Harnessing space technology for sustainable expansion of muga sericulture in Northeast India

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Muga silk (*Antheraea assamensis*), endemic to Northeast India, faces production constraints despite high demand. The present study utilises geospatial tools—remote sensing, geographic information systems, and global positioning systems—to identify suitable expansion areas across 53 districts in seven states. By integrating physiographic, climatic, and socio-economic parameters, the analysis categorised land suitability as highly suitable (17.14%), moderately suitable (16.37%), and marginally suitable (66.49%). Assam possesses the highest number of highly suitable area (55.76%). Results were validated against 1,400 farms and integrated into the Sericulture Information Linkages and Knowledge System geoportal. The present study highlights the efficacy of space-based technology in diversifying sericulture and securing sustainable livelihoods in non-traditional ecological zones.

Keywords: *Antheraea assamensis*, geospatial modelling, land suitability, Northeast India, SILKS, sustainable development.

Roxb. and *Litsea polyantha* Juss.), along with secondary host plants such as Digloti (*Litsea salicifolia* Hook), Mejankari (*Litsea cubeba* Lour.), Bogori or Ber (*Ziziphus jujuba* Mill.), Champa (*Michelia champaca* Linn.), and several others found abundantly in the Northeast region[5]. The silkworm thrives in the region's specific agro-climatic zones, making muga sericulture highly location-specific. Despite strong traditional knowledge and market demand, the industry faces challenges from habitat degradation, fragmentation of host plant areas, and climate variability. Consequently, production remains confined to traditional pockets, limiting its expansion and economic potential.

Despite the high demand for muga silk, production remains limited to a few traditional pockets in the northeastern region of India, and the decline in areas under silkworm host plants is a growing concern. There is considerable potential to increase muga silk production by expanding sericulture to new areas.

In this context, geospatial tools such as Remote Sensing (RS), Geographic Information Systems (GIS), Global Positioning System (GPS), and web technologies are essential for integrating, analysing, and disseminating satellite-derived information to identify suitable areas for sericulture