

CURRICULUM VITAE

1. Name: KARIAMPALLIL VARGHESE GEORGE

2. Education:

Institution (Date from - Date to):	Degree(s) obtained:
IIT Delhi, 2016	Ph.D.
Govt. Engineering College Jabalpur, M.P. 1988 - 1990	M.E. (Environmental Engineering)
Govt. Engineering College Jabalpur, M.P. 1983 - 1988	B.E. (Civil Engineering)

3. Present position:

Senior Principal Scientist,
National Environmental Engineering Research Institute (NEERI),
Nagpur 440 020, INDIA
Email: kv_george@neeri.res.in

4. Key qualifications:

More than 27 years of experience in the field of Environmental Engineering. Mainly conducted field studies, operated different equipment, computer simulation, data analysis, imparted training to college students, supervised Undergraduate and post graduate students thesis work.

Field work

- Air quality monitoring using
 - Four channel speciation sampler,
 - Federal reference method sampler,
 - Respirable dust sampler,
 - Eight stage cascade impactor.
- Meteorological monitoring using
 - SODAR,
 - Weather station,
 - Mini-Sonde for lapse-rate studies
- Ground water decontamination studies at Bhichri, Udaipur, India due to unplanned sub-surface disposal of H-acid waste.
- Reclamation of solar evaporation and land reclamation studies at Union Carbide India Limited (UCIL), Bhopal, M.P. India.
- Conducted field campaign for determining the permissible tourist carrying capacity of Taj Mahal, Agra, India.

Computer Modeling and simulation studies

- Use of Source dispersion model ISCST3, AERMOD, CALPUFF for prediction of ambient air quality.

- This is applied for underground coal mine fire (area source) at Jharia, Dhanbad, re-suspended dust emission from coal mine of Chandrapur, emission from loading and unloading work at railway yard and coal trading centres.
- Simulation of emission dispersion from elevated ducted sources of industries.
- Simulation of re-suspended dust emission dispersion under vehicle wake.
- Use of cluster analysis tool for source identification in receptor modelling studies. This is particularly applicable for cases where the source and receptors are very close to each other.
- Used Chemical Mass Balance (CMB 8.2) model for receptor modelling in pit head thermal power station area.
- ESP as control technique may not be sufficient for PM reduction from flue gas. Additional control technique like Bag Filter may also be required for PM control. Paper published on PM reduction plan.

Meteorological data Analysis

- Developed a new wind analysis methodology consisting of a new diagram named plumerose diagram, which is a replacement of wind rose diagram.
- Developed a methodology for quantification of wind velocity variation named horizontal dilution potential.

Air Quality Data Analysis

- Studied the air quality trend of multiple cities (Delhi, Nagpur, Chandrapur, Okha) using different graphical and statistical technique.
- Studied the impact of Odd-Even vehicle rule on ambient air quality at Delhi.

Tourist carrying capacity

- Developed a methodology for determining the number of tourist inside the Taj Mahal premises, their residence time, entry rate for optimising the tourist number for controlling the crowd.

Satellite data analysis

- Undertook basic and advanced web based training from NASA (Goddard Station) on air quality assessment using satellite observation. The outcome of training is being used in AVIRIS hyperspectral data analysis.

