



International Water
Management Institute

Research Intern - GIS and Remote Sensing

Lahore, Pakistan

The International Water Management Institute (IWMI) is seeking applications from enthusiastic students to assist with a geographic information system (GIS) and remote sensing project at its office in Lahore, Pakistan.

Scope of internship

The IWMI office in Lahore, Pakistan, is conducting various research projects that involve the collection and analysis of large-scale spatial (GIS and remote sensing) datasets to characterize the drivers of change and their implications on water, agriculture and food security in the Indus Basin. The intern will be involved in ongoing projects led by IWMI. The intern will be mainly involved in the provision of support to the collection, analysis and operationalizing of GIS and remote sensing datasets at a field scale as well as from various International data archives. The intern will also assist in performing major GIS/global positioning system (GPS) functions, including data development, maintenance and management, field surveying and mapping. The intern will assist with the development of GIS maps, identification of discrepancies in digitized documents, and field-scale data entry. A sound knowledge of GIS and GPS programs, and remote sensing-based image processing and relevant technologies such as computer-aided design (CAD) software is required.

Duties and responsibilities

- Assist in collecting and updating data using GPS, ArcGIS, ArcGIS Pro, QGIS and AutoCAD (optional) by performing onscreen digitizing of land use, physical/environmental parameters, park features, facilities/assets, architectural, surface water, groundwater and wastewater utilities, easements, and other municipal data.
- Assist in the entry of engineering, agriculture and other information from plans and drawings into geospatial and/or a database format(s) and in the reporting management system.
- Utilize a variety of survey techniques and equipment, including GPS data collector(s), and other tools to determine distance, location, dimension, depth, grade and volumes, and populate the dataset in ArcGIS mapping.
- Assist in digitization of physical maps and survey data and updates digital documents and information to the GIS features both with ESRI desktop and web map application.
- Conduct research on space-based information, open statistical datasets, and other Earth observation datasets and technologies.
- Conduct geospatial and statistical analysis, such as using interpolation techniques to create surfaces.
- Assist in the preparation of reports and research publications.

Qualifications, knowledge and experience

- Master's degree in engineering, geo-informatics or physical sciences (e.g., physical geography, GIS/remote sensing).
- Prior on-the-ground experience of GPS and methods used to collect, analyze and operationalize the spatial hydrological dataset, using principles and practices of geographic information databases.
- An intermediate understanding of the use and operation of ESRI ArcMap, ArcGIS Pro, and ArcGIS Online; familiarity with Open Source QGIS (not required, but helpful), GPS; and knowledge of the methods, techniques and procedures used in the planning, designing, maintenance, editing, and production of geographic data and mapping.
- Ability to understand the ArcGIS Collector mobile app, scanning hardware, and other miscellaneous hardware/software applications.
- Ability to take direction, facilitate communication, resolve problems, and work individually or as part of a team.

IWMI will provide a monthly stipend to the selected candidate during the internship period. In addition, all other field costs will be covered by IWMI.

The duration of the internship is 06 months with the possibility of extension based on the project and budget availability. This is a **nationally recruited internship and only citizens of Pakistan are eligible** to apply.

To apply, visit www.iwmi.org/jobs. Applications must be submitted by 24:00 (Pakistan time) on October 15, 2021 (Friday).

The International Water Management Institute (IWMI) is an international, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center and leads the CGIAR Research Program on Water, Land and Ecosystems (WLE). www.iwmi.org

IWMI believes that diversity powers our innovation, contributes to our excellence, and is critical for our mission. We offer a multi-cultural, multi-color, multi-generational and multi-disciplinary working environment. We are consciously creating an inclusive organization that reflects our global character and our commitment to gender equity. We, therefore, encourage applicants from all cultures, races, ethnicities, religions, sexes, national or regional origins, ages, disability status, sexual orientations, and gender identities.



International Water
Management Institute

Research Intern - Groundwater Modeling

Lahore, Pakistan

The International Water Management Institute (IWMI) is seeking applications from enthusiastic students to assist with a groundwater modeling project at its office in Lahore, Pakistan.

Scope of internship

The intern will provide support to the team at IWMI's office in Lahore, Pakistan, in carrying out different groundwater studies in the Indus Basin. The intern will assist in groundwater model development, calibration and validation, sensitivity analysis, documentation, and application of the model at different spatial scales. The intern may also be involved in data review, planning regional investigations and interpretation of parameters from aquifer tests, and in the use of geographic information system (GIS) applications to develop and review model inputs and outputs. The intern will also assist in developing climate change scenarios using climate and land use estimations, and in preparing donor reports and research publications.

Duties and responsibilities

- Assist in collecting hydrological variables from national and international data archives.
- Assist in correcting groundwater levels above the mean sea level using a high-resolution digital elevation model (DEM).
- Pre-process the primary data using different image processing software.
- Collect and compile Earth land surface datasets, including rainfall, DEM, watershed characteristics, soil characteristics, and land use and land cover data from various satellite remote sensing archives.
- Assist in parameterizing the groundwater model (e.g., MODFLOW) using the data collected from different data repositories.
- Assist in calibrating and validating the groundwater model for different land use and climate change scenarios.
- Analyze the datasets collected for computing the changes in water storage on different spatiotemporal bases.
- Compile and review the information available on artificial groundwater recharge, including groundwater levels, lithology, environmental impacts and aquifer characteristics.
- Analyze the datasets for watershed characteristics to identify the potential recharge zones.
- Assist in identifying the potential groundwater recharge sites as per the criteria developed and model outputs.
- Assist in organizing different stakeholder meetings and disseminating the results at different levels.
- Assist in preparing a progress report on the modeling work and a final report on potential zones for artificial groundwater recharge.

Qualifications, knowledge and experience

- Master's degree in water resources management, hydrology, geohydrology and/or geoscience, etc.
- Advanced knowledge of groundwater hydrology principles, and surface water and groundwater interactions.
- Prior experience with groundwater model development and application; specifically, simulating the impact of climate change on groundwater recharge, surface water-groundwater interactions and groundwater yield, including a detailed analysis of underlying systems, using MODFLOW or similar groundwater modeling codes.
- Basic knowledge of at least one image processing software (such as ArcGIS, ENVI, QGIS, etc.) and at least one programming language (such as MATLAB, Interactive Data Language [IDL], Fortran or Python).

IWMI will provide a monthly stipend to the selected candidate during the internship period. In addition, all other field costs will be covered by IWMI.

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