





Terms of Reference (ToR)

for

Assessing the Carbon Sequestration Potential of Trees and Mangroves in Thane city, under the project on 'Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban-LEDS II)

Details	Timelines
Posting of the Terms of Reference on the website	23 rd July 2021
Last date for submission of bid documents (soft copies)	30 th July 2021
Announcement of successful bidder	3 rd August 2021

About the project

Thane Municipal Corporation (TMC) and ICLEI – Local Governments for Sustainability, South Asia are implementing a project on 'Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban-LEDS II)' in Thane. The project is funded by European Commission and is supported by the UN Habitat as an implementing partner. This project aims to reduce greenhouse gas emissions and support implementation of climate actions at local level by the promotion of Urban Low Emission Development Strategies (Urban LEDS) in cities/towns of emerging economies (Brazil, Colombia, India, Indonesia and South Africa) and Least Developed Countries (Bangladesh, Lao PDR and Rwanda). This objective is aligned with the Paris Agreement, under the UNFCCC.

Background

Looking at the adverse impacts of climate change, there is a growing need to reduce greenhouse gas (GHG) emissions worldwide. About 44% of India's rapidly growing carbon emissions have urban origin, emanating from transport, industry, buildings and waste, contributing towards climate change¹. Various studies and experiences have shown that urban regions will have to cope with and adapt to increasing extreme climate events like short duration high intensity rainfall, heat waves etc. Furthermore, cities are already facing aggravated impacts due to change in land use and increase in concretized surfaces, which amplify the magnitude of heat risk via the urban heat island

¹ Source: https://smartnet.niua.org/csc/overview.php







effect, as well as urban flooding resulting from water logging, caused by short duration high intensity rainfall.

It has been observed that vegetation can play an important role in improving the urban climate, and promoting urban green infrastructure to develop a carbon sink, will help cities mitigate and adapt to climate change². Urban vegetation can directly offset GHG emissions by sequestering carbon dioxide (CO₂) through biomass storage and reduce the net GHG emissions, by acting as a carbon reservoir.

Urban Forests and Urban Green areas have very recently been brought under the ambit of the Draft National Forest Policy 2018³. The Green India Mission, which was launched as part of the National Action Plan on Climate Change, 2008 also focuses on afforestation and GHG emission reduction. Climate Smart urban development is a thrust area of the Government of India. This is exemplified further by the recently launched Climate Smart Cities Assessment Framework 2.0 by the Ministry of Housing and Urban Affairs, Government of India.

About Thane

Thane city, situated at the north east end of Mumbai, is an important satellite city of Mumbai. As per census 2011, the city has a population of about 1.8 million. The Ulhas River which lies towards the north and Thane creek which divides the city into two unequal halves are the two major water bodies in Thane. Thane city is surrounded by two hills, Yeoor and Parsik, having good vegetation. The forests of Yeoor are located towards the east of Thane, within Sanjay Gandhi National Park and are managed by the Maharashtra State Forest Department. Thane city has high proportion of natural areas due to presence of several ecosystems like forests, mangroves and water-bodies (estuary, creek, and lake). However the natural areas lack continuity and are fragmented. The study area for this assignment covers an area of Thane Municipal Corporation, (and does not include Yeoor forests which is a maintained by Forest department).

TMC has initiated many projects to enhance its green cover like developing urban forests, butterfly parks, gardens, plantation of trees and mangrove species, green footpaths, and green canopies on footpaths. The city has developed City Biodiversity Index (CBI) and Local Biodiversity Strategy and Action Plan (LBSAP) in the year 2015. The city has developed the People's Biodiversity Register (PBR) in 2020. TMC's Garden Department, Tree authority and Pollution Control Cell are responsible for such activities, including undertaking a tree census of the city.

² Chen,W.Y. 2015.The role of urban green infrastructure in offsetting carbon emissions in 35 major Chinese cities: A nationwide estimate. *Cities.* 44: 112-120

³ https://smartnet.niua.org/sites/default/files/resources/draft_national_forest_policy_2018.pdf







In this regard, ICLEI South Asia seeks consultancy from expert(s) (individual/organization/consortium) to assess the Carbon Sequestration Potential (CSP) of Tree and Mangrove Cover of Thane city. This assignment is part of the Urban LEDS-II project, being implemented by ICLEI South Asia and UN Habitat, in collaboration with TMC. The details of work are mentioned in the following table.