5. List of projects after 1995

No	Name of the Project	Name of the Client (for whom the work was carried out)	Nature of Experience	Period & Year
1.	Air Quality Assessment and Source Apportionment Study in Firozabad	District Magistrate, Firozabad	Air Quality and Meteorological Monitoring and modeling	2015-16
2.	Report on Dispersion Modelling of SO ₂ from proposed Pet Coke plant of Goa Carbon, Udaybhata, Jagatsinghpur, Paradeep, Odisha	Goa Carbon Limited, Panaji, Goa	Meteorological data analysis and dispersion modeling using CALPUFF	2015-16
3.	Consultancy service on the emission aspect of acid gas disposal by combustion for ONGC, Uran	ONGC, Uran, Navi Mumbai	Meteorological data analysis and dispersion modeling using CALPUFF	2015-16
4.	Macro Level EIA Study for cluster of Iron Ore Mines in the state of Goa	Department of Mines and Geology, Goa	Air Quality Monitoring and Socio-economic Environment	2014-ongoing
5.	Environmental assessment (EA) study before and after the proposed Urban Conservation and Tourism Development project of area around the World heritage site, Taj Mahal, Agra.	UPTDC, Lucknow.	Air Quality and Meteorological Monitoring and modeling	2012-15
6.	Dispersion modeling of Koradi and Khaparkheda Thermal Power Plant to assess the impact on Nagpur City	In-house Research	Air Quality Monitoring and Dispersion Modeling using CALPUFF	2012-15
7.	Source apportionment and dispersion modeling study at Coal Mine region, Chandrapur	In-house Research	Air Quality and Meteorological Monitoring, Source apportionment using CMB8.2, Dispersion Modeling using CALPUFF	2010-2016
8.	Source contribution assessment in Mithapur region	Tata Chemicals Ltd., Mithapur	Air Quality and Meteorological Monitoring and modeling, Source apportionment	2010
9.	Source Apportionment Study at Delhi	CPCB, Delhi	Air Quality and Meteorological Monitoring and modeling, Source apportionment	2008
10.	Urban Road Traffic and Air Pollution at Bangalore	CPCB	Air Quality Monitoring	2002
11.	Ambient Air Particulate Matter Reduction Action Plan for Greater Mumbai Region	MMRDA	Emission Inventory and Air Quality Monitoring	2001
12.	Environmental Impact of Mumbai – Pune express way between Adoshi and Kusgaon.	Honble' High Court Order	Air Quality Monitoring	2001

13.	Regional EIA Studies for Jamshedpur region	TATA Steel	Air Quality Monitoring	2000
14.	EIA Studies for Kudramukh Iron Ore Company Limited, Mangalore	KIOCL	Air Quality Monitoring	1999
15.	EIA Studies for Sterlite Industries India Limited. Tuticorin	Sterlite Industries, Tuticorin	Meteorological Monitoring	1999
16.	EIA Studies for U.P. Refinery at Lohgara, Allahabad.	BPCL	Air Quality Modeling	1999
17.	EIA Studies for 500 MW Refinery Residue based Thermal Power Plant of HPCL and APPCB, Vishakhapatnam	HPCL	Meteorological Monitoring and Air Quality Modeling	1998
18.	EIA Studies for Kota Thermal Power Plant	KTPS	Air Quality Modeling	1998
19.	EIA Studies for Gujrat State Fertilizer Corporation, Vadodara	GSFC	Air Quality Monitoring, Air Quality Modeling	1998
20.	Environmental Audit, Gujrat Refinery, Vadodara	IOCL	Air Quality Monitoring, Air Quality Modeling	1998
21.	EIA Studies for Pig Iron Plant, Chalgeri	Dalmia Industries	Air Quality Monitoring	1997
22.	EIRA studies for IGFC, Jagdishpur	IGFC	Meteorological Monitoring, Air Quality Modeling	1997
23.	EIA Studies for Expansion Plan of BPCL, Kathaura, Jagdishpur	BPCL	Meteorological Monitoring, Air Quality Modeling	1997
24.	Natural Resource Accounting of Yamuna River Sub Basin	MoEF, Delhi	Air Quality Monitoring, Meteorological Monitoring	1996
25.	EIA for Birla Jute and Industries Limited, Cement Division, Satna	BJIL, Satna	Meteorological monitoring	1996
26.	Carry Capacity Based Developmental Planning Project for Tapi Estuary Region, Gujrat	MoEF, Delhi	Meteorological monitoring	1996
27.	EIA of Thermal Power plant at Patalganga	Reliance Industries Limited	Meteorological monitoring and Air Quality Modeling	1995
28.	Carry Capacity Based Developmental Planning Project for National Capital Region.	MoEF, Delhi	Field monitoring of air quality parameters and meteorological monitoring	1995
29.	Assessment of Impact on Taj Mahal due to possible fire in Mathura Refinery	IOCL, Mathura Refinery	Air Quality Modeling	1995

6. Specific experience in the region: India

All the above referred studies were carried out in Indian sites only.

