CDRI
Coalition for Disaster Resilient Infrastructure

No.: 02-05003/1/2021-DIR_HR-OPS **Date: 07 April 2022**

Request for Expression of Interest (EoI)

International Case Study on Resilience of Data Centres

The Coalition for Disaster Resilient Infrastructure (CDRI) invites Expression of Interest (EoI) from eligible consulting agencies for a study titled “International Case Study on Resilience of Data Centres”.

The objectives, scope of work, deliverables, reporting, and supervision, etc. are mentioned in the **Terms of Reference (ToR).**

Interested consultants should provide information in the format given at **Annexure 1,** demonstrating that they have the required qualifications and relevant experience to perform the services.

The shortlisting and eligibility criteria are given in the Information for Consultant and ToR.

Consultants submitting an EOI may be required to make a presentation on their proposals before the shortlisting process. Shortlisted Consultants will be invited in the Request for Proposal (RfP) stage to submit their technical and financial bids. The final selection of the agency/consulting firm will be done based on the basis of Quality and Cost Based Selection (QCBS) method.

Interested consultants may obtain further information and may also give their comments on the objectives and scope of work at the email addresses below.

The EOIs should be submitted electronically to **E-mail: tender.projects@cdri.world by 2359 hrs (IST) on 25, May 2022** in PDF format.

I. INFORMATION FOR THE CONSULTANT

Client Name	Coalition for Disaster Resilient Infrastructure (CDRI)
Brief description of the required services	Considering the importance of data centres in the context of disasters and climate resilience, CDRI intends to undertake a comprehensive and scientific case study of data centres that have been affected by disasters in the past. The case study aims to cover 10 data centres under different geographic and hazard contexts, historically affected by disasters (Refer ToR, Section 4.2.2)
List and description of expected outputs to be delivered	Deliverables are listed under in the ToR.
Nodal person	Deepak Rawat Designation: Manager Procurement E-mail: deepak.rawat@cdri.world
Location of work	New Delhi, India
Expected duration of work	9 months
Criteria for Preliminary Examination of EOI	- Relevant experience of the Agency - Relevant experience of the proposed Team Leader - Proposed Team Composition - Overall experience of the agency - Documents of registration / incorporation in country of origin - Agency not blacklisted by any Govt. institution
Criteria for essential eligibility / qualification	- The agency must have experience of at least 5 years in conducting similar research studies for National/Sub-national Government or Agencies/Departments, Multilaterals and Bilateral agencies. - Agency with prior experience in conducting technical/ research studies on planning/ design/ standards/ mitigation/ damage assessment/ resilience assessments for ICT infrastructure assets/ Data Centres will be given priority. - Agency should have a team of experienced professionals from relevant fields relating to the subject matter of the proposed study. The agency should engage an adequate team of professionals having expertise around ICT infrastructure / Data Centres, disaster risk management, infrastructure resilience.

	- Demonstrated experience in application of FORIN methodology, case-study analysis for infrastructure systems will be an added advantage. - Demonstrated experience in case-study analysis, disaster preparedness, emergency management, business continuity planning, economic and financial analysis will be an added advantage - Demonstrated experience of resilience studies/ case-study analysis of infrastructure systems at international, national and local level will be an added advantage.
Who can apply	Proposals are invited from institutions/ organisations only.

Note:

1. CDRI or any of its designates reserves the right to cancel this request for EoI and/or invite afresh with or without amendments, without liability or any obligation for such request for EoI and without assigning any reason. Information provided at this stage is indicative and CDRI reserves the right to amend/add further details in the EoI.
2. The EOI is not an offer and is issued with no commitment. CDRI reserves the right to withdraw EOI and or vary any part thereof at any stage. CDRI further reserves the right to disqualify any bidder, should it be so necessary at any stage.

II. TERMS OF REFERENCE (ToR)

International Case Study on Resilience of Data Centres

1. Background

In a largely networked world, telecommunications are a 'lifeline infrastructure system' given the dependence of modern day living on its services. Telecommunication is equally crucial in the operation of infrastructure systems such as airports and power grids; as well as services such as education as demonstrated in the ongoing COVID pandemic.

