EXPRESSION OF INTEREST (EOI) DOCUMENT

FOR

ENGAGEMENT OF CONSULTANTS (REPUTED EDUCATIONAL AND RESEARCH INSTITUTIONS)

FOR

HEAT ISLAND STUDY IN ANGUL-TALCHER AREA IN ODISHA

STATE POLLUTION CONTROL BOARD, ODISHA
Paribesh Bhawan, A/118, Nilakanthanagar, Unit-VIII,
Bhubaneswar – 751 012, INDIA

STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII
Bhubaneswar – 751 012, India,
E-mail: paribesh1@ospcboard.org / Website: www.ospcboard.org

No_____12687_____ **Dt_02.08.2014_____**

INVITATION FOR EXPRESSION OF INTEREST (EOI) FOR STUDY OF HEAT ISLAND EFFECTS IN ANGUL-TALCHER AREA OF ODISHA

1. The State Pollution Control Board, Odisha intends to engage consultants (reputed educational and research institutions) to carry out a study on Heat- Island Effect and measures for its abatement in the Angul-Talcher area, Odisha. The study will be a single assignment for a period of one year.
2. Reputed educational and research institutions are requested to submit Expression of Interest (EOI) for carrying out the proposed study for the site. The EOI shall indicate their interest in carrying out estimation of Heat Island Effect and measures for its abatement in the Angul-Talcher area.
3. Interested educational and research institutions may submit the Expression of Interest (EoI) by providing required information as per the **prescribed format**, which is downloadable from the Website: **www.ospcboard.org (In Advertisement page under Tender & Advertisement tab)** of OSPCB.
4. The EoI filled in as per the prescribed format and supported with relevant documents must reach the Office of Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751 012 on or before 08-09-2014, 5:00PM. The envelope must be clearly superscripted as "**EXPRESSION OF INTEREST FOR HEAT ISLAND STUDY IN ANGUL-TALCHER AREA OF ODISHA".** The EOI can be submitted through Registered Post/ Speed Post. But the authority shall not be held responsible for any postal delay for non-receipt of EOI within scheduled date and time.
5. Interested educational and research institutions are advised to visit the site before submission of EOI. Once EOI received; it will be presumed that the institute has visited the site and collected relevant information for submission of his EOI.
6. The SPCB reserves the right to reject any or all EOIs without assigning any reasons thereof.

Sd/-
Member Secretary
State Pollution Control Board, Odisha

To

The Member Secretary,
State Pollution Control Board,
A/118, Nilakantha Nagar, Unit-VIII
Bhubaneswar-751012

Sub: Submitted Expression of Interest for engagement in Study of Heat Island Effects in Angul-Talcher area of Odisha

Sir,

I/ We do submit herewith our EOI in prescribed format in sealed cover as per requirement for the above stated study.

Yours faithfully,

Signature _____

Name _____

Designation _____

Institution Name, Seal

& Address _____

_____

GUIDANCE DOCUMENT FOR THE CONSULTANTS (REPUTED EDUCATIONAL AND RESEARCH INSTITUTIONS) FOR SUBMISSION OF EXPRESSION OF INTEREST (EOI) FOR STUDY OF HEAT ISLAND EFFECTS IN ANGUL-TALCHER AREA IN ODISHA

2. Brief about Objective and Scope of Work

Introduction:

Heat island (HI) refers to any area which is consistently hotter than the surrounding area. The main cause of heat island effect is from the modification of land surfaces and the secondary cause is the waste heat generated by energy usage. The HI decreases air quality by increasing the production of pollutants such as ozone and decreases water quality as warmer waters flow into area streams and put stress on their ecosystems. It has also affects health of local population due to increasing in ambient temperature.

