Perpetuating the myth of the return of native forests

Tracy Van Holt1,2* and Francis Edward Putz3

Viña et al. imply that native forests account for China’s marked increase in tree cover and that tree plantations play a minimal role. All 71 tweets linked to the article reinforce the idea that China’s native forests are returning, whereas a review of their methodology indicates that it is not likely accurate. Referring news articles (n = 19) were dominated by terms associated with native forests, whereas tree plantations were rarely mentioned.

The results presented by Viña et al. (1) relating to China’s marked forest recovery are interesting but beg many questions. Surprisingly, the authors use “tree cover” and “forest cover” interchangeably, and they do not mention “plantations” at all in their paper, which implies that the increased forest cover is entirely recovered native forests. However, we know that this cannot be true. It is possible for Viña et al. (1) to make this claim because they use the Food and Agriculture Organization (FAO) definition of forest that aggregates tree plantations and native forests, because FAO does not classify tree plantations as an “agricultural” land use (2). This aggregation is worrisome and even more so because it was not explicitly explained in the article by Viña et al. (1). We are not the only scientists concerned about China’s reforestation efforts and the focus on plantations to replace tree cover that was originally natural forests (3).

Even a plantation with a very large number of trees and a closed canopy does not make a forest. Given that monocultural plantations are so distinct from native forests in terms of their role in the biosphere, and the important ecosystem services that native forests provide to human beings that are not provided by plantations, these two

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Table 1. All the tweets associated with Viña et al. (1) were associated with native forests and not tree plantations.

<table>
<thead>
<tr>
<th>Tweets classified by category</th>
<th>Number of tweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest regrowth</td>
<td>44</td>
</tr>
<tr>
<td>Logging bans are helping to boost China’s forest regrowth</td>
<td></td>
</tr>
<tr>
<td>China’s forest regrowth may be receiving a boost from logging bans via @ScienceAdvances</td>
<td>1</td>
</tr>
<tr>
<td>50New #ScienceAdvances: Logging Bans Are Working to Boost China’s Forest Regrowth</td>
<td>1</td>
</tr>
<tr>
<td>Forest recovery</td>
<td>20</td>
</tr>
<tr>
<td>Effects of conservation policy on China’s forest recovery</td>
<td>3</td>
</tr>
<tr>
<td>China is increasing tree cover. Effects of conservation policy on China’s forest recovery</td>
<td>15</td>
</tr>
<tr>
<td>Conservation policy has increased forest recovery in 1.6% of China’s territory via @ScienceAdvances</td>
<td>1</td>
</tr>
<tr>
<td>China gov logging bans &amp; monitoring to prevent illegal logging has been instrumental in enhancing forest recovery</td>
<td>1</td>
</tr>
<tr>
<td>Reforestation</td>
<td>3</td>
</tr>
<tr>
<td>Encouraging on China’s reforestation gains since 2000</td>
<td>2</td>
</tr>
<tr>
<td>Dinamiche di ricostituzione della foresta in Cina</td>
<td>1</td>
</tr>
<tr>
<td>Forest conservation</td>
<td>3</td>
</tr>
<tr>
<td>Look at the forests conservation policy in China over the past decade plus #IntForestDay</td>
<td>2</td>
</tr>
<tr>
<td>In #China, forest conservation policy appears to be working, Important @ScienceAdvances study</td>
<td>1</td>
</tr>
</tbody>
</table>

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Fig. 1. Classification of tweets associated with Viña et al. (1). All tweets (n = 71) refer to forest regrowth, forest recovery, reforestation, and forest conservation, and there was no mention of tree plantations. [Note: percentage of tweets per category shown]
types of tree cover need to be carefully differentiated. Remote sensing experts struggle to find techniques that differentiate native forest from tree plantations, especially at large scales. However, despite this challenge and because FAO does not consider tree farms as agriculture based on its particular typology, scientists must be very clear about the difference between a fiber farm and a forest. Otherwise, researchers interested in the theories that explain the recovery of native forests have begun to address this basic methodological issue (9–12). The lack of clarity in the Viña et al. (1) paper about the distinction between tree plantations and native forests led to misinterpretation by the public, specifically the public that is tracked by Science’s AltMetrics tool.

**RESULTS**

Most media coverage of the work of Viña et al. (1) reported that native forests are recovering in China. All the tweets implied that this article refers to the return of China’s native forests (Table 1 and Fig. 1). Of the 71 tweets, 44 referred to “forest regrowth,” 20 were about “forest recovery,” and 3 each were about “reforestation” and “forest conservation.” News articles referring to Viña et al. (1) (Table 2 and Fig. 2) only referred to tree plantations 4 times in total, whereas native forest terms were far more prominent (41 times); tree cover, a more general term that can refer to native forests or tree plantations, was mentioned 41 times; and native forest terms occurred as well (15 times). In addition, many of the new trees are part of single-species plantations, often replacing biologically diverse forests (16).

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CONCLUSIONS

Fiber farms are farms, not “recovering forests.” We need tree plantations, but if we lump them with forests, then we are incorrectly modeling, studying, and analyzing forest and landscape change dynamics, and their effects on people and the environment. To develop and test improved approaches, we need to know the conditions under which incentives to regenerate native forests fail and when tree-planting programs succeed (13). If native forests are not differentiated from plantations in official definitions and research, we will fail to address challenges in the Anthropocene, which require us to understand linkages across different components of the biosphere.

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Acknowledgments

Competing interests: The authors declare that they have no competing interests. Data and materials availability: All data needed to evaluate the conclusions in the paper are present in the Info & Metrics section of Viña et al. (1) on advances.sciencemag.org. Additional data related to this paper may be requested from the authors.

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