The telecommunication sector is continuously transforming with emerging technologies and innovations. With the advent of new technologies such as 5G, high-speed-low latency broadband satellite-based internet, etc, there is a need to promote principles of resilience within this sector, to make it resilient to present and future shocks. In addition, a competitive market which works on efficiency and profitability must include principles of resilience within the business models to provide seamless service even during emergencies.

Data centres are pivotal components within the Information, Communication and Technology (ICT) infrastructure systems. A data centre is a physical infrastructure system that houses critical components and data essential for operation and management by and for governments, businesses and individuals, who are dependent on robust, reliable and accessible data, as well as applications, and cloud storage facilities. Although by design data centres may be physically located in different geographies, they are interconnected networks of data storage facilities.

Data centres consist of three primary components: computing equipment, storage and network. These work on 'supporting infrastructure' consisting of physical components — power, electrical, fibre optic cables, servers, physical infrastructure (built environment), cooling systems, etc, Data centres thus depend on reliable power, efficient cooling, fire protection and suppression, effective recovery and business continuity plans for their operational resilience. Given the rising trends of hurricanes, floods, wildfires etc., the ability of data centres to stay operational under all circumstances is challenged. In this context, most organizations, companies, businesses and governments are not prepared to manage these events.[1]

Although data centres are mostly managed, operated and implemented by private entities, the service of data centres extends to governments, businesses and individuals. Downtime of this service has indirect effects. A study on unplanned outages of data centres is estimated to

[1]Uptime Institute Rings Climate Change Warning Bell for Data Center Operators: https://www.datacenterknowledge.com/uptime/uptime-institute-rings-climate-change-warning-bell-data-center-operators

cost US$9000/ minute to companies[2]. With the increase in number of data centres around the globe, growing financial investment in digital infrastructure and proliferation of hyper-scale data centres[3] as large digital infrastructure assets, there is a need to understand the vulnerability of these assets. The pandemic has clearly highlighted the need for reliable and robust data or digital infrastructure and has put a sharp focus on the importance of data centres. Many countries such as Germany have even recognised it as a Critical National Infrastructure[4].

While there have been cases on data centre disasters, the learnings are limited in terms of documentation, analysis and synthesis, for adequate governance and policy development, and scaling up of good practices. All these factors, highlight the urgency to *learn from disasters* through a comprehensive and in-depth case study analysis of data centres affected by disasters in the past.

2. Objectives of the Proposed Study

Considering the importance of data centres in the context of disasters and climate resilience, CDRI intends to undertake a **comprehensive and scientific case study of data centres that have been affected by disasters in the past.** The exercise is intended to examine recent experiences of data centres in at least six geographic groupings (Section 4.2.2., Refer Table 1.) with the following objectives:

- Gain comprehensive knowledge of existing planning processes, design considerations, policies and management protocols contributing to failure/ successful delivery of services by data centres — during, pre and post disasters.
- Develop holistic recommendations for designing, planning, and managing 'supporting infrastructure' of data centres for future disaster scenarios.

3. Deliverables

The following outputs are expected from systematic, in-depth and comprehensive case study of data centres:

3.1 Individual case study reports

This will consist of individual case study reports for each data centre, consisting of:

1. Detailed documentation of each case study and its analysis with regard to internal and external factors that influence success/ failure in service delivery of data centres during disasters.
2. Comprehensive analysis of failures based on an understanding of root causes and dynamic risk drivers in the context of data centres. This will be in relation to policy making, risk identification and estimation, infrastructure governance, practice of disaster recovery,

[2]Emerson Network Power Study Says Unplanned Data Center Outages Cost Companies Nearly $9,000 Per Minute https://www.emerson.com/en-us/news/corporate/network-power-study

[3] What Is a Hyperscale Data Center? https://www.vertiv.com/en-in/about/news-and-insights/articles/educational-articles/what-is-a-hyperscale-data-center/#:~:text=Hyperscale%20data%20centers%20are%20massive,Facebook%2C%20IBM%2C%20and%20Microsoft.