Angul- Talcher area in the state of Odisha is one of the hottest districts in Odisha where maximum summer temperature goes up to 44-46^{0}C. Angul-Talcher area is one of the oldest industrial areas of the country and is declared as one of the Critically Polluted Area (CPA) by Central Pollution Control Board (CPCB). The CPCB has ranked the area as 7th most polluted area in the country based on the CEPI score of 82.09. This area is dominated with Red categories of industries like Coal mining, Aluminium Smelting, Thermal power generation, Steel making etc. In summer season due to self-oxidation, the exposed coal seam and stockyards of the coal mines catch fire and contribute to rise in temperature. The industrial activities like steel and thermal power plant release substantial quantity of heat causing high ambient temperature. The tall infrastructures in the industrial area also provide multiple surfaces for the reflection and absorption of sunlight, increasing the efficiency with which this area is heated. Thus it is likely that heat island effect in the area is highly pronounced.

Objective of the study:

In order to evaluate the heat stress comprehensively and to formulate an abatement plan to combat heat island effect a Heat Island study is intended to be carried out by Odisha State Pollution Control Board by engaging consultants from reputed educational and research institutions. The objective of the study is to find out significant factors causing high ambient temperature in the Angul-Talcher area and suggest appropriate remedial measures to mitigate heat the island effect.

Broad Scope of Work or service

The Broad scope of the proposed heat island study should cover following aspects

i. The proposed study shall cover the Critically Polluted Area (CPA) of Angul- Talcher area as approved by Central Pollution Control Board (CPCB) and any other area of major industries /mines which might have been established within close vicinity. Thus the area needs to be defined and delineated for the proposed study. :
ii. Land Use and Land Cover (LULC) classification of the study area on the basis of present Land use and land cover
iii. The classification of industrial, mining, transport and urban activity with respect to their heat generation/ radiation potential
iv. Heat balance study for the major existing and proposed industries of the area
v. Monitoring of temperature, humidity, and other micro meteorological parameters in the study area
vi. Assessment of weather conditions for one full year
vii. Evaluation of Heat-Island intensity of the area with help of appropriate models and to be validated with field level background and monitored data.
viii. Study on geometric effects (blocking of winds and canyon effects)
ix. Study on impacts weather and climate on Heat Island effect
x. Linkage of Heat-Island effect with meteorological parameters
xi. Linkage of Heat-Island effect with Land Use and Land Cover (LULC)
xii. Linkage of Heat-Island effect with industrial activity of the area
xiii. Identification of hot spots of the area in respects of Heat-Island effect
xiv. Formulation of Remedial measures for abatement of Heat-Island effect in the study area.

Expected deliverables of the assignment

The assignment shall be for a period of 24 months and the delivery schedule shall be as follows:-

1. Preliminary study report with list of units identified for field visits with the monitoring schedule for estimation of heat island effects as per the scope of work defined as above . (Step 1 and part of Step 2) - within 2 months.
2. Second Interim Report after completing field visits and monitoring of environmental parameters(Step 2 and Part of Step 3) -within 9 months
3. Draft final report - within 10 months
4. Final report after incorporating modifications suggested by the Board - within 12 months

Area details :

a) Location & Geographical Area:

The study area spreads mostly in Angul district and partly in adjoining Dhenkanal district. The study area is approximately 350 km^2. The area is about 150 kilometers from the state capital Bhubaneswar (Figure-1). Two National Highways NH-42 and NH-23 pass through the area. River Bramhani flows along Talcher from north-west to south-east. Most of the industries in this area are located along the river within a stretch of about 25 Km. The location of industries and mines and area as a whole are shown in Figure-1.

