

Curriculum Vitae

AMBICA PALIWAL

ambicapaliwal@gmail.com

Skype: ambicapaliwal

EDUCATION

Post-Doctoral Fellow-GIS (2015-2017)

Worked on: Methodology development of soil salinity assessment in rice areas using MODIS.

International Rice Research Institute

Philippines

Ph.D. in Wildlife Science (2005-2009)

Thesis title: Geospatial modelling of Ungulate Habitat relationship in Tadoba-Andhari Tiger Reserve

Wildlife Institute of India: Research Centre

Saurashtra University, Gujarat, India

M.Sc. in Geo-Information Science and Earth Observation for Environmental Modelling and Management.

Thesis title: Impact of modifiable areal unit problem on estimation of lake extent.

In Joint Programme of Erasmus Mundus: (2009-11)

University of Southampton, UK

University of Lund, Sweden

University of Warsaw, Poland

University of Twente, ITC, Faculty of Geo-Information Science and Earth Observation, The Netherlands

M.Sc. in Environment Management (2002-2004)

Forest Research Institute, Dehradun, India

RESEARCH INTEREST

Application of geospatial technology in agriculture incorporating citizen science and climate change.

WORK EXPERIENCE

- Broadening genetic base of crops as a response to Climate change by working CCAFS project using large volume of data and citizen science.
- Post-doctoral research experience on soil salinity assessment on rice crop using crop phenology assessment from MODIS.
- Crowdsourcing/ Citizen science in agriculture in India.
- Development of methodologies for landscape monitoring using geospatial techniques.
- Ecosystem services (Carbon sequestration) evaluation and scenario development for Natural resource management.
- Worked on projects funded by international donors such as BMGF, UN.
- Capacity development: Training to international and national staff, preparation of training manuals, scientific reports, progress reports and other communications and publications in peer reviewed journals.
- Project impact assessments of Seeds for Needs Project.

EXPERTISE/ SKILLS/COMPETENCIES

- Interdisciplinary research: Geospatial applications on agriculture, ecosystem services, wildlife habitat models and landscape ecology.
- Designing, surveying and executing geo-spatial research projects – includes supervising and leading field teams for coordination, capacity building, approach & methodology development and thematic mapping.
- Well acquainted with the working culture of international research organizations, government agencies and non-government organizations.
- Team coordination and proactive participation as a creative team member in multi-cultural environments.
- Working at varied landscapes/countries ranging from Himalayan foothills to western & central India, agriculture dominated area at eastern coast of India, Bhutan, European countries and Philippines
- Reporting and publication of research results in reports, peer-reviewed journals and symposium/conference proceedings.
- Result focus and continuous improvisation

PUBLICATIONS IN PEER-REVIEWED JOURNALS, BOOKS, PROCEEDINGS AND PUBLISHED THESIS

- Jacob van Etten, Kauê de Sousa, Amílcar Aguilar, Mirna Barrios, Allan Coto, Matteo Del'Acqua, Carlo Fadda, Yosef Gebrehawaryat, Jeske van de Gevel, Arnab Gupta, Afewerki Y. Kiros, Brandon Madriz, Prem Mathur, Dejene K Mengistu, Leida Mercado, Jemal Nurhissen Mohammed, **Ambica Paliwal**, Mario Enrico Pè, Carlos Quirós, Juan Carlos Rosas, Neeraj Sharma, SS Singh, Ishwar Solanki, Jonathan Steinke (2018). Crop variety management for climate adaptation supported by citizen science. *Proceedings of National Academy of Sciences (PNAS)*. Accepted for publication (In Press) will be available online in February 3rd week.
- **Ambica Paliwal**, Alice Laborte, Andy Nelson and R.K. Singh. (2018) Soil salinity detection in rice crop using time series MODIS VI data *International Journal of Remote Sensing* DOI:10.1080/01431161.2018.1513667.
- **Ambica Paliwal** and Alice Laborte (2016) Phenological Response of Rice Crop to Salinity Using Time Series Data: Paper presented in 37th Asian Conference on Remote Sensing, Colombo, Sri Lanka.
- Elumalai Kannan, **Ambica Paliwal** and Adam Spark (2016) Spatial and temporal pattern of rice production and productivity: A **book** chapter in book entitled “The future rice strategy for India”: Published by **Elsevier** on 15th June 2017 (<http://www.sciencedirect.com/science/book/9780128053744>)
- **Paliwal, A.**, Mathur, V.B. (2014) Spatial pattern analysis for quantification of landscape structure of Tadoba-Andhari Tiger Reserve, Central India. *Journal of Forestry research*. 25: 185-192.
- Maheshwari, A., Midha N., **Paliwal, A.**, Sharma, B.K., Ghose, P.S, Shershtha, P. and Pranjpe, S. (2013). A Preliminary overview of the subspecies of Red Fox and Tibetan Sand Fox in the Himalaya, India. *Journal of Bombay Natural History Society*. 110(3) Sep-Dec.