[4] The data centre sector in 2021 https://www.capacitymedia.com/articles/3827294/the-data-centre-sector-in-2021

business continuity planning, standards and certifications, innovations and emerging technologies, planning/ design, operations and management, safety and maintenance and technical or institutional capacity building/ development.

3.2 Synthesis report

A comprehensive output of the assignment, this report will cater to the knowledge needs of a large audience including researchers, practitioners, policy makers, the private sector – data centre operators and developers, etc. The report will consist of (but not limited to):

1. Objectives, scope, limitations of the study, the methodology used, and the sampling strategy followed
2. Synthesis of the lessons learned from all the individual cases of data centres covered in the assignment.

3.3 Policy briefs

To be used by policymakers within countries for planning, constructing, operating and managing risks of data centres in the context of disasters. The document will thus consist of policy recommendations addressing lessons around challenges inhibiting disaster resiliency of data centres.

In addition to the deliverables listed above, the Agency may propose additional knowledge products in the Technical Proposal that could be developed under the project.

All the deliverables must include original content, including referencing or citation of existing knowledge.

4. Scope of the study

This section provides theoretical and methodological considerations that together define the scope of the study. These considerations are for reference and to guide the proposal development for the Agency.

4.1 Theoretical considerations for the case study

Data centres across the globe have historically survived or been affected by hazards such as cyclones, storms, floods, heat waves, earthquakes, fires, etc. For the establishment and management of data centres various standards, policies, technologies and innovations, capacity building initiatives have been implemented. Similarly, as an interconnected and interdependent infrastructure system cooling and power play an important role in its operation. The study will thus help in informing policy and practice for building resilient data centres in the future. It will focus on strengthening disaster resilience of supporting physical components of power, electrical, fibre optic cables, servers, physical infrastructure (built environment), cooling systems etc. In this light, some critical perspectives for developing the research questions for the study are:

A. **Disaster risk management perspective**: Documentation and analysis of the performance of data centres affected by disasters, across different phases of the DM cycle - disaster prevention / mitigation, preparedness, response and recovery phases will help understand

the key strategies and action by concerned stakeholders. This will also elaborate strategies adopted for business continuity, data recovery and also reasons for hindrances to them. Similarly, documentation and analysis of data centres with respect to knowledge on risk exposure in the context of changing climate, extreme events and natural or man-made hazards will help understand the ability of decision-makers to plan or act in uncertain scenarios.

B. **Planning and design perspective:** Identification, observations, documentation and analysis of data centres in this perspective would help understand strengths and weaknesses of technical processes, systems, policies adopted across planning and design. This will help updating policies, construction, planning and design codes/ guidelines to improve resilience of facilities. This also includes aspects on finance, technology and innovation, standards & certifications and Standard Operating Procedures (SOP). This will also include analysis of systemic interdependency issues, such as dependency on water and power for cooling and operation would help in providing valuable inputs while planning and designing sustainable, centralised or decentralised solutions for improving resilience of data centres.
C. **Innovation and emerging technology perspective:** Analysis of different innovations and emerging technologies of infrastructure components of Data Centres adopted by organizations for safety and disaster recovery will help in developing an enabling environment for scaling / replicating good practices for improved resiliency.
D. **Operations and management perspective:** Operations and management of data centres are complex. Different organizations adopt innovative organizational/ business processes to conceptualized and implement processes to ensure smooth operations of data centre. Standard Operating Procedures (SOPs) are developed for maintenance, operation and management of main infrastructure, dependent infrastructure (power, water etc.) and data. The interdependencies among these factors are also critical to the resiliency of data centres. Thus, analysing these projects from operations and management perspectives will provide valuable inputs for designing a robust, agile, and lean data centre, as well as digital infrastructure system.
E. **Capacity/ technical expertise perspective:** Documentation and analysis of existing resources in terms of supporting infrastructure, technical expertise required for managing risks across disaster management phases would help in providing valuable inputs for developing and scaling policies, SOPs for building resilient data centres and infrastructure.

In addition to the above perspectives, the cases of data centres can provide an opportunity to develop multidimensional perspectives, knowledge, and insights through a systematic case study.

