Currently 4.70 million ha of forest area lost every year during a decade of 2010–20 which is less than 7.8 million ha yr⁻¹ in the 1990s [1]. The loss of forest areas are also reported as 98 million ha due to fires in the year 2015. Similarly, around 301 million ha (7.0 %) areas of natural regenerating forest are decreased over the past 30 years [2]. Deforestation contributed approx 20 percent of total green house gas emissions which is more as compared to industrial and transport emissions. Around 2.8 gigaton of carbon removal per year has been observed due to deforestation [3]. Faulty and unsustainable land use practices release gases into the atmosphere and affects overall carbon balance. Burgeoning populations necessitate food and shelter requirement that leads to forest land conversion into cultivable land. This conversion release enormous amount of carbon into the atmosphere resulted global warming. Approx 25.0 percent of total soil organic carbon pools are lost due to anthropogenic and deforestation activity [4]. Therefore, intentional deforestation practices reflects in-depth climate crisis around the world.

Forests as a terrestrial ecosystems work as a carbon sink and represents as biggest “Carbon Land”. Forest covered almost 4 billion ha land (30 percent of total earth land areas) consists a huge amount of carbon basically in tropical and boreal regions of S-E Asia and peatlands [5]. Varying life forms exists in the forests that play a key role in biodiversity maintenance and ecosystem processes. Climate change mitigation through carbon sequestration is an intangible form of ecosystem services provided by forest ecosystem [6]. Tropical forest sequesters 0.47–1.3 Pg C yr⁻¹ in both vegetations and soils [7]. As per FAO and ITPS [4], approx 1500 Pg carbon has been reported in 1m depth of soils. Both tropical and permafrost world comprising high amount of SOC pools in wetlands and peatlands regions [8]. The sequestration of carbon maintains soil organic carbon pools and regulates carbon budget and flux in the forests. Similarly, decaying of forest litters, twig and other residues adds organic matter into the soils that improve carbon and essential nutrient availability for better forest ecosystem (Raj et at. 2020) [9]. However, disturbance and some biotic interference in the forests make imbalance carbon status that can be solve through sustainable forest management practices. Sustainable Forest Management (SFM) improves health and productivity of forests and makes carbon balance and cycling for smoothening functions of ecosystem [10,11]. As per FAO [2] approx. 54 percent (2.05 billion ha) of world forest areas needed for long term management plan. Approx. 18.0 percent (700 million ha) of global forest areas fall legally under protected areas of national parks, game reserves and conservation areas. As per WEF [12] a global initiatives raised for growing, restoring and conserving of almost one trillion trees. In this context, a scientific based forest management practice enhances biodiversity which intensify ecosystem services. One question revolves in my mind “How forest regulates carbon and maintains ecological sustainability?” This question tells lots of story and recall the term “climate change mitigation”. Climate resilient forestry maintains ecological sustainability and environmental stability through greater holding of carbon in the form of biomass. Greater carbon absorption helps in climate change mitigation i.e. Climate security and storing carbons as biomass provides some tangible products (timber, fuelwood, fodder and food etc) ensure income security. Thus, recalling the term “Sustainable Management practices (SFM) ensure these significant ecosystem services that maintain overall food–soil–climate security at global scale. Thus, an effective policy and good governance are needed to minimize forest degradations that help in achieving our future forests as carbon land.
References


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