- **Paliwal, A.**, Mathur, V.B. (2012) Predicting potential distribution of Gaur (*Bos gaurus*) in Tadoba-Andhari Tiger Reserve, Central India. *Journal of Life Sciences*. 6:1041:1049. DOI:10.17265/1934-7391/2012.09.012
- **Ambica Paliwal** (2011) Impact of modifiable areal unit problem on estimation of lake extent. Published thesis from Faculty of Geo-information Science and Earth Observation, **University of Twente**. Available on http://www.itc.nl/library/papers_2011/msc/gem/paliwal.pdf.
- Joshi, P.K., M. Kumar, **Ambica Paliwal**, Neha Midha, P.P.Dash (2008). Assessing impact of industrialization in terms of LULC in a dry tropical region (Chattisgarh) India using Remote Sensing data and GIS over a period of 30 years. *Environmental Monitoring and Assessment*, DOI 10.1007/s10661-008-0211-z.
- **Paliwal A.** and V.B. Mathur (2007). Spatial analysis of landscape patterns and their relevance for large mammal conservation in the dry deciduous forests of central India. In: **Proceedings of International Association of Landscape Ecology (IALE) World Congress. Wageningen, The Netherlands July 8th -12th July 2007.**
- Joshi, P.K., M. Kumar, N. Midha, Vijayanad and **A. Paliwal** (2006). Assessing areas deforested by coal mining activities through satellite remote sensing images and GIS in parts of Korba, Chattisgarh. *Journal of Indian Society of Remote Sensing*, 34:415-421.

Article published in International Magazines

- “Rural poverty and rice”, An article published in *Rice Today* magazine of November 2016 edition, published by *International Rice Research Institute*, Philippines.

Published Technical Report

- Nilanjan Ghosh, Dipankar Ghose, G. Areendran, Divya Mehra, **Ambica Paliwal**, Krishna Raj, Kiran Rajasekariah, Ambika Sharma, Anil Kumar Singh, Shashank Srinivasan, & Sejal Worah (**WWF-India paper**) Valuing Ecosystem Services at a Landscape Scale: the case of Terai Arc Landscape in Uttarakhand.
- Technical progress report on WII-MoEF-NNRMS project “Mapping of National Parks and Wildlife Sanctuaries (2004-2006)” submitted to **MoEF (Ministry of Environment and Forest) Government of India.**

PUBLICATIONS IN PIPELINE/ UNDER REVIEW

- Gudina Legese Feyisa, Leo Kris Palao, Andy Nelson, Murali Krishna Gumma, **Ambica Paliwal**, Khin Thawda Win, Kin Nge Htar, and David E. Johnson. (*under review*) Characterizing and mapping cropping patterns in a complex agro-ecosystem: an iterative participatory mapping procedure using machine learning algorithms and MODIS vegetation indices: *Manuscript submitted to Remote Sensing of Environment*
- **Ambica Paliwal**, Alice Laborte. Phenological parameter derivation: A novel approach to detect salinity in rice crop: *Manuscript under preparation.*

- A. K. Srivastava and **Paliwal, A.** Land cover change assessment using hyper temporal vegetation index: Pixel based approach. *Manuscript submitted*

INTERNATIONAL EXPERIENCE

South Asia, South East Asia, Europe and USA

JOURNAL REVIEWER

International Journal of Remote Sensing

LANGUAGES

English- Fluent

Hindi - Native

Urdu- Conversational

Spanish- Basic

PROFESSIONAL EXPERIENCE

June 2017- June 2019

**Consultant- Climate Management Research Support
Biodiversity International, CGIAR, New Delhi India: Climate Change
Agriculture and Food Security) CCAFS Project**