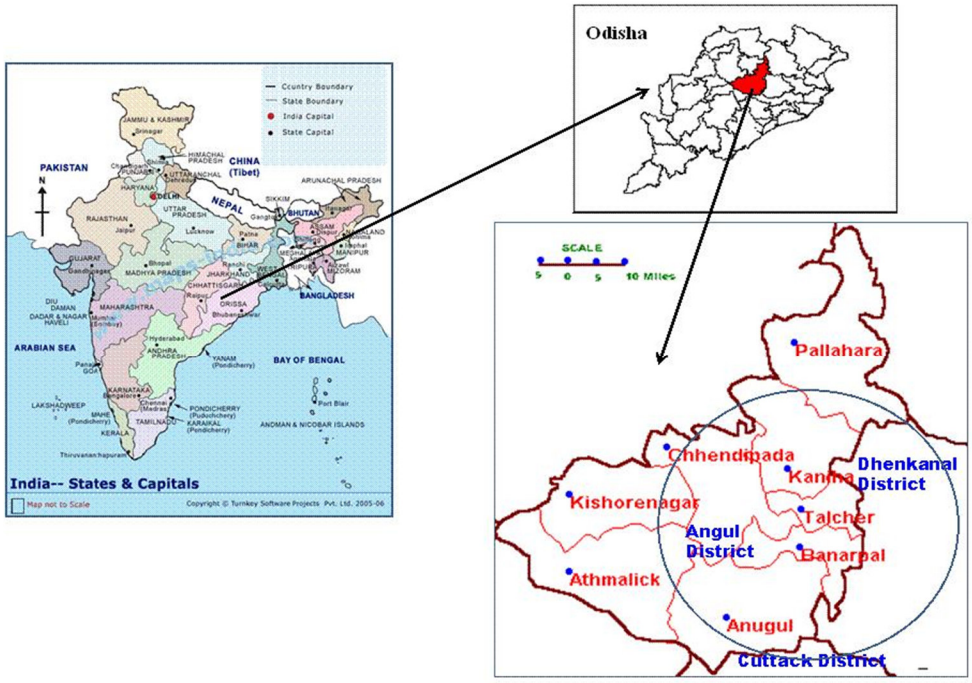

Figure-1 Location of Angul- Talcher area

Central Pollution Control Board (CPCB) has developed a Comprehensive Environmental Pollution Index (CEPI) to measure and manage multi-dimensional environmental problem in industrial cluster. The details of Critically Polluted Industrial Cluster (CPIC) area is shown in Figure-2.

