

**TABLE 1 – KEY CRITICISMS ANSWERED**

Page and paragraph	Criticism	Our response
4 – 2	<p>Elements ignored by the Ecological Footprint calculations represent the majority of today’s ecological problems.</p> <p><b>ORIGINAL : La liste des éléments ignorés par l’empreinte concentre ainsi la majeure partie des problèmes écologiques.</b></p>	<p>Environmental challenges can be divided into two categories: a) toxics and pollution, often with direct threats to human health, and b) over-exploitation of resources and biological capacity, or threats to the ecosystems (croplands, fisheries, forests, etc.) that form the direct underpinning of human well-being. While the environmental community in the twentieth century largely focused on problems in the former domain (and many measurement tools and regulations are now in place to attack those), the sheer scope and scale of the human economy has made the latter domain more and more relevant. We believe that this over-exploitation poses a large, underestimated risk to humanity in the twenty first century.</p> <p>The Ecological Footprint framework was specifically conceived to address this latter domain. It is an answer to a specific, well-defined research question (“how much of the regenerative capacity of the biosphere is occupied by human activities?”). It is this research question which is the “DNA” of Footprinting science.</p> <p>We explicitly state (including in the Footprint standards at <a href="http://www.footprintstandards.org">www.footprintstandards.org</a>) that the Footprint only covers use of those materials that are biological in nature, consistent with its focus on the use and availability of ecosystem goods and services. In contrast, those aspects that are inherently unsustainable need to be phased out, and are not captured by the Footprint. For instance persistent pollutants such as CFCs, PCBs, or heavy metals are not covered by the Footprint research question. They need to be addressed primarily with other measures. The effects on ecosystems associated with these toxic materials, however, are reflected indirectly in Ecological Footprint accounts through both the biological capacity required for their creation (e.g., energy, built-up land area) and the eventual decrease in ecosystem production that results when they are released into the environment.</p>
5-2	<p>Global Footprint Network has selected forests that seem to have a strong sequestration potential as a reference area for estimating the carbon Footprint, i.e., the biologically productive surface capable of sequestering anthropogenic carbon emissions. According to van den Bergh and Verbruggen, who question this choice, the calculation of the carbon Footprint which promotes afforestation for sequestering carbon would be both impractical and economically unrealistic</p>	<p>The Ecological Footprint in no way advocates planting forests as the primary solution to climate change. The results actually point out the opposite - that at present, the biosphere is unable to cope either through forest growth or other measures with the large amounts of carbon dioxide emitted by human activities. The accounts reflect this state by showing a large demand for waste sequestration capacity in excess of what is available. Thus we agree with Piguet et al. in recognizing that clearly the biosphere is unable to address anthropogenic emissions of carbon today, and that afforestation is not a viable solution.</p>

