In this article, we will report an experimental evidence of enhanced LIBS emission upon replacing a Bulk-Based ZnO target by the corresponding Nano-Based target. The plasma was initiated via interaction of a Nd:YAG laser at the fun-damental wavelength with both targets in open air under the same experimental conditions. The measurements show an enhanced emission from the Zn I-lines at the wavelengths of 328.26, 330.29, 334.55, 468.06, 472.2, 481.01, 636.38 nm. The measurements were repeated at different delay times in the range from 1 to 5 μs at constant irradiation level and fixed gate time of 1 μs. The average enhancement over the different Zn I-lines was found increases exponentially up to 8-fold with delay time. The electron density to each plasma was measured utilizing the Hα-line appeared in the emitted spectra from each plasma and was found to give similar values. The electron temperatures were measured via Boltz-mann plot method utilizing the relative intensities of the Zn I-lines and were found to give very close values. Moreover, the relative population density of the ground state of the zinc atoms (relative concentration) was measured spectro-scopically utilizing the Boltzmann plot method and was found to increase in a very similar trend to that of enhancement. The results of the spectroscopic analysis conclude that these signal enhancements can be attributed to the higher con-centration of neutral atoms in the Nano-Based material plasma with respect to the corresponding Bulk-based ZnO mate-rial