Surface soil moisture and freeze/thaw state monitoring is essential for quantifying water and heat exchanges in cold regions, e.g. the Tibetan Plateau. L-band (1.4 GHz, 21 cm) radiometry is recognized as one of the best suitable techniques for global monitoring of soil moisture and freeze-thaw dynamics. This study reports a long term ground-based L-band radiometry measurements conducted in a seasonally frozen grassland site located in the northeastern part of the Tibetan Plateau. The ESA funded ELBARA-III radiometer is deployed in a Tibetan meadow ecosystem where a well-instrumented in-situ soil moisture and soil temperature (SMST) monitoring network was developed. The network holds 20 SMST profile measurement stations, and each station records every 15-min readings of 5TM ECH2O probes installed at soil depths of 5, 10, 20, 40, and 80 cm. The ELBARA-III radiometer has been deployed in the center of the SMST network at the beginning of 2016. The L-band radiometer is mounted on a tower with a height of 4.8m, and the antenna beam waist is about 6.5m above the surface. Brightness temperature ($T_B$) measurements with vertical and horizontal polarizations are performed every 30 min at observation angles of 40° to 70° in steps of 5°. A sky measurement with an observation angle of 155° is performed once per day for calibration purposes next to the internal calibration sequence performed as part of every measurement run. The internal calibration adopted to derive the $T_B$ from the raw data is based on a two-point calibration strategy using a resistive load (RL) and an active cold load (ACL). A vertically dense SMST measurement profile is installed next to the radiometer tower. Concurrent measurements of micrometeorological variables are also performed in vicinity of the radiometer tower, such as solar radiation, wind speed, air temperature, air pressure, and humidity. A rain gauge and eddy-covariance system are setup in the ELBARA-III field site at the end of 2016 providing precipitation and surface heat flux measurements. Preliminary analysis of the ELBARA-III $T_B$ measurements will be given in this study.