

MEMORANDUM OF UNDERSTANDING

Between

Karnataka State Natural Disaster Monitoring Centre,
Department of Revenue (Disaster Management)
Government of Karnataka



AND

CSIR Fourth Paradigm Institute

(Formerly CSIR Centre for Mathematical Modelling and Computer Simulation)

A constituent laboratory of Council of Scientific & Industrial Research (CSIR),
Ministry of Science and Technology
Government of India



CSIR-4PI

APRIL - 2022

1. Participants

1.1. This Memorandum of Understanding (hereinafter called "MoU") was made and entered into on this _ _ _ day of **January, 2022**, by and between the **Council of Scientific and Industrial Research**, a society registered under the Societies Act of India 1860, having its registered office at Anusandhan Bhavan, 2, Rafi Marg, New Delhi-110001, represented by one of its constituent laboratories, **CSIR Fourth Paradigm Institute**, with its principal place of work at CSIR-NAL Belur Campus, Wind Tunnel Road, Kempapura, Bellandur, Bengaluru, Karnataka 560 037, India (hereinafter called "**CSIR-4PI**", which expression shall, where the context so admits, include its successors and permitted assigns) of one part;

AND

Karnataka State Natural Disaster Monitoring Centre (KSNDMC), an Autonomous Organisation to Revenue Department (Disaster Management), Government of Karnataka, Major Sandeep Unnikrishnan Road, Near Attur Layout, Yelahanka Bengaluru- 560064 is a nodal agency in the State to monitor and provide Science & Technology (S&T) inputs for managing and mitigating natural disasters as **SECOND PART**.

1.2. Hereinafter, both parts are individually referred to as "**Party**" and collectively as "**Parties**" in the MoU.

2. Preamble

2.1. Whereas **CSIR Fourth Paradigm Institute (CSIR-4PI)** is a CSIR Laboratory established with a vision to tap the power and scope for mathematical modelling and computing and big data analytics that is poised to grow manifold in years to come. CSIR-4PI would like to play a pivotal role by bringing in this emerging technology in its fullest power to the service of science and the nation.

2.1.1. CSIR-4PI has the objective to:



2.1.1.1. To develop the capability for addressing critical issues of scientific significance and social benefit.

1.1.1.1. To enhance the scope and strength of mathematical modelling by developing new techniques/algorithms, including big data analytics.

2.1.1.2. To train and develop high-quality manpower in Mathematical Modelling and Computer Simulation.

2.1.1.3. Provide High-Performance Computing facilities to computational scientists of CSIR.

2.1.2. Institute hosts one of the country's fastest and largest High-Performance Computing facilities. Presently it houses a 363 Teraflops (Peak) HPC cluster for internal research and collaboration with other organisations.

2.2 Karnataka State Natural Disaster Monitoring Centre (KSNDMC), a registered Society and an Autonomous Institute affiliated to Revenue Department (Disaster Management), Government of Karnataka is responsible for providing Science & Technology(S&T) inputs for managing and mitigating natural disasters in Karnataka State. KSNDMC is engaged in a number of activities related to synergising S & T activities and providing a common platform for the response players in Disaster Management in Karnataka State. KSNDMC has installed a network of weather monitoring stations which comprises Solar Powered GPRS enabled Telemetric Weather Stations (T.W.S.) at 747 Hoblis (~200 sq km) and 173 Micro-Watersheds and Telemetric Rain Gauge Stations (T.R.G.) at all the 6500 Gram panchayats (~25 sq km) in Karnataka State. Data on Temperature, Relative Humidity, Wind Speed, Wind Direction, Rainfall Intensity and amount of Rainfall are collected from these stations at an interval of 15 minutes. The near-real-time data collected through the network is being analysed, and maps & reports are generated in real-time. KSNDMC has employed various dissemination systems to communicate Disaster-related information through Alerts, Advisories and

Early Warnings to all the Government Executives & Communities on a Real-time basis.

2.3 Whereas, **KSNDMC** and **CSIR-4PI** approached each other and mutually agreed for collaboration in the following areas:

2.3.1 Improving Regional Weather forecast through Data Assimilation

2.3.2 Weather Forecast Evaluation and Impact assessment

2.3.3 AI / ML Applications in Weather Forecast and Remote sensing based Agro-advisories

2.3.4 GNSS and Broadband seismological research activities.

2.3.5 Analysis, management and mitigation of landslide events over Karnataka

2.3.6 Heat wave modelling and mitigation strategy at regional scale over Karnataka

2.3.7 Modelling Thunderstorm events over Karnataka

2.3.8 Data Sharing for all the Research activities

The above areas of co-operation will be expanded on mutual consent by the Parties.

