

# Development of Root-Carving Industry Leads to Ecological and Environmental Degradation in China

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## Abstract

Root-carving artwork is among the most highly appreciated traditional forms of art in China because of its ornamental and collection value. However, this ancient and highly appreciated art form is in fact currently a major cause of environmental damage. We argue that the state and local forestry administrations and related industry associations should develop more effective measures to better manage the root-carving industry and thus reduce environmental damage currently associated with it. This article presents some insights on this issue, including suggested improvements for supervision of the illegal excavation of tree roots in mountain areas; tracing the source of the root-carving artwork raw materials; formulating detailed regulations supervising root diggers; enforcing rules and regulations to market trading of root-carving raw materials and artworks and imposing heavy fines for the artworks that are carved from roots of rare and protected species.

**Keywords:** Root-carving artwork; Tree root; Environmental damage; Current situation; Measures

## Introduction

Root-carving artwork is among the most highly appreciated traditional forms of art in China because of its ornamental and collection value. Because of the beautiful shape and the rich cultural elements, root-carving artworks are often bought by both Chinese and international collectors as adornments and investment goods [1]. The price of root-carving artwork has increased considerably in recent years. For example, the giant root-carving artwork named “the century elephant” was sold for RMB 600,000 (~\$96,400) in 2004. A giant lion root-carving artwork, “the king of the forest” was sold for RMB 18 million (~\$2.89 million) on an exhibition in Shanxi Province in 2011 [2]. In response to this increasing demand for root-carving artworks, the demand and supply of root-carving artwork more doubled between 2007 and 2012 (Figure 1). However, what we argue here is that this ancient and highly appreciated art form that was designed to celebrate nature is in fact currently a major cause of environmental damage [3-4].

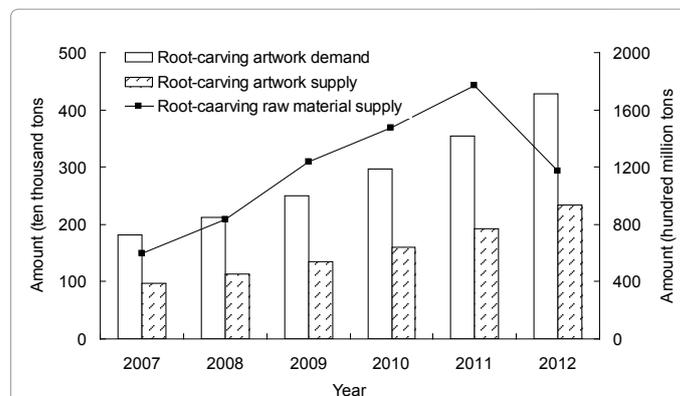
## Root-Carving Industry Leads to Ecological and Environmental Damage

Most root-carving artworks are sculptured into figures, animals and other objects based on the natural texture and shape of tree roots. This entails that tree roots with particular shapes and textures are primarily used as raw material. Such roots in turn tend to be produced by slowing, long-lived tree species common to fragile habitats such as cliffs or valleys that tend to be covered with thin soil layer [5, 6]. In such habitats excavation of tree roots can lead to irreversible soil degradation [7]. In addition the slow growth of the tree species involved entails that recovery of vegetation is very slow.

The development of root-carving industry has therefore resulted in a series of ecological and environmental problems. For example, the Bagui Metropolis Daily has pointed out that active root excavation currently takes place in parts of Guangxi province rocky mountain. This area is characterized by both steep and tall mountain slopes with thin and fragile soils. It generally takes 600 to 1500 years to dissolve

30 cm thick rock and accumulate 1 cm thick of soil parent material. However, it only requires 1 to 2 years of root excavation to, these soils that were formed accumulated over thousands of years to be washed away.

Producers of root-carvings can acquire raw materials either by excavating roots themselves or by purchasing roots from farmers.



**Figure 1:** The demand and supply of root-carving artwork and its raw material from 2007 to 2012 in China (Data resources: <http://cn-report.com/report/107951.html>, based on the registries root-carving and root-carving raw material supply company (Editor, 2013)

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However, due to uncertainties associated with obtaining material indirectly, purchasing roots is usually favored. This generally results in a rather uncontrolled exploitation of roots [8]. According to an interview of resources and forest governance director of Forestry Bureau of Shandong Province, the excavation of 1 m<sup>3</sup> of roots, results in the destruction of at least 4-6 m<sup>2</sup> of vegetation and the loss through erosion of 4 m<sup>3</sup> soils. Thus, the 1769.9 hundred million tons of roots that were excavated for roots carvings in 2011 (Figure 1) likely entailed the destruction of 1.31 - 1.97 million km<sup>2</sup> of forest and 1.31 trillion m<sup>3</sup> of soil erosion.

According to news reports [9], there are a large number of unregistered root-carving workshops and root-carving raw material diggers in root-carving regions. Tree roots were illegally dug by local farmers, but as these farmers often have insufficient expertise, a lot of tree roots thus obtained cannot be used as root-carving raw materials. According to reporters' investigations on private root-carving workshops, a large number of root-carving artworks become damaged or are destroyed in the process of production and storage, and could not flow into the market and are thus wasted [10]. These factors entail that the real environmental damage caused by the root-carving industry, is probably much larger than the statistics mentioned above suggest.

