering, SCADA system with water metering	**1154**	6540 Smart Electrical Metering with AMR facility; 40 km of pipe network, water connections to all houses and business establishments with SCADA & Telemetry system and metering
	Sub Total	**1654**	
	TOTAL	**52661**	

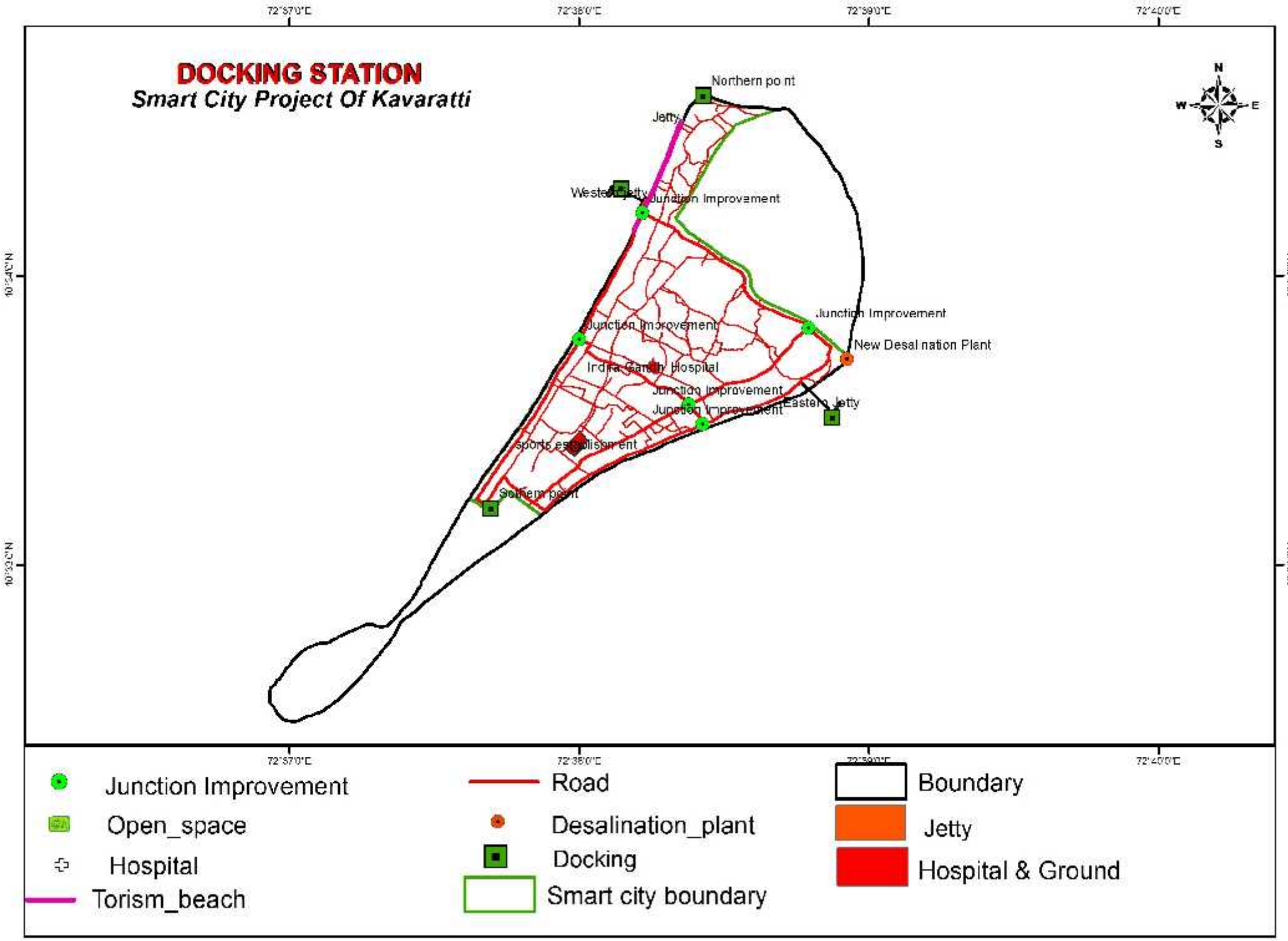
CORAL 3-12 FINANCIAL TIME LINE

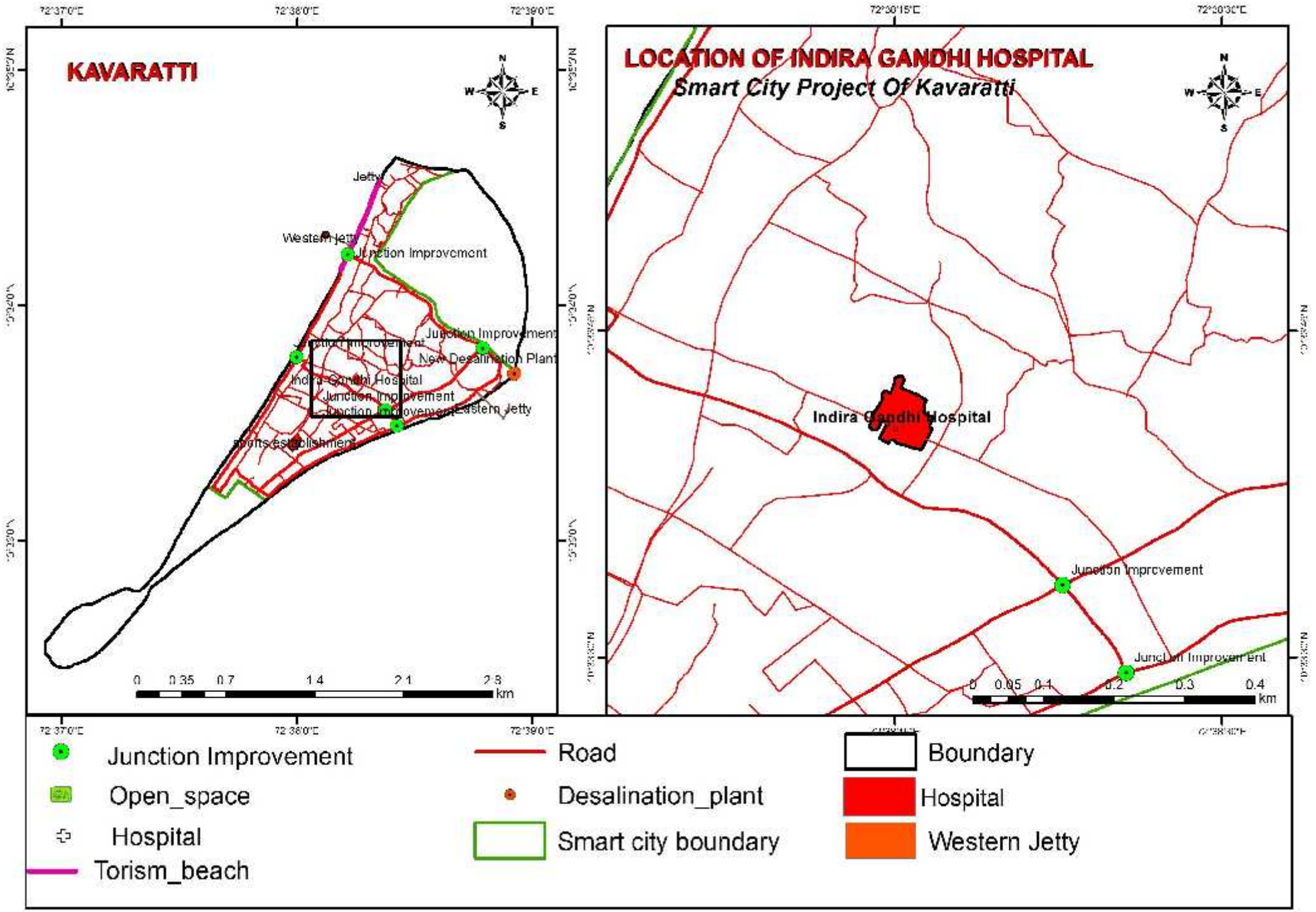
S. No	Components	Cost in Rs.Lakhs	No. of months	1st Half	2nd Half	3rd Half	4th Half	5th Half	6th Half	Total
Area Based Development										
	Arogyam- Health for All, by strengthening of specialty medical facility	510	18	50	250	210				510
	Bandham– High speed internet connectivity, ITES to stimulate e-governance	3350	24	850	825	850	825			3350
	Vathayanam- All weather access to main land and Inter island connectivity	26600	36	600	4600	7175	7200	6500	525	26600
	Sancharam– Road network in the form of 'spine and spur' pattern with arterial road having footpath on either side, proper signages and road markings	1290	24	530	450	240	70			1290
	Urja Kiran: Assured Electric Supply; 100% renewable source of energy through solar and biomass, replacing diesel based	1425	12	725	700					1425
	Sudha-jalam- Clean Water; Additional desalination plant	14590	24	4000	3700	3630	3260			14590
	Suchithwam– Sanitation and Solid Waste Management; Modernization of SWM, sewerage and septage management	940	20	315	300	305	20			940
	Innovative use of Open/Public space	980	18	400	480	100				980
	Jagratha- Safety of Citizens; An integrated and efficient disaster alert and guidance system	350	10	250	100					350
	Haritham – Smart Agricultural – Introduction of Hydroponic Cultivation	30	6	30						30
	Vidyalayam– Education; International Centre for Diving , Smart Class rooms	592	24	207	100	100	185			592
	Kayikam- Envisaging dedicated high end sports facilities	350	18	150	100	100				350
Pan City Proposal- "ECOSMART"										
	Establishment of integrated IT solutions including Geospatial database, Enterprise GIS, data and disaster recovery centre in mainland	500	15	200	200	100				500
	Enterprise level utility service solutions- Smart electric metering, SCADA system with water metering	1154	18	600	400	154				1154
	Total	**52661**		**8907**	**12205**	**12964**	**11560**	**6500**	**525**	**52661**

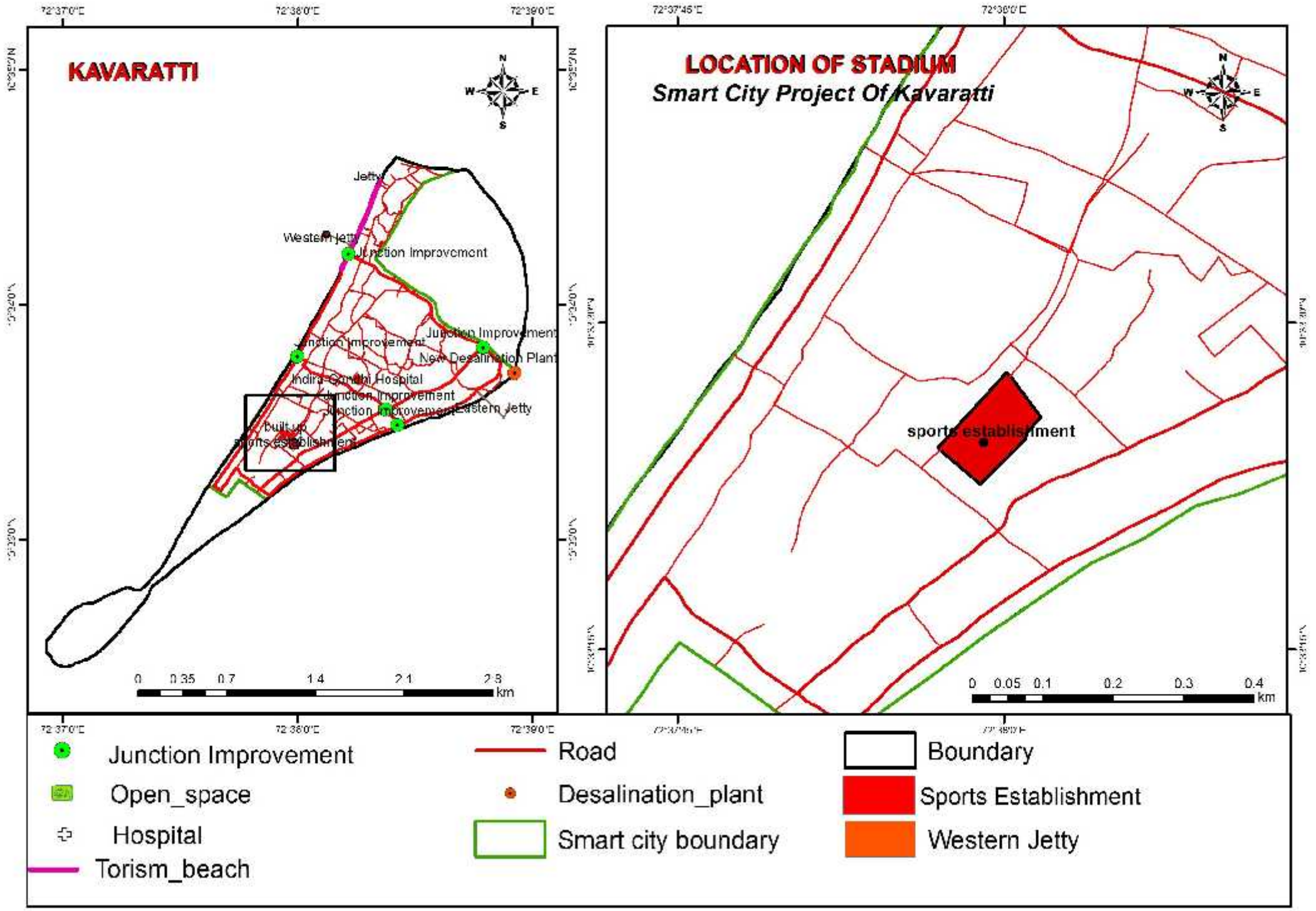
CORAL 3-13 ARCHITECTURAL DIAGRAM FOR GIS

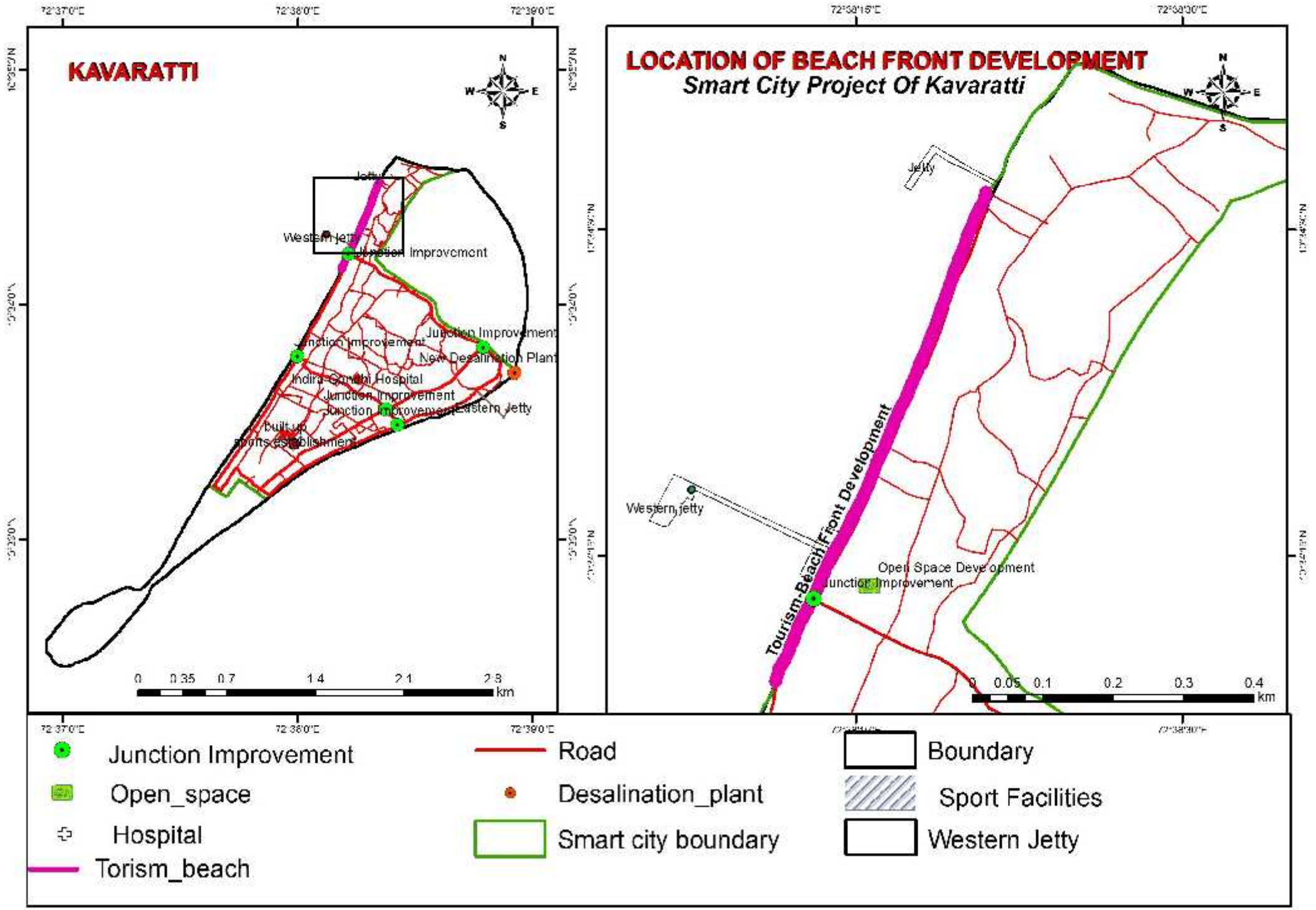
ERP based E-Governance System for Kavaratti

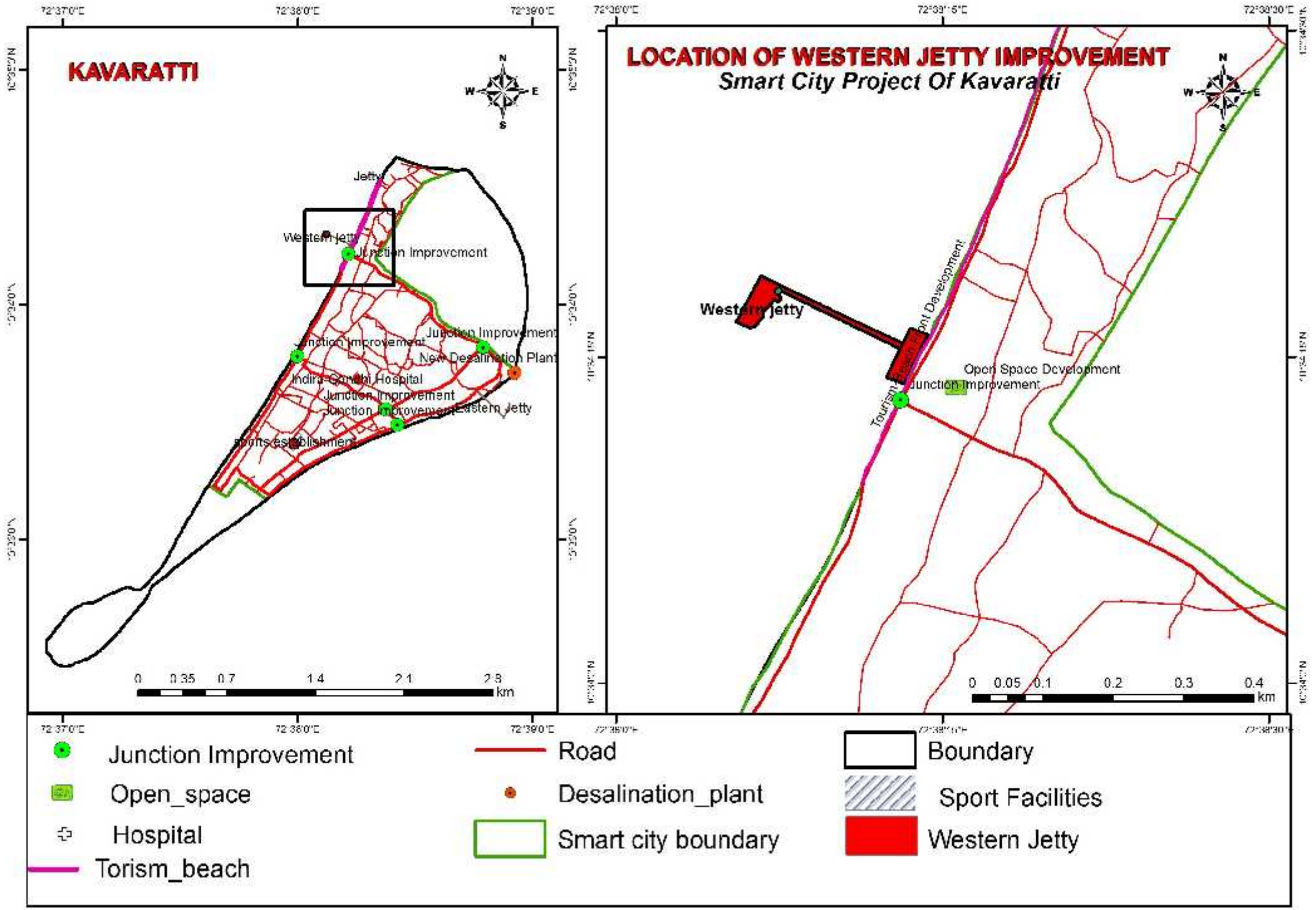



DOCKING STATION
Smart City Project Of Kavaratti
72°37'0"E
72°38'0"E
72°39'0"E
72°40'0"E
10°34'0"N
10°33'0"N
N
S
E
W
Northern po nt
Jetty
Junction Improvement
Junction Improvement
Junction Improvement
New Desal nation Plant
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
Eastern Jetty
Sports establishment
Southern point
Junction Improvement
Open_space
Hospital
Torism_beach
Road
Desalination_plant
Docking
Smart city boundary
Boundary
Jetty
Hospital & Ground


KAVARATTI
LOCATION OF INDIRA GANDHI HOSPITAL
Smart City Project Of Kavaratti
Jetty
Western jetty
Junction Improvement
Junction Improvement
New Desalination Plant
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
Eastern Jetty
sports establishment
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
0 0.35 0.7 1.4 2.1 2.8 km
0 0.05 0.1 0.2 0.3 0.4 km
Junction Improvement
Open_space
Hospital
Torism_beach
Road
Desalination_plant
Smart city boundary
Boundary
Hospital
Western Jetty


KAVARATTI
LOCATION OF STADIUM
Smart City Project Of Kavaratti
Jetty
Western Jetty
Junction Improvement
Junction Improvement
Junction Improvement
New Desalination Plant
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
Eastern Jetty
built up
sports establishment
sports establishment
0 0.35 0.7 1.4 2.1 2.8 km
0 0.05 0.1 0.2 0.3 0.4 km
Junction Improvement
Open_space
Hospital
Torism_beach
Road
Desalination_plant
Smart city boundary
Boundary
Sports Establishment
Western Jetty


KAVARATTI
LOCATION OF BEACH FRONT DEVELOPMENT
Smart City Project Of Kavaratti
Western jetty
Junction Improvement
Junction Improvement
Junction Improvement
New Desalination Plant
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
Eastern Jetty
built up
sports establishment
Jetty
Western jetty
Tourism-Beach Front Development
Open Space Development
Junction Improvement
0 0.35 0.7 1.4 2.1 2.8 km
0 0.05 0.1 0.2 0.3 0.4 km
Junction Improvement
Open_space
Hospital
Torism_beach
Road
Desalination_plant
Smart city boundary
Boundary
Sport Facilities
Western Jetty


KAVARATTI
LOCATION OF WESTERN JETTY IMPROVEMENT
Smart City Project Of Kavaratti
Jetty
Western jetty
Junction Improvement
Junction Improvement
Junction Improvement
New Desalination Plant
Indira Gandhi Hospital
Junction Improvement
Junction Improvement
Eastern Jetty
Sports establishment
Western Jetty
Tourism Beach Development
Open Space Development
Junction Improvement
0 0.35 0.7 1.4 2.1 2.8 km
0 0.05 0.1 0.2 0.3 0.4 km
Junction Improvement
Open_space
Hospital
Torism_beach
Road
Desalination_plant
Smart city boundary
Boundary
Sport Facilities
Western Jetty

SMART CYCLES FOR SMART CITIZENS MOBILITY IN CORAL CITY

PEDAL WITH PRIDE

REDUCE CARBON

BY-CYCLE SHARING

SAVE FUEL

GREEN RIDE

33. SPV

Goals, Policy and Human resources plan of SPV

Special Purpose Vehicle (SPV) will be created in Kavaratti for implementing Smart City project, the structure and functions of which are given below.

