**Supplementary File 1**

**Perspectives**

As mentioned in the discussion of conservation implication of Dipterocarps in various sections and sub-heads, it is opined that the advancements in genome-based molecular tools relatively ease out the complexity of tropical forests where the family probably originates. Genetic diversity research advancement not only lies in the evaluation of $H_E$ but changing single nucleotide base change may also govern the allelic variability. The key outcomes and important recommendations arising from this review are as follows:

1. Presence of genetic variability in trees are essential for their further improvement by providing options to the breeders to develop new varieties and hybrids. This can be achieved through phenotypic and molecular characterization of FGRs for which understanding patterns of genetic diversity is essential.
2. The review helped refine prescriptions for management that would aid to reduce the damage and restoration in specifically dynamic forest-based ecosystems. These genetic patterns interpretations are of great significance for scientifically and comprehensively formulating reasonable conservation strategies for family Dipterocarpaceae.
3. Variation in the population's gene pool allows natural selection to act upon traits that allow the population to adapt to changing environments. Understanding of these variations will aid to supplement the genetic diversity that increases the likelihood of the population to adapt and survive.
4. These findings provide important information for future allele/gene identification using genome-wide association studies (GWAS) and marker-assisted selection (MAS) to enhance genetic gain in conservation and breeding programmes of Dipterocarps and other forestry species. Conservation policy makers may need to focus their efforts below the species level to stem further losses of genetic resources with development of site-specific biotechnological solutions for restoration and rehabilitation of fragile forest ecosystems.
5. Furthermore, review creates a database for patterns of Asian Dipterocarps which is essential to enhance cyber-bioprospecting-based infrastructure in forest biotechnology combined with tree genomics, as genomic analysis, transcriptomics, metabolomics, and image analysis become accessible tools for genetic engineering and systems biology of forest trees.
6. The accelerated climatic changes result in the range contraction of Asian Dipterocarps and affect the genetic connectivity across the landscape, and could potentially lead to a great loss of genetic variation; which require time bound mitigation measures and conservation plans.