Responsibilities

- Analyze data on climatic variables using scientific programming tools
- Implement new data collection methods, like crowdsourcing and citizen science.
- Technical assessment of satellite images and geospatial datasets.
- Development of methodology for agriculture framework
- Develop training materials and deliver training on data collection and interpretation
- Provide general project management support including organize and coordinate logistics for meetings and field activities, monitoring the implementation of research activities by partners, drafting of research report and communication products
- Support preparation of information for meetings and international conferences

Feb 2017-March 2017

**International Consultant
IRRI (International Rice Research Institute), CGIAR, Philippines
Address: Pili Drive, UPLB, Los Baños 4031, Laguna, Philippines**

Responsibilities

Document the drought assessment image processing protocol using MODIS for PRISM Operations Manual; Application of protocol to another site to evaluate its robustness

Feb 2015- Feb 2017

**Post-Doctoral Fellow- GIS and RS
IRRI (International Rice Research Institute), CGIAR, Philippines
Address: Pili Drive, UPLB, Los Baños 4031, Laguna, Philippines**

Responsibilities

In a multi-cultural environment and in cooperation with multidisciplinary scientists, I contribute my cross-cutting skills and techniques in Remote Sensing and GIS to a

Bill and Melinda Gates foundation project, and my tasks mainly include:

- Develop, apply and validate methods for assessing rice areas in South Asia that are prone to stresses such as soil salinity using MODIS.
- Contribute to enhancing the technical capabilities of partners and collaborators to use advanced tools and methods for spatial analysis through training and collaborations.
- Compile and organize data needed in developing and prioritizing rice breeding product profiles in South Asia and South-East Asia
- Based on data compiled from various sources and derived through modeling, identify and characterize spatially explicit target domains for dissemination of rice varieties in South Asia and South East Asia
- Manage and organize geospatial data and metadata
- Publish research results in international journals and reports
- Supervise and train IRRI staff.

2011- 2014

Coordinator- GIS and RS

World Wildlife Fund (WWF) – India

Address: 172B, Lodhi Estate, New Delhi, India

Responsibilities

Working with WWF-India contributed immensely to my experience on natural resources by working with other WWF centers around the world. I worked on several projects, my tasks included:

- Support provided on remote sensing & GIS components of all the nine priority landscapes of WWF-India
- Leading and coordinated teams and providing them with necessary RS/GIS support
- Capacity building of frontline staff in protected areas and WWF staff of Bhutan and Nepal by providing trainings.
- Land use Land cover classification and change detection
- Ecosystem Service valuation and scenario development using InVEST
- Spatial and non-spatial data collection and its analysis, Geo-spatial modelling using satellite data
- Facilitation of stakeholder meetings and consultations
- Identification of biodiversity areas and monitoring connectivity of wildlife habitats.
- Proposal development, Presentations, Technical documentation, report compilation and research presentation.
- Liaising with government and non-government organizations

Projects worked on:

→ Living Himalayas Global Initiative (Transboundary project) – Land cover monitoring using spatio-temporal approach of analyzing conservation issues for the Himalayan region of Nepal, Bhutan & India using the integration of geospatial and ground based data and policies.

→ Plantation area estimation in parts of Eastern Himalayas

→ Ecological Corridor delineation between Pench and Satpuda Tiger Reserve

→ Anti-poaching plans at Pilibhit wildlife sanctuaries using GIS

→ Natural Capital Project: Red panda habitat modelling at Sikkim Landscape and valuation of ecosystem services using InVEST and geo-statistical tool.

→ Phenological modelling using hyper-temporal remotely sensed data

→ GIS database creation for all the nine landscapes in India.

2006- 2008

Senior Research Fellow

Wildlife Institute of India

Address: Post Box #18, Chandrabani, Dehradun – 248001, Uttarakhand, (India)

Responsibilities

As a researcher, I worked on Govt. of India funded project by Ministry of Environment and Forest (**MoEF**) and National natural resource management system (**NNRMS**) “Mapping of National parks and Wildlife Sanctuaries”. My task in the project included:

Landscape pattern analysis, Habitat suitability modelling using GIS, Geostatistical analysis, Spatial and non-spatial data collection on biodiversity, Technical documentation, report compilation and research presentation.

