3. OBJECTIVE OF THE PRESENT WORK

The objective of the present research work includes the performance analysis of following points:

a. To study and to analysis the performance of forthcoming future generation wireless networking technique i.e. WiMAX as the upcoming 4G standard for meeting the requirements of last mile end to end wireless network with greater system capacity with improved bit error rate.

b. To study the various types of antenna diversity techniques for mitigating one of the most challenging and interesting problem of wireless communication i.e. effects of small scale as well as large scale fading.

c. To analyze the features of antenna diversity techniques in wireless communication for nullifying the limitations due to multipath fading by simulating the system in terms of system throughput and bit error rate under MATLAB based environment

d. To derive and model the effects of various wireless channels like AWGN and Rayleigh for getting the utility of them as efficient wireless channels in terms of bit error rate with respect to signal to noise ratio.

e. To simulate the complete WiMAX system by implementing antenna diversity techniques and Alamouti coding in it to fulfill the current demands of the modern wireless networks with the anticipation of improvement in bit error rate thereby increment in system reliability.

f. To feel the virtual reality of WiMAX system by modeling the WiMAX IEEE 802.16 standards with MATLAB SIMULINK for real time data i.e. image and speech analysis. This objective can be undertaken by processing the whole flow in the following way:

- Thorough analysis of WiMAX model by end to end simulation of inner parameters of basic sub blocks and deciding final throughput by input output characteristics.

- Implementation of various antenna diversity techniques, Alamouti coding and OFDM in the WiMAX model for the improvement of system performance in terms of bit error rate and capacity.
- Real time data implementation in WiMAX system by transmitting and receiving the real time signals such as image and speech signals.
- The achievement of improved WiMAX system performance under real time data scenario with the implementation of antenna diversity techniques.

Ultimately the main objective of this research work is to design the quality based algorithms for antenna diversity techniques and to simulate, design and model the most sophisticated future generation wireless networking standard i.e. WiMAX system with the implementation of antenna diversity techniques along with Alamouti coding by observing the improvement in BER and system capacity with the transfer of real time image and speech signals.