Details of the consultancy service

Sr.	Title	Details	
A	Task	To Assess the Carbon Sequestration Potential of Tree and Mangrove Cover in Thane City under the project Urban-LEDS II Location: Thane city (Municipal boundary), Maharashtra state, India	
В	Overall scope of the work	 The scope of above-mentioned task is sub-divided in five (5) parts as following: a) Data collection, demarking sample plots and on ground physical surveys to prepare baseline assessment for calculating the carbon sequestration by trees. TMC has carried out tree census recently and it is envisaged to use the same data. Work of tree census is still under process in small areas and supposed to finish soon. If not, the earlier census's tree data to be used for such areas (excluded during the available tree census). b) Defining mangrove areas based on GIS and remote sensing, demarking sample plots and on ground physical surveys for calculating the carbon sequestration by mangroves. c) To estimate the soil carbon in the mangrove areas d) To estimate existing and projected carbon sequestration potential (CSP) of the tree and mangrove cover in the city and representation of the zone/area level CSP on the map e) To propose city level actions to enhance the natural carbon sink, along with identification of potential plantation sites, species etc. 	













surveyed by the city corporation). The required data shall be collected based on combination of methods such as GIS, Remote Sensing and physical surveys to identify the species, and understand the species density of each mangrove species. Based on grids, sample plots should be marked for actual ground level surveys to collect information on girth at breast height (GBH), height, and health of an individual and GPS coordinates of the individual mangrove in non- destructive manner. The total area to be surveyed should depend on the access to the location but capable for justified representation of the mangrove diversity throughout the city boundary.
The area to be sampled will be selected through stratified sampling/forming grids and quadrats, ensuring representative sampling for the total area. Each quadrat will be of the size of 10mX10m. The selection of areas shall be proposed by selected consultant and finalized in consultation with ICLEI South Asia and TMC. A detailed report shall be prepared showing collected data and its analysis. The report shall also include all the necessary assumptions used to develop citywide projections to estimate the species wise mangrove cover. All the assumptions should be clearly mentioned and approved by ICLEI South Asia and TMC.
c) To estimate the soil carbon in the mangrove areas
Description: The objective of this task is to estimate the soil carbon in the mangrove areas in the city, using an appropriate technical and sampling approach. The detailed sampling and testing methodology needs to be mentioned by the bidder for the same and should be proposed in consideration of the timeline of the assignment. The site-wise soil carbon also needs to be mapped on the mangrove map of Thane and a detailed report provided on the same. The minimum number of soil samples should not be less than 30 while representing total area.
d) To estimate existing and projected carbon sequestration potential (CSP) of the tree and mangrove cover in the city and representation of the ward/zone/area level CSP on the map, based on land use classes







		Description: Based on the results of tasks 'a', 'b' and 'C', and using principles and guidance provided by the Intergovernmental Panel on Climate Change (IPCC) ⁴ the carbon sequestration potential of Thane city shall be calculated. The CSP results should also be presented separately for new plantations, areas with mature trees, mangroves etc. The zone wise CSP should also be represented on the city map. Based on the results obtained, the CSP shall also be projected for next 20 years considering various scenarios like Business as Usual (BAU), survival rates, new plantation rate, land use changes and theoretical growth rates etc.		
		e) To propose city level actions to enhance the natural carbon sink, along with identification of potential sites		
		Description: It is expected to provide city level actions to enhance the carbon sink (without negatively altering the existing ecosystem). Various measures proposed, should be supported by the details like responsible agency and time frame need to be included. The set of action should cover both soft and hard measures, needed to be implemented to increase the CSP of Thane city. The report shall consider ongoing and planned activities of TMC, Maharashtra State government and other statuary departments within TMC jurisdiction to increase the carbon sink in Thane city. For this purpose selected consultant will have to consult with TMC officials to identify potential sites.		
		It is also envisaged to plan a meeting for TMC officials to present the methodology and outputs of this assignment. The final methodology notes should be very detailed and include all the references, assumptions and suggestions for improvement.		
	Project	Deliverables Time line		
D	Deliverables and time frame	1) Detailed methodology for assessing CSP of trees and mangroves in TMC andWithin seven (7) days from the award of		

