Bio-data

Name	**:**	Dr K V Ramesh
Designation	**:**	Chief Scientist and Head
Department	**:**	Artificial Intelligence and Machine Learning Unit
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Joined CSIR family as Scientist-C in 2004 and was promoted to Chief Scientist in 2022, demonstrating sustained scientific excellence and leadership in research (Annexure –II). Hold PhD in Physics, University of Pune; MTech in Atmospheric Sciences; MSc in Physics (Electronics) and Post Graduate diploma in Computer applications.

Areas of Specialization: Mathematical Modelling, System dynamical modelling, Domain specific Data-driven Modelling: Agriculture, Engineering, Health and Environment, Geospatial image analytics, crop modelling. Socio-economic Modelling

1. **Leadership qualities & Strategic Vision**

- Currently, as Scientist G and Head of the AI & ML Unit at CSIR-NIIST, is actively developing the unit and guiding high-impact, mathematical modelling cum AI-driven multidisciplinary research towards practical, real-world applications that address societal and industrial needs.
- Successfully conceptualized, formulated, and led high-value, multi-institutional national mission projects, including a Rs. 24.84 crore CSIR Mission on Smart Agro-Technologies, coordinating 9 CSIR labs.
- Acted as a principal investigator in 8+ major projects (4 mission), showcasing exceptional skills in project formulation, execution, stakeholder coordination, and policy-oriented research translation (Annexure –II).
- International Collaborations: Led Indo-China, Indo-Italy, and Indo-French joint research initiatives, reflecting diplomatic and collaborative leadership in global science partnerships.
- Led multi-sector field operations, from UAV-based crop assessments to urban ecosystem mapping, combining scientific rigor with practical problem-solving for societal benefit.

2. Transformative hybrid AI Contributions

- Developed and deployed hybrid machine learning models for agriculture (crop yield prediction, disease modelling), environment (heatwave and flood prediction), and socio-economic systems (livelihood modelling, urbanization dynamics).
- Innovated deep learning solutions (LSTM/Bi-LSTM, CNN, and GANs) in precision agriculture, climate modelling, and remote sensing analytics, impacting farmers, policymakers, and planners.
- Designed Hybrid Predictive Analytic and Modelling Systems, integrating AI with remote sensing and system dynamics for evidence-based interventions.

3. Societal and Environmental Impact: Policy Influence

- Livelihood Enhancement: Developed integrated system dynamic models that provided implementable interventions to improve livelihoods in the Himalayan regions. These were adopted by state agencies for policy development.
- Environmental Protection: Mapped 188 water bodies in Bangalore using ML, analysed decadal changes in lake ecosystems, and submitted findings to the Honourable High Court of Karnataka to support environmental policy.
- Agricultural Advancement: Used AI-driven UAV-based multispectral imaging and data analytics in Northern Karnataka to guide farmers in sustainably improving crop yield and quality.
- Enhanced Livelihoods: Developed decision-support tools for farmers and rural communities in the Himalayan regions and Northern Karnataka, improving sustainability and income security.

- Policy Development: Outcomes of his models informed state and national policy, including contributions to the NASS Big Data in Agriculture Policy Paper.

4. Capacity Building & Mentorship

- Mentored 50+ postgraduate students, 7 PhD scholars, and 2 DST Women Scientists, shaping the next generation of mathematical modelling including AI and environmental researchers.
- Delivered 20+ keynote addresses and invited talks, fostering AI knowledge dissemination across national and international platforms.
- Organized workshops, training programs, and expert panels, contributing significantly to scientific capacity-building and AI skill development.

5. Funding, Recognition & Scholarly Output

- Total Project Funding Secured as Principal Investigator: ~Rs. 35.5 crore, from prestigious agencies including CSIR, DST, MoEF&CC, BBMP, and State Horticulture Universities.
- Awards: Recipient of INSA Medal for Young Scientists, CSIR Young Scientist Award, IITM Silver Jubilee Award, and IMS Prof. A.D. Vernekar Award—recognizing both scientific excellence
- Publications: Authored 45+ high-impact papers and 2 books on mathematical modelling and AI applications in agriculture, climate science, and environmental systems.