Visits Abroad

- Member of Indian ANTARTICA expedition to 'MAITRI' Station (2000 – 2001). Study of Waste Management Practices of Indian Antarctica Station 'MAITRI'. December 31, 2000 to March 22, 2001.

- Raleigh, North Carolina, USA, (2006). To attend the orientation and training course on the smoke generator machine at Eastern Technical Associates (Garner, Raleigh) used for visual emission observation sponsored by USEPA, Washington DC, USA. This methodology was proposed to be used for coal based thermal power plant emission in India under Chandrapur Action Plan. August 1-5, 2006.

7. Other relevant information (e.g. Publications): List attached

List of Paper Published in International Journals

1. **George, K.V.**, D.D. Patil, M.N.V. Anil, Neel Kamal, B.J. Alappat, Prashant Kumar (2016). Evaluation of coarse and fine particles in diverse Indian environment. Environmental Science and Pollution Research. DOI 10.1007/s11356-016-8049-3.
2. **George, K.V.**, D.D. Patil, B.J. Alappat (2013). PM₁₀ in the ambient air of Chandrapur coal mine and its comparison with other environments. Environmental Monitoring and Assessment. 185 (2):1117-1128.
3. **George, K.V.**, D.D. Patil, Prashant Kumar, B.J. Alappat (2012). Field comparison of cyclonic separator and mass inertial impactor for PM₁₀ monitoring. Atmospheric Environment. 60: 247-252.
4. **George K. V.**, Verma P., Devotta S., (2009), 'Identification of air pollutant sampling period using horizontal dilution potential', Environmental Monitoring and Assessment, 151:337-343.
5. A.D. Bhanarkar, DD. Majumdar, P. Nema, **K.V. George** (2009). Emissions of SO₂, NO_x and particulate from a pipe manufacturing plant and prediction of impact on air quality. Environmental Monitoring and Assessment.
6. **George K.V.**, P. Vera, S. Devotta (2008). Locating air quality monitoring station using wind impact area diagram, Environmental Monitoring and Assessment. 145:113-118.
7. Verma P., Singh P., **George K.V.**, Singh H.V., Devotta S. and Singh R. N. (2008), 'Uncertainty Analysis of flow and transport of pesticide in an unsaturated layered soil profile using fuzzy set theory', Applied Mathematical Modeling. 33, 770-782.
8. Verma P., **George K.V.**, Singh H. V. and Singh R. N. (2007). 'Modeling Cadmium accumulation in Radish, Cabbage, Spinach and Carrot', Applied Mathematical Modeling, 31: 1652-1661.
9. Verma P., **George K. V.**, Singh H. V., Singh S. K., Juwarkar A. and Singh R.N. (2006). 'Modeling Rhizo-filtration: Heavy metal uptake by plant roots', Environmental Modeling and Assessment. 11: 387-394.
10. Verma, P., **George, K. V.**, Singh, H. V., Mathew, T. P., Singh, R. N. (2004). Simulating water movement and its uptake by plant roots in Unsaturated zone, Journal of Environmental Studies. 61(1), February, 39-48.

11. Nema, P., **George, K. V.**, Karemore, M. G., Kotangale, J.P. (2004). Performance Evaluation of Water Treatment and distribution system infested with Chironomus Larvae. Journal for Water Supply: Research and Technology, AQUA, U.K., 53(8), 573-580.
12. **George, K.V.**, Manjunath, S., Rao, C. V. C., Bopche, A. M. (2003). Cyclone as a pre-cleaner to ESP – A need for Indian Coal Based thermal power plants, Environmental Technology, U. K., 24(11), 1425-1430.
13. **George, K.V.**, Krishnaprasad, Mathew, T. P., Verma, P. (2003). Development of Site Specific Empirical Formula for Minimum Stack Height Estimation, Environmental Contamination and Toxicology. 71(5), November, 892-898.
14. **George, K.V.**, Verma, P., Singh, H. V., Mathew, T. P. (2002). Design and operation of solar evaporation pan for recalcitrant wastewater management, Water Resources Journal, ST/ESCAP/SER.C/213, 13-20.
15. **George K.V.**, Patil M.P., Swaminathan R. (2001). Study for reclamation of land occupied by solar evaporation pond at UCIL, Bhopal, India. Waste Management & Research, 19 (6), 573 - 578.
16. **George K.V.** (2001). Early action plan for groundwater decontamination – A case study. Water Resources Journal, ST/ESCAP/SER.C/209, 209: 11 - 20.