⁴ 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Agriculture, Forestry and Other Land Use.

https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf







		methodology for surveying and calculation of soil carbon in mangrove areas, developed and finalized after discussions with ICLEI South Asia and TMC	
		2) Baseline assessment report proposing sample plots for tree cover, mangrove areas and locations of soil sampling along with identification of data gaps	Within fifteen (15) days from the award of contract
		3) 1 st draft report on assessment of CSP of trees and mangroves in TMC limits based on actual ground level surveys on sample plots	Within one and half (1.5) months from the award of contract
		4) 2 nd draft report on city wide estimations of existing and projecting future CSP of trees and mangrove cover in Thane along with maps showing zone/area level CSP and recommendations for the actions to enhance the carbon sink of city. a detailed note on methodology followed while assessing CSP	Within two (2) months from the award of contract
		Note*: It shall be the sole responsibility of the selected bidder to conduct on ground surveys in the sample plots.	
Е	Payment schedule	 First instalment (50%): Satisfactory completion and acceptance by ICLEI South Asia and TMC of the deliverable '1' as mentioned in 'Section D – Deliverables and timeframe' of this document Second instalment (50%): Satisfactory completion and acceptance by ICLEI South Asia and TMC of the 	
		deliverables 2, 3 and 4 as me Deliverables and timeframe' of th	







F	Methodology	The consultancy will entail a combination of comprehensive desk reviews and document analysis; baseline data collection and analysis, consultations with key stakeholders (as required), site visits, field work, surveys, presence in the meetings planned with decision makers/higher authorities of the Thane Municipal Corporation and ICLEI South Asia. It shall be noted that in any case there is no possibility of timeline extension for this consultancy including ground level surveys. Hence bidders shall work parallel on ground work and desktop work. In case of incomplete work the payment will be made on pro rata basis for the tasks completed and the same will be decided by ICLEI South Asia.
G	Qualification and experience	 The consultant should qualify for the following minimum qualifications and experience: Eligibility Individual/organization/consortium can bid for this assignment. At least three of the following conditions are required to satisfy as eligibility for this ToR. In case of consortium; together is required to satisfy the eligibility criterion. 1. Minimum 10 years experience in similar consultancy/tasks/projects related to carbon sequestration calculations. 2. Minimum 10 years experience in GIS based mapping of trees and mangroves 3. Successful completion of at least two relevant projects with the ULBs/academic institutes/private sectors/NGOs on calculating carbon sequestration especially for the exiting and/or new plantation in last 5 years, particularly for technical evaluation and reporting. 4. Minimum turnover of 15 lakh (INR) during last 2 years would be required in case of organization(s) <u>Additional information</u> 5. Presence of a plant taxonomist in the team is mandatory 6. Experience of working in the same city/region/country would be an additional benefit. 7. The consultant should demonstrate ability to effectively work and manage similar consulting projects. 8. The consultant/team leader should have strong and relevant academic background of at least masters in







		 relevant fields. 9. In case of consortium a lead partner shall be defined and the same will be responsible for all the deliverables. Role of all other partners also needs to be clearly defined. 10. Consultants should furnish the self-attested copy of work orders for these works and a copy of certificates for satisfactory evaluation of carbon storages for biomass especially trees/mangrove from the same Institution. 	
		Details required in proposal:	
Т	Proposal submission	 <u>Technical Bid:</u> Technical bid shall cover following points. 1. Proposal with detailed approach and methodology for undertaking the current assignment. Details should include the carbon sequestration calculation procedure/references as well. The methodology also needs to indicate the approach for soil carbon sampling and calculations. The methodology followed must be in accordance with the IPCC and relevant national guidelines such as the Forest Survey of India (FSI). The proposal should also include detailed work plan (activity schedule and duration) to accomplish the task within the scheduled project duration. 2. Credentials of organization(s) and/or individuals 3. Details of at least 3 similar previous projects implemented by the organization(s)/individual with documentary proof for the same 4. CVs of key personnel along with time distribution should be given. All relevant CVs shall be provided in full detail. If 	
		 the CV of a proposed staff is found incorrect, the award of the consultancy to the bidder may also be liable to cancellation in such an event. 5. Proposal/Bid Submission Form (Annexure I) 6. Valid organization registration certificate with relevant statutory department 	
		Financial bid shall cover following points.1. Financial bid for the tasks listed in the ToR document. The total cost should include all the expenses for required to	