2.4 Developing collaborative projects between **CSIR-4PI** and **KSNDMC**

2.5 **CSIR-4PI** scientists will help give training/mentoring to **KSNDMC** scientists on a need basis on R&D activities.

2.6 Now, therefore, the **Parties** have agreed to enter into this **MoU** for collaborative activities that could be pursued under this **MoU** through mutual consultations in the above-mentioned identified areas. Parties may enlarge/reduce the above areas later on the basis of mutual interest.

3 **Scope of MoU**

3.1 This **MoU** represents an undertaking by each party to make reasonable efforts to reach agreement on all points and to write these agreements into formal documents acceptable to each party in its discretion, and to obtain the necessary internal approvals for the execution of such agreements, which may include consultancy projects, co-operative/collaborative projects, and PhD guidance. Each task will be separately identified, and details of

cost/time/deliverables and responsibilities of each party will be worked out for approval by the competent authority. This MoU is not intended to create any legally binding obligations, and such obligations will neither exist nor be enforceable until definitive agreement/s or specific contract/s is ("Definitive Agreements") entered into, and then only to the extent stated therein.

3.2 Obligations of the Parties: These obligations will be determined and specified in individual agreements on specific topics identified later within the areas of mutual interest as in 2.3, and those agreements will be entered into under this MoU. Such agreements should cover the following aspects:

3.2.1 Responsibilities of KSNDMC:

1. Share the location details of the weather observation stations installed in Karnataka.
2. Provide observational weather data collected from the weather monitoring stations for research activities.
3. Ensure availability of FTP server at KSNDMC for downloading and uploading of data.
4. The Nodal officer is expected to have a reasonably good understanding of the operations, processes and requirements of KSNDMC.

3.2.2 Responsibilities of CSIR-4PI:

1. Knowledge sharing of high-resolution model and dynamical downscaling (short-range) over Karnataka and adjoining region with KSNDMC.
2. CSIR-4PI will use the meteorological observation data obtained from the KSNDMC, only for R & D in modelling/assimilation and verification of the N.W.P. model.
3. Provide need-based training to the scientific personnel of KSNDMC.
4. CSIR-4PI will help KSNDMC improve the prediction of heavy rainfall events and urban flooding through knowledge/information sharing.



3.2.3 Financial Aspects: This will be decided later on a need/project basis with mutually agreed terms and conditions like cost/time/deliverables and responsibilities of each party with the approval of competent authorities from both sides.

4. Confidentiality

4.1 During the **initial tenure of five years** of this **MoU** and **extended period if any** after that, the **Parties** shall undertake on their behalf and on behalf of their sub-contractors or employees or representatives or associates to maintain strict confidentiality and prevent disclosure to any third party of any information and data exchanged or generated pertaining to work under this **MoU** for any purposes other than under this **MoU**. Each party shall treat the proprietary intellectual property, business, technical and financial information and the negotiations as confidential information, and either party shall make no public announcement without the approval of all the other party to this Memorandum. Neither party shall disclose any confidential information to any third party without the other party's written consent or use such Confidential information except to the extent necessary to carry out obligations for which it has been provided. Any **Confidential Information** exchanged by the **Parties** and entitled to protection hereunder shall be identified as such by an appropriate stamp or marking on each document exchanged designating that the information is "**Confidential Information**". **Confidential information** disclosed in other than written form shall be considered **Confidential Information** only to the extent that before any disclosure thereof, the **Disclosing Party** puts the **Receiving Party** on notice that such information is **Confidential Information** and after that summarises the same in written form within **30 (Thirty)** days of disclosure which identifies such information as **Confidential Information**.

4.2 Above Confidential obligation does not apply if that information:



- 4.2.1 is generally becomes available to the public without any fault from Receiving party; or,
 - 4.2.2 is independently developed by the receiving party without the use of such disclosed information/materials; or,
 - 4.2.3 is lawfully in possession of receiving party prior to disclosure without breach of this **MoU**; or,
 - 4.2.4 has been acquired through a third party who is not obligated under this agreement; or,
 - 4.2.5 is disclosed by the receiving party with the Disclosing Party's prior written approval; or,
 - 4.2.6 is required to disclose the information by operation of law. In such a case, receiving party promptly informs the Disclosing Party well in advance and co-operates with Disclosing Party to avoid the inadvertent and improper disclosure of confidential information.
- 4.3 Parties acknowledge that confidential information is valuable and unique. In case of a breach, the affected party shall be entitled to claim injunctive relief in addition to all other remedies available in law or equity, including monetary damages.
- 4.4 Upon termination or expiry of this **MoU**, or earlier demand thereof, the receiving party shall return to the Disclosing Party's all of the Disclosing Party's known tangible forms of the confidential information and copies thereof in the receiving party's possession.