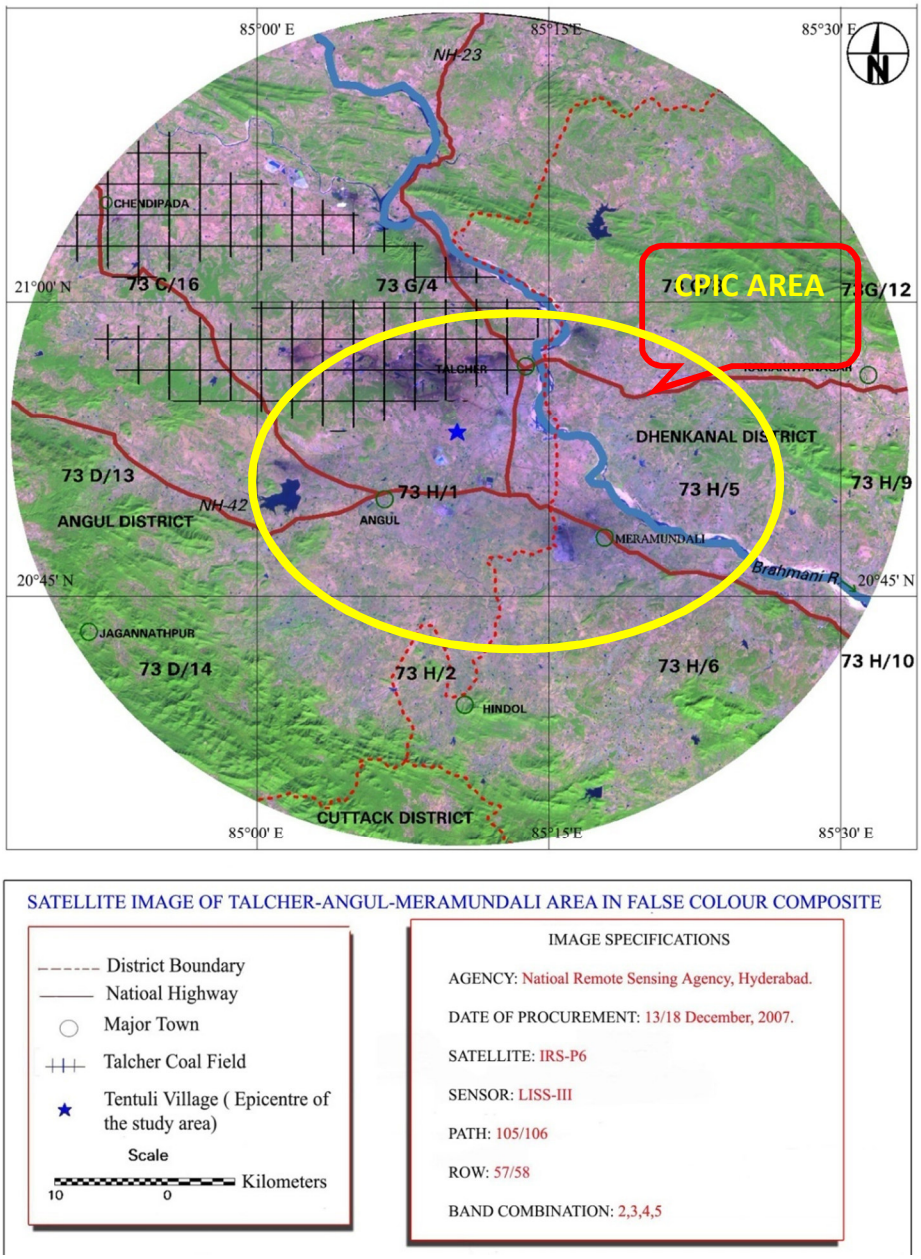

Figure-2: Geographical boundary of Critically Polluted Industrial Cluster (CPIC)

b) Topography:

Topographically the area can be divided in to three natural tracks. First is a chain of hills running along the northeastern boundary of the district covering Pallahara. Another chain of hills runs along with south west boundary covering Athamallik and Angul. The third natural division is a valley of river Bramhani running along with boundary of Talcher through Kaniha touching Pallahara.

c) Demographics:

The total population of the cluster would be approximately 3.0 lacs. According to the 2011 census Angul district has a population of 1,271,703.

d) Availability of Minerals:

Varieties of mineral areas are occurring in the district which includes Coal, Chromite, Graphite, Manganese, Mica, Keyanite, Granite, Laterite, Sand (stow), Quartz etc .However Coal, Sand (stow) and Quartz are only commercially exploited.

e) Climate:

The area experiences tropical monsoon climate with three distinct seasons in a year viz. summer, rainy and winter. The summer season extends from March to May, rainy season from June to September and winter season from November to February.

f) Rainfall:

The average annual rainfall of the study area is 1421 mm. However there is a great variation of rainfall from year to year. The rainfall in the district during the last 10 years varied between 896 mm & 1744 mm.

g) Temperature:

There is a meteorological observatory in Angul district. The data of this observatory may be taken as representative of the meteorological condition of the whole area. The hot season commences by beginning of March and May is the hottest month with a mean daily maximum temperature at 44 degree Celsius. With the onset of monsoon, early in June day temperature drops appreciably. After withdrawal of monsoon by the 1st week of October both day and night temperature begin to diminish steadily. December is usually the coldest month of a year with a mean daily minimum temperature of 11^0 C.

h) Winds:

Winds are generally light to moderate with some increase in force in the summer and southwest monsoon seasons. Winds usually blow from southwest and northwest directions in the monsoon. In the post monsoon and cold seasons winds blow between the west and north. In the summer months the winds become variable in direction.

