Forest accounts for about 30% of the global geographic area. The quantity of biomass in a forest is a result of the difference between production through photosynthesis and consumption by respiration and it plays a very important role in the global carbon cycle. Tropical forests store about 80% of all above-ground and 40% of all below-ground terrestrial carbon. Remote sensing techniques have the potential to provide some of the important information regarding the biomass estimation. The present study was carried out in Shendurney wildlife sanctuary having an area of 128 km² and is located in the southern part of the Western Ghats, which is a mega biodiversity hot spot in India. Based on the field data and remote sensing data tree biomass was calculated using volume equations. Forest vegetation data of the study area was collected from 28 locations of quadrats having size 25 x 25 m². To obtain the biomass of the entire study area, the biomass calculated from the 28 quadrats were interpolated using Inverse Distance Weighted method in geostatistical analyst. The biomass and carbon stock values in the Shendurney wildlife sanctuary ranges from 101 tons/ha to 519 tons/ha and 51 tons/ha to 253 tons/ha respectively. The analysis and results of this study can be used for developing the sustainable forest management strategies and can be applied in any tropical forest area.