complete all the tasks mentioned in this ToR. should be inclusive of all taxes, travel and pe	
etc.	

- 2. Item wise break up for all components including GIS, Remote sensing maps, ground surveys and Cost of mandays (unit rate) (Annexure II)
- 3. Financial details of the organization(s) to confirm its eligibility
- 4. Valid PAN card
- 6. Valid GST registration and TIN (in case of organisation)
- 7. Audited account statements for last 2 years

Financial bid should include all costs including taxes, transport, labour, experts, data collection etc. and should be all inclusive. The total amount indicated in the financial proposal shall be without any condition attached or subject to any assumption, and shall be final and binding. In case any assumption or condition is indicated in the financial proposal, it shall be considered nonresponsive and liable to be rejected.

Note: All Technical and Financial bids should preferably be in English. Bidders are encouraged to visit the study area before submission of the bid. Soft copy of the proposal/bid document (technical and financial) should be mailed to ICLEI South Asia on the contact details mentioned in this document no later than 30th July 2021.

The successful bidder will be selected by 03rd August 2021.

In addition, the applying individual/organization/consortium should send cover letter, two sets of the technical and financial proposals (in separate envelopes) to the contact information provided in this ToR document in hard copy within three days of the last date of soft copy bid submission. Please send your application super scribed **"To Assess the Carbon Sequestration Potential of Tree and Mangrove Cover of Thane City under the project Urban-LEDS II"** in the subject line in one sealed envelope.

Please note:

1. The bidder shall acquaint with the work and working conditions at site and locality. No claim shall be entertained on this issue after the bid has been







		submitted.	
		2. The hard copy of bid document shall reach to the	
		mentioned address not later than 3 days from the last	
		date of submission of bid document, provided the bid	
		has been submitted through email before the due date	
		of submission. (Relaxation may be given to submit the	
		hard copies subject to lockdown guidelines in	
		concerned city due to pandemic situation)	
		3. Bid Validity: All bids submitted shall remain valid for a	
		period of 30 days from the date of submission. Any	
		bids submitted for a lesser duration will be disqualified.	
		4. Notification of selected consultant: The bid shall remain	
		open for a total of 7 days from the day of floating the	
		ToR. Only the successful/shortlisted consultant(s)	
		would be notified.	
		For bid submission (soft copy):	
		i) Soumya Chaturvedula,	
		Deputy Director,	
		ICLEI South Asia,	
		Email: soumya.chaturvedula@iclei.org	
		ii) Bhaskar Padigala,	
		Deputy Manager (Energy & Climate),	
		ICLEI South Asia,	
		Email: <u>bhaskar.padigala@iclei.org</u>	
		iii) Mr. Nikhil Kulkarni	
	Contact	Assistant Manager,	
	information	ICLEI South Asia,	
		Email: nikhil.kulkarni@iclei.org	
		For bid submission (physical/hard copy): Ms. Soumya Chaturvedula,	
		Deputy Director,	
		ICLEI South Asia,	
		C-3, Lower Ground Floor, Green Park Extension, New Delhi -	
		110016, India. Tel: +91 – 11 – 4974 7200, Fax: +91 - 11 -	
		4974 7201	
		Email: soumya.chaturvedula@iclei.org	
		For local information and queries:	







Mr. Nikhil Kulkarni
Assistant Manager,
ICLEI South Asia,
Tel: 97665 28899
Email: nikhil.kulkarni@iclei.org