The SPV may appoint Project Management Consultants (PMC) for designing, developing, managing and implementing Area Based Development projects. SPV may take assistance from any of the empanelled consulting firms in the list prepared by MoUD, Government of India and the handholding agencies.

Goals of SPV:

- Smart and Efficient Implementation of Smart City Mission
- Professional support for developing and implementing Smart City Mission Projects
- Focused and single point responsibility
- Government owned with smart features
    - Financial strength matching with smart city scale
    - Can enter into DBFOT (PPP) and JVs
    - Has dedicated and capable staff

Transparency and good governance

Key Functions

- Plan, Implement, manage and operate smart city projects
- Approve and sanction the projects including technical appraisal
- Mobilize resources
- Implement and monitor the Smart City Proposal with complete operational freedom and comply with the requirement of MoUD, GoI

Incorporate Joint Ventures and subsidiaries and enter into PPP as may be required.

Shareholding, Fund Raising

- Grants
    - Smart City Grant funds provided to the SPV will be kept in a tied Grant fund to use only for approved purposes
    - In addition to making the equity contribution, Union Territory of Lakshadweep (UTLA) can also provide grants to ensure availability of funds to the SPV.
- Equity
    - Minimum paid up equity capital of the SPV will be Rs. 200 crores
    - UTLA will use approved Smart City Grant funds to make its equity contribution to the SPV, with approval of MoUD.
- Revenue Model
    - Dedicated and substantial revenue stream is made available to SPV to make it self – sustainable and creditworthy.
    - SPV will also access funds from other sources such as debt, loans, user charges, taxes, surcharges etc.

Ownership of SPV

- The Company will be promoted by UTLA.
- UTLA will have majority shareholding, and control of the SPV
- Private sector and financial institutions can also be shareholders in the SPV

Government of India

GOVERNMENT OF INDIA
LAKSHADWEEP ADMINISTRATION
(DIRECTORATE OF HEALTH SERVICES)
KAVARATTI-682555

F.No.1/60/2015-DHS

Dated: 13/11/2017

13.11.17.

SMART CITY PROJECT

Sub:- Smart city project-Proposal-reg.

Ref;- F.No. 1/Smart city/2017/2213 dated 07-11-17.

1. **How many specialist Doctors are available to take care of Cardiac Unit, Dialysis Unit and Cancer Care Unit?.**

At present no specialists Doctors are available to take care the units. However Dr.K Shaik Koya and Dr.Anwar has been managing the Cardiac units at IGH Kavaratti. Dedicated four Para medical staff attached to Cardiac care units.

Dialysis Units is functioning at IGH Kavaratti in collaboration with Shanti Medical Service Centre Thrissur and PUSHPA Kavaratti. Dialysis services is providing to the needy patients on almost every day in the dialysis unit, 1652 free dialysis has been done and at present 4 cases were getting service and six cases are pending for dialysis for want of anastomosis.

Now Department is proposes to start the Chemotherapy Centre at IGH Kavaratti. In this connection the team from RCC were visited the IGH and found satisfactory to establish the Centre at IGH Kavaratti. One GDMO and two Staff Nurse are deputed to RCC Trivandrum for training on cancer chemotherapy for a period of 3 months and 2 weeks respectively as per the feasibility report submitted by the team. Two dedicated rooms identified for Chemotherappy in the newly constructed annex building. The providing infrastructure and other logistics are under process.

2. **Whether any separate building is required? Whether land is available for new constructions?**

Medical and Health care delivery facilities are provided through one Specialty Hospital (PPP mode), One First Referral Unit (FRU), one Sub District

Hospital, three Community Health Centre and four Primary Health Centers. There are adequate numbers of GDMOs who are manning these facilities; the issue is with respect to the availability of the specialists.

Twelve posts of specialists of Central Health Service have been sanctioned for the Hospitals in the UT. These posts are under the Central Health Service and they are to be filled by the Ministry of Health and Family Welfare. There are 12 posts of Specialists sanctioned to this Hospital, they are one each Physician, Ophthalmology, Pediatrician, Pathologist and two each Gynecologist, Anesthetist, Surgeon and Public Health Specialists. Out of which these 12 posts 10 are laying vacant. Ministry of Health Family Welfare is deputing 5 to 6 specialists on rotation basis for a period of 90 days since commencement of IDA (Island Developmental Authority) under the Chairmanship of Hon'ble Prime Minister.

Now Ministry has accorded approval for outsourcing of specialty services at IGH Kavaratti under PPP model. Accordingly department has invited e-tender. In addition department has issued an appointment order to 6 Specialists Doctors under NHM to serve in IGH Kavaratti.

The Indira Gandhi Hospital Kavaratti was constructed long year back with a capacity of 50 beds. This Hospital is functioning as First Referral Units and providing various essential specialty services. The patients from various islands are reaching to headquarter island exclusively for specialized treatment. Considering the exigency, being a headquarter island, department has already proposed to construct 100 bed District Hospital in the existing Land as per IPH Standards, for which Plan sketch was approved by the design division of Ministry of Health & Family Welfare almost 12 years back. The Plan sketch and design got revised and re-revised and finally accepted by the Administration after a power point presentation. The old wing of IGH was also handed over to PWD for demolition and to start the work in a phased manner.

3. Present capacity of Indira Gandhi Hospital (Number of Beds).

   50 Beds.

4. Number of Doctors and Para medical staff available at Indira Gandhi Hospital Kavaratti.

	Permanent	Contract
Doctors	14	6
Paramedical	31	35

5. Number of evacuations took place during 2016 -17.
   2016 – 162 (Mainland – 84, RGSH – 78)
   2017 – 163 (Mainland – 122, RGSH – 41)

6. Annual Expenditure towards medical evacuation during 2016 – 17.

   Not available in the Department.-Met by Director, PSA

7. Any Central Govt. Scheme to start Cardiac Unit, Dialysis Unit and Cancer Care Unit.

   No. However these units are running within the available budget of UT.

NOTE:

1. Medical and Health care delivery facilities are provided through one Specialty Hospital (PPP mode), One First Referral Unit (FRU), one Sub District Hospital, three Community Health Centre and four Primary Health Centers. There are adequate numbers of GDMOs who are manning these facilities; the issue is with respect to the availability of the specialists. Twelve posts of specialists of Central Health Service have been sanctioned for the Hospitals in the UT.These posts are under the Central Health Service and they are to be filled by the Ministry of Health and Family Welfare. There are 12 posts of Specialists sanctioned to this Hospital, they are one each Physician, Ophthalmology, Pediatrician, Pathologist and two each Gynecologist, Anesthetist, Surgeon and Public Health Specialists. Out of which these 12 posts 09 are laying vacant. Ministry of Health Family Welfare is deputing 5 to 6 specialists on rotation basis for a period of 90 days.
2. Now Ministry has accorded approval for outsourcing of speciality services at IGH Kavaratti under PPP model. Accordingly department has invited e-tender. In addition department has issued an appointment order to 6 Specialists Doctors to serve in IGH Kavaratti.

3. The shortage of specialist doctors is a matter of concern in the islands and needs to be addressed appropriately. U.T Administration is bound to provide specialized treatment and services to the inhabitants, classified as Scheduled Tribes. In the absence of specialist doctors, cases are being referred and evacuated to Agatti and mainland specialty hospitals by arranging special sortie of helicopter, as delay in appropriate treatment can endanger life of the patients.

4. The incidence of evacuation to Kochi and Agatti has been on the rise. It is also point out that, department has initiated a proposal to construct Super Specialty Hospital at Kavaratti, for which sufficient land has identified by the Land acquisition Collector. Administrative approval not been accorded yet for acquisition of the identified land. However department is suggested that the construction of 100 bed Multi Speciality hospital may be included in smart city Project and expedited the proposal.

5. **The ongoing process for the construction of a NEW HOSPITAL,is in the final stage of approval in the existing campus may not be included in the smart city project.**

Yours faithfully,

Kavaratti
09/11/17.

(Dr.M.K.Mohammed Aslam)
Director Health Services

Bharat Sanchar Nigam Ltd
(A Govt.of India Enterprise)
O/O Principal General Manager
Ernakulam, Kochi-16

No.AGM(EB)/Smart City / 2017-18 dated 12-10-2017

To
Sri.Reghu Kumar

Sir,

Sub: Proposal for Smart City Kavarathi

Internet connectivity is the most demanding resource to be provided to the Smart City Kavarathi. BSNL BTSs (Mobile Towers) are working at the highest traffic in Kavarathi. Hence it is suggested that 10 Wi-Fi Hot Spots with 4 Mbps Back Haul each and 30 Access points will be an ideal solution for Kavarathi Smart City.The Locations proposed are given in Annexure I.The approximate project cost is also worked out and is attached as Annexure II.

Sudhakaran
Assistant General manager,
Enterprise business,
Ernakulam

Annexure-I

Proposed Locations at Kavaratti for Wi-Fi Hot Spot

Sl.No	Location Name
1	Main Jetty
2	Main Junction near Bismillah
3	Fisheries Jetty
4	Government House
5	Muttiyar Children Park
6	Pushpa Junction
7	Eastern Jetty
8	Post Office Junction
9	Secretariat Junction
10	Helipad

Annexure-II

Approximate Project Cost Estimate

Sl Number	Item	Annual Rate Per site	Quantity	Total
1	4 Mbps IDR Charges	137.385 Lacs	10	1373.85 Lacs
2	4 Mbps Wi-Fi Back Haul bandwidth Charge	3.5534Lacs	10	35.534 Lacs
3	Transportation and Technical support charges	1 lac	10	10 lacs
	Total			1419.384 Lacs
	GST @18%			255.48912 lacs
	Total Estimate *			1674.87312 Lacs

*This is annual charges. The rate quoted is only for one Year.The same charges are to be paid every year for continued service

GOVT. OF INDIA
LAKSHADWEEP ADMINISTRATION
(Lakshadweep Public Works Department)
Kavaratti – 682 555

04896262262 (Personal)
04896263367 (Fax)
Email:selpwd@gmail.com

F.No. DB/33/EE/CHN/2015 /1408 **Dated: 04. 04 . 2016**

ORDER

In exercise of powers delegated vide Ministry of Home Affairs, letter No.15039/ 15/91-Plg cell (Pt III) dated. 9.9.95 the Administrator, Union Territory of Lakshadweep is pleased to accord Administrative approval and expenditure sanction to the work named below subject to the budget provision and availability of land free from all encumbrances.

NAME OF WORK	ESTIMATED COST
Construction of Retaining wall at beach road side at Kavaratti Island (140 mtrs)	**Rs.1,01,97,300/- (Rupees One Crore One Lakh Ninty Seven Thousand Three Hundred) Only**

The expenditure is debitable to the head of account **5054** Capital Outlay on Road & Bridges, 03 ,00,53 Major Works (Plan).

This has the approval of Administrator vide dairy No. **3295**.. dated **03./04/2016**

DESPATCHED
DATE 16.08.2016

J.A

(J. Ashok Kumar IAS)
Secretary (works)

To,

The Assistant Engineer PWD Sub Division Kavaratti. with preliminary estimate
Copy to :- The Executive Engineer, Division Kavaratti with copy of estimate.

Registered

14.11.17

भारत सरकार
GOVT. OF INDIA
लक्षद्वीप संघ शासित क्षेत्र प्रशासन
ADMINISTRATION OF THE
UNION TERRITORY OF LAKSHADWEEP
(बिजली विग)
(DEPARTMENT OF ELECTRICITY)
कवरत्ती - ६८२ ५५५
KAVARATTI - 682 555

F.No. 75/1/2017– Ele /2573 **dated 14th November 2017.**

To,

The Executive Engineer (Smart City)
Circle Office (PWD)
U.T. of Lakshadweep
Kavaratti.

Sub :- Department of Electricity – Details for preparation of Under smart city Project - Regarding.

Ref :- Letter No. 1/ smart City /2017/2228 dated 09-11-2017 of Executive Engineer (PWD) Smart City Kavaratti.

Sir,

Kindly see the reference cited on the subject mentioned above. The brief Note on Renewable Energy is enclosed here with for further necessary action.

Yours faithfully

Mohammed Kudage
Executive Engineer/ कार्यपालक अभियंता

RENEWABLE ENERGY

Back ground

Electricity is produced by diesel generators. Diesel generators available at Kavaratti are given below

Diesel Generators

1. 2 x1000 KW
2. 2 x 600

Total installed capacity is 3200 KW.

Max. Demand: 1300 to 1600 Kwl.

Average Monthly Generation : 924839 Kwh

Diesel (HSD) Consumption

Average Daily Consumption: - 8666 Ltrs

Average Monthly Consumption: - 260000 Ltrs

Average Yearly Consumption: - 3120000 Ltrs

a) Total capacity Soar plant installed now.

Sl. No	Island	Renovation Capacity (kWp)	Augmentation Capacity (kWp)	Total Capacity (KWp)
1.	Kavaratti	100	660	760
2.	Andrott	100	220	320
3.	Minicoy	100	110	210
4.	Agatti	100	-	100
5.	Kalpeni	100	-	100

6.	Kadmat	150	110	260
7.	Kiltan	100	-	100
8.	Bitra	50		50
9.	Bangaram	50		50
	Total	850	1100	1950

b) Future plan to generate from Renewable energy

1. Roof top Solar power plant
2. Floating Solar power plant
3. Small wind generators.
4. Bio gasifier plant

c) Schemes under MNRE

1. Solar power plant
2. Wind Energy
3. Biomass power plant
4. Biogas plant
5. Solar Air dryers

Points on Renewable Energy in Lakshadweep islands.

1. Roof top Solar Power plant:- Ministry of New & Renewable Energy allocated a target for this UT for implementation of Solar Rooftop power plants. A target of 10 MW capacity of Solar Rooftop power plant was allocated to Lakshadweep and the target fixed to be completed by the year 2022. In this regard LEDA (Lakshadweep Energy Development Agency), the implementing agency for Renewable Energy Projects in Lakshadweep, has made an initial assessment of availability of roof area on Govt. Offices/Institutions and residential building suitable for roof top power plants throughout the islands. It is presumed that the target allocated can be easily accommodated on the available roof area. Capacity of plants to be erected may vary from building to building. Applications are invited from electricity consumers in islands

and received 289 Nos applications. LEDA prepared tender document for Govt: as well as private building and submitted for approval. and will be implemented by the end of 2017.

2. **Floating Solar Power plant:-** Lakshadweep Administration started new venture to reduce diesel consumption and carbon edition by introducing a green energy technology best situated for Lakshadweep environment conditions. LEDA already proposes to 10 MW floating solar in the lagoon area of Lakshadweep islands Kavaratti Island. The floating solar plant can be install by deploying solar panels in the availability of lagoon area in all islands. EoI prepared and submitted for approval.

3. **Wind Energy:-** This Administration under process of installation of small wind turbines at Kadmat, Minicoy and Kalpeni islands. Feasibility study already conducted by M/s World Institute Sustainable Energy (WISE), Pune. As per the wind data according to NIWE, Chennai report during the period from January 1993 to December 1995 wind speed at 50 mtrs height is 9.52 m/sec in mansoon period and 4.3m/s in fair seasons. Off shore type small wind turbines 225/250 KW capacity may be installed in all islands in a hybrid mode and limited number of hours may be utilized a diesel saver.

4. **Biomass Gasifier Power plant:-**It is proposed to **install** 250 KW biomass gasifier plant in major islands. NTPC Officers already visited and studied availability of biomass in islands and they suggested to install and commission 250 KW gasifier plant in islands. NTPC under the under preparation on DPR.

1.Schemes approved by the Ministry:-

a) 10 MWp Roof top Solar Power plant

b) 10 MWp Floating Solar Power plant

2. Budget available 2017-18: -Two crore.

Fund Pattern

(a) U.T. budget : Two crore

(b) Under Smart city project :-.....

Views on Renewable Energy in Lakshadweep islands.

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RENEWABLE ENERGY

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8.	Bitra	50		50
9.	Bangaram	50		50
	Total	850	1100	1950

b) <u>Future plan to generate from Renewable energy</u>

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c) <u>Schemes under MNRE</u>

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1.Schemes approved by the Ministry:-

a) 10 MWp Roof top Solar Power plant

b) 10 MWp Floating Solar Power plant

2. Budget available 2017-18: -Two crore.

<u>Fund Pattern</u>

(a) U.T. budget : Two crore
(b) Under Smart city project :-……..

1. There are two projects in the SAAP - I as detailed below;

Sl. No	Name of Work	Amount approved in the SAAP (in Lakhs)	DPR approved for(Rs in Lakhs)	Work awarded	Central Assistance Released (in Lakhs)	Expenditure incurred as on 07.09.2017 (in Lakhs)
1	C/o 75 ferro cement rainwater harvesting structure of 10,000 litre capacity	66	66	Work awarded for the construction of 75 Nos tanks and the amount agreed by the L1 bid is Rs.35,58,950/-	Rs.14	Rs.9.96 (30 Nos completed remaining in progress)
2	Providing interlocking tiles footpath for children's park	1.70	1.70	Work awarded for Rs.1.59 Lakhs		Rs.1.59 (Work completed)

2. There are three projects in SAAP - II as detailed below.

Sl. No	Name of Work	Amount approved in the SAAP (in Lakhs)	DPR approved for(Rs in Lakhs)	Work awarded	Central Assistance Released (in Lakhs)	Expenditure incurred as on 07.09.2017 (in Lakhs)
1	C/o 116Nos of ferro cement rainwater harvesting structure of 10,000 litre capacity	102.08	102.08	Not awarded*	Rs.24	Nil
2	Providing one number of battery operated vehicle	15	15	Work awarded. As per rate quoted by L1 bid cost of vehicle - **Rs.16.2Lakh** AMC for 5 years after one year guarantee -**Rs. 6 Lakh** **Total 22.2 Lakh**		Nil
3	Providing fountain & Play equipments to existing parks	2.92	2.92	Tender being floated		Nil

* Regarding the construction of *116 Nos of individual ferro cement rainwater harvesting structure of 10,000 litre capacity due to lack of beneficiaries the SLTC & SHPSC has recommended to construct community rainwater harvesting tanks within the amount allocated for the construction of 116 individual rain water harvesting tanks and requested the Ministry for approval vide F.No.118/01/2017-S4/1656 dated 16.08.2017 and waiting for the approval from the Ministry. DPR is prepared accordingly.*

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

3. Third and Final SAAP 2017-20
   The following projects are approved and released 1st installment of CA Rs.35 Lakh.

Sl. No.	Sector	Project	Number	Cost
1	Water	Community Rain Water Harvesting Tanks	10*	154 Lakh
2	Parks	Play equipments for the existing park		4 Lakh
3	Transport	Vehicle charging stations	4	15 Lakh
	Total			173 Lakh

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

Ocean Thermal Energy Conversion (OTEC) Brief Note

1. The islands of U.T of Lakshadweep are scattered in Arabian Sea from 8°to 12° 30' North Latitude and from 71°to 74° east longitude. There are 36 islands, submarine reefs, sand banks and 10 islands are inhabited apart from one island developed as tourist resort. The indigenous population is Schedule Tribe (ST). Total population is 64,473, as per 2011 census. The land area of the territory is 32 Sq.km. There are no surface water source like stream and rivers available in islands.
2. Ministry of Earth Science MoES- NIOT successfully established the Low Temperature Thermal Desalination Plant (LTTD) at Kavaratti on 23rd May 2005 to supply potable water to the islanders as a pilot project with their own fund at a cost of Rs.4.9 Crore. The LTTD Plant at Kavaratti was commissioned in July 2005. The plant was run by NIOT for one year then handed over to Lakshadweep Public Work Department (LPWD) in August 2006. As per the request of the UTL Administration, NIOT had installed similar plants at Minicoy in April 2011 at a cost of 10.3 Cr and at Agatti in July 2011at a cost of 16.5 Cr. The plant is running round the clock and producing 1 (one) Lakh litre per day. Plants are running efficiently since then without major maintenance. The outbreak of waterborne diseases is reduced to a greater extent after the installation of these plants. In a study conducted during 2006-07 in Kavaratti by team of doctors from Sri Ramachandra Medical University, it was found that the local hospital record shows that a significant drop in the incidents of water borne diseases such as dysentery, Diarrhea, etc. With the commissioning of these LTTD plant at Kavaratti, Minicoy and Agatti, the pressure on the ground water has come down substantially.
3. Island wise Per capita availability of drinking water and the deficit @ 40 LPCD is tabled below. The UT Administration's proposal for the installation of LTTD plants in the remaining island (Andrott, Amini, Kadmat, Kalpeni, Kiltan & Chetlat) is in the advanced stage of approval. The deficit of the islands Andrott, Amini, Kadmat, Kalpeni, Kiltan & Chetlat can be reduced by installing the proposed plants.