4.2 Methodological Considerations for the Case Study

To further support the scoping of the work in this project, methodological considerations are elaborated in the following sections. The Agency is encouraged to demonstrate its domain expertise and experience in designing the Technical Proposal for the case study research. Key considerations are:

4.2.1 Depth of case study

The research methodology is expected to align to the seminal work on case study research of Robert Yin[5], Eisenhardt [6,7,8], or similar well-accepted research methodology. Crucial aspects of case study research, such as robustness and rigour, may be considered from literature - meeting the burden of proof in case study research[9], requirements of theory elaboration by case study[10], and rigour in single-case research[11]. The study must also include a comprehensive analysis of failures based on an understanding of root causes and dynamic risk drivers in the context. Therefore, the study must adopt an integrated and interdisciplinary perspective that may result in a longitudinal analysis and a comparative analysis between cases. For better comprehension, the methodology proposed in Forensic Investigation (FORIN[12]) on disasters may also be considered.

In terms of 'data' collected for the case study, it is expected that study would not rely on just one source of information such as policies about data centres or press releases. Researchers should design systems to collect and triangulate original data from multiple sources. Visits to data centres to collect qualitative, quantitative data, visual data etc., are strongly recommended as part of the methodology.

Further, the case study may start with descriptive analysis but must delve into deeper scientific investigations covering interdependencies among phenomena, stakeholders, departments, functionalities, multi-hazard risks, etc. The scientific analysis should also explore the 'secondary layer effects' comprising of unintended results that may/ may not be desirable.

4.2.2 Sampling Criteria for Case Study

Many types of data centres have been established which serve diverse range of users from governments, businesses, individuals. **The case study aims to cover 10 data centres under different geographic and hazard contexts, historically affected by disasters**. The sample of case studies must be selected to cover types of data centres from both replicable successes and preventable failure perspective. The sample must consider the following areas:

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[5] Yin, R.K., 2014. Case Study Research: Design and Methods, 5th ed. Sage, UK.
[6] Eisenhardt, K.M., 1989. Building theories from case study research. Academic of management review, 14(4), 532-550.
[7] Eisenhardt, K.M., 1991. Better stories and better constructs: The case for rigor and comparative logic. Academy of Management review, 16(3), pp.620-627.
[8] Eisenhardt, K.M., 1991. Better stories and better constructs: The case for rigor and comparative logic. Academy of Management review, 16(3), pp.620-627.
[9] Taylor, J.E., Dossick, C.S. and Garvin, M., 2011. Meeting the burden of proof with case-study research. Journal of Construction Engineering and Management, 137(4), 303-311.
[10] McCutcheon, D.M. and Meredith, J.R., 1993. Conducting case study research in operations management. Journal of Operations Management, 11(3), pp.239-256.
[11] Dyer Jr, W.G. and Wilkins, A.L., 1991. Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt. Academy of management review, 16(3), 613-619.
[12] The FORIN PROJECT, Forensic investigation of disasters, IRDR, October 2011 https://www.preventionweb.net/files/25016_forinreportweb.pdf

1. Disasters caused either by rapid or slow onset events which may be geophysical, hydrological, climatological and meteorological. It must also consider a diverse set of hazards such as fires, flooding, heat stress, etc.
2. The samples may also consider dependency issues and failures, such as damages caused due to failure of power.
3. It may also include data centre types such as: hyperscale, colocation, wholesale colocation and telecom, set up in proposed geographical contexts.
4. The samples will consider data centres with areas equal to or greater than 10,000 sqft.

Furthermore, during sample selection, cases representing a diverse mix of economic, social and political contexts, along with uniqueness shall be considered. It shall consider disasters in last 10 years, with preference to recent disasters. Additionally, the case studies shall include samples that offer lessons, in terms of innovative, efficient, and scalable solutions that are suitable for adaption to different contexts globally. It must necessarily include data centres where disasters have occurred.

Table 1. Suggestive sample selection scheme:

Sr. No	CDRI Member Countries & Geographical groupings	Data Centres (Total 10)
1	**North America**	2
2	**European**	2
3	**South America**	2
4	**Indian Ocean/ Pacific Ocean SIDS**	1
5	**Asia & Pacific**	3

Note: The Agency will compile a comprehensive list of data centres and provide scientific rationales for selecting cases. CDRI shall approve the final list of cases.

