



## Microwave Remote Sensing and Soil Moisture analysis in semi arid Environment For Climate Change using Backscattering Coefficient ( $\Sigma_0$ )

\*S. Mohd. A Rizvi, \*\* Saied Pirasteh and \*\*Amir A. Mahmoudzadeh

\*Remote Sensing & GIS, Dept., of Geology AMU, ALIGARH-202002, Correspondence  
Email: rizvirrs@gmail.com

\*\* GeoSTARS Lab Department of Geography & Environmental Management Faculty of Environment University of Waterloo Waterloo, Ontario N2L 3G1, Canada

\*\*\* Amir A.Mahmoudzadeh, University of Islamic Azad, Najafabad, IRAN

### ABSTRACT

Scientific & technological Approaches can solve many existing and unforeseen climate related problems. This paper presents an analysis of backscattering coefficient ( $\Sigma_0$ ) and Soil Moisture Analysis (SMA)) using a Ground based monostatic Scatterometer. This Instrument operated at L-Band, linear & Cross Polarization,  $20^\circ$  angle of incidence. The Sensor of the Scatterometer is installed on cherry Picker mobile platform (Truck Mounted). The study area was selected near Play Ground within a Campus of Space Application Center, Ahmedabad, Gujarat, India. For the measurements of Backscattering Coefficient, the Target area was plotted about 07meters by 07meters. The soil of the area is sandy in nature, well sorted with dry & fine roots were present, Porosity & permeability are medium to high, Plastic limit and Flow Index are low. Soil Moisture & backscattering Coefficient was measured under different moisture Condition (i.e. Before Rainfall & after Rainfall) along with Calibrated data. Soil Samples were collected at different depths ranging from 0 to 5cm and from 05 to 10 cm with the help of tube & screw augers respectively. These Moist Soil Samples were oven dried at temperature  $105^\circ$  C for 24 hours continuously. Calculated valves of Backscattering Coefficient

( $\Sigma_0$ ) and Soil Moisture data were analyzed and plotted. The trends of  $\Sigma_0$  with soil moisture were studied for output. The work shows that the water present on surface and sub-surface are affecting to dielectrical properties along with others physical parameters to understand the behaviors of  $\Sigma_0$ . It shows that Soil moisture contents are effective to global climatic change because it allows to soil water content to evaporate more easily in semi environment. Fluctuation in water content in soil during evaporation can also change humidity, temperature and other aspect of the eco-system around the moist Zones. Under the right circumstances, all of these play an important role in changing/shifting rainfall/local climatic conditions. The results show that the  $\Sigma_0$  with SMC analysis may helpful to understand the best Local Climatic and Hydro- meteorological Modeling for better Agro-products, Urban & Industrial planning and management. These approaches require more attention in using Microwave Remote Sensing techniques and high resolution sensor's data with high frequency data analysis in conjunction with Soil Moisture in semi arid environment and adjoining areas to Monitoring Climate change.

**Key Words:** Microwave Remote Sensing, Backscattering Coefficient, Soil Moisture, Climate Monitoring and Hydro-meteorological modeling, Semi-arid, Environment.