i) Rare Weather Phenomenon

The area is affected by hailstorm and depressions in the monsoon season and in October, when winds increase in force and widespread heavy rain occurs. Thunder storms occurs mostly in the afternoon in the summer months and in October.

j) Industrial activities in the area:

Industrialization started in this area quite early with the operation of coal mines. The presence of River Bramhani with its tributaries and two National Highways, provide

the basic requirements water and communication facility along with coal (fuel) for development of industries. Coal mines, thermal power, alumimum smelter, iron and steel, sponge iron, coal beneficiation and ferro alloys are the major industrial activities in this area. Other small scale industries like stone crusher, brick Kilns, tyre-retrading units add industrial development in the area.

According to Geological Survey of India, the Talcher Coalfield has reserves of 38.65 billion tonnes, the highest in India. Talcher Coalfield covers an area of 500 square kilometers (190 sq mi). Amount of land being converted to ash ponds (due to increase in number of thermal power plants) and solid waste disposal facilities is increasing day by day. This process converts green agricultural lands to unproductive barren lands; thus, increasing the ambient temperature of the area. There are 9 numbers of "17 category" of highly polluting industries (Red-A) and 144 numbers of 54 category (Red- B) industries in the area.

Major Industries

i. NALCO : National Aluminium Company Limited is an integrated Alumina-Aluminium complex located in Angul. NALCO has capacity of 4.6 MTPA Aluminium Smelter and 1200 MW Captive Power Plant. NALCO manufactures primary Aluminium metal in the form of Ingots, Wire Rods and Billets. NALCO has its own township for its employees

ii. NTPC : The National Thermal Power Corporation, has its 3000 MW super thermal power station at Kaniha, in Angul. Coal for the power generation is sourced from the Talcher Coal Field and water is taken from river Tikira which is up stream of Samal Barrage Reservoir. NTPC Kaniha has its own township for its employees.

iii. MCL : Mahanadi Coal Field Limited is located in Talcher (20 km from Angul) has a number of both opencast and underground coal mines in the region with present production capacity of more than 60 MTPY. MCL has its own township for its employees.

iv. HWP: The Heavy Water Plant is located in Talcher (20 km from Angul), is a Govt. of India Organisation under the aegis of Ministry of Atomic Power & Energy. This plant is involved in production of Organic Solvents like TBP, D2EFHA, TAPO & TOPO etc. and other allied chemicals required as a part of the Nuclear Power Programme of the country. HWP has its own township for its employees.

v. TTPS: Talcher Thermal Power Station was one of the oldest power generation plant of the Government of Odisha, which has been taken over by NTPC. It has a capacity of 460 MW power generations and it is located in Talcher. Coal for the power generation is sourced from the Talcher Coal Field and water is taken from nearby Bramhani river. NTPC Talcher has its own township for its employees.

vi. JSPL : Jindal Steel and Power Ltd is a major steel industry which has come up in Angul district for production of 6. MTPA steel and 1500 MW power generation unit. It is under commissioning in phases.

vii. BPSL : Bhushan Power and Steel Ltd is a 5.6 MTPA integrated steel plant operating in the area.. It has different units of Sponge Iron, Blast furnace, Coke Ovens, Steel Melting Shops, Thermal Power Plants, Waste heat recovery units etc. It is under commissioning in phases.

viii. GMR : GMR Energy is a coal based thermal power plant with the units of 3 x350 MW. Coal for the power generation is sourced from the Talcher Coal Field and water is taken from nearby Bramhani river.

ix. NBVL : Nava Bharat Ventures Limited has ferro alloy units (75000 MTPA) and thermal power generation of (158 MW).