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

Per capita availability of drinking water and the deficit @ 40 LPCD

Sl.No	Island	Population as per 2011 census	Desalinated Water from LTTD plants	Rain water Harvested	Deficit @ 40 LPCD
1	Kavaratti	11210	9 lpcd	5 lpcd	-26
2	Mnicoy	10447	10 lpcd	5 lpcd	-25
3	Agatti	7521	13 lpcd	8 lpcd	-19
4	Andrott	11191	Nil	2 lpcd	-38 lpcd
5	Kadmat	5404	Nil	6 lpcd	- 34 lpcd
6	Amini	7661	Nil	5 lpcd	- 35 lpcd
4	Kalpeni	4419	Nil	9 lpcd	- 31 lpcd
5	Kiltan	3949	Nil	8 lpcd	- 32 lpcd
6	Chetlat	2347	Nil	13 lpcd	- 27 lpcd

The above table does not reflect the potable ground water available in the islands which is generally in the form of small lens. Considering that the decadal growth rate of population for UTL as per 2011 census is 6.23% (national average is 17.64%). The population growth has stabilised.

4. Kavaratti is the Capital Island and hence Government offices and major Educational institutes are situated at Kavaratti. Inhabitants of other islands are depending Kavaratti for their various needs. The present deficit of Kavaratti is 26 lpcd but it may be high considering the floating population of Kavaratti. Providing one additional plant of capacity 1 (one) lakh litre per day at Kavaratti may reduce the present deficit to 17 lpcd. The proposed OTEC plant is a pilot project and fully funded by MoES /NIOT. Kavaratti being capital Head Quarter, UT Administration prefers to establish one more plant at Kavaratti.
5. Desalination plant powered by OTEC Technology does not require power supply. This will considerably reduce the cost of desalinated water and also reduce the pollution. Now electricity is generated by diesel generator. Dependency on fossils fuel will be reduced.

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

NOTE ON DRINKING WATER SUPPLY IN LAKSHADWEEP

1. Lakshadweep consists of 36 islands, submerged reefs and sand banks and has 10 inhabited islands viz Kavaratti, Agatti, Minicoy, Androtт, Kalpeni, Amini, Kadmat, Chetlat, Kiltan and Bitra. The indigenous population is Scheduled Tribe. The total population is 64,473. There are no rivers, streams or water bodies in any of the islands and the only potable water resources for the inhabitants is the ground water, which is recharged during every monsoon rainfall (Average rainfall 1600mm).
2. Water supply is partial in quantity. It is combination of ground water, rain water, Desalination Plant. Water supply scheme has been introduced in all islands but the supply is partial in quantity. The only natural source of water is ground water. Quantity of ground water is limited and the quality is disturbed by sea water intrusion and lack of proper sanitation network.
3. Ground water is limited. The Administration has taken steps to reduce the ground water extraction by constructing Rainwater Harvesting Tanks (RHT) and by installing Low Temperature Thermal Desalination Plants (Sea water based). 4457 Nos Rainwater Harvesting Tanks (RHT) have been constructed, 3 Nos of Low Temperature Thermal Desalination Plants of 1 Lakh litre per day capacity are installed in three Islands viz Kavaratti, Minicoy and Agatti. It is proposed to install 6 Nos (six) similar Plants at remaining islands (Androtт, Kalpeni, Amini, Kadmat Chetlat & Kiltan). One No 25 thousand liter per day capacity sea water based Reverse Osmosis (RO) plant installed at Bitra Island. Bitra is the smallest island having population of 271 as per 2011 census and the land area is 0.1 Sq Km.
4. In three islands namely Kavaratti, Agatti and Minicoy water is produced by Low Temperature Thermal Desalination Plants (LTTD) and supplied to public by street taps. The per capita supply of desalinated water through street tap at Kavaratti, Minicoy and Agatti is 9 LPCD, 9.6 LPCD and 13 LPCD respectively. In the remaining Islands, requirement of drinking water is met by ground water and rain water harvesting.
5. Water testing laboratories have been installed in all islands to monitor quality of water except Bitra Island. The water quality of the Bitra Island is monitored by the laboratory at Chetlat.

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

6. The per capita supply of Desalination Water through street tap at Kavaratti is 9 LPCD. It is also proposed to set up a Desalination plant of One Lakh litre capacity powered by OTEC technology (Ocean Thermal Energy Conversion). It is fully funded by Ministry of Earth Science. UT Administration has constructed rain water tanks (10,000 litre capacity) ..... Nos. Rain water harvested is 5 LPCD.

   a. Water supplied through LTTD plant = 9 LPCD
   b. Water supply from proposed OTEC plant = 9 LPCD
   c. Rain water harvested = 5 LPCD

   Total supply of water = 23 LPCD

   All this will not meet the minimum national average of 40 LPCD portable water.

   d. It is therefore proposed to setup One and Half Lakh litre capacity Desalination plant (13 LPCD) under Smart City project.

   Total of (a) + (b) +(c) + (d) = 36 LPCD

(Mohammed Kudage)
Superintending Engineer

SUPERINTENDING ENGINEER
L.P.W.D. LAKSHADWEEP ADMN.
KAVARATTI-682 555

भारत सरकार
GOVT. OF INDIA
लक्षद्वीप प्रशासन
LAKSHADWEEP ADMINISTRATION
(पर्यावरण एवं वन विभाग)
(Department of Environment & Forests)
कवारत्ती द्वीप – 682555
Kavaratti Island – 682555

एफ नं। 66/1/2017 - ई एंड एफ /100 दिनांक: 14.11.2017

To

The Executive Engineer,
Circle Office (PWD),
Smart City,
Kavaratti Island.

Sub: - Proposal under Smart City Project - Views and Comments on Solid Waste Management of Lakshadweep- Reg;

Ref:- F.No. 1/Smart city / 2017 dated 09.11.2017.

Sir,

With reference to your letter cited regarding Proposal under Smart City Project. The Views and Comments with Fund requirements on Solid Waste Management of Lakshadweep is herby enclosed for reviewing the Proposal under Smart City Project

Yours faithfully,

Encl : As above;

(Damodhar A.T.,) IFS
वन संरक्षक
CONSERVATOR OF FORESTS

SOLID WASTE MANAGEMENT OF LAKSHADWEEP

The Lakshadweep Administration has formulated a comprehensive waste disposal system and implementing by the department of Environment & Forests effectively. The two major schemes of the Slid Waste management systems are the **Scientific Management of Non Biodegradable Waste (NBD) Collection and Disposal of Non Biodegradable Waste in all islands and Sanitation, Health & Hygiene of the Biodegradable Wastes to maintain the cleanliness in the islands.**

1. Scientific Management of Non Biodegradable Waste (NBD) in all islands:-

The scheme for collection and disposal of Non Biodegradable waste is formulated with the objective of collect, transport, segregate and significantly disposes all sorts of non biodegradable wastes generated in islands to improve the living surroundings, ensure the proper cleanliness, freedom from pollution and giving aesthetic environment to human & wildlife thereby maintaining the healthy biodiversity and bio resources in all islands for the benefit of stakeholders. Considering the above objectives, the department is implementing the scheme with following physical components is allowed in the year.

1. Waste Assessment Workers engaged for check and verify the collection of NBD wastes on daily basis
2. Collection labours engaged for collection of NBD wastes from blue waste bin to Central Garbage Depository yard in all the islands.
3. Sorting labours engaged for sorting the daily collected wastes in all the islands.
4. Land rent for the Central Garbage Depository yard in all the islands
5. Purchase of implements for implementing the scheme
6. Hiring the vehicle for Transportation of NBD waste from blue waste bin to Central Garbage Depository yard and to Incinerator site on daily collection basis in all the islands.

According to the implementation of the scheme the NBD wastes generated per day is as follows.

Sl.No.	Islands	2015-16	2016-17
1	Agatti	330 Kg	410 Kg
2	Chetlat	65 Kg	85 Kg
3	Amini	350 Kg	420 Kg
4	Kadmat	220 Kg	295 Kg
5	Kalpeni	90 Kg	110 Kg
6	Minicoy	310 Kg	325 Kg
7	Kavaratti	650 Kg	910 Kg
8	Andrott	390 Kg	680 Kg
9	Kiltan	85 Kg	125 Kg
10	Bitra	10Kg	10 Kg

10 **Sanitation health & Hygiene in all islands:-**

The scheme is implemented in all the islands were conceived with the prime objectives to keep the island clean and neat from accumulation of Biodegradable wastes and pollution caused by it with the following objectives.

1. To keep the open space are freee from Bio- waste accumulation and pollution
2. To keep the regular maintenance of public roads through sweeping and disposal of wastes scientifically
3. To avoid accumulation of wastes at waste dumping open place
4. To set up bio manure unit from collected waste
5. To have proper waste generation data for micro planning on sanitation

Fund allotment for the following schemes in the year 2017-18

Scheme	Amount
Scientific Management of Non Biodegradable Waste (NBD) Collection and Disposal of Non Biodegradable Wastes in all islands	150Lakh
Sanitation Health & Hygiene in all islands	100 Lakh
Total	250 Lakh

Fund required under Smart City Project:-

The vehicle or goods carrier is necessary requirements in the above said schemes implementation. Detailed Specifications is follows.

Sl.No.	Requirements	Amount
1	Vehicle (2 Nos. X Rs.18,00,000)	36 ,00,000
2	Driver (2 Nos. Skilled labourers X Rs.1,30,000)	2,60,000
3	Collection (4 Nos.unskilled labourers for 12 months X Rs.1,10,000)	4,40,000
4	Diesel (Rs.12,000 X 5 barrel X 2 Vehicle X 12 Months)	14,40,000
5	Maintenance (Rs. 1,00,000 X 2 Vehicles)	2,00,000
	Total Rs	59,40,000
	Rounded Rs.	**60,00,000**

BRIEF NOTE ON DISASTER MANAGEMENT AUTHORITY IN LAKSHADWEEP AND RESOURCE DETAILS

1. Disaster Management Cell at Collectorate, Kavaratti

In 2009, a Directorate of Relief & Disaster Management established by the Administration (as per the order No. 19/14/2009/Esst, dated:" 22.07.2009). Collector is the Ex officio Secretary and ADM is the Director.

As per the DM Act 2005 Lakshadweep Disaster Management Authority has been formed to streamline the Disaster Management in Lakshadweep. The Administrator, Union Territory of Lakshadweep is the Chairperson of the Lakshadweep Disaster Management Authority. The organization chart is appended below.

1. Administrator : Chairman
2. Secretary (General Administration & Services) : Chief Exe. Officer
3. Member of Parliament UT of Lakshadweep : Member
4. President-Cum Chief Counselor, District Panchayath : Member
5. Superintendent of Police, Lakshadweep : Member
6. Commandant, I.R. Battalion : Member
7. Managing Director, LDCL : Member
8. Director of Medical & Health Services : Member
9. Executive Engineer (Electrical) : Member

Currently, a Disaster Management professional Posted on contract basis (As per the order. F.No. 41/5/2016-Dm/ADM, dated: 14.07.2017) for coordinating DM activities and one UDC for the DM cell.

2. There are no equipments available with the DM cell. However sanctioned has been accorded to DCs/SDOs for purchasing the following equipments to 9 islands except Bitra.

Sl.No	Name of the Equipment	Quantity
1	Heavy duty Torch light	2 Nos
2	Emergency Lamp	1 Nos
3	Chain saw	1 Nos
4	Hand saw	1 Nos
5	Steel Cutter	1 Nos
6	Axe	2 Nos
7	Shovel	1 Nos
8	Rope (18 mm)	16Kg/(110m)
9	FH Ladder (6 feet)	6 Nos
10	Umbrella	6 Nos
11	Raincoat	6 Nos
12	Boot	6 Nos
13	Gloves	6 Nos
14	First Aid Kit	2 Nos
15	Emergency Blanket	2 Nos

Proposal under Smart City Project

EF11: SAFETY OF CITIZENS ESPECIALLY CHILDREN, WOMEN AND ELDERLY

Main project: **Jagratha – An integrated and efficient alert and guidance system**

1. An integrated and efficient alert and guidance system. Considering the disaster prone scenario of Lakshadweep islands, monthly disaster management drills are proposed.

   AV based training kits will be made available to all on entry to Kavaratti to ensure sufficient readiness in case of emergencies

Sl. No.	Activity / Component	Indicator	Baseline (as on)	Target	Resource Required (INR in Lakhs)	Likely date of completion
	Jagratha - Safety of Citizens					
1.	An integrated and efficient alert and guidance system. Monthly disaster management drills and AV based disaster management training kits	Unit	NIL	CCTV cameras, Alert Alarm, Sensors, Computer system, training kits etc.	350	10 months

Fund Pattern

(a) U.T. budget : 3.50 crore

(b) Under Smart city project:-……. crore

16.11.17

Government of India
Lakshadweep Administration
(Directorate of Education)
Kavaratti – 682555
Phone-04896-262241, 263835,262419

F.No.6/1/2015-Edn(AW)/849 **Dated.** 16 **/11/2017**

To,

The Executive Engineer,
(Smart City)
PWD, Circle Office
Kavaratti.

Sub:-Smart Class – Details of Class Room in Schools of Kavaratti reg:

Sir,

As per the request of Smart City authority the details of class rooms available in Schools of Kavaratti needed for smart class room facility. There are 76 class room are available altogether in all schools. The Lakshadweep administration proposed to introduce 2 smart class rooms in one each in two Senior Secondary Schools. The remaining 74 class rooms are available for smart class rooms. The details of required smart class rooms, Language lab and IT Lab are as given below.

Area	Lakshadweep Administration Provide	Required from Smart City Authorities
Smart Class Rooms	2	74
Language Lab	NIL	7
IT Lab	Nil	7

The Language Lab & IT Lab required 2 each in GSSS and GGSSS, 1 each in SBS, JBS (N) and JBS (E)

Yours Faithfully.

16/11/17

(K.Buzar Jamhar)
Director of Education

95. As part of implementation of smart classes in schools of Lakshadweep, Hon'ble Administrator UTL, directed the Director of Education to visit Director, IT@School, Kerala at Thiruvanathapuram to study the way the Kerala Government introducing ICT equipments and cost of ICT materials for smart class in Kerala. Director of Education UTL and Subject Expert (Physical Science) in Directorate of Education Kavaratti visited to Shri.Anver Sadath, Vice Chairman Executive Director, Kerala Infrastructure and Technology for Education at IT@School Poojapura, Thiruvanathapuram on 25/09/2017 and made a study and discussion on the implementation of smart class rooms in Kerala.

96. Govt. of Kerala has constituted a Technical Committee under IT@School project to review and fix the minimum specification, maximum price & service conditions for procurement of ICT equipments for schools and institutions under General Education Department of Kerala. Based on the recommendations of the Technical Committee thus constituted, KELTRON has undertaken the national level tendering process of ICT equipments. The Technical committee finalised the price, specifications and service conditions of the ICT equipments for smart classes. The minimum requirements for a smart class room is a Laptop/Desktop, Multimedia project, White Board, USB Speaker and Broadband Internet connection with networking .The committee advised to prefer Laptop rather than desktops. Laptop doesn't need any UPS and the costs of the Laptops are lesser than that of Desktops. Hence the Kerala Govt specified the following equipments for a smart class room

Details of Equipments required in a Smart Class Room

Sl.No	**Equipment**
1	Laptop
2	Multimedia Projector mounted in the ceiling
3	Whiteboard
4	USB Speaker
5	Broadband Internet connection with networking

The Specifications of the ICT equipments and its market price is as detailed

1. Laptop Computer	**Maximum Price: Rs. 28,990/-**
ITEMS	**Minimum Specifications**
Processor	Dual core 2.0 GHz, Tptal cache 3 MB supporting 4 threads
Chipsets	Intel/ATI/N-Vidia/AMD
Motherboard	OEM
Memory	4 GB DDR3-1333 MHz
HDD	500 GB SATA 6 Gbps, 7200 rpm
Display	14" or Higher active matrix wide screen WXGA
Graphics	Intel HD/ATI-Radeon XPRESS/N-Vidia Geforce
Optical Drive	Integrated DVD Writer 8X
Network Connectivity	802.11 b/g/n, and 10/100/1000 Fast Ethernet
Speaker	Integrated Stereo Speaker
Interface-I/O Ports	RJ-45, 3 x USB(at least 1 USB 3), HDMI, VGA port for external Monitor, Mic in/Speaker/Headphone Out/combo port, DC in for connecting AC adapter
Power	230V, 50 Hz AC Supply with rechargeable LI-ION Battery Pack
Battery Backup Time	Minimum 3 Hrs under normal operations
Additional Items	Optical scroll Mouse(USB)
OS	IT@School Edubuntu 14.04
Warranty	5 Years on site comprehensive including battery and power adapter
Carry Case	Back Pack standard quality(OEM)
Keyboard Protector	Keyboard Protector skin for Laptop
Accessories and Other Items	Driver fir IT@School Edubuntu 14.04. All drivers shall provided in CD media
Certification	ISO 9000 and 14000, EPEAT

2. Mutimedia Projector	**Maximum Price: Rs. 25,630/-**
ITEMS	Minimum Specifications
Native Resolution	XGA (1024x768)
Brightnrss	3000 ANSI Lumens
Aspect Ratio	4:3 and 16:9 compatible
Input	HDMI, VGA, Composite A/V input to connect TV output
Accessories	HDMI, Audio and VGA cables, Remote control
Warranty	5 years comprehensive on site including Lamp
Certification	The product should have BIS certification

3. White Board	**Maximum Price: Rs. 7900/-**
Type	Non Magnetic White Writing Board, Ceramic coated non glossy semi mat surface used for both projection & writing
Size	6 feet x 4 feet
Thickness	11 mm or above with aluminium frame and nylon corners

4. USB Speaker	**Maximum Price: Rs. 770/-**
Type	2.0 Mutimedia Stereo Speaker
Power	USB Powered
Connectivity	Hardwired 3.5 mm connction(for audio)
Controls	Power & Volume controls
Warranty	5 years comprehensive on site
5. Projector Mounting Kit	**Maximum Price: Rs. 4900/-**
Celing Mount Kit for projector	Universal Type (Compatible with all projector brand & models), made on aluminium alloy, power coated, 60 cms

	length, extending upto 1 meter. Shall be able to fix on any type of roofing
HDMI Cable	Length:15 meters Version 1.3 or higher
VGA Cable	Length:15 meters
Power Cable	Length:15 meter with 5 amp plug suitable for connecting projector
Casing & Cap for laying power cable & HDMI cable	25 mm, BIS approved
Warranty	5 years (Carry-in)

The Total costs of the ICT Equipments are

Sl.No	Equipment	Cost
1	Laptop	Rs. 28,900
2	Multimedia Projector	Rs. 25,630
4	USB Speaker	Rs. 770
5	Projector Mounting Kit	Rs. 4900
6	White Board	Rs. 7900
	Total	**Rs. 68,100/-**

97. Around Rs. 68,100/- (Rupees Sixty Eight Thousand One Hundred) will be the total cost of equipments excluding the installation charges and Transportation Charges from mainland to Islands. KELTRON a Kerala state govt. owned public sector for schools in the state. On the basis of this IT@School Project Under General Education Department Govt of Kerala has already entered in to an agreement with KELTRON for supply of these equipments through a national tendering process. Govt. of Kerala is going to install the smart class room of 4 District 600 Hundred schools by the end December 2017.

98. The Govt of Kerala laid the following conditions including Procurement and Service. The proceedings of the Director Public Instruction Thiruvanathapuram is **flaged as –A-**

Other Conditions

- If the procurement process follow the purchase condition followed by IT@School from KELTRON that include 50% advance, Balance 50% within one month of successful installation and commissioning and acceptance at a common point of distribution.

Service Conditions

- All items mentioned above will have 5 year On-site warranty for all components. No additional charges for installation and transportation should be levied from the customer under any circumstances.
- All equipments should possess 5 year on site warranty.
- Any change in technical specification- however minor it may be /shall be informed to the Directorate for obtaining its prior sanction before affecting the supply. However supply of equipments with higher specifications at the quoted price shall be entertained provided the same substantiated by test report
- The supplier shall demonstrate the performance of the equipments to the satisfaction of the School IT coordinator
- The following shall be clearly marked on the equipments using labels or indelible ink in the presence of School IT coordinator: The Date of Installation, Period of warranty and The details of service person
- Supplier has to set up a web based portal along with a call center/Telephone number to register, monitor and rectify all the calls from the school regarding hardware and software support arising after the supply(Kerala)
- The rates are inclusive of all applicable taxes.

