

INVASIVE ALIEN TREE SPECIES – A THREAT TO BIODIVERSITY

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Abstract

The spread of Invasive Alien Species (IAS) is now recognized as one of the greatest threats to the ecological and economic well being of the planet. These species are causing varying degree of damage to biodiversity and valuable natural and agricultural systems upon which human beings depend. Direct and indirect health effects are increasingly serious and the damage done is often irreversible. The effects are exacerbated by global changes and chemical and physical disturbances to species and ecosystem.

Alien tree species have long been introduced for commercial forestry, agroforestry, erosion control and landscaping. Pakistan has a long history of introduction of foreign plant and animal species. The main objective of introduction of exotic forest tree species was to fill the gap between supply and demand of timber, fuel-wood and fodder. Out of 700 alien species 2 forest tree species viz. *Broussonetia papyrifera*, and *Prosopis juliflora* were recognized as high impact invasive. *Eucalyptus camaldulensis* is another example highlighting the invasive behaviour. In addition, *Robinia pseudoacacia*, *Ailanthus altissima* and *Leucaena leucocephala* are also aggressive in nature and may pose threat to the local flora and fauna in the future. This paper presents the present status, impact and possible control measures of invasive alien forest tree species.

Introduction

The spread of invasive alien species (IAS) is creating complexity and far reaching challenges to both natural biological wealth of the earth and well being of its citizens. While the problem is global, the nature and severity of the impacts on society, economic life, health and natural heritage are distributed uneven across nations and regions. Thus some aspects of the problem require solution tailored to the specific values, needs and priorities of nations while others call for consolidated action by the world community. Preventing the international movement of invasive alien species and coordinating a timely and effective response to invasion will require cooperation and collaboration among governments, economic sectors, non-government organizations and international treaty organizations. The problems and scale of solution may appear dauntingly complex, the issue presents an unparalleled opportunity to respond with action that link preservation and management of biodiversity with protection of health and livelihood of the world's human population.

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Impact of Invasive Alien species

Impact at global level

Biological invasion by alien species is one of the major threats to the local biodiversity. The impact of invasive species on indigenous species is immense and irreversible on global level. Climate change, environmental pollution and habitat degradation are threats resulting from intentional and unintentional introduction of tree species to establish in modified habitat. As many as 10% of the world 300,000 vascular plants, have the potential to invade other ecosystem and affect native biota in a direct or indirect way (Rejmanek *et al.*, 2000)

Economic loss is always coupled with biodiversity loss. The invasive alien species may cause enormous economic losses to national economy. The data on economic losses due to invasive alien species in many countries are not available at present though sporadic information on biodiversity losses and environmental degradation have been published. However, it has been reported that just 79 invasive species in USA caused US\$ 97 billion losses from 1906-1991 and another 15 species may cause US\$ 134 billion losses in future (Randall & Marinelli, 1996).

Invasive alien species are causing billions of dollar worth of damage in Southeast Asia in addition to displacement and in some cases extinction of native species. Despite the scale of damage, the importance given to control IAS in the convention on Biological Diversity (CBD) and the many international protocols and initiatives to tackle this issue, almost no attention is paid to this threat in most of the developing countries including Pakistan.

In many cases, the introduction of invasive species resulted in some financial benefits, but the main question pertaining to significant losses in terms of biodiversity values and skills remain unattended. It is generally believed that the damage caused to biodiversity through species extinction and disruption of natural ecosystem is far greater than benefits of introduced invasive species.

The rate of introducing alien species is greatly increasing with the globalization of trade and more people traveling around the world. Moreover as natural areas are transformed by rapid development, the openings for invasion are more numerous.

There is often a short-term advantage of planting an exotic species in places where its natural pests and diseases are absent. In some cases these species spread out of control displacing natural vegetation and profoundly changing the natural ecology. The Chinese Super – tree *Paulownia tomentosa*, for example, is listed as invasive in many countries. Several introduced conifers have become established in the Southeast Asian region and the spread of