2004- 2006

Junior Research Fellow

Wildlife Institute of India

Address: Post Box #18, Chandrabani, Dehradun – 248001, Uttarakhand, (India)

Responsibilities

As a researcher, I worked on Govt. of India funded project by Ministry of Environment and Forest (MoEF) and National natural resource management system (NNRMS) “Mapping of National parks and Wildlife Sanctuaries”. My task in the project included:

Digital image processing, field sampling design plan, extensive field work in forested landscape, data collection on mammalian and floral aspect, land use/land cover mapping, database creation in GIS domain.

INFORMATIVE SKILLS

Remote Sensing & GIS - ERDAS, ENVI, ArcGIS, Idrisi, ArcView, E-Cognition, DIVA-GIS,

Programming language- R scripting, Python scripting with Arc GIS and EML scripting

Statistics – MS Excel, SPSS, R

Spatial Pattern Analysis –Fragstats, Timesat, ENFA

Ecosystem service evaluation: InVEST

Population Estimation – Distance

System Dynamics – STELLA, VENSIM

Hydrodynamics – STREAM

Others – Used HP I-Paq integrated with GPS to collect data in the field.

RESEARCH PRESENTATIONS AND ABSTRACTS

- Paliwal, A., Laborte, A. (2016) Phenological Response of Rice Crop to Salinity Using Time Series Data: Ambica Paliwal and Alice Laborte: Abstract accepted in 37th **Asian Conference on Remote Sensing 2016**, Colombo SriLanka
- Paliwal, A., 2013. Presentation on Habitat modeling of Red Panda using InVEST at **Stanford University, California, USA**. 12 March 2013.
- Paliwal A. and Mathur V.B., 2008. A GIS Based Approach for Assessing Habitat Suitability of Select Ungulate Species in Tadoba-Andhari Tiger Reserve, XXIIth **Annual Research Seminar of Wildlife Institute of India (WII)**, Dehradun, India, 19th–20th September 2008 (received best presentation award)
- Paliwal A. and Mathur V.B., 2007. Spatial analysis of landscape patterns and their relevance for large mammal conservation in the dry deciduous forests of central India. **International Association of Landscape Ecology (IALE) World Congress. Wageningen, The Netherlands** July 8th -12th July 2007

- Paliwal A. and Mathur V.B., 2007. Spatial Distribution of Ungulates and vegetation structure in Tadoba-Andhari Tiger Reserve, Maharashtra. XXIth **Annual Research Seminar of Wildlife Institute of India, Dehradun, India**, 23st – 24nd September 2007 (received best presentation award)
- Paliwal A., 2007. Spatial database inputs for Preparation of management plan of Tadoba-Andhari Tiger Reserve, Maharashtra at **Tadoba-Andhari Tiger Reserve, Maharashtra, India**, 11th March 2007
- Paliwal A. and Mathur V.B., 2006. Mapping of land cover types and patch dynamics in Tadoba-Andhari Tiger Reserve, Maharashtra. XXth **Annual Research Seminar of Wildlife Institute of India, Dehradun, India**, 21st – 22nd September 2006.
- Paliwal A. and Mathur V.B., 2005. Establishing Spatial Database in Tadoba-Andhari Tiger Reserve, Maharashtra, India: Initial results of vegetation classification. XIXth **Annual Research Seminar of Wildlife Institute of India Dehradun, India** 19th September 2005

REPORTS SUBMITTED

- Report on drought assessment image processing protocol using MODIS for PRISM Operations Manual.
- Technical project progress reports submitted to IRRRI
- Technical progress reports submitted to donors in WWF
- Final technical report on WII-MoEF-NNRMS (National Natural Resource Management System) pilot project “Mapping of National Parks and Wildlife Sanctuaries (2004-2008)” submitted to **Ministry of Environment and Forest (MoEF), Government of India**.
- Report of participation in International Association of Landscape Ecology (IALE) World Congress. Wageningen, The Netherlands (July 8th -12th July 2007) to **Royal Netherlands Embassy, New Delhi**.
- Technical progress report on WII-MoEF-NNRMS project “Mapping of National Parks and Wildlife Sanctuaries (2004-2006)” submitted to **MoEF (Ministry of Environment and Forest) Government of India**.
- Self-assessment report for promotion from Junior Research Fellow to Senior Research Fellow on completion of two years of tenure- submitted to **the research committee of Wildlife Institute of India**.