99. Based on the discussion, Shri. Anver Sadath Vice Chairman Executive Director, Kerala Infrastructure and Technology for Education at IT@School, recommended the following suggestions for implementation of smart classes in Lakshadweep

- Formation of a Technical Group in Lakshadweep
- Formation of IT Coordinators in all islands
- Supply of required ICT equipments for smart classes by the IT@School on the basis of the rules and regulations mentioned in pre paras and the govt. of Kerala following.
- Proper training to IT coordinators can be given by the IT@School for the installation of smart class room equipments.
- After training the equipments can be supplied to all IT Coordinators to their respective school at a common site (Kochi).
- Necessary software can be had from IT@School.

100. As per the view from the Technical Committee of IT@School, a smart class is a usual class room equipped with ICT materials to facilitate the class room teaching and used as a Teaching Aid for a teacher. It doesn't mean to teach entire unit by using the electronic machines. A teacher can utilize the smart class room facilities as a teaching aid as and when required. A neat class room with the following amenities required for a smart class room.

- The class room should possess a roof/ceiling for fixing the Projector
- Enough space for putting white board
- Availability of Electric connections/plug/switch/Light etc
- Able to lock the class room and equipments safely.

101. A smart class room doesn't need any Air Conditioned facilities. It is not single class room which access for entire school. It can be given standard wise from secondary level to senior secondary level. A smart class room can be given from standard IX to XII to an island. So that entire classes and the teachers, students get the benefits for class room learning.

102. Current financial year 2017-2018 the Scheme wise and component base allotted fund for setting up of smart class room is Rs.10 Lakh**.(flaged-B-).** A single smart class room cost Rs.68,100/- excluding installation and transport charges. Allotted fund Rs. 10lakh may not be sufficient for setting up of smart class room for standard wise from IX to XII in all islands during this year.As a pilot project we can give at least one smart class room to an island(Senior secondary school) including SBS Bitra this current year by using the allotted fund.

S.No	**School/Island**	**No of Unit**
1	GSSS Agatti	1
2	MGSSS Androth	1
3	GGSS Androth	1
4	GSSS Amini	1
5	GSSS Chetlat	1
6	JNSSS Kadmat	1
7	Dr.KKMGSSS, Kalpeni	1
8	GSSS Kavaratti	1
9	GGSSSS Kavaratti	1
10	GSSS Kiltan	1
11	GSSS Minicoy	1
12	GSBS Bitra	1
	Total	**12**

103. Procurement of the ICT materials for setting up of smart class rooms can be followed the tendering procedures done by the Govt of Kerala by using the KELTRON a Kerala State Govt. Owned public sector institution. We may also write to the Secretary Education, Govt of

Kerala to get their concurrence for supplying the ICT materials for setting up smart class rooms by the present rate and tendering method following, using KELTRON and by the help of IT@School for getting training to the IT coordinators, Installation and services.

104. In addition to the above mentioned para 95 to 102 n/f, we checked one more firm which provide the smart room facilities to school. We visited the web site of **EDUCOMP SOLUTIONS LTD**, Gurgaon, a Haryana based institution. In the website www.smartclass.educomp.com they provided the specification of equipments for smart class room. They haven't provided the cost of equipments in the website. One e-mail has been send to their office for providing the specification, price, and way of procurements of equipments from the Educomp. We are yet to receive any information from them.

105 The equipment specified for smart class room by Educomp is

Equipment and Specification Required for Smart Class

A. List of equipment

Sl. No.	Items Description	Quantity
1	Integrated Digital Podium	1
2	Ultra Short Throw LCD projector	1
3	120" Motorized Screen with remote control	1
4	Full HD 55"LED TV	2
5	5KVA online UPS with 60 minutes battery backup	1
6	Digital interfacing and all digital cable connectivity to integrate all the equipment	1 Lot

B. WI-FI LAN Work along with equipment

1	Supply, laying, termination and testing of UTP CAT 6 Cablewith casing and capping for Networking of AP complete withnecessary ferrule numbering at both the ends of each piece ofcable complete	1box (305 Mtr)
2	Supply, installation, testing and commissioning of CAT - 6Information outlets (I/O) with face plate and flush PVC boxcomplete to be installed concealed in wall.	5
3	Supply, installation and fixing of 24 port Gigabit Fast Ethernet Web Managed L2 PoE Switch	1
4	Supply, installation and fixing of 300 Mbps Wireless AccessPoint with PoE Support	3
5	Patch Cord Cat 6 UTP Blue 1m - Moulded	6

6	Patch Cord Cat 6 UTP Blue 2m - Moulded	6
7	Supply, installation and fixing of Patch Panel Cat 6 UTP Modular -24 Port- Loaded 0.5U Height	1
8	Supply, installation and fixing of 9 U Wall Mount Rack withAccessories	1

106. The detailed equipment wise specification is placed below (**Flagged-C-)** for reference. Para 95 to 103 mentioned the details of smart Class equipments available in Kerala and it can be procured through KELTRON. Para 104 to 105 and the details flagged as-C- are the smart class materials available in EDUCOMB, a Haryana based firm, the details collected from the website.

107. Submitted for kind perusal and consideration.

Subject Expert (PS)

108. May kindly peruse from para 95, n.f onwards with regard to the setting up of Smart Class Room in the Schools of Lakshadweep .Director of Education along with the Subject Expert (Physical Science) have visited Kerala to learn the procedure adopted by the Kerala in this field. The Electronic /other accessories for the Smart Class Rooms of Kerala was purchased through Kerala based public under taking called KELTRONE and Unit cost incurred for this is come around Rs.68100/.

109. The Department of Education has also made an attempt to search any other agency available in this field and it is learnt from the internet that EDUCOMB, a firm based on Haryana also supplying materials for this purpose but the cost of the materials are not available in their website.

110. At present an amount of Rs 10.Lakhs is allotted in the budget for the setting up of smart class room and therefore maximum number of smart class rooms may be set up with available fund by following procurement procedure.

GOVT. OF INDIA
LAKSHADWEEP ADMINISTRATION
(Department of Tourism Development)
Kavaratti – 682 555

F.No.18/12/2012-TD Date: 25.11.2017

To

The Executive Engineer
Circle Office (PWD)
Smart City
Kavaratti

Sub: - International Dive Center at Kavaratti – Reg.
Ref: - Your Note dated Nil.

Sir

May kindly see the reference cited above. As requested the following inputs are furnished.

- **Details of PADI Registration with SPORTS**

Sl.No.	Location	Registration No.
1	Lakshadweep Diving Acdemy – 5 Star Dive Resort (Primary Location)	23185
2	Kadmat Dive Center (Secondary Location)	23186
3	Bangaram Dive Center (Secondary Location)	24324
4	Minicoy Dive Center (Secondary Location)	23186
5	Kalpeni Dive Center (Secondary Location)	24245

- **Land Available**

Sufficient land is available nearby Paradise Island Hut which is situated in the land owned by Department of Tourism. This land can be utilized for the construction of International Dive Center.

- **Brief History of Diving in Kavaratti**

The diving in Lakshadweep is started during 1980 and the Lakshadweep Diving Academy is established under the aegis of SPORTS funded by the Department

of Tourism with primary objective of promoting Lakshadweep as a dive tourist destination. The Lakshadweep Diving Academy is affiliated with PADI (Professional Association of Dive Instructors), Australia, the largest divers association in the world and is accredited by PADI as 5 Star (Instructor Development Center) Resort. The Dive Academy was established in the year 2012 Kavaratti as Its Head Quarter and Kadmat, Bangaram, Minicoy and Kalpeni as its subsidiary dive centers.

- **The detail of personnel trained by LDA is attached as Annexure-1.**

- The International Dive Center proposed will be run and managed by Department of Tourism. The Department is under the process of formulation guidelines for establishment of Dive Centers in Lakshadweep. The guideline will open up window for establishment of dive centers in Lakshadweep by local players. However the dive activities will be controlled by department of tourism.

- **The details of manpower engaged under Lakshadweep Diving Academy are as below.**

Chief Instructor	-	1 No.
Project Associate	-	1 No.
Dive Instructor	-	12 Nos.
Asst. Instructor	-	1 No.
Dive Masters	-	35 Nos.
Dive Assistants	-	30 Nos.

Lakshadweep Tourism is promoting Lakshadweep as Diving destination at national as well as international level. Department is in the process of finalizing **Scuba Diving Centre** guidelines to promote Lakshadweep as Diving Destination as well as to provide employment opportunities to the local youth who are trained in Diving.

- **Viability of Funding.**

The Department of Tourism has not earmarked any funds during FY 2017-18 for construction of International Dive Center. However, the required funds can be earmarked in the Budget during FY 2018-19.

RAHUL SAINI,DANICS
Director (Tourism Development)

Encl.As Above.

Run Date: 25 November 2017

lakshadweepdivingacademy@gmail.com
Lakshadweep Diving Academy #23185
Sports
Lakshadweep Tourism
UT of Lakshadweep 682555
INDIA

CertificationName	2017	2016	2015	2014	Prior to 2014	Total
Professional Certifications						
Assistant Instructor	0	0	0	0	1	**1**
Divemaster	11	0	25	0	9	**45**
Open Water Scuba Instructor	0	0	0	0	9	**9**
Total Professional Certifications	**11**	**0**	**25**	**0**	**19**	**55**
Diving Certifications						
Advanced Open Water	34	57	40	66	68	**265**
Junior Advanced Open Water	0	1	1	0	0	**2**
Junior Open Water	4	0	3	1	1	**9**
Open Water	120	146	77	65	81	**489**
Rescue Diver	20	52	32	27	6	**137**
Total Diving Certifications	**178**	**256**	**153**	**159**	**156**	**902**
Emergency Care and Safety						
Care for Children w/AED Instructor	0	0	0	0	11	**11**
EFR - Primary Care (CPR) & Sec Care (1st) w/ AED	27	45	31	27	11	**141**
EFR Instructor	0	0	0	0	11	**11**
EFR-Primary Care (CPR) & Sec Care (1st aid)	0	0	0	0	69	**69**
Total Emergency Care and Safety	**27**	**45**	**31**	**27**	**102**	**232**
Grand Total	**216**	**301**	**209**	**186**	**277**	**1189**

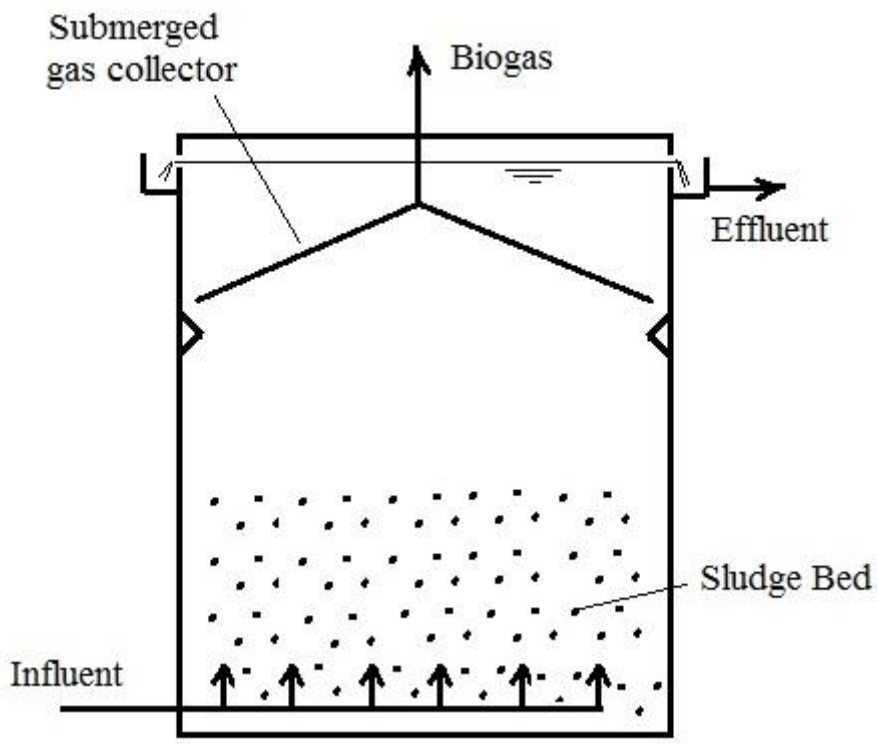
SEPTAGE TREATMENT PLANT, BRAHMAPURAM, KOCHI MODEL

The standalone unit has an installed capacity to process one lakh litres of septage a day. The technology employed is anaerobic treatment in Upward Anaerobic Sludge Blanket (UASB) reactor followed by aeration in Moving Bed Bio Reactor (MBBR) process. The septage that reaches the plant is pumped into the UASB reactor in pre-determined quantities for treatment and then aeration, sedimentation, filtration and chlorination process.

Up Flow Anaerobic Sludge Blanket (UASB) Technology

The upflow anaerobic sludge blanket wastewater treatment process is typically used for treatment or pre-treatment of wastewaters with a high BOD concentration. The process has a sludge blanket in the reactor zone, through which the influent wastewater flows. Also, the top part of the reactor includes a means for collecting the biogas generated by the anaerobic process. A schematic flow diagram of the process is shown here: The principle of UASB reactor is to introduce raw sewage/septage at the bottom of the UASB reactor. This helps in maintaining a sludge blanket, the incoming septage passes through the blanket and fine suspended particles are filtered and soluble components are absorbed in the Biomass. This Biomass converts the waste into the Biogas and some new Biomass. The gas leaves the blanket in bubbles and provides necessary mixing. The settled sludge is digested in the bottom zone. Upstream velocity and settling speed of the sludge is in equilibrium and forms a locally rather stable, but suspended sludge blanket. Sloped walls deflect material that reaches the top of the tank downwards. The clarified effluent is extracted from the top of the tank in an area above the sloped walls. A gas-liquid-solids separator (GLSS) separates the gas from the treated wastewater and the sludge. After several weeks of use, larger granules of sludge form which, in turn, act as filters for smaller particles as the effluent rises through the cushion of sludge. Because of the upflow regime, granule-forming organisms are preferentially accumulated as the others are washed out. Fortunately, these bacteria are also more efficient for biogas production than flocculated biomass.

The main units are UASB reactor in which most of the Biodegradation takes place, Biogas Holder where bio-gas generated from UASB reactors is collected, Polishing Unit to remove the balance BOD, Secondary Clarifier and Sludge Drying Beds for dewatering and drying of sludge. The space required to accommodate plants based on UASB is less than that required for conventional treatment. UASB is able to bring down the BOD load to a tune of 100 – 70 mg/L requiring a secondary aerobic treatment to enable to meet discharge standards. UASB Reactors are constructed out of concrete or another watertight material and can be designed in a circular or rectangular way.



Up flow Anaerobic Sludge Blanket Reactor

Moving Bed Bio Reactor (MBBR)

The MBBR system consists of an activated sludge aeration system where the sludge is collected on recycled plastic carriers. These carriers have an internal large surface for optimal contact water, air and bacteria. MBBR technology employs thousands of polyethylene biofilm carriers operating in mixed motion within an aerated wastewater treatment basin. Each individual biocarrier increases productivity through providing protected surface area to support the growth of heterotrophic and autotrophic bacteria within its cells. It is this high-density population of bacteria that achieves high-rate biodegradation within the system, while also offering process reliability and ease of operation. This technology provides cost-effective treatment with minimal maintenance since MBBR processes self-maintain an optimum level of productive biofilm. Additionally, the biofilm attached to the mobile biocarriers within the system automatically responds to load fluctuations.

SEPTAGE TREATMENT PLANT
Brahmapuram, Kochi

SWACHH BHARAT MISSION (GRAMIN) | SUCHITWA MISSION, KERALA

1. **Health for all: Project amount Rs.510 Lakhs**

a.	Cost of construction- 200 sq.mtr @ Rs. 46000/ sq m	92 Lakh say 100 Lakh
b.	Hospital furnishing	50 Lakh
c.	Bed and linens	50 Lakh
d.	Instruments for Cardiac unit, Dialysis unit and Cancer care unit	300 Lakh
e.	Smart Health Card	10 Lakh
	Total	510 Lakh

2. **Jetty improvements**

a.	Construction of New passenger hall 600 sq.mtr @ Rs. 46000/ sq m	276 Lakh Say 300 Lakh
b.	HVAC system (Air conditioning system)	40 Lakh
c.	Parking	40 Lakh
d.	Illumination of Jetty area	15 Lakh
e.	Landscaping	20 Lakh
f.	Extension of Jetty- 80mtr length	120 Lakh
g.	Furnishing including security instruments	60 Lakh
	Total	595 Lakh say 600 Lakh

3. **Urja Kiran: Solar Paneling 2MW (2000 KW)@Rs.70000/KW -1400 Lakh**
4. **SudhaJalam- Potable Water**

a.	OTEC: Ocean Thermal Energy Conversion is a new Technology. The project will be funded by MoES, the amount is calculated by National Institute of Ocean Technology (NIOT), Chennai.	10,000 Lakh
b.	Establishment of new Desalination Plant of 1.5 Lakh Litre Capacity. 6 Desalination Plants have been sanctioned by Ministry of Drinking Water. The project cost is taken from Standing Finance Committee (SFC).	4,500 Lakh
c.	Cost of construction of rain water tank 10,000 Ltr	90 Lakh

	Capacity(Ferro Cement Tank) @0.90 Lakh/ Tank. Proposed to construct 100 tanks.	
	Total	14,590 Lakh

5. Smart Class rooms

a.	76 Class rooms @70,000/Each	53 Lakh
b.	Language Lab- 3 Numbers@9 Lakh/Each	27 Lakh
c.	E- Library - 5 School @3 Lakh/Each	15 Lakh
d.	Civil works for modifying the Class rooms	12 Lakh
	Total	107 Lakh

6. Establishment of Gymnasium

a.	Civil Work (G+2) Building -120x3= 360 sqm @ Rs. 46,000	166 Lakh Say 170
b.	Equipments (50+50)- Ladies and Gents	100 Lakh
c.	Modernisation of existing stadium	30 Lakh
	Total	300 Lakh

7. Establishment of 1MLD STP

UASB model 1 MLD Plant established at Brahmapuram, Cochin. The details obtained from Cochin Corporation, the cost of the Plant including 5years O&M is Rs. 460 Lakh. For execution of this project at Kavaratti, additional cost Rs. 265 Lakh is considered (Rs. 725 Lakh).

8. Smart cycle

a. It is proposed to procure 200 Smart non- rusting Bicycles @ Rs. 20,000/ Each= 40 Lakh
b. 5 Numbers Smart Docking Station@ 6 Lakh/ Each= 30 Lakh

9. Construction of Beach Road

a. It includes retaining wall on sea side, filling of material, etc. Hence cost of construction is Rs. 0.74 lakh per m.

General Information

1. The cost of construction is Rs. 46,500 per sq.m. All the building materials required for construction are brought from Mangalore/Calicut by Motor Sailing Vessels (MSV).
2. All essential commodities such as rice, sugar, edible oil, etc. are transported by Government barges from mainland to Island.
3. The existing roads are cement concrete and having 3m width.
4. The date of commissioning of SCP is assumed as 1st January 2018.
5. For Internet connectivity project **,Initial investment** and **Annual maintenance** and repair for first two years will be funded under Smart city Project.

(7)

GOVERNMENT OF INDIA
LAKSHADWEEP ADMINISTRATION
SMART CITY CELL
KAVARATTI – 682555

F.No.1/1/2015-SCC Dated 14.12.2015

Goals, Policy and Human resources plan of SPV

Given the challenges of building smart cities, a Special Purpose Vehicle (SPV) will be created in Kavaratti for efficient deployment of human and physical resources. The structure and functions of the SPV are given below. After selection of Kavaratti in Stage II of the Challenge, the process of implementation will start with the setting up of the SPV. The SPV may appoint Project Management Consultants (PMC) for designing, developing, managing and implementing area-based projects. SPVs may take assistance from any of the empanelled consulting firms in the list prepared by MoUD and the handholding agencies. For procurement of goods and services, transparent and fair procedures as prescribed under the State/ULB financial rules will be followed.

SPV will be formulated with following Goals:

- Smart and Efficient Implementation of Smart City Mission
- Professional support for developing and implementing Smart City Mission Projects
- Focused and single point responsibility
- Government owned with smart features
  - Financial strength matching with smart city scale
  - Can enter into PPP and JVs
  - Has dedicated and capable staff
  - Transparency and good governance

Key Functions of SPV

1. Plan, implement, manage and operate smart city projects
2. Approve and sanction the projects including technical appraisal
3. Mobilize resources

4. Implement and monitor the Smart City Proposal with complete operational freedom and comply with the requirements of MoUD
5. Incorporate joint ventures and subsidiaries and enter into Public Private Partnerships as may be required
6. Enter into contracts, partnerships and service delivery arrangements as may be required
7. Determine and collect user charges as authorised by the ULB
8. Collect taxes, surcharges etc as authorised by the ULB

Shareholding, Fund Raising

- **Grants**

  - Smart City grant funds provided to the SPV will be kept in a tied Grant fund and can be used only for approved purposes to create infrastructurethat has public benefit outcome
  - In addition to making the equity contribution, UTL can also provide grants to ensure availability of funds to the SPV

- **Equity**
  - Minimum paid up equity capital of the SPV will be Rs 200 crores
  - The UTL will use approved Smart City grant funds to make its equity contribution to the SPV, with prior approval of MoUD

- **Revenue model**
  - A dedicated and substantial revenue stream is made available to the SPV to make it self sustainable and creditworthy
  - The SPV will also access funds from other sources such as debt, loans, user charges, taxes, surcharges, etc
  -

Policy of the SPV

In Kavaratti, an SPV (Public Limited Company incorporated under Companies Act 2013) will implement Smart City projects.

The Company will be promoted by UTL.