5. Ownership and Sharing of Intellectual Property Rights

- 5.1 No rights in Industrial and/or Intellectual Property (Including without limitation, letters, patent, registered design, software copyrights, trademark and copyright) existing as on the date of the signature of this **MoU** and owned by the **Parties** on their part are hereby granted by the owning **party** to the other **party**, nor shall any such rights be deemed to be granted except specified in particular Agreements.
- 5.2 **Parties** rights with respect to ownership and sharing of benefit in foreground I.P. generated from the



collaboration activity will be specified in individual contracts that will be performed under this **MoU**.

- 5.3 As a collaboration partner, **KSNDMC** shall have joint ownership, non-exclusive and first right of refusal for licensing on jointly developed technology on mutually agreed terms and conditions. The revenue generated by **KSNDMC** by licensing operations of technology will be shared with **CSIR-4PI** as per the mutually agreed terms and conditions.
- 5.4 It is hereby agreed that, If **KSNDMC** is not able to license the technology in the first three years, then **CSIR-4PI** reserves the right to either market the technology on its own, or enter into any commercial agreement with any other third party or institution of its independent choice, without any prejudice to the commercial operation arrangements granted to **KSNDMC** under this **MoU**. In such cases, the money realised by **CSIR-4PI** will be shared with **KSNDMC** as per the mutually agreed terms and conditions.
- 5.5 Notwithstanding the above, **CSIR-4PI** shall have the right to license the technology during the period of license given to **KSNDMC** if the Government of India desires **CSIR-4PI** to disclose the technology for its use in India in the national interest. In such cases, money accrued there from shall be shared between **CSIR-4PI** and **KSNDMC** on a mutually agreed basis.

6. Effective Date, Duration and Termination

- 6.1 This **MoU** shall become effective upon execution by both the **Parties** and shall remain in effect initially for **five years** and extendable for a further period as mutually agreed by the **Parties**. Suppose a Definitive Agreement for individual contracts has not been made and necessary internal approvals of the **parties** within the above-specified terms of **MoU** is received. In that case, this **MoU** shall cease to operate with regard to the conduct of the **parties** without any extension or amendments.
- 6.2 This **MoU** may be terminated by either **party** on the grounds of non-performance of any of the responsibilities by any



Party, by giving three months' notice of termination to the other party. However, prior to termination of M.O.U. on such grounds, both the **Parties** will endeavour to settle any disputes by mutual discussion/correspondence. In the event either **party** wished to terminate the **MoU** for reasons other than non-performance of responsibilities, such termination shall be through mutual consent in writing.

- 6.3 Notwithstanding the termination of this **MoU**, any licenses or agreements already entered into by either **party** with third parties and **Parties** shall not get terminated but will continue to obtain the benefits of and fulfill their obligation hereunder for the term of each and every such license or **MoU**.
- 6.4 Upon termination of the agreement, all rights granted to and the obligations undertaken by the **Parties** hereto shall cease to exist forthwith except the obligation on the part of the **Parties** to keep the information confidential vide Clause (4) herein.
- 6.5 This **MoU** constitutes the entire understanding and agreement between the **Parties** relating to the subject matter hereof and supersedes and cancels any and all previous or collateral agreements, negotiations, commitments, representations or understandings between the **Parties** to this agreement and the subject matter hereof. If any of the provisions of this agreement are determined to be invalid under applicable law, they are, to that extent, deemed omitted. The invalidity of any portion of this agreement shall not render any other portion invalid. This **MoU** shall be binding upon and inure to the benefit of the **Parties** hereto and their respective heirs, personal representatives, successors and assignees.
- 6.6 Provisions of this **MoU** will not affect the **MoUs** /Contracts/Agreement executed with the third **parties** prior to execution of this **MoU**, and each party has the right to continue with these agreements unless those are not affecting the provisions of this **MoU**.
- 6.7 No amendment or modification of this **MoU** shall be valid unless the same is made in writing by both the **Parties**





or their authorised representatives and specifically stating the same to be an amendment of this **MoU**. The modifications/changes shall be effective from the date on which they are made or executed unless otherwise agreed to.