In terms of 'data' collected for the case study, it is expected that study would not rely on just one source of information such as press releases. Instead, for selected data centres, the Agency should design systems to collect and triangulate primary and secondary data from multiple sources including, but not limited to, visits to data centres by the Agency's research team or its local partners to make first-hand observations.

4.2.3 Expected Research Design

The cases of data centres in the context of the disasters are unique. These cases offer opportunities for scientific investigation, new hypotheses, testing old theories, and drawing inferences for future actions. The technical proposal should provide an overarching framework with details of data collection and analytics likely to be used at different stages of the case study. A robust scientific underpinning of such methodological frameworks, citing previous examples, is expected.

Case studies also offer opportunities for exploratory research. In the light of this understanding, the Agency undertaking this assignment is expected to develop their research design and proposal, keeping in mind the research opportunity that may emerge.

4.2.4 Research Questions

The research is centred around the key question, "From the experiences of recent disasters, what lessons can be drawn with regard to policies, technical planning and design, operation and management of data centres to strengthen their disaster resilience in the future?" The experiences may include success/ failure stories.

The case study investigation can be pursued with the following indicative research areas and questions:

A. Vulnerability, risks and impact:

1. In terms of disasters, what is observed, documented from each case, what are the trends? What do disaster trends in data centres indicate in terms of larger vulnerabilities of these assets?
2. What are the different cascading and compound risks (local or network wide) arising from disasters? What were the accumulated risks?
3. What were the challenges faced in setting of the data centres? How did these challenges, when not resolved, act as drivers of risk?
4. Taking a systems approach for data centres, what are the critical infrastructure systems essential for the functioning of data centres, especially in a disaster context? Based on the lessons from data centres, what steps can be taken to promote resilient functioning of the network of critical infrastructure?
5. What are the risks for critical infrastructure dependent on data centre? what measures can they take?
6. What were the early warning systems used for decision making? What can be done to take robust decision?

B. Governance and policy:

1. What are the various enablers or barriers that affect resiliency of data centres?
2. What role do private and government sector stakeholders play in disaster resilience of data centre?
3. Which strategies were more effective in dealing with different disasters and under which conditions? What can be a more effective and efficient strategy for future disaster scenarios? What were the conditions that prompted or created barriers for decision-making? (Such as lapses/ vulnerabilities in the existing infrastructure, political priorities, etc.)
4. What were the enablers that supported swift decision-making and mobilization of resources for disaster response? (remarks - Disaster Recovery Plans, SOP, protocols, pre-positioning arrangements, coordination with other stakeholders corporate sector, etc.)
5. Who were the primary stakeholders in the creation of data centres and its supporting/ dependent infrastructure systems? How have the dynamics between different stakeholders changed post disasters? How can such change in dynamics and learnings affect the future of data centres resiliency?

6. What lessons can be drawn in terms of policies, codes and standards, capacity building etc. for planning, design and construction for data centres? How do these lessons support/ contradict local / prescriptive practices adopted for the development of data centres? How can these new lessons be mainstreamed to build data centre infrastructure in more resilient ways?
7. What are some of the gender and inclusion related concerns that should be addressed in planning or designing, management and operation of data centres?

C. Innovation and emerging technology, and capacity building:

1. What considerations in relation to the concept of resilience building were applied for the development and implementation of data centres? What lessons can be drawn for building resilient data centres infrastructure? What are the important lessons drawn from the accidents at data centres for designing safer and resilient infrastructure in the future?
2. What were the lessons concerning innovations and emerging technology used that enhanced the effectiveness of operations of data centres for disaster risk management? How can these lessons be adopted to improve mainstream practice for promoting resilient, agile, lean, and efficient data centre infrastructure systems?
3. What are some inspiring human stories (data centre engineers, network infrastructure engineers, policy makers, decision makers, administrators etc.), that CDRI can share with the world for building resilient data centres?

Note: The above list is indicative. It is recommended that the Agency includes additional research questions in their proposal based on selected cases of data centres.