UTL will have majority shareholding, and control of the SPV

Private sector and financial institutions can also be shareholders in the SPV

Proposed Board of Directors of SPV are:

- Collector cum Development Commissioner, UTLA -CEO cum Managing Director
- GOI Representative - Member
- Chief Executive Officer, District Panchayath - Member
- Superintending Engineer, LPWD - Member
- Director of Tourism, UTLA - Member
- Executive Engineer, Electricity Department, UTLA - Member
- Director of environment and forest, UTLA - Member
- Director, IT - UTLA – Member
- Director, Port, Ship & Aviation - UTLA – Member

Preliminary Human Resources Plan

- Project Director (Infrastructure)

  Engineer Experts - 4 (1Senior Level, 1 Middle Level, 2 Junior Level)

  Procurement Expert -1

  Environmental Expert - 1

- Project Director (ICT)

  Engineer Experts - 4 (1Senior Level, 1 Middle Level, 2 Junior Level)

  Procurement Expert -1

- Administrative Staff

  Manager - 1, Clerical Staff -3, Supporting Staff - 8

(J. Ashok Kumar)
Secretary (Works)
UTL ADMINISTRATION

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J.Ashok

(J. Ashok Kumar)
Secretary (Works)
UTL ADMINISTRATION

15 YEARS PERSPECTIVE PLAN

ON

PORT, SHIPPNG & AVIATION

UNION TERRITORY OF LAKSHADWEEP

(2015-2030)

October, 2016

I N D E X

Executive summary

Shipping service, being the basic means of transport for men and material between mainland and Lakshadweep islands and inter-island, is the life line for socio-economic activities and development of U.T of Lakshadweep island territory. Considering the increase in passenger and cargo transport, Govt. of India constituted a Committee in 2000AD to formulated a composite perspective plan to assess the shipping requirements for next 15 years to plan acquisition of vessel. The Committee after detailed study on the shipping scenario and other related matters in the sector recommended requirements for augmentation of passenger shipping service in the island sector upto 2014-15. The recommendations contained in the above perspective plan have almost been completed and implemented. The above perspective plan has considered only acquisition of ships to handle the requirements upto 2015.

The shipping services since carried out at outer open sea in Lakshadweep islands, put the requirement of support crafts for passenger and cargo operations and also harbour facilities. In order to remove the risk involved in the shipping operations, it is very much necessary to develop harbor and off-shore facilities in parallel to acquisition of ships. Moreover air connectivity is the only alternative mode of transport, which also need to be developed for better connectivity and faster development of the islands.

Therefore a detailed study has been carried out for overall development of Port, Shipping & Aviation requirements for the next 15 years (2015-2030) taking into consideration of the present scenario of each sector, difficulties being faced and the requirements to overcome the problems.

The requirements proposed in this Perspective Plan, if implemented at the earliest, will facilitate in providing speedy, timely, efficient and uninterrupted shipping service to the people of these islands.

PART - I

Summary of requirements:-

1. Shipping:-

Shipping service being the life line of the people of the Lakshadweep islands and in order to handle growing passenger traffic and cargo transportation requirements, the following are the requirements during the Perspective Plan period.

- ❖ Acquisition of one all-weather ship of capacity 500 passengers for induction by 2020.
- ❖ Acquisition of two 150 Passenger all-weather vessels to ensure round the year connectivity from Kavaratti (HUB) to other islands.
- ❖ Acquisition of two all-weather ships of capacity 150 passengers by 2025 to operate between islands to Beypore/Mangalore for induction at the time of withdrawal of M.V.Amindivi & M.V.Minicoy.
- ❖ Acquisition of one 250 Passenger all-weather ship for tourists visiting the islands.
- ❖ Acquisition of 6 Nos. 600 MT Multipurpose Cargo Vessels as replacement vessels for M.V.Ubaidulla and M.V.Thinnakara (2018), M.V.Laccadives (2020) and M.V.Cheriyam (2022) and also to handle the growing cargo traffic.
- ❖ Acquisition of one 700/750 MT Oil Barge to handle transportation of HSD especially for generation of electricity, petrol, kerosene and ATF for chopper operation.
- ❖ Acquisition of 3 Nos. LPG cylinder carrier with capacity to carry 2000 LPG cylinders in each vessel.
- ❖ Registrar of ships:- to facilitate registration of ships being constructed by the Administration as well as registration of boats and other seagoing crafts/vessels.
- ❖ Ship Surveyor:- to facilitate completion of various surveys and certifications/documentation of ships for timely availability of ships for operations and to comply rule requirements during new construction.

2. Port & Harbour Infrastructure:-

In order to eliminate the risk involved in the shipping operation carried at outer open sea and also to maintain off-shore facilities, following requirements are proposed during the plan period.

- ❖ Dredging of channel from lagoon entrance upto jetty in all islands to facilitate safe entry of all High Speed Crafts having a draft of 1.35 mtrs. even in low-tide conditions. This can be done by placing sufficient dredgers/rock cutters etc. with all the clearances required from the competent authorities.
- ❖ Provide appropriate fender arrangements or any other alternative arrangements in the berthing head of eastern side jetties at Kavaratti, Minicoy, Agatti and Amini and mooring buoys/dolphin buoys for safe berthing of all ships and to achieve 100% berthing of all ships upto 400 Passenger capacity in eastern side jetties.
- ❖ Construction of eastern side jetties in all other islands subject to techno-economic feasibility and with proper study to eliminate all the shortcomings observed in the jetties constructed at Kavaratti, Minicoy, Agatti and Amini.
- ❖ Strengthening of existing Marine Workshop at Kavaratti with modern facilities and sufficiently qualified manpower to attend repair and maintenance of all support crafts engaged in shipping operation and also urgent repairs of inter-island High Speed Carfts.
- ❖ Establishment of workshop units in major islands to attend urgent repairs of support crafts.

3. Civil Aviation:-

Air connectivity is the only alternate transport facility to connect with mainland and inter-island. Therefore, it is necessary to develop civil aviation sector taking into account facilities and air-safety to augment and enhance the capacity utilization and accordingly following requirements are proposed for development under this perspective plan.

- ❖ Development of Night Landing Facilities in all the helipads to enable operation of helicopter service in any emergency situation even at night/bad weather.
- ❖ Development of re-fueling stations at Androtti and Kiltan to enhance the capacity utilization/air safety in helicopter operation.
- ❖ Extension of Airport at Agatti.
- ❖ Introduction of Sea Plan Service.

PART - II

1.0 Background

Union Territory of Lakshadweep is a group of islands located 200-400 kms off South-West Coat of India. It consists of 36 islands of which 10 are inhabited. The traditional occupation of the people of these islands is fishing and coconut cultivation. There are no highways, roads and bridges to connect any of these islands as they are separated by deep sea and lie far away from one another. Till the year 1959 the inter-island connectivity was maintained by small rowing boats and the connectivity between islands and mainland was maintained with traditional sailing vessels, which are no more in existence in the islands. Till the early part of 1960s these islands were not having any hospital and schooling facilities. Only few people attained education at the basic level in Mainland in those days. The Lakshadweep group of islands was declared as a Union Territory on 1st November, 1956. Considering the total backwardness and geographical isolation of these islands and to provide special packages of health and schooling facilities, the Government of India declared the entire population of these islands as Scheduled Tribes in the year 1959. Thereafter, the Government of India started extending socio-economic programmes for the overall development of these islands. Development in shipping sector was also a part of these socio-economic programmes extended to these islands though without any serious study to assess the shipping services on a long term basis. There are no major agricultural and industrial activities in these islands except coconut cultivation, its harvesting and fishing. Hence all food items including rice, wheat, sugar, pulses and vegetables etc. are transported from mainland. Further, all commodities like building materials, kerosene, Diesel for electricity generation, clothing, stationeries, provisions and other essential items required to meet the daily requirements of the local people are transported from mainland. Schooling facility up to 10 + 2 level is only available in islands and for further educational requirements people have to travel to mainland. There are limited medical facilities in these islands and for any specialized treatment, people are forced to travel to mainland. Shipping services, therefore are the life line of the people of these islands. Any inadequacy in this sector has a direct and adverse affect on the development of these islands.

Though the total population of Lakshadweep is around 65000, the people live in 11 different islands which are separated by deep sea and lie at an average distance of 60 Kms. to 300 Kms. Therefore, the main connectivity of these islands is by ships only. Accordingly the Government of India constituted a Committee to prepare overall shipping plan from 2000-2015 and prepared a

Perspective Plan accommodating the transport requirement upto 2015 AD. The recommendations contained in the above plan have been almost completed and implemented. The above perspective plan has considered only shipping requirements upto 2015. However it is now necessary to consider the requirements in overall development of Port, Shipping and Aviation sectors considering the growing passenger travel requirements, transportation of cargo, port and harbor facilities to overcome the risk involved in the shipping operation in outer deep sea and also in the civil aviation field as an alternate mode of transport. Therefore the proposals required in developing above sectors for the next 15 years (2015-2030) as discussed below.

2.0 Topography

The Lakshadweep islands cover 32 Sq.Km and the islands are separated from one another by deep sea and are at a distance of 60 to 400 Kms. from one another. They lie between 8^{o} N to 13^{o} N latitude and between 71^{o} E and 74^{o} E longitude. A plan showing the geographical location of the islands is given as **Annexure-I**.

The following are the inhabited islands of Lakshadweep from north to south:-

i. Chetlat
ii. Bitra
iii. Kiltan
iv. Kadmat
v. Amini
vi. Andrott
vii. Agatti
viii. Kavaratti
ix. Kalpeni
x. Minicoy

As per 2011, population in the islands is 64429 and for the last ten years the population in all islands has grown and so has the need for transportation.

The islands are surrounded by lagoons which are fenced by coral reefs all round. These reefs provide a natural shelter form rough seas besides adding beauty to the islands. However, at the same time these reefs restrict the navigation of the islands due to shallow depth of water over the reefs. The islands are navigated by small and low draught vessels through some limited navigable entry points of these reefs where navigable depth of water over the reef is available.

Thus, the main problem of navigating these islands is that vessels with drafts more than 2 meters cannot enter the lagoons, except Kavaratti, Minicoy and Androtт where vessels with 2.7 meters are able to enter inside the lagoon. Hence embarkation and disembarkation of passengers and loading/unloading of cargo in most of the islands is carried out in open deep sea which are then brought to the islands and vice versa by small launches/dumb barge and boats. This makes the whole exercise of shipping operation very dangerous.

The Andaman & Lakshadweep Harbour Works, undertakes the required infrastructure facilities in these islands. The present Port facilities in various islands include jetties with lengths varying from 60m to 260m. Some of the jetties have cargo handling cranes and forklift facilities. Berthing facilities are also being developed in eastern side of four islands to enable berthing of bigger ships. Such jetties are completed at Minicoy, Agatti, Kavaratti and Amini. However, these eastern side berthing facility could only be utilized for a limited period of the year depending on weather/sea conditions.

Details of present port facilities at different islands are given in **Annexure-II**.

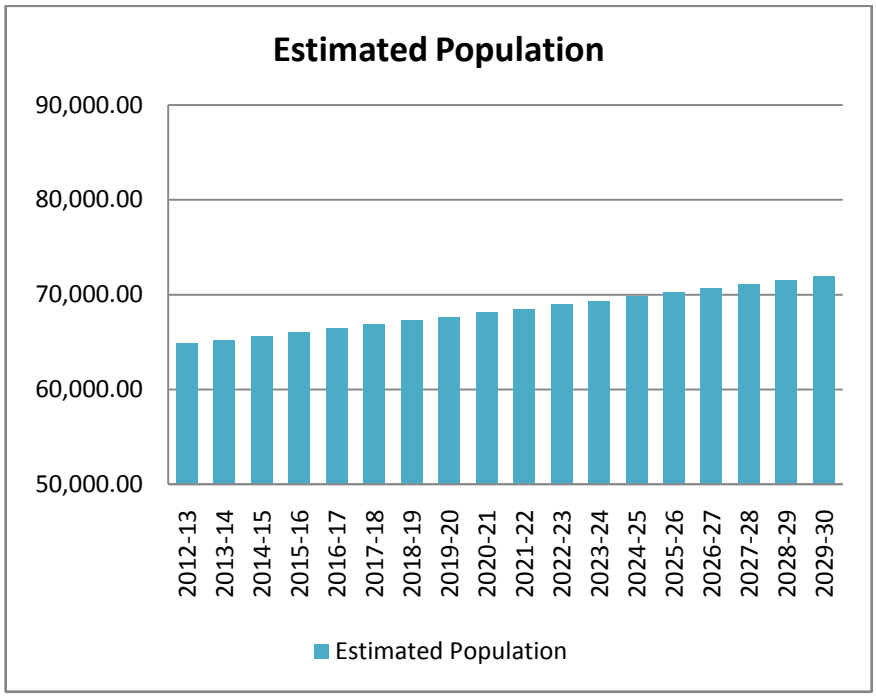
3.0 Population

The population of various islands in the past two censuses was as follows:

Island	**2001**	**2011**
Chetlat	2553	2345
Bitra		271
Kiltan	3664	3945
Kadmat	5319	5389
Amini	7340	7656
Androtт	10720	11191
Agatti	7072	7560
Kavaratti	10113	11210
Kalpeni	4319	4418
Minicoy	9495	10444
	60595	**64429**

It can be observed from the above that the total population of this group of islands in the year 2011 was 64429 while in 2001 it was 60595 which amount to overall increase of 6.23% over a period of ten years or annual compound growth rate of 0.615%. At this compound growth rate, the estimated total population of the islands in the year 2015 and subsequent years is expected to be as follows:

Year	Estimated Population at present annual growth rate
2012-13	64825
2013-14	65224
2014-15	65625
2015-16	66029
2016-17	66435
2017-18	66843
2018-19	67254
2019-20	67668
2020-21	68084
2021-22	68503
2022-23	68924
2023-24	69348
2024-25	69775
2025-26	70204
2026-27	70635
2027-28	71070
2028-29	71507
2029-30	71947



PART – III

1.0 Growth and Development of Passenger Traffic

The passenger traffic in the islands consists of the Islanders, Government Servants, Permit Holders and Tourists. The passenger transportation, which is the life line of the people of Lakshadweep, consists of two sectors.

(i) Mainland – Island traffic

(ii) Inter – Island traffic

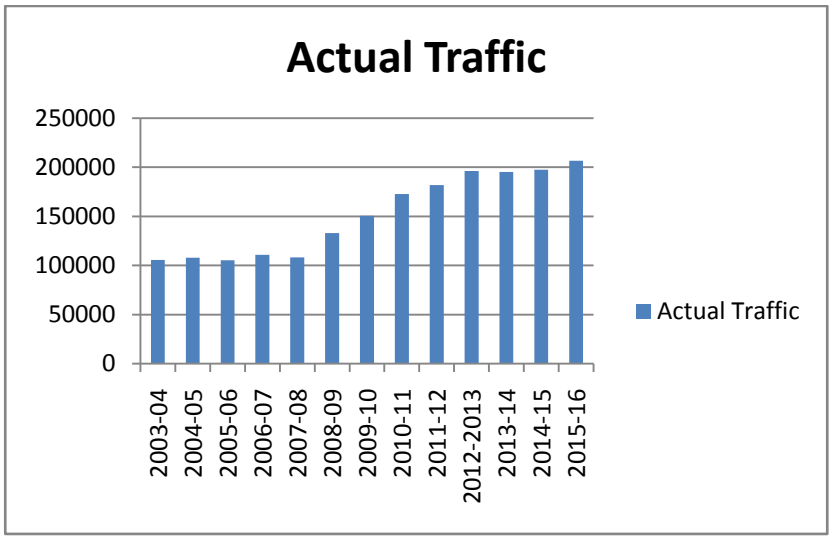
The present trend of the traffic in both these sectors have been analyzed and the expected future growth is projected in the following paragraphs.

1.1 Mainland-Island Passenger Traffic (Past Trend and Future Projection)

The present mainland-island services by bigger all-weather ships (capacity of 250 passenger and above) are mainly from Kochi and smaller fair-weather ships (150 passenger capacity) from Kochi, Beypore and Mangalore. Besides High Speed Crafts of 150 passenger capacity are also operated from islands to Kochi and Beypore during fair-weather only.

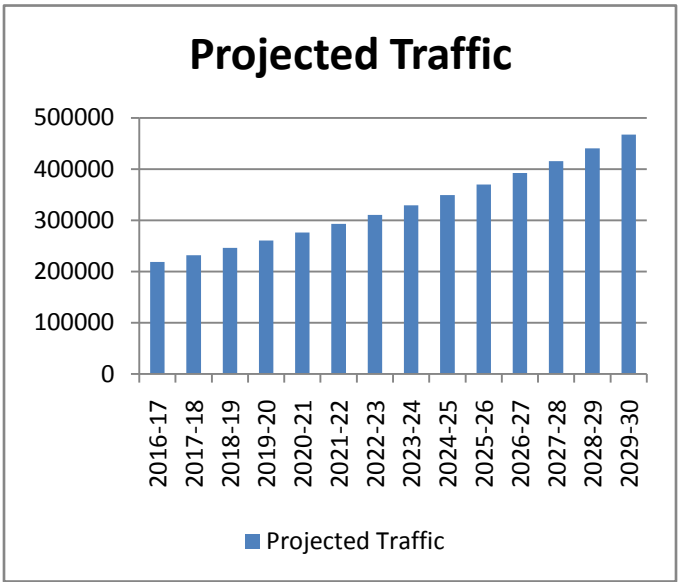
The Passenger Traffic by ships on Mainland-Island sector (i.e from Mainland to different island & vice versa) during last 13 Years is as follows.

Year	Passenger Traffic
2003-04	105714
2004-05	107950
2005-06	105442
2006-07	110831
2007-08	108294
2008-09	132943
2009-10	150699
2010-11	172680
2011-12	181790
2012-13	196216
2013-14	195238
2014-15	197447
2015-16	206645



For projecting the future traffic between the Mainland and various islands, linear extrapolation approach appears most reasonable presumption, where in a linear trendline is drawn based on the data available on the actual passenger traffic during the period 2003-04 to 2015-16. As per the actual passenger traffic from 2003-2016, there is an average annual growth rate of 6% in passenger traffic. At this growth rate, future passenger traffic is expected to be as follows. There is tremendous growth in tourist visiting the islands. Therefore, the projected passenger traffic also incorporate expected tourist traffic during the Perspective Plan period.

Year	Projected Traffic
2016-17	219044
2017-18	232186
2018-19	246118
2019-20	260885
2020-21	276538
2021-22	293130
2022-23	310718
2023-24	329361
2024-25	349122
2025-26	370070
2026-27	392274
2027-28	415810
2028-29	440759
2029-30	467204



1.2 <u>Mainland-Island passenger shipping scenario.</u>

At present following ships/vessels are operated between Mainland-Lakshadweep islands. Particulars of the vessels are as follows.

Mainland-Island Vessels:-

Name of Vessel	Year built	Passenger Capacity		Total	Cargo Capacity (Tonnes)	Phasing out year
		Cabin / VIP Class	Seat/ bunk			
M.V.Kavaratti	2007	400	300	700	160	2032

M.V.Arabian Sea	2009	52	200	252	100	2034
M.V.Lakshadweep Sea	2010	52	200	252	100	2035
M.V.Corals	2014	52	350	452	250	2039
M.V.Lagoons	2015	52	350	452	250	2040
M.V.Amindivi	2000	0	150	150	25	2025
M.V.Minicoy	2000	0	150	150	25	2025

Inter-Island High Speed Crafts:-

Name of Vessel	Year built	Passenger Capacity		Total	Cargo Capacity (Tonnes)	Phasing out year
		VIP Class	Seat			
Valiyapani	2007	4	150	154	Nil	2032
Cheriyapani	2007	4	150	154	Nil	2032
Parali	2007	4	150	154	Nil	2032
Blue Marline	2007	4	50	54	Nil	2032
Black Marline	2007	4	50	54	Nil	2032
Skip Jack	2007	4	50	54	Nil	2032
Viringili	2006	0	15	17	Nil	2031
Bangaram	2006	0	20	22	Nil	2031

Three 150 Passenger High Speed Crafts (Valiyapani, Cheriyapani, Parali), acquired during 2007 are also being operated in Mainland-Island sector with special approval of the DGS depending upon the requirement.

M.V.Tipu Sultan which was the main passenger ships of the Administration since her induction to the shipping fleet in 1988 was withdrawn from service during end 2009-10 as it was difficult to keep seaworthy for passenger service and beyond economic repairs. The vessel has been scrapped in 2013. M.V.Dweep Setu, one of the fair-weather ship operated between mainland-island sector has now been withdrawn from service due to dilapidated conditions and beyond economic repairs. The vessel is now proposed for scrapping. M.V.Bharat Seema, passenger cum cargo ship which had completed its economic life has been handed over to A&N Administration as per the decision of the Ministry of Shipping.

All the fair-weather ships/vessels are operated from 1st October to mid May of the year. During lay-up in monsoon period, necessary repairs/surveys are carried out. This also implies that these vessels will be out of service for about 5 months a year. All the all-weather passenger ships are required to undergo mandatory dry-dock repairs and surveys for which ships are taken out of service at least for one month.

2.0 Growth and Development of Cargo Traffic

2.1 Cargo Traffic (Past trend and future projections)

Cargo traffic between mainland and Lakshadweep islands are catered mainly by the cargo ships as follows.