Other terms and conditions

- 1) The Terms of Reference (ToR) shall be downloaded free of cost from the ICLEI/ICLEI South Asia website
- 2) The bid shall be valid for a period of 30 days from the date of submission of bid document
- A bidder shall submit the bid documents that satisfies each and every condition laid down in this notice, failing which, the bid will be liable to be rejected by ICLEI South Asia.
- 4) In case the bidder wishes to sub-contract part of his deliverables, the final responsibility of delivery and performance solely lies with the bidder.
- 5) Selected consultant has to deliver expertise and assist project team which will be consists of the representatives of ICLEI South Asia and officials of TMC.
- 6) Selected consultant (individual/organization/consortium) is expected to perform the activities as mentioned in the section 'C' and provide deliverables as mentioned in the section 'D' following the methodology prescribed in the section 'F' of this ToR.
- 7) The consultant is allowed to propose amendments to the methodology, when they find it necessary. Actual amendment in methodology will be in force only after written approval from ICLEI South Asia.
- 8) The bidder shall be deemed to have carefully examined the work and site conditions'. In this regard, he/she will be given necessary information to the best of knowledge of ICLEI South Asia in consultation with TMC but without any guarantee to it.
- 9) If applicant has any doubt as to the meaning of any portions of these general contract terms, or the scope of the work, or any other matter concerning the contract, he/she shall in good time, before submitting his/her proposal, set forth the particulars thereof and submit them to the point of contact, as given in this ToR, by email in order that such doubts may be clarified authoritatively before tendering. Once a proposal is submitted, the matter will be decided according to the ToR conditions in the absence of such authentic pre clarification.
- 10) All applications will be treated in the strictest confidence and only successful candidates will be contacted for further discussions.
- 11) The technical and financial proposals should be submitted as separate documents.







- 12) In case the winning bidder fails to indicate his/her intent to undertake the said work within the stipulated time of seven (7) days and observe the formalities as above, the Letter of Intent will be cancelled and the next bidder will be finalised by ICLEI South Asia in consultation with TMC officials.
- 13) ICLEI South Asia reserves all the rights to reject any proposal, and to terminate the selection process and reject all proposals at any time, without thereby incurring any liability to the affected applicant or any obligation to inform the affected applicants of the grounds for such decision.
- 14) It should be noted that the consultant has to work in Thane Municipal Corporation's jurisdiction, Maharashtra and hence instructions to bidders will be given by ICLEI South Asia in consultation with TMC officials.
- 15) ICLEI South Asia will be overall in-charge for all the works that would be executed under the present scope of work.
- 16) The applicant shall also obtain necessary permissions from concerned government departments related to the work/data collection if deemed necessary and in coordination with TMC and ICLEI South Asia.
- 17) All data and information received from TMC and ICLEI South Asia for the purpose of this assignment are to be treated confidentially and are only to be used in connection with the execution of these Terms of Reference.
- 18) The contents of written materials obtained and used in this assignment may not be disclosed to any third parties without written approval from ICLEI South Asia and/or TMC.
- 19) The decision of ICLEI South Asia will be final and binding.
- 20) The proposals received will be scrutinized and evaluated by the ICLEI South Asia, in consultation with TMC.
- 21) Detailed Work Order will be issued to winning applicant within seven (7) days of announcing the results.
- 22) The selected applicant is to forward the signed and sealed work order to ICLEI at the earliest or not more than seven (7) working days from the date of issuing work order.
- 23) If found suitable, ICLEI South Asia reserves the right to propose formation of consortium or divide the scope of this ToR among the bidders with their mutual consent based on their expertise to improve overall quality of work.
- 24) The bidders should agree that any matter or issues arising hereunder or any dispute hereunder shall be subject to the exclusive jurisdiction of the courts of situated at New Delhi, India.
- 25) The final amount should be quoted in both figures and words. (In case of any discrepancy between the amount quoted in figures and words, the amount quoted in words will be considered for evaluation purposes).