5. Confidentiality and sensitivity

CDRI is a partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions. The projects undertaken by CDRI are for scientific inquiry to build resilient infrastructure. Further, the Agency shall agree that data centres are sensitive assets and house sensitive information with regards to organizations, businesses and governments security and must ensure confidentiality. Further, the Agency shall not promote or publish findings of the report that may, directly or indirectly, affect the sensitivity and confidentiality during or after the project.

6. Timeline and Payment Schedule

1. The estimated project duration is **nine months.**
2. In case of delays in any intermediate milestones, the research agency agrees to deploy additional resources and efforts to recover delays.
3. The interested agency shall be free to propose delivery milestones and corresponding payment schedules as per their understanding of the project requirements given in the ToR. However, the payment schedule shall explicitly mark the percentage budget

proposed for the various components. The tentative composition for the cost breakup of the project is given below (Refer Table. 2)

4. The budget and milestones should account for workshops/stakeholder consultation meetings required for User need assessment and other activities proposed in TOR.

Table 2: Deliverables, Timelines, and Payment schedule (*Calendar days)

Sr. No.	Project component	Deliverable	Timeline* (T= project start)	Payment (parts)
1	Project inception report	Inception report describing the scope, types of data available, approach, project milestones and timeline, workshops, responsibility matrix, project risk and their mitigation plans.	T + 45 days	10%
2	Intermediate review	Comprehensive output of the assignment including detailed case study of all the selected cases. Monthly progress report/review and intermediate outputs	180 days (Monthly review)	20%
3	Individual case study reports	As per Section 3.1	210 days	20%
4	Study synthesis report	As per Section 3.2	240 days	20%
5	Policy brief	As per Section 3.3		
6	Workshop	Dissemination workshop for sharing learnings with key stakeholders/ representatives from government and private sector	270 days	30%

7. Staffing Requirements

The Agency submitting the proposal should have the requisite expertise, qualifications, and minimum experience as given in the table below. If all the required skills are not available within the institute/ firm, it is encouraged to associate with other institutes/ firms. Appropriately curated consortiums of academic institutions/ think-thanks/ firms are appreciated to fulfil the entire gamut of requirements.

CVs of key experts will be used for the evaluation of Technical Bids. Any additional CVs shall not be considered in the assessment of the Technical Proposal. However, the Agency must propose a complete team that will work on the project. The Agency can use additional personnel (apart from the Proposed Team) as required to achieve the project's aims. CDRI reserves the right to seek more details regarding the qualifications and experience of the key experts, including samples of previous works.

Table 3: List of Key Experts to work on the project

Team Composition	Expertise	Qualifications in relevant field with weightage	Minimum Years of relevant work experience
1. Team Lead	Relevant experience in digital infrastructure sector. Background in disaster management/ infrastructure resilience/ data centre management; with a track record of publications of case study research	100% for PHD 90% for Masters in disaster management/ electronics and telecommunications engineering/ electrical engineering/ civil engineering	15 years
2. Data centre management expert	Intensive experience in data centre management/ network infrastructure/ with experience of research in relevant field	100% for PHD 90% for Masters in electronics and telecommunications engineering/ electrical engineering	15 years
3. Research / Case study experts	Background in conducting in-depth case study research with a demonstration of previous publications on a case study in any of the field of disaster management/ electronics and network engineering/ disaster management/ resilient infrastructure	100% for PHD 90% for Masters in disaster management/ electronics and telecommunications engineering/ electrical engineering/ civil engineering	15 years
4. Disaster management expert	Background in disaster response planning/ disaster mitigation/ disaster recovery planning/ disaster policy planning with field experience.	100% for PHD 90% for Masters in disaster management/ electronics and telecommunications engineering/ electrical engineering/ civil engineering	10 years
5. Data Centre Infrastructure expert	Experience in planning/ designing/ construction of data centre projects, with professional/ educational qualifications in Construction Management/ Planning/ Project Management.	100% for PHD 90% for Masters in disaster management/ civil engineering	10 years