7. Notices

7.1 All notices and other communications required to be served on **Parties** under the terms of this **MoU** shall be considered to be duly served if the same shall have been delivered to, left with or posted by registered mail to **another party** at its last known address of the business. The **Parties** designate the following representatives as the point of contact for all notices and communications in respect of this **MoU**. Either **party** may change these exclusive contacts by giving written notice to the other **party**.

For CSIR-4PI	For KSNDMC
Name: Head Address: CSIR Fourth Paradigm Institute, CSIR NAL Belur Campus, Bangalore 560 037 Ph.No: +91 80 2505 1921 E-mail: head@csir4pi.in	Name: Director Address: KSNDMC, Revenue Department (Disaster Management), Government of Karnataka. Yelahanka, Bengaluru- 560064 Ph: 080-67355000 Email: director@ksndmc.org

8. Individuality

8.1 This **MoU** is not intended to constitute, create, give effect to, or otherwise recognise a joint venture, partnership, or formal business organisation of any kind, and the rights and obligations of the parties shall be only those expressly set forth herein. Nothing in this **MoU** shall be construed to grant either party the right to make commitments of any kind for or on behalf of the other without the other's prior written consent. At all times contemplated herein, **KSNDMC and CSIR-4PI** shall remain independent entities, each responsible for its employees. Each party assumes no responsibility to



the other for costs, expenses, risks, and liabilities arising from the efforts of the party.

9. Force Majeure

9.1 Neither **Parties** shall be held responsible for non-fulfilment of their respective obligations under this agreement due to the exigency of one or more of the Force Majeures events such as, but not limited to, the acts of God, War, Flood, Earthquake, Strikes, Lockouts, Epidemic, Riots, Civil commotions etc. provided on the occurrence and cessation of any such event the **party** affected thereby shall give notice in writing to the other **party** within 30 (Thirty) days of such occurrence or cessation. If the Force Majeure conditions continue beyond 6 (six) months, the **Parties** shall jointly decide about the future course of action.

10. Governing Laws and Arbitration

10.1 The laws of India shall govern this agreement. The courts at Bangalore shall have exclusive jurisdiction in matters related hereto. The **Parties** agree that in the event there are any disputes or differences between them with regard to the interpretation of this agreement, the **Parties** endeavour to settle the matter through mutual negotiations and discussions in the spirit and understanding of the **Parties** in entering into this agreement, and failing such settlement, same shall be referred to a two-member committee consisting of Heads of both the Institutions and if even that too fails, the same shall be referred to sole Arbitrator in accordance with **The Arbitration and Conciliation Act, 1996 and the rules framed there under from time to time**. The Arbitrator shall be appointed by mutual consent between the Parties; the venue for arbitration proceedings shall be at Bangalore. The arbitration proceedings shall be conducted in English language. The decision of the Arbitrator shall be final and binding on the Parties. The Parties shall equally bear the cost of arbitration and its proceedings unless the award provides otherwise.

11. Seal of the Parties

11.1 In witness whereof the **Parties** mentioned above, represented by their authorised representatives, set forth their hands on this the day, month and year and have caused this agreement to be signed in the presence of the following witnesses:

Agreed and accepted on the date first written above.

For and on Behalf of CSIR-4PI	For and on Behalf of KSNDMC
Signature: Name: Dr G K Patra, Chief Scientist & Business Development Officer डॉ. गोपाल कृष्ण पात्रा / Dr. GOPAL KRISHNA PATRA व्यवसाय विकास अधिकारी / Business Development Officer सीएसआईआर-चौथा पैराडाइम संस्थान CSIR-Fourth Paradigm Institute एनएएल बेलूर कैम्पस / NAL Belur Campus बेंगलूरु / Bengaluru-560037, भारत / India	Signature: Name: Dr. Manoj Rajan, Director Seal & Designation: Director Karnataka State Natural Disaster Monitoring Centre BENGALURU - 560 064.
Witnesses (Name & Signature): 1. Mrs. M.K. Sharada Designation: Chief Scientist 2. Dr. V Rakesh Designation: Principal Scientist	Witnesses (Name & Signature): 1. Sri.S.Jagadeesh 2. Sri.SSM.Gavaskar