



University of Zabol

Graduate School

Faculty of Soil and Water

Department of Rangeland and Watershed Management

**Thesis Submitted for the degree of Master of Science in
Range Management**

**Comparison of carbon and nitrogen
sequestration in habitat of *Zygophyllum
atriplicoides* and *Artemisia sieberi* in Luchunasi
rangelands of Zahedan city**

Supervisor:

Dr. Mahdieh Ebrahimi

Advisor:

Dr. Morteza Saberi

By:

Mojdeh Shirzaei

December 2020

Abstract

There are 90 million hectares of pastures in Iran that can play an important role in the carbon sequestration process. Utilization of rangelands according to their ability, in addition to meeting human needs, will maintain the functional role of these ecosystems, especially in terms of carbon and nitrogen storage. In the present study, the carbon and nitrogen storage capacity of *Artemisia sieberi* and *Zygophyllum atriplicoides* was studied in Lochonasi rangelands of Zahedan city, Sistan and Baluchestan province. For this purpose three 100 meter transects were randomly assigned and four plots with 25 m intervals were systematically installed along each transect. Biomass of *Artemisia sieberi* and *Zygophyllum atriplicoides* was measured in all plots by cutting and weighing method at the end of spring. At the beginning and end of each transect, a soil profile was excavated at three depths of 0-30, 30-60, and 60-90 cm for each species. Data were analyzed by one-way ANOVA and independent T-test using SPSS 24. The results of statistical analysis showed that there is the significant difference between organic carbon and nitrogen in aerial organs of two species. The highest amount of carbon (2.45 t/ha) and nitrogen (18.83 t/ha) reserves were observed in *Artemisia sieberi*. There was a significant difference between the amount of organic carbon and nitrogen storage in the two studied species between the different soil depths that the mean comparison showed that carbon and nitrogen storage in the first depth is higher than two other depths. The highest nitrogen storage was in *Zygophyllum atriplicoides* and soil depth 0-30 cm equal 14.01 t/ha. Generally, the highest carbon storage in the aerial organ and soil were allocated to *Artemisia sieberi* and *Zygophyllum atriplicoides*, respectively.

Keywords: Carbon Pool, Nitrogen Pool, Global Warming, Steppe Rangelands