8. Additional Information

1. Please note that CDRI may facilitate the process of data collection and meetings with the requisite stakeholders, but the primary responsibility for these will lie with the Agency.
2. The Agency will propose a standard form for the Project Management Report (PMR) in their proposal.
3. The Agency shall report and communicate the status and products of the project to the CDRI representative via a written PMR on the first business day of each month after the project's initiation.
4. There will be quarterly Project Meetings following project initiation. An inception report should be provided at the first Project Meeting. All the quarterly report and the PMRs should be communicated in English language.
5. The Agency will closely interact and report to the Client's team that will accept the deliverables.
6. The CDRI will not be providing any facilities to the Agency for this project.
7. Licensing: All data procured and developed for this project will be done on behalf of the CDRI. The intent is that the data shall be licensed to allow for free access and distribution in a manner that follows the Open Database License (ODbL). The license includes the right of the CDRI (and sub-licensees) to freely access and distributes data.
8. All work products created or produced by the Agency under the ToR shall be considered the property of CDRI. Accordingly, the Agency will not own work products created under the ToR, nor possess particular or exclusive usage rights to those work products and may not use the work products in any manner apart from the ToR except as per the written authorization of CDRI.
9. The Agency must ensure the protection and confidentiality of private and/or legally protected information and data created under this project.
10. The Agency must ensure the security of data and information in accordance with the international and local legislation and practices.
11. Information and data created according to the ToR should follow internationally accepted standards and practices. In addition, the methods and procedures used in producing information and data consistent with the ToR should follow prevailing scientific standards, techniques, and professional ethics regarding objectivity and independence.
12. The Agency must provide documentation of the methodologies used to generate data created or produced under the ToR, including metadata for all data files.
13. All data and work products created under the ToR shall be transmitted in their entirety and promptly to the Client via commonly used electronic formats appropriate to the information or data. In addition to the structures defined above, other data examples include tabular data should be transmitted in Microsoft Excel, DBF, or CSV format; textual information should be transmitted in Microsoft Word or TEXT format.
14. After the inception stage, the Agency shall prepare a detailed schedule and task-flow diagram, which depicts the interrelationship of various tasks in the assignment and depicts how they lead to completing the different tasks. The Team Leader/Project

Manager of the Agency will be the principal contact and is expected to be available during project implementation. The Agency shall be responsible for all aspects of the performance of services as outlined in the ToR.

15. The ownership of the raw data collected by the Agency during the study and the deliverables, including documents, maps, images, processed data, etc. will rest with CDRI. The Agency will keep the data and work products/outcome documents confidential. Dissemination of the outputs/outcomes/reports/framework/tools will require the written authorization of the CDRI.
16. Any other related information is specific to the study/assignment necessary to be furnished to all the bidders.
    a. As this project will be implemented at the time of travel restrictions due to COVID-19, the Agency should account for all restrictions in the proposal.
    b. The cost of logistics for organizing Workshops/stakeholder consultancy to complete the scope of work will vary based on the mode of workshops (online or in-person). This will depend on prevailing COVID-19 restrictions in place at the time. Thus, the logistics costs of the workshops will be reimbursed as per actual.
    [Note: Logistics does not include the Agency's staff time, or resource persons, or coordination. For web-based meetings, this does not include the cost of purchase of hardware or software, only services if any.]

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III. Annexure 1

Format for submitting consultant information

1. Name of Agency

2. Contact Information including Address, Phone Number and Email

3. Name and contact details of Nodal person

4. Year of establishment of Agency

5. Registration/ Incorporation details

6. Self-certification for not being blacklisted/debarred by any Govt. Institution

7. A brief write-up about the agency

8. Year-wise annual turn-over details for the last 3 financial years with supporting documents

9. Any documents in support of above or eligibility criteria mentioned in the EoI

10. Overview of proposed team leader and team composition based on understanding of ToR

11. Overview of proposed methodology and possible innovation or enhancement of scope

12. **Tentative budget for conducting the work across CDRI Member Countries & Geographical groupings with list of 10 case studies, as proposed in Section 4.2.2 of ToR**.

13. List of completed projects of similar nature and brief description of services performed.

Name of Client	Title of Project	Sponsoring Agency	Date of award and date of completion	Cost of Project	Brief description of relevance to current project

14. Any other supporting documents

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