WORKSHOPS/CONFERENCES/ SYMPOSIUM ATTENDED

- 37th Asian Conference on Remote Sensing (ACRS), Colombo, SriLanka.
- 36th Asian Conference on Remote Sensing (ACRS), Manila, Philippines.
- Presented in International Association of Landscape Ecology (IALE) World Congress. Wageningen, The Netherlands (July 8th -12th July 2007).
- Workshop on ‘Assessment and Monitoring of Natural World Heritage Sites ’ conducted by Wildlife Institute of India in Dehradun India in collaboration with United Nation Foundation, University of Queensland, IUCN, UNESCO.(14-15 March 2007).
- Presented at workshop on ‘Poaching of tiger and its anti poaching techniques at Tadoba-Andhari Tiger Reserve’ at Tadoba-Andhari Tiger Reserve conducted by Wildlife Protection Society of India (7th November 2006).
- Site level workshop at Satpura Conservation Area, India, on ‘Management of Forest in India for Biological diversity and Forest Productivity- A New Perspective’ (14-16 January 2006).
- Workshop on ‘Management of Forests in India.’ conducted by Forest Research Institute, India (19 March 2003).

TRAININGS PROVIDED

- Trained faculties and researchers at Indian Institute of Forest Management (IIFM), Bhopal on InVEST (Integrated Valuation of Ecosystem services and Tradeoffs. InVEST is a suite of free, open-source software models used to map and value the goods and services from nature.

- Trained staff of WWF-India, WWF-Nepal and WWF Bhutan on remote sensing techniques
- Trained frontline staff of protected areas in India on GPS use and map reading
- Trained staff at International Rice Research Institute on remote sensing and agricultural stresses.

TRAININGS ATTENDED

- Scientific writing workshop at IRRI, Philippines by CSIRO Publishing (September 2015) at IRRI, Philippines
- Training on leadership at IRRI Philippines in three modules by Growing edge, Hongkong at IRRI, Philippines
- Training on "Geospatial-temporal analysis of climate data and remote sensing for vegetation monitoring with R" during 12- 16 October, 2015 at the Joint Graduate School of Energy and Environment (JGSEE), King Mongkut's University of Technology Thonburi (KMUTT), Bangkok.
- Training on Integrated Valuation of Ecosystem services and Tradeoffs (InVEST), suite of free, open-source software models used to map and value the goods and services from nature.
- Master class on Land change modeling methods: calibration, validation and extrapolation at Wageningen University, The Netherlands, 7th July 2007
- Master class on FRAGSTATS at Wageningen University, The Netherlands, 7th July 2007
- Wildlife Technique Training at Wildlife Institute of India, Dehra Dun at Sariska Tiger Reserve, Rajasthan, India. (January 2005 – February 2005).
- Training on ARC IMS, ESRI at Wildlife Institute of India, Dehra Dun, India. (December 20, 2004 – December 23, 2004).
- Training on Arc GIS 9.0, ESRI at Wildlife Institute of India, Dehra Dun, India. (December 13, 2004 – December 17, 2004).
- Training on Erdas Imagine Professional, Vector & Virtual GIS, Erdas India Private Limited at Wildlife Institute of India, Dehra Dun, India. (December 6, 2004 – December 10, 2004).
- Training in Ranbaxy Laboratories Limited on their Effluent Treatment Plant. (February-March,2004) at Himachal Pradesh
- Training on Environmental Management plan of expansion of Sulphuric acid and Single super phosphate plant and Instrumentation at Bharat Heavy Electrical Limited, Human Resource Development Centre Haridwar, India (7March-6April 2003).

AWARDS & SCHOLARSHIPS

- **European Union Erasmus Mundus Scholarship**, 2009 for M.Sc in Geo-information Science and Earth Observation for Environmental Modelling and Management.
- **An award of Rs 1500/-** in Annual research seminar at Wildlife Institute of India, for **best presentation** in 2007 and 2008.
- Euro € 2290/- by **Royal Embassy of Netherlands, India**, for participating in International Association of Landscape Ecology, World Congress July 2007 at Wageningen. (Utilized).
- Euro € 1500/- **European Science Foundation** for participating in International Association of Landscape Ecology, World Congress July 2007 at Wageningen. (Returned).
- Rs. 20,000/- **Department of Science and Technology** for participating in International Association of Landscape Ecology, World Congress July 2007 at Wageningen. (Returned).