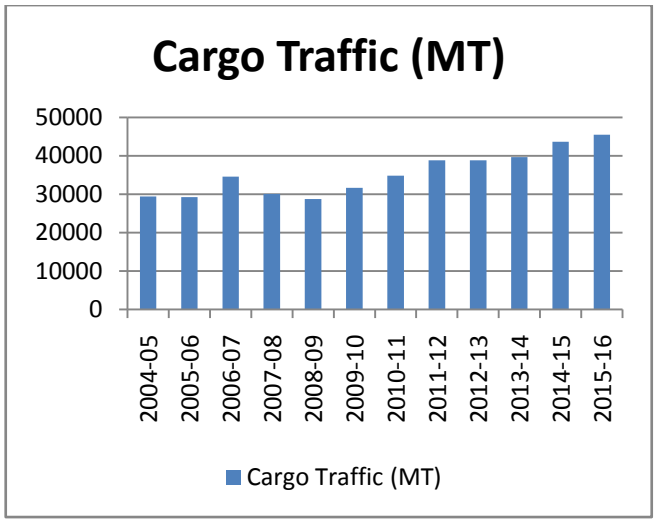
Name of Vessel	Year built	Cargo Capacity (Tonnes)	Phasing out year	Remarks
M.V.Ubaidulla	1993	600	2018	General cargo and petroleum products in barrels.
M.V.Thinnakara	1993	600	2018	
M.V.Laccadives	1995	600	2020	
M.V.Cheriyam	1997	600	2022	
M.V.Sagar Samraj	2016	800	2041	Multipurpose Cargo Vessels
M.V.Sagar Yuvraj	2016	800	2041	
M.V.Elikalpeni	2012	60	2037	2000 LPG cylinders OR 300 barrels of petroleum products
M.B.Suheli	1987	60	2012	Utilized to cater bunker requirements of Inter-island High Speed Crafts plying between islands.
M.V.Kodithala	2013	150	2038	

Some essential cargoes are carried on the passenger cum cargo ships. But the quantum of this cargo is very limited because the passenger cum cargo ships are operated on regular time schedule, which mainly cater the passenger transport requirements. Carriage of heavy cargo on these vessels hampers the sailing schedules.

The cargo movement is mainly from mainland to various islands. Cargo which moves from islands to mainland is very limited and mostly consists

of coir and copra. Cargo traffic from mainland to islands in UTL cargo vessels for the past 12 years is as follows.

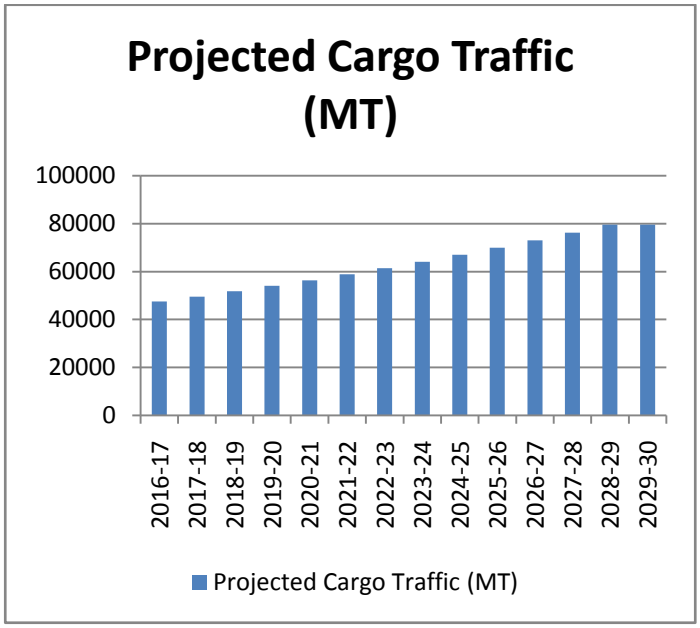
Year	Cargo Traffic (MT)
2004-05	29448
2005-06	29209
2006-07	34617
2007-08	30071
2008-09	28710
2009-10	31670
2010-11	34861
2011-12	38851
2012-13	38854
2013-14	39679
2014-15	43700
2015-16	45500



The increase in cargo traffic during 2006-07 is mainly due to increase in cargo handled by passenger cum cargo ship (m.v.Bharat Seema, m.v.Amindivi & m.v.Minicoy). However from 2007-08 onwards loading of cargo in m.v.Aminidivi & m.v.Minicoy was restricted by MMD due to increase of Light Weight of the ship and thereby issues related to load line of these ships. Moreover there was reduction in number of voyages of cargo barges comparatively during 2007-08 due to withdrawal of cargo barges for dry-dock repairs. Number of voyages of m.v.Bharat Seema, passenger cum cargo ship, also got reduced comparatively after 2007-08. From 2008-09 this ship had performed an average of only 40 voyages yearly when she had performed average of 60 voyages prior 2008-09. This is because of withdrawal of the ship for intensive dry-dock repairs & survey due to aging of the ship. From 2009-10 cargo traffic had increase with the induction of passenger cum cargo ships, namely m.v.Kavaratti, m.v.Arabian Sea and m.v.Lakshadweep Sea. Moreover Cargo handled by four cargo barges also got increased thereafter.

Based on the cargo movement during the past years, the average annual growth rate in cargo traffic is about 4.40%. At above growth rate, future projection in cargo movement would be as follows.

Year	Projected Cargo Traffic (MT)
2016-17	47496
2017-18	49580
2018-19	51755
2019-20	54026
2020-21	56396
2021-22	58870
2022-23	61453
2023-24	64149
2024-25	66964
2025-26	69902
2026-27	72968
2027-28	76170
2028-29	79512
2029-30	79512



2.2 Cargo shipping scenario.

Out of the ships available with the Lakshadweep Administration, all the passenger cum cargo ships are primarily used for passenger movement and carry only essential cargoes required. These vessels are not utilized for normal cargo transportation in order to keep the passenger traffic uninterrupted. The vessel M.V.Elikalpeni is a dedicated vessel for transportation of LPG domestic cylinders. M.B.Suheli and M.V.Kodithala, which are oil barges, are generally stationed at Kavaratti as oil storage vessels to cater bunker requirements of inter-islands High Speed Crafts operated between the islands.

It may be observed that due to limited harbor facilities all the cargo operations are carried out in outer sea in all the islands except Kavaratti,

Minicoy and Andrott. Further due to inclement climate and sea conditions prevailing in this sector especially during monsoon, it makes cargo operation extremely difficult. As the discharge of cargo takes place in open sea, the speed of operation is also very slow which means lesser turn around trips. Hence it is assumed that the UTL cargo vessels would be able to perform only about 16 voyages in a year after all mandatory dry-dock repairs and surveys, and if each vessels calls at 3 to 4 islands in a voyage. With all such assumptions, the available capacities of the UTL cargo vessels would be as follows.

Name of Vessel	Voyage per year	Vessel Capacity (MT)	Available Capacity (MT)
M.V.Ubaidulla	16	600	9600
M.V.Thinnakara	16	600	9600
M.V.Laccadives	16	600	9600
M.V.Cheriyam	16	600	9600
M.V.Elikalpeni	33	2000 cylinders OR 300 barrels of ATF/Petrol	66000 cylinders OR 9900 barrels

2.3 Special cargo requirement.

LPG:-

- Present supply & consumption

At present LPG domestic cylinder supply facility is only available at Kavaratti and Minicoy. Total connections at Kavaratti is 2661 and at Minicoy is 2000. Therefore average monthly supply requirement at Kavaratti and Minicoy at one cylinder per connection would be 4661 cylinders. This supply requirement can be handled with the capacity of M.V.Elikalpeni (LPG cylinder carrier vessel). Besides transport requirement of LPG cylinders, this vessel also cater the transport requirements of Petrol to all islands and ATF for helicopter operation.

- Future supply & consumption

LPG supply is currently being extended to two more islands, Amini & Kiltan and in next 15 years it is expected that all islands will depend on LPG for cooking purpose. The rate of present LPG connections with population in the island is at about 20% and at this rate following would be the connections and supply requirement when LPG supply is extended to all islands.

Name of Island	**Project population in 2030**	**No. of connections (projected for 2030)**	**Monthly cylinder requirement at one cylinder per connection (projected for 2030)**
Androtт	12497	2449	2449
Kalpeni	4933	987	987
Agatti	8442	1688	1688
Amini	8549	1710	1710
Kadmat	6018	1204	1204
Kiltan	4405	881	881
Chetlat	2619	524	524
Bitra	303	61	61
Kavaratti	12518	2971	2971
Minicoy	11663	2333	2333
Total	**71947**	**14808**	**14808**

The present capacity of M.V.Elikalpeni is only 2000 cylinders per trip. At 33 voyages per annum, it can supply only 66000 cylinders per annum, which would only be sufficient to meet the requirement at Kavaratti and Minicoy. When LPG supply is extended to all islands, future annual cylinder requirement would be approximately 178000 for which additional LPG carrier would be required.

Petrol:-

- Present supply & consumption

Supply of Petrol in islands is carried out by LCMF through Supply & Marketing Societies. Transportation is done in barrels and carried as deck cargo in Administration's cargo barges due to restriction imposed by MMD to carry Petrol in cargo holds. Moreover there is total ban on transportation of Petrol in wooden Mechanized Sailing Vessels (MSV). There is no private supply of petrol in the islands and therefore fully depends on govt. supply. With the present transport availability, average minimum supply is 20 ltrs. for 3 / 4 wheelers and 10 ltrs. for 2 wheelers, which is further reduced depending on availability. At this supply rate and, present supply requirement for the vehicles on road would be as follows.

Type of vehicle	Average no. of Vehicles on road	Supply rate per vehicle (in liters)	Minimum monthly requirement (in barrels)	Minimum annual requirement (in barrels)
Motor cycle	7600	10	380	4560
3 wheelers	760	20	76	912
4 wheelers	520	20	52	624
Total			508	6096

At the above minimum supply rate, annual requirement of petrol would be about 6000 barrels, ie. about 24 voyages of M.V.Elikalpeni at 300 barrels per trip.

- Future supply & consumption

As per the Motor Vehicle Department there is an increase of 1000 vehicles of various types per year, ie. about 11%. At this increase rate, the requirement of petrol would annually increase by about 660 barrels.

Aviation Turbine Fuel (ATF):-

- Present supply & consumption

Two helicopters are presently in operation in Lakshadweep islands. These helicopters are operated for evacuation of serious patients from other islands to Kavaratti/Agatti and to Kochi for specialized medical care, to connect flight passengers between Headquarter Island (Kavaratti) and Agatti (only Airport Island) and also for movement of passengers between islands during monsoon period. These two helicopters fly an average of 2321 hours in a year. At an average 375 ltrs of fuel is consumed per flying hour and therefore ATF requirement at above rate per annum would be around 870581 ltrs. i.e 4352 barrels. Till acquisition of M.V.Elikalpeni, ATF was transported as deck cargo in barrels in Administration's cargo barges with special permission from DGS/MMD. Now this requirement is also catered by M.V.Elikalpeni, besides transportation of LPG Cylinders. This vessel is also required to meet transportation of petrol to all islands. Therefore at times it become necessary to depend on cargo barges for transportation of ATF in order to meet the aviation requirement, which is one of the life saving service of the Department of Port, Shipping & Aviation.

- Future supply & consumption

The Govt. of India has approved in principle for deployment of two more helicopters for operation in Lakshadweep islands in order to provide daily air-connectivity between islands. With the induction of these two helicopters in the coming years, the requirement of ATF would also be doubled than the present requirement, implies that future ATF requirement would be around 8700 barrels per year assuming four helicopters in service. (Equivalent to 29 voyages of M.V.Elikalpeni at 300 barrels per voyage).

PART – IV

1.0 Shipping Requirements

1.1 Passenger ships.

Two new passenger cum cargo ships of capacity 400 Passenger and 250 MT Cargo ships (M.V.Corals & M.V.Lagoons) built at Colombo Dockyard, Sri Lanka has been inducted to the shipping fleet. These ships were delivered on 28th October, 2014 and 26th February, 2016. Though these ships has enhanced the passenger capacity, at the same time following capacities will be withdrawn from the shipping fleet.

Name of Vessel	Year built	Passenger Capacity	Remarks
M.V.Bharat Seema	1973	386	It has been handed over to A&N Administration as per the decision of the Ministry of Shipping, GOI.
M.V.Amindivi	2000	150	Economic life of the vessels will be completed by 2025 and will need replacement to handle the passenger traffic
M.V.Minicoy	2000	150	
Total		686	

In view of the above and to handle the projected and growing passenger traffic in mainland-island and inter-island sectors, the following requirements are projected during the Perspective Plan period.

- Acquisition of one all-weather ship of capacity 500 passengers for induction by 2020 which would provide for connectivity between mainland and Kavaratti, the capital, which would act as a hub.
- Acquisition of two 150 Passenger all-weather vessels by 2020 to ensure round the year connectivity from Kavaratti (HUB) to other islands.

- ❖ Acquisition of two all-weather ships of capacity 150 passengers by 2025 to operate between islands to Beypore/Mangalore also and for induction at the time of withdrawal of M.V.Amindivi & M.V.Minicoy.
- ❖ Acquisition of one 250 Passenger all-weather ship for tourists visiting the islands.

The summary of the passenger ship acquisition proposals is as follows.

Proposals	Replacement	Justification	To be inducted by	Acquisition process to be initiated by
1x500 Passenger Ship	N/A	• Introducing a Hub and Spoke Model. • Setting up one island viz Kavaratti as the HUB. • Passengers from mainland would be brought to Kavaratti by this 500 pax ship.	2020	2016-17
2x150 Passenger ships	N/A	• These all weather vessels would ensure the round the year connectivity from Kavaratti to other islands on introduction of Hub & Spoke Model.	2020	2016-17
2x150 Passenger ships	Replacement	• These vessels are proposed as replacement for M.V.Amindivi & M.V.Minicoy.	2025	2022-23
1x250 Passenger ship	N/A	• UTL does not have a dedicated ship for tourist transport. • At present all the major ships have a certain number of seats blocked for the tourists which is barely sufficient to meet the tourist requirements. • After appreciating the changing tourism scenario, it has	2020	2017-18

		become necessary to procure a 250 passenger capacity dedicated tourist ship to meet the growing tourists demands.		

1.2 Cargo ships.

In order to enhance the capacity of cargo movement, the Administration had placed orders for construction of 2 Nos. 800 MT Multipurpose Cargo Vessels. The first vessel is expected for delivery by end December, 2014 and second vessel by June, 2015. These vessels are intended to carry all types of general cargoes and including petroleum products in barrels inside cargo holds. It is also proposed to acquired one 700/750 MT Oil Barge (Bulk carrier) for transportation of petroleum products in bulk. Govt. of India had already approved the proposal and tenders and being finalized. It is expected that this vessel could also be acquired within next two years.

Though these vessels will enhance the capacity of cargo movement, at the same time the cargo barges being operated presently will have to be withdrawn from service after expiry of economic life in a phased manner. The expected phasing out of present cargo barges would be as follows.

Name of Vessel	Year built	Cargo Capacity (Tonnes)	Remarks
M.V.Ubaidulla	1993	600	Will complete economic life of 25 years by 2018.
M.V.Thinnakara	1993	600	
M.V.Laccadives	1995	600	Will complete economic life of 25 years by 2020.
M.V.Cheriyam	1997	600	Will complete economic life of 25 years by 2022.

At present, the requirement of petrol, ATF for helicopter operation and LPG needs of two islands (Kavaratti & Minicoy) are fulfilled by M.V.Elikalpeni. With the growth of population and increased development, the requirement of petrol is also expected to increase multifold. Similarly LPG supply is currently being extended to two more islands, Amini & Kiltan and in next 15 years it is expected that all islands will depend on LPG for cooking purpose. Accordingly specialized carriers for petroleum products will be required because the present capacity of M.V.Elikalpeni is only 2000 cylinders per trip. At 33 voyages per annum, it can supply only 66000 cylinders per annum.

In view of the above and to handle the growing demand of cargo transportation between mainland and islands, the following requirements are projected during the Perspective Plan period.

- ❖ Acquisition of 6 Nos. 600 MT Multipurpose Cargo Vessels as replacement vessels for M.V.Ubaidulla and M.V.Thinnakara (2018), M.V.Laccadives (2020) and M.V.Cheriyam (2022) and also to handle the growing demand.
- ❖ Acquisition of one 700/750 MT Oil Barge to handle transportation of HSD especially for generation of electricity, petrol, kerosene and ATF for chopper operation.
- ❖ Acquisition of 3 Nos. LPG cylinder carrier with capacity to carry 2000 LPG cylinders in each vessel.

The summary of the cargo ship acquisition proposals is as follows.

Proposals	Replacement	Justification	To be inducted by	Acquisition process to be initiated by
6x600 MT Multipurpose Cargo Vessels	Replacement	• Replacement for M.V.Ubaidulla, M.V.Thinnakara, M.V.Laccadives, and	1st & 2nd vessels in 2018 3rd vessel in	2016-17

		M.V.Cheriyam and two vessels to meet the growing cargo traffic.	2020 4th vessels in 2022 5th and 6th vessels 2025	
1x700/750 MT Oil Barge	N/A	• To handle transportation of petroleum products especially for generation of electricity (HSD), Petrol, Kerosene and ATF for chopper operation.	2022	2019-20
3x2000 LPG Cylinder Carrier	N/A	• LPG facilities will be introduced in near future in two islands of Amini and Kadmat. • In the next 5 years LPG facilities will be introduced in all the 10 islands of UTL. • Since the demand for supply of LPG cylinders will increase manifold from the current 60000 per annum to an estimate of 1,78,000 per annum for all the islands, it is proposed to acquire 3x2000 LPG cylinder carrier.	1st vessel in 2020 2nd & 3rd vessels in 2021	2018-19

2.0 Other requirements in shipping sector.

2.1 Registration of ships and surveys.

At present Lakshadweep Administration is operating 26 ships of various sizes and capacities and are also constructing new ships from various shipyards including foreign yards. During the operation of ships and also in the course of construction of new ships, various surveys are required to be done to comply with the maritime rules and regulations. However the Administration had to depend upon ship surveyors at Mumbai/Kochi, at some time surveys get delayed

due to non-availability of surveyors at the require time, which in turns delay the operation of ships and also schedule of construction of ships. Moreover the new ships being constructed are also required to be registered with competent authority. At present these facilities are available with major ports only. Hundreds of crafts belonging to Department of Port, Shipping & Aviation as well as those traditionally operated by natives of Lakshadweep ply between nearby islands without any classification and registration. Considering that Lakshadweep Administration is operating a shipping fleet of 26 ships and inducting new ships by construction and several wooden crafts operated in Lakshadweep, it is proposed to make following establishments to facilitate the timely registration and surveys of ships.

- **Registrar of ships**:- to facilitate registration of ships being constructed by the Administration as well as registration of boats and other seagoing crafts/vessels.
- **Ship Surveyor**:- to facilitate completion of various surveys and certifications/documentation of ships for timely availability of ships for operations and to comply rule requirements during new construction.

PART - V

1.0 Port & Harbour infrastructures.

1.1 Present scenario.

Shipping activities are performed from three mainland ports namely Kochi, Beypore and Mangalore.

Kochi:- This port facilitate for passenger movement and as health lifeline. All the bigger ships are operated from Kochi. Kochi also facilitates for lay-up of all fair-weather ships/vessels during monsoon and for dry-dock repairs. Accordingly a dedicated berth of 300 mtrs. have been created exclusively for berthing of UTL ships and passenger terminal facilities also developed for handling passengers during embarkation and disembarkation at Kochi.

Beypore:- This port acts as Fuel lifeline for the people of these islands. All the petroleum products like, HSD for generation of electricity/fishermen, ATF for helicopter operation, Kerosene, petrol etc. Besides fair-weather ships like M.V.Amindivi/M.V.Minicoy, High Speed Crafts are also operated from Beypore to handle passenger traffic. Considering all these aspects and as per UTL requirements, Govt. of Kerala has allotted land and water area for development of Berth of size of 200x20 mtr. For a total estimated cost of Rs.49.23 crores. The Administration will be creating the berth facilities after the approval of the project by the Govt. of India.

Mangalore:- All the PDS items are transported from Mangalore and therefore acts as the food lifeline. Passenger traffic between Mangalore and islands are also been handled with small fair-weather ships and High Speed Crafts. Therefore a proposal was taken up with Govt. of Karnataka and they have accorded in principle approval for allotment of waterfront area for creating a 300 mtr. Berth.

In the islands all the shipping operations such as passenger embarkation/disembarkation and unloading of cargoes are carried out in the outer deep sea except Kavaratti, Minicoy and Andrott. However at these three islands bigger ships are attended at outer sea as they cannot come inside the lagoon. Normally in all islands passengers are handled with small Pablo boats from ship to island and vice-versa and cargo with the help of dump barges with are towed by tugs. Jetties are created inside

the lagoon in all islands for berthing of boats where passenger embark and disembark and cargo unloading from dump barges. In order to speed up the passenger handling in island, it is necessary to bring atleast all the small High Speed Crafts inside the lagoon and berth in the jetty, which will reduce the danger in passenger operation and also reduce the expenditure incurred in engagement of boats. All the High Speed Crafts are constructed with alluminium hull in order to reduce the weight so that they can be brought inside the lagoon. However this has been hampered due to low channel clearance inside the island lagoons. This can be overcome only with proper dredging of channel from the lagoon entrance upto jetty by deploying rock cutter, if necessary, without which there cannot be further development in any of the activities in the shipping sector.

In order to facilitate berthing of ship in the islands for handling passenger and cargo, eastern side jetties were constructed at Kavaratti, Minicoy, Amini and Agatti. Though these jetties are completed, it is not been able to utilize due to heavy surging/swell, which otherwise put the ships into risk of hull damage. Presently ships are berthed at these jetties depending upon sea/weather condition. Since the jetties are completed after incurring huge expenditure, it is necessary to put the jetties under 100% utilization by putting additional infrastructures (such as additional fenders/mooring buoys etc) to make the jetty safe for berthing.

As discussed in pre-paras, the shipping operation (passenger and cargo) in all the islands are carried out by small boats in the outer deep sea and cargo operation by using dump barges towed by tugs. This is because that ships/vessels cannot come inside the harbor area inside the lagoon due to shallow water and has to remain in outer sea in anchorage/mooring/drifting. Further purpose of shipping operation department had acquired boats, tugs, dump barges etc.

In order to maintain above crafts seaworthy, regular repair and maintenance are to be done for which at present only one workshop with minimum machineries and manpower is available at Kavaratti Islands. Due to augmentation of shipping services with acquisition of new ships/vessels, the fleet of support crafts such as passenger boats, tugs, dump barges, etc has also increased with time. At present all the crafts are brought to Kavaratti for repairs. However, the department propose to develop repair units in other islands to enable to save such time in taking

the crafts to Kavaratti for minor repairs. The department is having the following crafts for passenger and cargo operations in the islands.