	<p>ORIGINAL : Les forêts semblant avoir un fort potentiel de séquestration du carbone, le GFN les a sélectionnées comme espace de référence pour estimer l'empreinte carbone, soit la surface biologiquement productive capable de séquestrer les émissions de carbone anthropogène.</p> <p>Selon Van den Bergh et Verbruggen, qui remettent en cause ce choix, le calcul de l'empreinte carbone dénoterait le projet d'étendre les surfaces forestières afin de séquestrer du carbone, ce qui serait non praticable et « irréaliste dans une perspective économique »..</p>	
10-2	<p><i>A carbon Footprint based upon an arbitrary sequestration rate?</i></p> <p>Due to the incapacity to discern the overexploitation of natural resources, the calculation of the carbon Footprint becomes a major challenge, especially because it accounts for half of humanity's Footprint. The 1.06 gha per capita for the carbon Footprint (table 2) are calculated based on the net emissions of 5 gigatonnes of carbon per hectare per year (5 Gt C yr<sup>-1</sup>). This number of 1.06 gha per capita is nevertheless somewhat hypothetical since it indicates a biologically productive area, which should be at our disposition, i.e. a non-existent space or a potential.</p> <p>ORIGINAL : Une empreinte carbone basée sur un taux de séquestration arbitraire ?</p> <p>Du fait de cette incapacité à discerner la surexploitation des ressources naturelles,</p>	<p>Calling the carbon Footprint “hypothetical” is one of the most common misunderstandings of Ecological Footprint accounting dating back to an article by van den Bergh and Verbruggen. In their 1999 article, they called the carbon Footprint in excess of biocapacity “hypothetical”. In our Ecological Footprint accounts, we show that humanity demands more global hectares than are available whenever it harvests resources faster than they regenerate. This is “overshoot” – not hypothetical. For instance, harvesting 10 hectares of forest for timber at 50 percent above its regeneration rate is shown as demanding the equivalent of 15 hectares worth of forest production. The missing 5 hectares of timber land is not “hypothetical.” Rather it measures the extent of overshoot. Hence Ecological Footprint accounting compares actual available capacity with actual human demand.</p> <p>Similar to demanding forest for timber, CO<sub>2</sub> emissions represent actual, physical waste products released into the biosphere that demand sequestration capacity. The amount of carbon that can be sequestered per hectare of global forest can be analyzed from a number of perspectives, but we believe our estimates, based on United Nations Food and Agriculture Organization and IPCC accounting methods are the most widely accepted sources. The calculation sheet of our assessment is available from Global Footprint Network website (<a href="http://www.footprintnetwork.org/criticism">www.footprintnetwork.org/criticism</a>). Also see discussion above regarding the accurate framework for conceptualising the carbon sequestration factor.</p>

	<p>le calcul de l’empreinte carbone devient un enjeu majeur, d’autant qu’elle compte pour la moitié de l’empreinte totale. Les 1,06 hag <i>per capita</i> de l’empreinte carbone du tableau 2 sont calculés à partir d’émissions nettes de 5 gigatonnes de carbone par hectare et par année (5 GtCan-1). Ce chiffre de 1,06 hag <i>per capita</i> a cependant quelque chose d’hypothétique puisqu’il indique un espace biologiquement productif qu’il faudrait avoir à disposition, un espace non existant, un <i>potentiel</i>.</p>	
13-2	<p>The Footprint leads the public astray by proposing a single cause for the disruption of our planet for which it provides evidence. It indicates that we would need three planets if everybody in the world adopted a French lifestyle (5.6 gha per person / 1.8 gha per person = 3.1) however four planets would be necessary if each inhabitant of the earth produced as much carbon as a Frenchman or woman (2 tC / 0,5 tC = 4).</p> <p><b>ORIGINAL</b> : L’empreinte induit le public en erreur sur la seule cause de dérèglement de la planète qu’elle met en évidence. Elle indique qu’il faut seulement trois planètes en cas de généralisation du mode de vie moyen des Français (5,6 hag / 1,8 hag = 3,1) mais quatre planètes sont indispensables si chaque Terrien émet autant de carbone qu’eux (2 tC / 0,5 tC = 4).</p>	<p>Many sources quote the 0.5 t carbon emission per person and year (or 1.8 t of CO<sub>2</sub>) as the greenhouse gas amount that could be emitted presently without further increasing the CO<sub>2</sub> concentration in the atmosphere (<b>assuming no other land-use, productivity, and population change</b>). While this number is consistent with our accounts, we do not use it as a reference point. Rather we compare the overall demand of humanity (for carbon sequestration, timber, food etc.) against overall biocapacity.</p> <p>We do not agree that dividing the amount of carbon emissions per person by the 0.5 t of carbon per person and year can be interpreted as “number of planets necessary if everybody lived like this person.” The only way to draw such conclusions as to how many planets are necessary in the aggregate, considering all land types, is to perform an analysis that considers all land types. Accounting only for carbon ignores the potential for substitution between land types or for changing management practices. This carbon ratio thus in no way accurately reflects the “number of planets” necessary, and cannot be directly compared to our estimate of “number of planets used by humanity” or “numbers of planets used if everybody lived like a given person”. The reason is simple: the carbon sequestration service is just one of many other services nature provides.</p>