Tree root excavation has both faster and considerably more negative impacts on forest ecosystems than logging, the common form of tree destruction and a major issue in conservation [11]. This is because with root excavation their ability to fix the soil is immediately lost, and as noted, this greatly enhances the probability of soil erosion. A study in Fujian province of southeast China on the impact of *Pinus massoniana* Lamb roots on soil and water erosion showed that the quantity of soil loss in plots where stumps roots were excavated was 3.5 times faster than that in plots where stumps roots were not excavated under the same heavy rain conditions [7].

### The Present Countermeasures on the Ecological and Environmental Problems Caused by the Root-Carving Industry and Current Situation

In response to the ecological and environmental problems caused by the root-carving industry, the State Forestry Administration of China has drawn up relevant laws and regulations in an attempt to ban the excavation of tree roots in the protected areas. For example, according to article 41 of "Regulations on the implementation of forestry law of the People's Republic of China", persons who damages forest or forest wood (for example, destroy forest to collect seeds or violate rules of operation technique to extract stumps, debark or over lop) should compensate the losses according to the law. Furthermore the competent forestry authority of people's government should order cessation of the illegal conduct, replant trees of 1 to 3 times the amount of destroyed stems, and may impose a fine of 1 to 5 times the value of destroyed forest wood. Article 51 of "Soil and Water Conservation Law of the People's Republic of China" stipulates that for any conduct of turf cutting or root digging in the key areas, the competent water resources department of a local people's government may order a cessation of the illegal conduct and take of remedial measures, confiscate illegal gains, and impose a fine of not less than 1 but not more than 5 times of the illegal gains. In case of no illegal gains, a fine of no more than RMB 50,000 may be imposed. The China Root-Carving Association also has applied certain measures. All root-carving artworks presented in the National Root-Carving Competition, for example, were required to be carved with dead tree stumps and roots.

Unfortunately, due to the lax enforcement of these laws and regulations, and the lack of supervision of illegal excavation, illegal root excavation continues in many parts of China despite some progress having been made. In many places, restrictive laws and measures have been largely ignored as roots can be traded illegally via many black market channels. In addition, as the laws and regulations have made it more difficult to acquire root material, prices have risen which has further stimulated illegal excavation. Overall, the result has been that the total volume of excavated roots in China has steadily increased and the consequences have been getting worse (Figure 1).

### Some Opinions on How to Improve the Current Situation

We argue that the state and local forestry administrations and related industry associations should develop more effective measures to better manage the root-carving industry and thus reduce environmental damage currently associated with it. Firstly, the state, provincial and local forestry administrations should intensify supervision of the illegal excavation of tree roots in mountain areas, especially the main producing areas of root-carving such as Jiangsu, Guangdong, and Zhejiang provinces (Figure 2). Secondly, the root-carving artworks, especially large expensive ones, should indicate the source of the raw materials, so that they can be traced to the locations where the root-carving raw materials come from. At the same time, it is better for the China Forestry Administration to formulate detailed regulations supervising root diggers to level up the land and plant trees immediately after excavation rather than prohibit excavation. In addition, local forestry authorities should enforce rules and regulations to market trading of root-carving raw materials and artworks. In order to make the root-carving industry healthier, the forestry authorities should impose heavy fines or confiscate the artworks that are carved from roots of rare and protected species. Now is the time for comprehensive and effective solutions for this problem and for protecting its natural beauty and values of forests in China.

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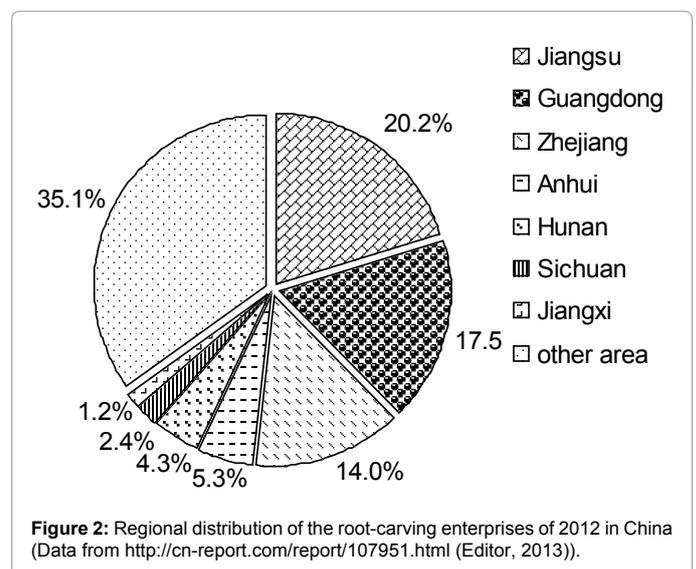


Figure 2: Regional distribution of the root-carving enterprises of 2012 in China (Data from <http://cn-report.com/report/107951.html> (Editor, 2013)).

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