Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 01 (JAN-FEB, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

GIS and Remote Sensing Application in Water Management of Agriculture Fields

(*Sangeeta Danga and Narendra Danga)
Central Arid Zone Research Institute, Jodhpur, Rajasthan
*Corresponding Author's email: sdsd675314@gmail.com

Abstract
The abstract highlights the potential uses of remote sensing in managing water resources for irrigated agriculture and emphasizes the importance of using this technology to improve understanding of the relationship between crop growth and water management. It also notes that while research has made progress in this area, remote sensing data is not widely used by practitioners in the field. The abstract also points out the challenges in data collection and analysis, particularly in developing countries, and the need for bridging the gap between researchers and practitioners by illustrating the practical applications of remote sensing and identifying real problems that it can help to solve. The key takeaways from this abstract are that remote sensing and GIS can be used to map agriculture area, detect change, and improve water management in irrigation.

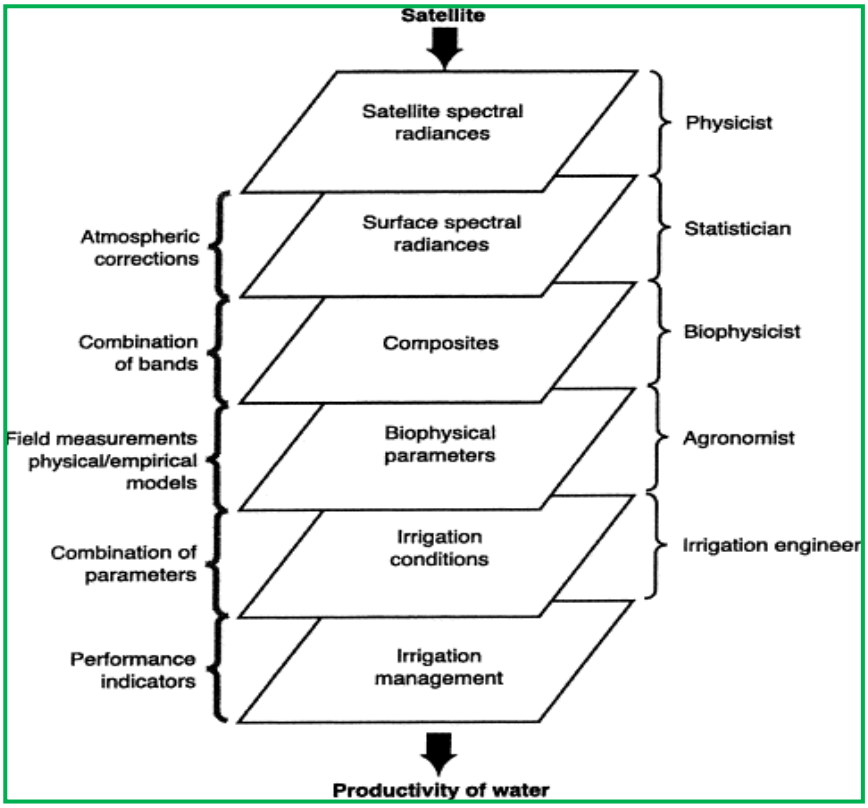
Introduction
The introduction of this document highlights the importance of irrigation in producing food crops and the need for better management of water resources to meet future demands. It notes that irrigation accounts for a large percentage of freshwater withdrawals and that water management and planning requires good information, which is currently scarce. The authors point out that remote sensing and GIS can provide regular information on agricultural and hydrological conditions for vast areas and can be used as efficient and effective tools for irrigation water management. The introduction also states that the main problem is that water managers and policy makers are often unaware of the new technical possibilities of remote sensing and GIS, partly because the discussion about these technologies remains within the remote sensing community. The methodology section describes the process of using satellite data to extract useful information for water management, including a sequence of procedures and a diagram illustrating the process. GIS (Geographic Information Systems) and remote sensing can be used in water management in agriculture fields to improve irrigation efficiency and crop yield. GIS can be used to create detailed maps of the fields, including information on soil type, slope, and drainage patterns. Remote sensing data, such as satellite imagery and aerial photography, can be used to monitor crop growth and detect areas of stress due to lack of water. This information can then be used to optimize irrigation schedules and target specific areas for irrigation. Additionally, GIS and remote sensing can be used to monitor and predict water availability and to identify potential sources of water for irrigation.

Objectives
1. Analyse the results to identify gaps and diagnose issues related to irrigation performance and crop production
2. Explain the use of remote sensing in assessing water use in agriculture

3. Remote sensing based approach to estimate high resolution actual evapotranspiration and biomass production
4. Conduct irrigation performance assessment at a scheme level using indicators such as water productivity.

Methodology

This section describes a methodology that was developed using a Geographic Information System (GIS) to select, design, install, and manage an irrigation system for a farm. GIS was used to create different thematic layers that include various attributes necessary for analyzing different irrigation system types. These layers include data such as topography, soil texture, soil water retention, bulk density, infiltration rate of water, and field drainage system. These layers were then used in conjunction with water availability and water demand to design and plan the farm irrigation systems. The authors also mention several studies that have used GIS and remote sensing in irrigation management and water resources management. These studies have shown that GIS and remote sensing can be used for optimal allocation of water resources, monitoring and mapping of surface and sub-surface waterlogged areas, precision farming, and irrigation scheduling. They also mention the use of GIS in analyzing the effects of salinity on irrigation.



Conclusion

The conclusion of this document emphasizes the importance of developing long-term strategies for managing water resources, as patterns of water use are changing due to increasing pressures. It states that strategic water use requires good information on irrigated areas, cropping patterns, evaporative use, and historical use of water and that information from ground sources is often based on design data rather than actual figures. The authors highlight that using remotely sensed data and GIS application can provide the best performance for studying irrigated areas and that AUTOCAD can also be used to design irrigation methods.