National Journal

1. **K. V. George**, Arif Khan, P. Verma, B. J. Alappat (2009). A simple rule based fuzzy air pollution index. The 4th Indian International Conference on Artificial Intelligence (IICAI-09), December 16-18, 2009, Tumkur, India.
2. **K. V. George**, P. Verma, S. Devotta (2008). Comparison of wind data using an estimate of horizontal dilution potential and wind impact area diagram. J. of Institution of Engineers (India). Vol. 90, pp. 12-17.
3. **K. V. George**, P. Verma, S. Devotta (2007). Use of wind data for estimating horizontal dilution potential of atmosphere. J. of Environmental Science & Engineering, 29(2), pp. 87-92.
4. **K. V. George**, P. Verma, S. Devotta (2007). Estimation of horizontal air pollution potential and monthly wind summary – A new approach. J. of Indian Association of Environmental Management, NEERI, Nagpur, 34 (1).
5. **George, K. V.**, Rao, C. V. C., Labhsetwar, P. K., Hasan, M. Z, (2002). Minimum stack Height Formula for Coal Based Thermal Power Plant in Northern India. J. of the Institution of Engineers (India). 82, 31-34.
6. M.H. Ansari, **K.V. George** (2002). Assessment of wastewater treatment scheme at Indian Antarctica station 'MAITRI'. Department of Ocean Development New Delhi, India. Annual Report, 2002.

Conference / Workshop

1. **K.V. George** (2007). Workshop on application of Industrial Source Complex (ISC) model in air quality modelling held at Indian Institute of Coal Management (IICM), Ranchi, Jharkhand. December 17-18, 2007.
2. **K.V. George** (2005). A case study on Aerometric monitoring program plan for PM_{2.5} / PM₁₀ air quality study conducted in the USA by DRI /USEPA. Presented at Central Pollution Control Board (CPCB), Delhi for participants (TERI, ARAI, SIAM, NEERI) of project on source apportionment study of particulate matter in six cities on May 30, 2005.
3. **K.V. George** (2005). Expert deliberation on Urban Solid Waste; Introduction, present scenario, overview of problems, perspectives and legal framework. Training course on bio-remediation of Urban Waste held at Environmental Planning & Coordination Organisation (EPCO), Bhopal. May 31 – June 1, 2005.
4. **K.V. George**, P. Verma, H.V. Singh, T.P. Mathew, R.N. Singh (2004). Model software for Rhizo-filtration: Uptake of heavy metal by plants. Indo-French seminar on emerging technology for water and wastewater management held at IIT Delhi, India, February 9-12, 2004.
5. **K.V. George** (2003). Use of hourly observed vertical temperature profile in air quality modelling. Indo-US workshop on ‘Modeling of transport of air pollutants’ held at Nagpur conducted by Ohio Supercomputer Systems, USA, November 11-13, 2003.

Software Copyright

1. **NEERI PHYTOREM**: Software is developed for simulating metal movement in unsaturated zone and its uptake by plant roots. This model is helpful in understanding the partitioning of metal between soil and water and approximation of its uptake by vegetation in the rejuvenation of mine spoil dump sites. SW-1803/2005.
By P. Verma, **K.V. George**, H.V. Singh, T.P. Mathew, R.N. Singh
Programming Language: Visual Basic.
2. **NEERI VADZON**: Software is developed for simulating moisture movement in unsaturated zone and its uptake by plant roots. Soil properties that are expensive to be measured can be estimated using functions (Pedo- transfer Functions) based on easily measurable parameters and is incorporated in the software.
By P. Verma, **K.V. George**, H.V. Singh, T.P. Mathew, R.N. Singh
Programming Language: MATLAB and Visual Basic.