- 26) For on ground surveys; it is a sole responsibility of consultant to get all the necessary permissions from statutory government departments. ICLEI South Asia will facilitate the same in consultation with TMC.
- 27) ICLEI South Asia reserves the right to change the scope of work or replace the areas, in case of delay in permissions/rejections/restrictions for the proposed/undertaken activities on any of the area within TMC Jurisdiction controlled by any of the government department.

Extension of date of completion

On occurrences of any events causing delay as stated hereunder, the bidder shall intimate immediately in writing to ICLEI South Asia.

Materials/Appliance at site

Neither ICLEI South Asia nor TMC undertakes any responsibility for supply of any materials/ equipment/ appliance/ tool for site analysis to the bidder.

All materials/ equipment/ tools brought to site by the bidder shall be the responsibility of the bidder. TMC and ICLEI South Asia shall extend help as and when approached by the bidder to keep any materials/ equipment/ appliance/ tool, however not liable for any loss, theft or damage due to fire or other cause, the responsibility for which shall lie entirely on the bidder.

Safety and security

Safety and security of the manpower/experts involved in this consultancy including on ground surveys will be the sole responsibility of the bidder. Neither ICLEI South Asia nor TMC undertakes any responsibility for the same. Bidder should provide necessary trainings, safety equipments and supervise the progress regularly. Any claim in this respect shall not be entertained by ICLEI South Asia and/or TMC.

Final Inspection of Work

TMC and ICLEI South Asia team shall jointly make final inspection/review of all work included in the contract/work order, or any portion thereof, or any completed structure forming part of the work of the contract, as soon as practicable after notification by the bidder that the work is completed and ready for acceptance.

Conflict Resolution

In case of a conflict, the same would be addressed through mutual discussions. In case the conflict cannot be mutually sorted, the ICLEI South Asia's decision would be final and binding.







Termination of Contract

In case the consultant is unable to perform as per the expectations of the project team and/or project cities, the contract of the consultant can be terminated based on mutual consent. In case of contract termination, the consultant would be paid on the basis of deliverables completed to the satisfaction of ICLEI South Asia.

Force Majeure

In case of extraordinary events under force majeure (Natural phenomena, including but not limited to abnormally bad weather, unprecedented flood and draught, earthquakes & epidemics, political upheaval, strikes, lockouts, acts of any Government (domestic/foreign) including but not limited to war, properties, and quarantine embargoes), the terms of contract can be redrafted through mutual consent. In such cases, none of the parties can be held liable under the Contract.







Annexure I: Proposal/Bid Submission Form

To The Executive Director ICLEI-Local Governments for Sustainability, South Asia New Delhi – 110016

I/We have read and examined the terms of reference (ToR) documents relating "To Assess the Carbon Sequestration Potential of Tree and Mangrove Cover in Thane city under the project Urban-LEDS II" including the main tender document and Annexure I, II.

I/We hereby submit our proposal for execution of the work/consultancy referred to in the aforesaid documents in accordance with the terms and conditions contained or referred to therein and in accordance in all respects with the specifications, designs, drawings and other relevant details at the rates furnished in the bid document and within the period(s) of completion as stipulated in Annexure documents and our proposal.

If I/We fail to keep the proposal open as aforesaid of make any modifications in the terms and conditions of the proposal which are not acceptable to ICLEI South Asia or after signing of contract are unable to provide work or services to the satisfaction of ICLEI South Asia as per the terms of the contract and annexure documents, I/We agree that ICLEI South Asia shall without prejudice to any other right, be at liberty to forfeit earnest money absolutely. Should this proposal be accepted, I /We agree to abide by & fulfil all the terms conditions of aforesaid document and the annexure documents.

If after the proposal is accepted, I/we fail to commence the execution of the work, I/We agree that ICLEI South Asia shall without prejudice to any other right or remedy is at liberty to forfeit the said earnest money absolutely.

Signature and stamp of applicant.....

Name.....

Organization	
Organization	

Date and place.....







Annexure II: Financial Bid Template

S.No.	Budget head	Amount
1	Manpower X number of days	
2		
3		
4		
5		
6		
7		
8		
9		
10		
	Total	
	Taxes	
	Grand total	