Annexure II- Details of projects handled

Title of the Project	Amount received	Sponsoring Agency	My Role as defined
Design and Development of a Spatiotemporal Fusion Architecture Using Multisensor Data	10 lakhs	CSR Grant	Principal Investigator
Smart Lipids for Metabolic Health: Scale-Up and Preclinical Evaluation for Hyperlipidemia Management and Disease Prevention	82.61 lakhs	ICMR	Co-Principal Investigator
Adapting Deep Learning for Prediction of Anaemia using Multimodal Data Analysis	60.94 lakhs	ICMR	Co-Principal Investigator
Region specific smart agro-technologies for enhancing soil and plant health	2484 Lakhs	CSIR	As Nodal Scientist conceptualized and collaborated with 9 CSIR laboratories along with 3 state agricultural Universities
Enhancement of the quality of livelihood opportunities and resilience for the people in the Indian Himalayas, through Design of Intervention strategies aimed at maximizing resource potential and minimizing Risks in urban-rural ecosystem.	242 lakhs	MoEF&CC	As Principal Investigator conceptualized and collaborated with GBPNIHE, Almora, Kashmir University and State government
Integrated System dynamical model to design and Testing Alternative intervention strategies for Effective Remediation & Sustainable water Management for two selected river basins of Indian Himalaya.	247 lakhs	MoEF&CC	As Principal Investigator conceptualized and collaborated with GBPNIHE, Almora, Kashmir University and State governments
Hyperspectral Imaging for sharper definitions of Himalayan Ecosystems and its high value plant species under climate uncertainties	15.6 lakhs	MoEF&CC	As Principal Investigator conceptualized and collaborated with GBPNIHE, Almora, BHU and University of Kashmir
Design and Development of a Hybrid Modelling System for the management of select horticultural crops in Andhra Pradesh.	15 lakhs	Dr YSR Horticulture University	As Principal Investigator conceptualized and collaborated with YSRHU and Implementation at Farmer fields
Quantification of past changes and assessment of present status of water bodies distribution over	15.48 lakhs	CSIR NEERI	Principal Investigator, Report submitted through CSIR NEERI,

Bangalore			Honourable High Court of Karnataka
Extreme weather and climate events in the 21st century climate projections from different climate scenarios	35.97 lakhs	DST	Principal Investigator
Design intervention strategies for mitigating the impacts of heat waves through modified land cover	15.8 lakhs	DST (WOS-A)	Mentor
A physically based Coupled Modeling Testbed for assessing hydrological impact and design of sustainable intervention strategies to mitigate adverse impacts on surface water cycle process under future climate over Monsoon Driven River Basins of India	29.28 lakhs	DST (WOS-A)	Mentor
Mathematical Modelling of Capsule rot Disease of small cardamom	7.98 lakhs	ICRI	Co-Principal Investigator
Integrated Analysis for Impact, Mitigation and Sustainability (IAIMS)	4370 lakhs	CSIR	Co-Principal Investigator, CSIR Outreach Programme on Environment and Climate (COPEC): Coordinator for Organizing national expert committee meetings, Coordination, etc. ((IISc, IIT-Delhi, IIT-KGP, NBSS, CSIR-NPL etc)
Multi-scale simulation and quantification of sustainability and vulnerability under climate stress and other natural hazards.	550 lakhs	CSIR	Co-Principal Investigator
Hobli level forecast to Karnataka state	450 lakhs	KSNDMC	Team Member

Annexure-I Positions held

S. No.	**Designation**	**Period**		**Organization**
		From	To	
1	Scientist C	14-07-2004	13-07-2008	CSIR CMMACS
2	Scientist E1	14-07-2008	13-07-2012	CSIR CMMACS
3	Principal Scientist	14-07-2012	13-07-2017	CSIR 4PI
4	Senior Principal Scientist	14-07-2017	13-07-2022	CSIR 4PI
5	Chief Scientist	14-07-2022	01-02-2023	CSIR 4PI
6	Scientist G	02-02-2023	Present	CSIR NIIST