3. Instruction to consultants

- Reputed educational and research institutions are requested to submit Expression of Interest (EOI) for carrying out the proposed study of heat island effects for the site at Angul-Talcher area. The EOI shall indicate their interest in carrying out estimation of Heat Island Effect and measures for its abatement in the Angul-Talcher area.
- Interested educational and research institutions may submit the Expression of Interest (EOI) by providing required information as per the **prescribed format**, which is downloadable from the Website: **www.ospcboard.org (In Advertisement page under Tender & Advertisement tab)** of OSPCB.
- The EOI filled in as per the prescribed format and supported with relevant documents must reach the Office of Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751 012 on or before 08-09-2014, 5.00 P.M. The envelope must be clearly superscripted as "**EXPRESSION OF INTEREST FOR HEAT ISLAND STUDY IN ANGUL-TALCHER AREA IN ODISHA".** The EOI can also be submitted through

Registered Post/ Speed Post. But the authority shall not be held responsible for any postal delay for non-receipt of EOI within scheduled date and time.

- Interested educational and research institutions is advised to visit the site before submission of EOI. Once EOI received; it will be presumed that the institute has visited the site and collected relevant information for submission of his EOI.
- The SPCB reserves the right to reject any or all EoIs without assigning any reasons thereof.
- The EOIs will be evaluated by a Consultancy Evaluation Committee (CEC) constituted for the specific purpose. The scores will be assigned to the response of each consultant based on the weightage assigned to each of the criteria in EOI (Pls refer section-4). The following weightage criteria will be followed.
    - Past experience of the institute – 60%
        - Nos of years of experience- 20%
        - Past experience of studies of similar nature- 50%
        - Past experience of studies in related sector- 20%
        - Studies carried out in India- 10%
    - Experience of Key Personnel – 25%
        - Qualifications- 30%
        - Relevant experience – 70%
    - Facility available for conducting such studies / Rating of the consultant (Educational and research institution)- 15%
- The shortlisted consultants will be included for final selection process and will be called for submission of technical and financial bids.

4. Eligibility/ prequalification Criteria of Consultant (Reputed educational and research institution)

- Consultant must be a reputed educational or research institute like IIT, NIT or CSIR laboratory or any other similar institutions recognized by Govt. of Odisha / Govt of India
- The Consultant must have similar type of experience in conducting Heat Island or other such related metrological studies
- The Consultant should have capacity to undertake all type of measurement on atmospheric phenomena, Climate and weather monitoring facility survey of area, modeling studies and other related measurement towards estimation of heat island effect.

- The Consultant should have qualified & experienced Environmental Engineers/ Meteorologists/ Atmospheric Experts, Surveyor etc. to conduct the field work as well as preparation of Heat Island Study. The educational qualification of functional experts, area of specialization and technical skill, experience and expertise in relevant field will be criteria for selection of consultant.

5. Format for submission of Expression of Interest (EoI) for Heat Island Study In Angul- Talcher, Area in Odisha

Name of the Educational /Research Institute		**:**		
Date of Registration/ Incorporation/ Establishment of the Institute		**:**		
Address of communication		**:**		
Phone	**Fax**		**E-mail**	**Website**
Core area of specialization (✓ in appropriate box)		**:**		
			Meteorological and tropical weather study Climatological studies Estimation of Heat Island Effect Industrial Process Analysis EIA and Risk Assessment Studies Any other similar studies	
Key persons for above areas of specialization (Pls enclose separate sheets if space provided is inadequate)		**:**		

Name	**Highest Educational qualification**	**Area of specialization**	**Experience**	**Year of association with the institute**

Project executed by the Institute on climate, weather and heat island study (during last ten years) (Pls enclose separate sheets if space provided is inadequate)

Name of the project	Description of project	Name of the Client	Date of completion / Or on going

The Bio-data of the principal investigator of the above projects and research papers published in peer reviewed journals.

Details of facility available to conduct such type of studies (please present brief description of offices, laboratory etc.)

I hereby declare that the above information is true to the best of my knowledge and I am authorized by my firm to fill up and submit on its behalf.

Authorized Signatory