1	34 Nos. 30ft Passenger Boats
2	14 Nos Wooden/Steel Tugs
3	4 Nos. Passenger Launch
4	One Mobile Workshop (Wooden Craft)
5	3 Nos. 75 MT Dump Barge 7 Nos. 50 MT Dump Barge 7 Nos. 25 MT Dump Barge

Moreover minor repairs on alluminium hull High Speed Crafts are also required to be attended by workshop at Kavartti. Due to non-availability of aluminimum welding facilities, these carfts are required to be taken to mainland for such minor repairs which consumes time over expenditure. Therefore to overcome such problems, it is necessary to strengthen the existing Marine Workshop at Kavaratti with modern facilities and sufficiently qualified manpower and also to establish repair units in other islands.

1.2 Requirements for development of Port & Harbour infrastructure.

- Dredging of channel from lagoon entrance upto jetty in all islands to facilitate safe entry of all High Speed Crafts having a draft of 1.35 mtrs. even in low-tide conditions. This can be done by placing sufficient dredgers/rock cutters etc. with all the clearances required from the competent authorities.
- Provide appropriate fender arrangements or any other alternative arrangements in the berthing head of eastern side jetties at Kavaratti, Minicoy, Agatti and Amini and mooring buoys/dolphin buoys for safe berthing of all ships and to achieve 100% berthing of all ships upto 400 Passenger capacity in eastern side jetties.
- Construction of eastern side jetties in all other islands subject to techno-economic feasibility and with proper study to eliminate all the shortcomings observed in the jetties constructed at Kavaratti, Minicoy, Agatti and Amini.
- Strengthening of existing Marine Workshop at Kavaratti with modern facilities and sufficiently qualified manpower to attend repair and maintenance of all support crafts engaged in shipping operation and also urgent repairs of inter-island High Speed Carfts.
- Establishment of workshop units in major islands to attend urgent repairs of support crafts.

PART - VI

1.0 Civil Aviation.

1.1 Present scenario.

The Helicopter service was started in Lakshadweep on 31st January, 1987 on lease agreement with M/s.Pawan Hans Helicopters Limited and since then it has become the most crucial part of transport and communication systems in Lakshadweep. The helicopter is stationed at Kavaratti, Headquarters of Union Territory of Lakshadweep Administration and provides connectivity for emergency evacuation of patients and inter-island services especially during monsoon when there is no other mode of transport. In all the islands helipads are constructed for safe landing.

During 2010, second helicopter was introduced, which is also based at Kavaratti. However in order to enhance air safety, fueling station were created at Agatti and Minicoy in addition to the Fueling Station at Kavaratti Base. This has also enhanced the capacity of the helicopter. Since the introduction of helicopter service, it had played a crucial role as a medical ambulance to evacuate serious patients from different islands to mainland for specialized medical treatment. However till now there are certain difficulties in operation of helicopter during night time, due to non-availability of night landing facilities in the helipads. Moreover the safety of flying can be further enhanced with creation of some more re-fueling station.

The Govt. of India has now sanctioned deployment of 3rd helicopter for Lakshadweep Administration.

1.2 Requirements for development of Civil Aviation sector.

- ❖ Development of Night Landing Facilities in all the helipads to enable operation of helicopter service in any emergency situation even at night/bad weather.
- ❖ Development of re-fueling stations at Androtт and Kiltan to enhance the capacity utilization/air safety in helicopter operation.
- ❖ Introduction of Sea Plan Service.

1.3 Air connectivity.

1.3.1 Extension of airport at Agatti:

Air connectivity with mainland is only between Kochi and Agatti, where the only airport in the islands is situated. The Airport at Agatti was commissioned in 1988 having a runway of 1204m x 30m. ATR-72 and ATR-42 types of aircrafts are being presently handled with load restriction due to runway length. Considering various operational difficulties in handling bigger aircrafts in the present runway and also difficulties in complying with DGCA and CAR regulation, it is now proposed to extend the runway and allied facilities. Based on the requirement to develop the airport, Airports Authority of India (AAI) has prepared the Master Plan in the expansion of Agatti Airport for operation of Q-400 type of aircrafts with full load. In the Master plan, runway is proposed to be extended to 1725 m, which required additional land of 17.6 acres at Agatti for extension of runway and construction of allied infrastructures and 0.5 acres at Kalpitti Island for installation of navigational equipments. AAI has carried out the inspection of land during July, 2013 and as per the inspection report, several structures of resorts, houses etc. are to be demolished, additional land for rehabilitation of AAI colony and construction of more staff quarters for additional staff, re-location of mosque situated abutting the existing airport boundary, additional land for installation of NDB (Non-Directional Beacon) as navigational equipments such as DVOR (Doppler Very high frequency Omni-Directional Range) and NDB cannot be installed in proximity to each other due to operation requirements, bridge connectivity over lagoon from Agatti to Kalpitti islands, construction of RCC platform over lagoon area of approx.

42 acres, installation of simple approach lighting system on Kalpitti Island (5.5 acres approx.).

Considering the land requirements projected in the Master Plan, the Lakshadweep Administration is in the process for acquisition of additional land for extension of the runway and allied facilities in the airport. It is proposed that extension could be completed by 2018

Benefits:-

- Facilitate operation of aircraft types of Q-400 without any load restriction.
- Enhancement in air-safety in operation of aircrafts.
- Improve air-connectivity with mainland as bigger aircrafts can be handled with proposed extension.
- Boost tourism industries in the islands due to improved air-connectivity.

PART - VII

Re-organization of Department:-

The Department of Port, Shipping & Aviation is the nodal department coordinating the activities in the Port development, passenger and cargo shipping services and also activities related to Civil Aviation sector.

Until 2000 only three passenger ships, namely M.V.Bharat Seema (386 Pax & 160 MT Crago), M.V.Dweep Setu (150 Pax) and M.V.Tipu Sultan (658 Pax), two inter-island ferries, namely M.V.Kadeeja Beevi and M.V.Hameedath Bee (100 Pax each), four Cargo Barges of 600 MT namely M.V.Ubaidulla, M.V.Thinnakara, M.V.Laccadives and M.V.Cheriyam and one Oil Barge of 60 T capacity, M.B.Suheli were in service in the shipping sector to cater the passenger and cargo requirements. During the time only one helicopter was in operation to cater to medical as well as administration's requirements. Though the activities/functioning of the department were increasing manifolds, the manpower strength of the department remained the same as created ear back in 1987 with following staff strength.

Name of post	No. of post
Director (Port, Shipping & Aviation)	1
Deputy Director (Supply & Transport)	1
Assistant Engineer (Shipping)	1
Assistant Director (PSA)	5
Chief Engine Driver	3
Port Assistant Gr.A / Shipping Inspector	7
Port Assistant Gr.B / Signaller	8
Junior Engineer	1
Technical Assistant	4
Equipment Mechanic	4
Tally Clerk	5
Multi Skilled Employee (Boat Lascar)	122
Electrician	1
Carpenter	2
Senior Srang	3
Mechanic Gr.A / Marine Engine Driver / Assistant Marine Engineer / Engine Fitter / Enginer Driver / Assistant Engine Driver / Srang	19
Mechanic Gr.B / Boat Driver / Engine Crew / Tindel / Seacuny / GP Crew / IIF Crew	72
Total strength	**259**

With the approval of 15 years Perspective Plan on shipping requirement in Lakshadweep from 2000-2015 and on implementation of its recommendation, 18 ships/vessels of various size and types have been inducted to the shipping fleet.

1. 2 x 150 Passenger 25 MT Cargo Ships, M.V.Amindivi & M.V.Minicoy.
2. 700 Passenger cum 160 MT Cargo Ship, M.V.Kavaratti
3. 2 x 250 Passenger cum 100 MT Cargo Ships, M.V.Arabian Sea and M.V.Lakshadweep Sea.
4. 3 x 150 Passenger High Speed Crafts, HSC Parali, HSC Valiyapani & HSC Cheriyapani.
5. 3 x 50 Passenger High Speed Crafts, HSC Skip Jack, HSC Blue Marlin, HSC Black Marlin.
6. 15 Passenger High Speed Craft, HSC Viringili.
7. 2000 LPG Cylinder Carrier, M.V.Elikalpeni.
8. 150 MT Oil Barge, M.V.Kodithala.
9. 2 x 400 Passenger cum 250 MT Cargo Ships.
10. 2 x 800 MT Multipurpose Cargo Ships

Following ships are under acquisition which will be added to the fleet in the coming years.

1. 700/750 MT Oil Tanker (Bulk Carrier) under acquisition. Tender floated and under finalization. Expected for completion in two years time.

Following are the proposals for acquisition in the 2nd Perspective Plan period 2015-2030.

Passenger Ships	
1	1x500 Passenger ship
2	4x150 Passenger ships
3	1x250 Passenger ship

Cargo Ships	
1	6x600 MT Cargo vessels
2	1x700/750 MT Oil Tanker
3	3x2000 LPG cylinder carrier

With the augmentation of shipping fleet, harbor infrastructure & off-shore facilities and support crafts for passenger and cargo operations are also getting added up in parallel. Jetties are being developed in all islands (inside lagoon) to handle support crafts for passenger and cargo operations. Break water has been constructed at Androtт for berthing of small ships/HSCs and cargo barges. Eastern side jetties are constructed in four islands at Agatti, Amini, Minicoy and Kavaratti to facilitate berthing of bigger ships. The fleet of support crafts such as passenger boats, tugs, dump barges, etc. has also increased with time. The department is presently having following crafts for passenger and cargo operations in the islands which are being further augmented.

1	34 Nos. 30ft Passenger Boats
2	14 Nos Wooden/Steel Tugs
3	4 Nos. Passenger Launch
4	One Mobile Workshop (Wooden Craft)
5	3 Nos. 75 MT Dump Barge 7 Nos. 50 MT Dump Barge 7 Nos. 25 MT Dump Barge

All the repairs and maintenance of these crafts are carried out by the Port Workshop at Kavaratti having very minimum machineries/equipments and manpower.

Lakshadweep islands being isolated from mainland and having limited facility fully depend on mainland for all the day today requirements, food, petroleum products, education, specialized treatment etc. and therefore depend on following mainland ports.

1. Kochi:- This port facilitate for passenger movement and as health lifeline. All the bigger ships are operated from Kochi. Kochi also facilitates for lay-up of all fair-weather ships/vessels during monsoon and for dry-dock repairs. In order to liaise all the shipping and transport activities, an office was set up at Kochi since the beginning. This office liaise and function all the activities in other mainland ports also. Due to increase in shipping activities and passenger traffic with time and due to non-availability of Passenger Terminal at Cochin Port, need was felt to develop proper and dedicated berthing facilities for handling all shipping operation in a better and efficient manner giving priority to security and safety. Accordingly a dedicated berth of 300 mtrs. have been created exclusively for berthing of UTL ships with passenger terminal facilities developed for handling passengers at Kochi. The introduction of dedicated berth has added up the activities of the department without any increase in the staff strength.

2. Beypore:- The port acts as Fuel lifeline for the people of these islands. All the petroleum products like, HSD for generation of electricity/fishermen, ATF for helicopter operation, Kerosene, petrol etc. are transported from Beypore. In the initial days, functions from this port was limited in handling cargo barges. The activities are increasing day by day and now fair-weather passenger ships like M.V.Amindivi/M.V.Minicoy and High Speed Crafts are operated from Beypore for the movement of passengers. With the increase in day-to-day activities and ships being called, a need was felt to develop a dedicated berth at Beypore also. Govt. of Kerala has allotted land and water area for development of Berth of size of 200x20 mtr. On completion of the berthing infrastructure, the functioning of the department will be further augmented as there is no qualified hand to supervise and also attend to the daily operations of the Berth.

3. Mangalore:- During the initial days the function was limited to transportation of the PDS items and therefore acts as the food lifeline. With the time activities are been added up including passenger movement between Mangalore and islands with small fair-weather ships and High Speed Crafts. Considering the increase shipping traffic from this Port, need is felt to develop Berthing facilities and necessary proposal already taken up with the Govt. of Karnataka. Creation of the infrastructure will further enhance the activities of the department, which would require manpower to handle/manage the operations.

As stated above, the Department is also the nodal department to coordinate with the activities in the Civil Aviation sector. The helicopter service started in the islands, basically as medical ambulance and for inter-island connectivity, in 1987. Since the introduction of helicopter service, all the activities such ground operation, passenger handling, development of helipads etc. are carried out by the staff strength of Port Sector. The second helicopter was inducted in the service in 2010. In order to enhance the air-safety of the operation of helicopters, it became necessary to establish fueling station as per approved criterion of DGCA CAR. The Department has established three Aviation Fuelling Station (at Kavaratti, Minicoy & Agatti) and another two stations (at Androtт & Kiltan) will be set up soon. These Fuelling Stations are established as per the approval of the Director General of Civil Aviation and are required to be maintained as per the approved Quality Control Manual. One of the most important criterion in the aircraft operation is the Quality Control and Safety in re-fuelling, which cannot be compromised. As per the approved Quality Control Manual of the Aircraft Fuelling Stations, it is required to have a Quality Control Manager to supervise the overall activities of all the Stations, one Quality Control Officer in each Station to ensure the Quality Control procedures in the location and in addition fuelling personnel and Bowser Operators for taking up allied activities. Further, various other developmental activities are also being taken up in the civil aviation sector such as extension of Agatti Airport,

development of Green field Airport at Androth, development of night landing facilities for operation of helicopters in the islands during night and bad weather condition. Though facilities and activities and augmented with creation of various infrastructures, there is no qualified manpower to handle the activities/infrastructure effectively and efficiently.

All the activities are related to civil aviation sector are being handled by the staff strength sanctioned for Port sector.

In view of above, re-organization of Port, Shipping & Aviation Department of U.T of Lakshadweep is inevitable for better management and effective handling of various services and development projects.

-:0:-

1. Initial investment and Annual maintenance and repair for first two years will be funded under Smart city Project.
2. The cost of construction is Rs. 46,500 per sq.m. All the building materials required for construction are brought from Mangalore/Calicut by motor sailing vessels (MSV).
3. All essential commodities such as rice, sugar, edible oil, etc. are transported by Government barges.
4. The existing roads are cement concrete and having 3m width.
5. The date of commissioning of SCP is assumed as 1st January 2018

All the Islands are geographically separated and scattered in the Arabian sea. Kavaratti is at a distance of 404 Km from Kochi. Government Hospital at Kavaratti is 50 bedded hospital. For all specialized treatment patient needs to go to main land.

Now a days life style has changed. Heart patient, Kidney patient and Cancer patient have increased. Average expenditure per day at Kochi is Rs. 2500 per person per day. This does not include medical expenditure. For medical treatment at main land for 20 days approximate expenditure is 1.5 Lakhs (for patient + one escort). This is a big concern fora common man. During interaction with elected members (Village Panchayath member, District Panchayath member, Member of Parliament) the main concern was need of a multi specialty Hospital under Smart City Mission.

It is proposed to start Cardiac unit, Dialysis unit and Cancer unit at Government Hospital Kavaratti.It is proposed to procure medical equipments required for Cardiac unit, Dialysis unit and Cancer unit. Para medical staff required for these units shall be appointed on contract basis. The expenditure required for establishment component shall be met under UT budget. The details of equipments required for these unit is attached.

The health facilities will meet the requirement of Kavaratti Island as well as the requirement of all other Islands. UT Administration is spending 4.6 cores (approximate for medical evacuation every year. The commissioning of Cardiac unit, Dialysis unit and Cancer unit will reduce expenditure on medical evacuation.

PHASE 1

BUILDING TO BE DEMOLISHED:

1. MATERNITY WARD & LAB
2. FEMALE & MALE WARD (PART)

NEW BUILDING TO BE CONSTRUCTED:

AT GROUND FLOOR:

1. CASUALITY DEPT.
2. ICU & HDW
3. GYNEC DEPT.
4. PHARMACY
5. MAIN ENTRY & EMERGENCY ENTRY

AT FIRST FLOOR:

1. PEDIATRIC IMMUNIZATION CLINIC,PUBLIC HEALTH DEPT.
2. LABOUR ROOM/DELIVERY SUIT WITH ALL AMINITIES
3. PRE DELIVERY WARD & PREPARATION
4. MATERNITY ICU
5. NEO NATAL I.C.U
6. TELE MEDICINE

AT SECOND FLOOR:

1.DERMATOLOGY/ VENEREOLOGY DEPT.
2. UROLOGY DEPT
3. LABOUR ROOM/DELIVERY SUIT WITH ALL AMINITIES
4. POST PARTUM UNIT
5. MATERNITY WARD
6. MATERNITY PAY WARD
7. CONFERENCE HALL
8. SEMINAR HALL

PHASE 2

BUILDING TO BE DEMOLISHED:

1. AYURVEDEC BLOCK
2. FEMALE & MALE WARD (PART)
3. DMHS (PART)

NEW BUILDING TO BE CONSTRUCTED:

AT GROUND FLOOR:

1. RAMP
2. STRETCHER LIFT
3. MAIN LOBBY
4. RECEPTION
5. PRO
6. O.T DEPT.
7. AYUSH DEPT.

AT FIRST FLOOR:

1. O.T DEPT
2. DENTAL DEPT

AT SECOND FLOOR:

1. DETAL LAB
2. STORE
3. WARD MANAGER
4. SPECIALITY O.T

PHASE 3

BUILDING TO BE DEMOLISHED:

1. O.T DEPT
2. PHYSIOTHERAPY& MEDICAL STORE
3. DIRECTORATE
4. O.P DEPT.(PART)
5. NRHM (PART)

NEW BUILDING TO BE CONSTRUCTED:

AT GROUND FLOOR:

1. ADMINISTRATIVE DEPT.
2. IMAGING DEPT.
3. O.P DEPT.
4. PMR DEPT
5. MEDICINE STORE
6. TOILET BLOCK

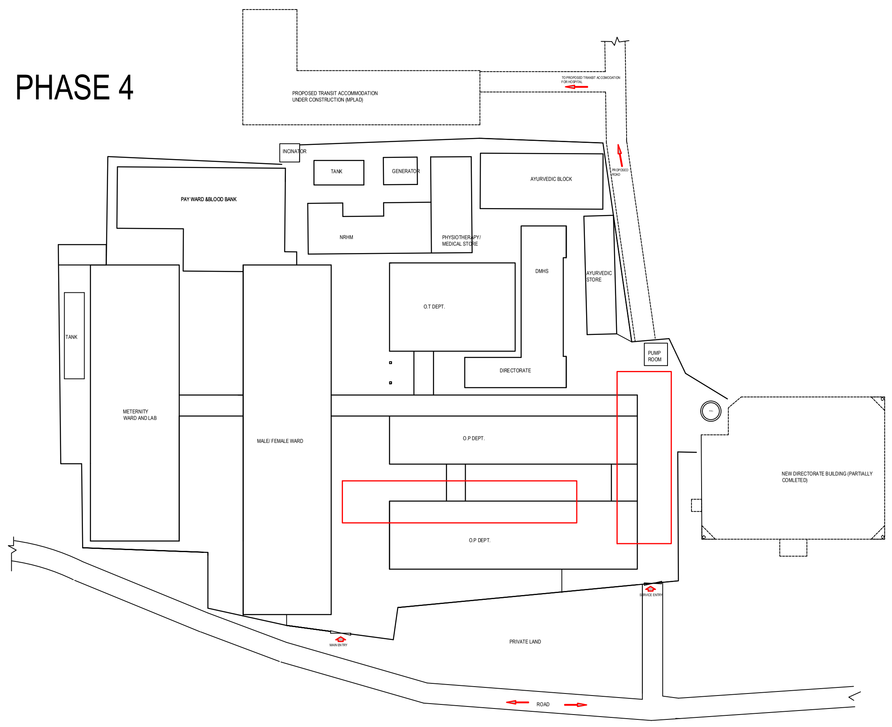
AT FIRST FLOOR:

1. OPHTHALMOLOGY .DEPT
2. O.T DEPT
3. ORTHO DEPT
4. SURGICAL WARD
5. SURGERY SPECIALIST
6. ANESTHESIANIST
7. AYUSH WARD
8. CENTRAL STERILE SUPPLY DEPT.
9. TOILET BLOCK

AT SECOND FLOOR:

1. NUROLOGY & PHSYCHATRY DEPT.
2. CADIAC CONSULTANT
3. PAY WARDS
4. SPECIALITY WARD
5. ENDOSCOPY UNIT
6. DIALISIS UNIT
7. ISOLATION WARD
8. TOILET BLOCK
9. BUFFER STORE

PHASE 4



BUILDING TO BE DEMOLISHED:

1. O.P DEPT.

NEW BUILDING TO BE CONSTRUCTED:

AT GROUND FLOOR:

1. O.P DEPT.
2. CANTEEN & KITCHEN BLOCK
3. TOILET BLOCK

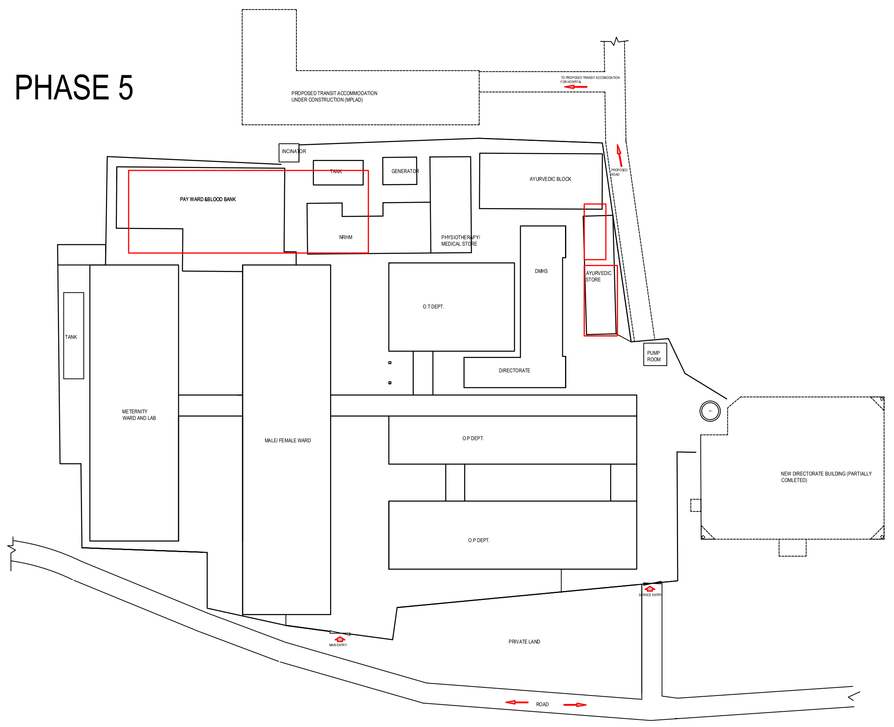
AT FIRST FLOOR:

1. E.N.T DEPT.
2. PEDIATRIC ICU
3. TOILET BLOCK
4. STAFF DINNING
5. DIET KITCHEN FOR PATIENT/WARD

AT SECOND FLOOR:

1. PAY WARD
2. STAFF LOUNG (MALE & FEMALE)

PHASE 5



BUILDING TO BE DEMOLISHED:

1.PAY WARD & BLOOD BANK
2. NRHM (PART)
3. AYURVEDIC STORE

NEW BUILDING TO BE CONSTRUCTED:

AT GROUND FLOOR:

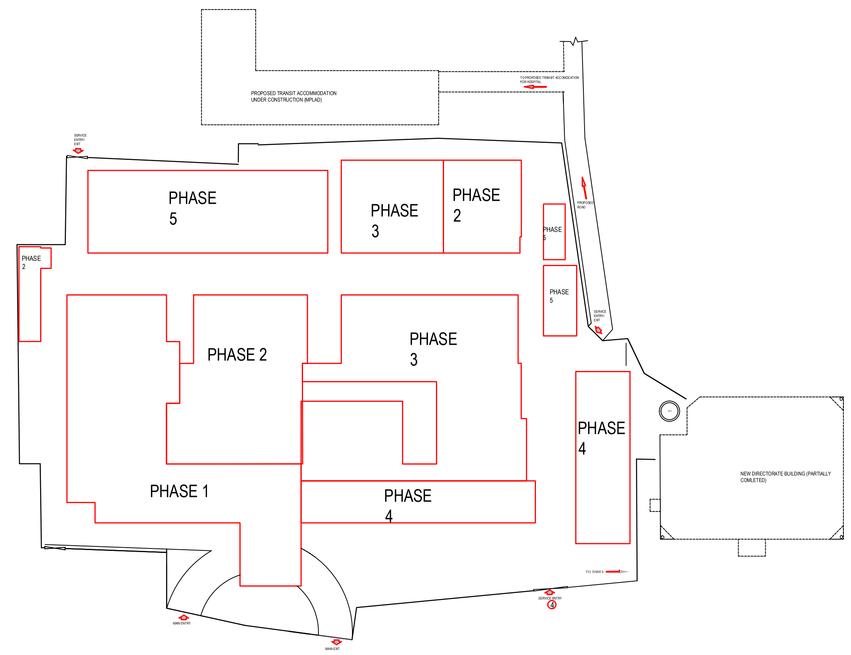
1. CLINICAL LAB
2. MEDICINE STORE DEPT.
3. BLOOD BANK
4. ENGG. & MAINTENANCE CELL
5. GENERATOR & PANEL ROOM

AT FIRST FLOOR:

1. GENERAL WARD (MALE & FEMALE)
2. PEDIATRIC WARD
2. HOSPITAL LAUNDRY /HOUSE KEEPING

AT SECOND FLOOR:

1. GENERAL WARD (MALE & FEMALE)
2. HOSPITAL LAUNDRY /HOUSE KEEPING



PROPOSED NEW BUILDING LAYOUT

d+a
Design Associates
ARCHITECTS, ENGINEERS, DESIGNERS & PLANNERS
Building no:C-13-80,Link Road ,
Near DC office, Kavaratti.
Phone no:04896263099,9447459640
Email-designassociates.kvt@gmail.com

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2. Do not scale from this drawing.

3. All dimensions are in centimetres, and all levels are in metres. All dimensions to be verified on site & approved by the Engineers or architectes.

4. This drawing should be read in conjuction with other relevant Architectural, Structural, Mechanical and Electrical Drawings and all relevant sections of the specifications.

Rev	Discription	Date	Checked	Authorised
0	conceptual/priliminary drawing	13.09.13	PPS	VMN

Purpose of issue	Rev	Date	Authorised

Clients

LAKSHADWEEP PUBLIC
WORKS DEPARTMENT(LPWD)
KAVARATTI ISLAND.

Project:

PROPOSED 100 BEDDED
INDIRA GANDHI HOSPITAL
AT KAVARATTI ISLAND,
LAKSHADWEEP.

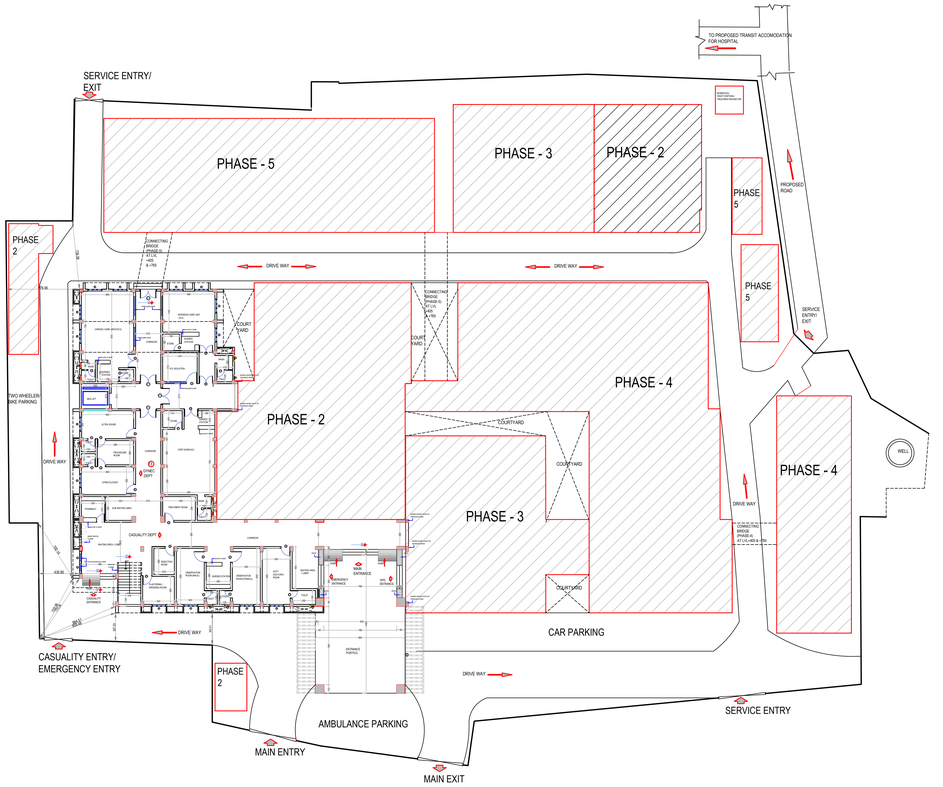
Drawing Title:

PHASE WISE CONSTRUCTION DETAILS

Scale	Drawn	Checked	Authorised	
	Date 18.11.2017	PPS	VMN	

Drawing Number: 111/ A / 2015 Rev 1

SITE PLAN WITH EXISTING BUILDING LAY OUT



PHASE -1
PROPOSED SITE PLAN

ARCHITECTS:

d+a
Design Associates

ARCHITECTS, ENGINEERS, DESIGNERS & PLANNERS
Building no:C-13-80,Link Road ,
Near DC office, Kavaratti.
Phone no:04896263099,9447459640
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4. This drawing should be read in conjuction with other relevant Architectural, Structural, Mechanical and Electrical Drawings and all relevant sections of the specifications.

5.any discrepancy between drawings should be brought to the notice of the Architect.

Revision details

Rev No:	Date	Discription	Purpose of issue
0	13.09.2013	conceptual/ priliminary drawings	for approval
1	31.10.2013	conceptual/ priliminary drawings	for approval
2	28.01.2014	construction drawings	for construction

Scale	Date	Drawn	Checked	Authorised
Not to scale	18.11.2017	pps	vmn	Ar. NADISHA.V.M

Drawing Number: 06/ A / 2014

Clients

LAKSHADWEEP PUBLIC
WORKS DEPARTMENT(LPWD)
KAVARATTI ISLAND.

Project:

PROPOSED 100 BEDDED
INDIRA GANDHI HOSPITAL
AT KAVARATTI ISLAND,
LAKSHADWEEP.

Drawing Title: PHASE -1

SITE PLAN WITH BUILDING LAY OUT

Quantity of Rain Water Harvested at Kavaratti Island

Population of Kavaratti Island	-	11,210
Number of Households	-	2249
Average person	-	5 person per house
Water Consumption	-	40 LPCD
Water required per households @ 40 LPCD	-	40 X 5 = 200 litre/day

Total Rain Water Harvesting tank constructed in Kavaratti island is 645 nos. Out of which 494 numbers are constructed by PWD and 151 numbers are by LIWAMP.

Capacity of Tank	By PWD	By LIWAMP	Total
10,000 Litre Capacity	394	151	545
5,000 Litre Capacity	100	-	100
Total	494	151	645

LIWAMP- Lakshadweep Island Water Management Project

A. For 10000 Litre capacity

Total No of Tanks constructed	-	545
Total Rainwater collected in single time	-	54,50,000 Litre
Time period to empty 10000 litre tank	-	10000/200 = 50 Days
Normal rainy season June to September	-	4 Months
Few showers November to December	-	1 Month (effectively)
Total rainy months (approx)	-	5 Months (150 days)
Approximately tank gets filled (in a year)	-	150/50 = 3 times
Rainwater harvested per year	-	3 x 545 x 10,000 =1,63,50,000 Litre (A)

B. For 5000 Litre capacity

Total No of Tanks constructed	-	100
Total Rainwater collected in single time	-	5,00,000 Litre
Time period to empty 10000 litre tank	-	5000/200 = 25 Days
Normal rainy season June to September	-	4 Months
Few showers November to December	-	1 Month (effectively)
Total rainy months (approx)	-	5 Months (150 days)
Approximately tank gets filled (in a year)	-	150/25 = 6 times
Rainwater harvested per year	-	6 x 5000 x 100 = 30,00,000 Litre (B)
Total Rainwater harvested per year(A+B)	-	1,93,50,000 Litres
Rainwater harvested per day	-	1,93,50,000/365
	=	53,014 Litre per day
Rainwater harvested per capita	-	53014/11210
	=	4.73 LPCD

20.11.17
Asun. Jadhav
EE (PMU).

Brief note on introduction of Hydroponics system in Lakshadweep

for horticultural crop production.

Introduction:

The Lakshadweep Islands are coconut forests looking like scattered emeralds in the blue see. The major crop cultivation activity carried out by Lakshadweep farmers is coconut cultivation. Scientific cultivation practices are not followed by coconut farmers. Zero management practices with an average spacing of 3 meters have changed the Islands to a dense forest of coconut palms. Due to the shaded condition other horticultural crops growth is very limited. Palms have established the network of roots in the soil. Hence plants fail to establish in the soil.

About 90 per cent of the requirements of fruits and vegetables are met through transportation from Main land. Horticulture was not much popular among farmers. Very recently public has become aware about the ill effects of chemically treated fruits and vegetables of main land. It is an appreciable observation that nowadays women groups and unemployed youth has started establishing fruits and vegetable gardens for domestic production.

Department of Agriculture has established demonstration plots at various Islands. For Demonstration purpose department utilizes 12.995 Ha of government owned land and 5.3 Ha of private land (hired). But through these demonstrations department could not enhance domestic horticulture production to a remarkable point. Lack of open area with availability of sufficient sunlight is the main constrain that hinder horticulture development in Lakshadweep. A change is necessary at this juncture to tackle the problem of increasing health hazards by use of chemically treated fruits and vegetables from main land. ***Hydroponics is an effective method to enhance the production with limited land area***. Hydroponics growing system is not introduced in Lakshadweep till date. State Development plans also do not have any component on introduction of Hydroponics.

"Hydroponics" refers to growing plants in a wide variety of media other than soil. This system has several advantages over soil such as no weeds, no soil born pest & diseases and no soil is required for cultivation. In Lakshadweep Hydroponics system of cultivation for horticulture development can be successfully introduced through demonstrations by establishing system in already owned / hired demonstration plots. Production can be obtained hydroponically in local green houses. A higher quantity of fruits and vegetables can be produced from limited land area.

Objective: The major objective is to enhance domestic crop production through introduction of Hydroponics growing system.

Important areas to be focused are:

- To acquire self sufficiency in vegetable and fruit production and improve nutritional security.
- To extent appropriate technology to the farmers including hi-tech horticulture.
- To orient farmers towards toxin free cultivation of vegetables and fruits.
- To teach farmers hydroponic growing method.
- To create career and employment opportunities to unemployed youth and provide income support.
- To provide technical guidance for popularization and creation of awareness in the field of horticulture.

Present scenario of crop production:

A large quantity of vegetables and fruits are transported from main land since vegetable & fruit production through demonstration unit of agriculture department and few kitchen gardens meet only 10% of the local demand. Horticultural crops that successfully grow in Lakshadweep weather condition and soils includes Banana, Papaya, suppota, guava, almost all vegetable groups such as cucurbits, tuber crops, pulses, brinjal, bindi, chilli, tomato and leafy vegetables like curry leaf, drumstick and palak *etc*. Because of chemically treated vegetable and fruits, which are transported from main land causes health

hazards to the people. Land area is limited for horticulture production. Therefore, with the prime objectives of enhancing the crop production from a limited land area the proposal of “Introduction of Hydroponic system in Lakshadweep “ is submitted.

- **PROJECT AREA**

As an initiative, the project is targeted to be implemented in Kavaratti as a part of smart Kavaratti programme. The project is intended to attain self sufficiency in vegetables. The project envisages on setting up hydroponics growing system in one of the demonstration plots under Agrl. Demonstration Unit of Kavaratti with minimum inputs, labour and space. This shall also facilitate to teach a new technology to the farming community and create employment to generate additional income. Crops such as tomato, cucumber, chilli and amaranthus can be tried in the system. .

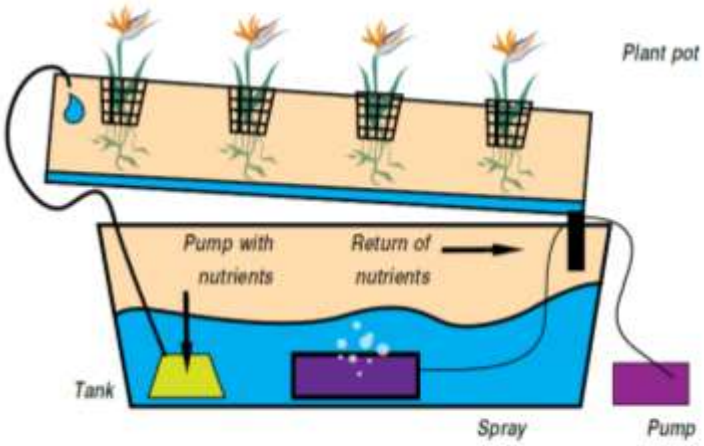
- **INTERVENTION:**

Establishment of Hydroponics system in a Demonstration plot with an area of 3080 sq mt under local green house.

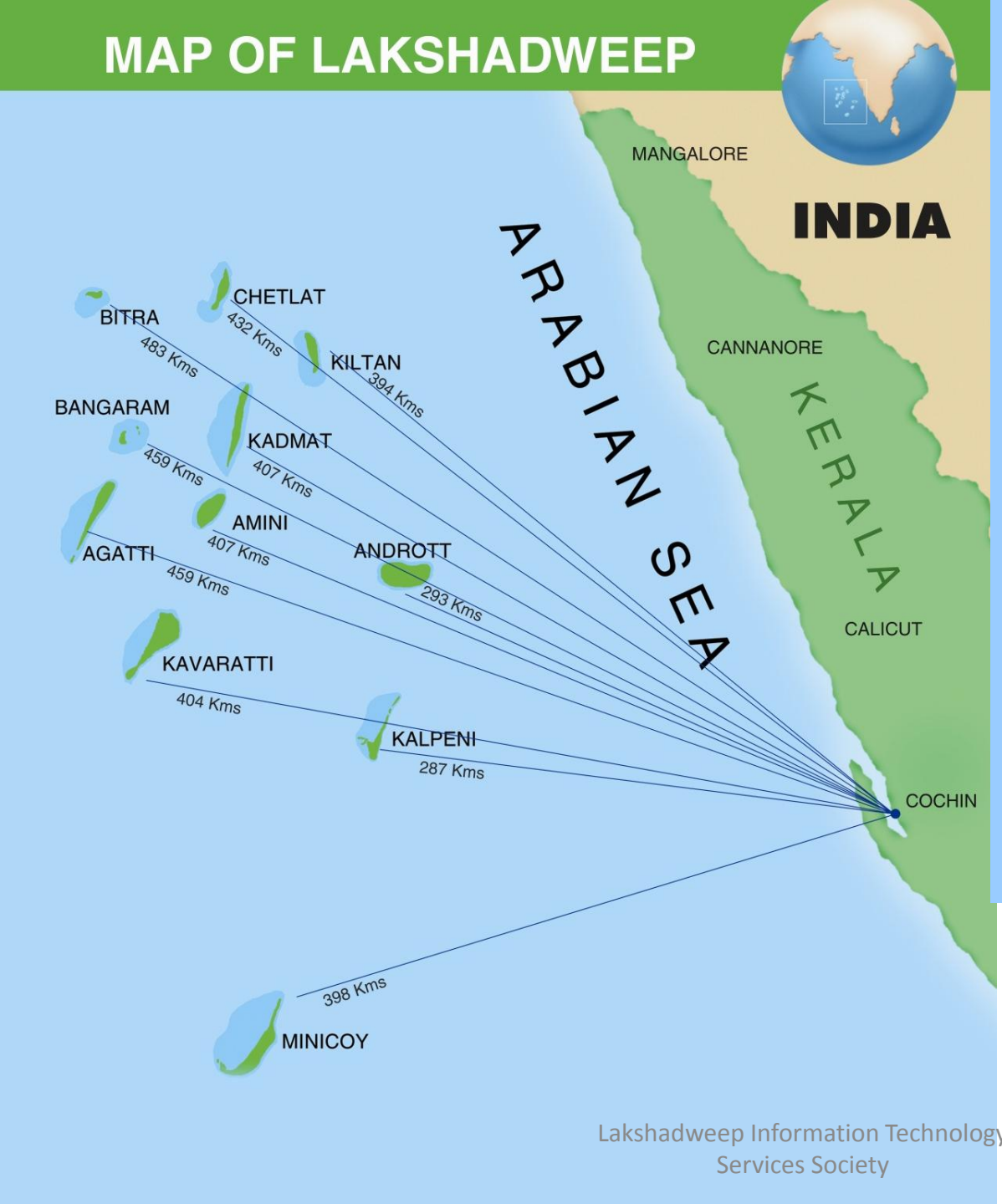
Main types of Hydroponics system are: Wick system, Deep water culture, N.F.T system EBB & Flow system, Drip System and Aeroponics. Out of all system NFT system can be effectively established in Lakshadweep condition.
Description on N.F.T. system:

Under N.F.T. system the nutrient solution is transferred from the tank to the container where the plants are fixed in small plastic cups with holes for roots to grow. The nutrient solution is delivered with the help of a pump. The solution gets to the roots and then drops back into the tank. The flow is either maintained constantly or switched on automatically within small time periods. The roots are in touch with a thin layer of the nutrient solution that is constantly on the tank bottom. Roots receive enough oxygen due to humid air above the solution. In such type of hydroponics solution. There is no substrate used except for air what helps to keep it cheap. The main disadvantage of this system is the sensibility for power shortage or pump breakdown. In case of the lack of electricity roots start

drying almost immediately. As a solution autonomous energy sources are used (batteries) as well substrates to prevent roots from drying.



For installing hydroponics system deep knowledge and expert supervision is necessary. Willing agencies who can establish such a hydroponic system can be employed on payment for installing a hydroponic system successfully in Kavaratti Island.



LOCATION :

$8^0 – 12^0$ N LATITUDE

$71^0 – 74^0$ E LONGITUDE

Distance from the West Coast of Kerala : 220 – 440 km

Coastline length : 132 km

Population (2011 Census) : 64,429

Temperature : 23^0 C – 33^0 C

Average Annual Rainfall : 1612 mm

CORAL 4-7 HUMAN RESOURCE PLAN OF SPV

Preliminary human resource plan of SPV

GOVERNMENT OF INDIA
LAKSHADWEEP ADMINISTRATION
SMART CITY CELL
KAVARATTI – 682555

F.No.1/2/2015-SCC Dated 14.12.2015

PRELIMINARY HUMAN RESOURCES PLAN OF THE SPV

In order to implement the projects Smart City Mission, an SPV has proposed. The Proposed manning of SPV are as follows:

CEO cum Managing Director

Project Director (Infrastructure)

Engineer Experts – 4 (1Senior Level, 1 Middle Level, 2 Junior Level)
Procurement Expert -1
Environmental Expert - 1

Project Director (ICT)

Engineer Experts – 4 (1Senior Level, 1 Middle Level, 2 Junior Level)
Procurement Expert –1

Administrative Staff

Manager - 1, Clerical Staff -3, Supporting Staff - 8

J.ALK

(J.Ashok Kumar IAS)
Secretary Works