



UNDERSTANDING THE INFLUENCE OF GATED ENCLOSURES ON THE PHYSICAL AND CHEMICAL PROPERTIES OF SOIL – TFRI JABALPUR, A CASE STUDY

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ABSTRACT: The impact of gated enclosures on soil properties holds immense significance given the scenario of climate change and decreasing vegetation cover all around the world. Better soil properties allow better growth of vegetation, which in turn results in more carbon sequestration in soil as well as biomass. The present study was conducted in Tropical Forest Research Institute Jabalpur campus and its surrounding areas to comprehend the effect of gated enclosures or confined areas on physico-chemical properties of soil over a period of three years. The effect of natural vegetation inside the campus and the fact that the area is forbidden from animal grazing, trampling etc was evident in the comparative study of the characteristics of soil collected from inside and outside the TFRI campus. Bulk density and sand fraction of soil was found higher in the disturbed soil of outside the campus. Water holding capacity and nitrogen content was found higher in the soil collected from inside the campus. The Soil Organic Carbon (SOC) in the surface soil samples collected from inside the study area was significantly higher than the corresponding samples collected from outside the study area by around 67.7% and 30% in the sub surface soil samples. The litter and humus found on floor due to lush vegetation is the main cause for amended soil properties inside TFRI campus.

Keywords: Gated enclosures, TFRI Jabalpur, Soil properties, Litter

Citation: Verma S, Jain A (2019) Understanding the influence of gated enclosures on the physical and chemical properties of soil – TFRI Jabalpur, A Case Study. Indian J Trop Biodiv 27(2): 14-19

INTRODUCTION

Tropical Forest Research Institute is one of the eight research Institutes under Indian Council of Forest Research and Education, Dehradun (Uttarakhand). The Institute came into existence in April 1988, although its origin goes back to 1973 when a Regional Centre of Forest Research Institute, Dehradun was established at Jabalpur to provide research support to the problems of forest management in Central India. The Institute is situated 10 km southeast of Jabalpur on NH-12A. The campus is spread over an area of 109 ha. Tropical Forest Research Institute (TFRI), Jabalpur can conveniently be considered as a small pocket of forest, it has a unique mixture of native and exotic plant species. The entire institute campus is vegetated providing a mosaic of habitat to the native fauna. Gradually native species found in the nearby forest have started appearing in the campus area. Apart from this, the planted species are also successfully

regenerating on the campus (Verma and Jain, 2020).

Gated enclosures are the natural areas separated from the surrounding areas by some sort of fencing and in some cases are subjected to supervised management. A few examples of such gated enclosures are parks, zoos, botanical gardens, private landholdings, educational institutes spread over vast areas, etc. These enclosures prevent unwanted human and animal interactions like grazing, trampling, removal of litter, small wood, and humus. Most physicochemical properties of soil like soil organic carbon, bulk density, water holding capacity recover as a result of being subjected to confinement. The biotic attributes such as vegetation structure and diversity recover comparatively slower, and consequently, they are rarely measured (Ruiz-Jaen and Aide, 2005). Recent studies on soil-vegetation feedbacks on range land health focused on the relationship between enclosure age and its effectiveness in improving the soil's