

## Supplementary material

**Tab. S1** - The table summarizes the production of space (i.e., the actions and representation on the forests) related to different forest functions and the consequent effects of these actions on the forest space (product space), highlighting the final change on the space appearance of the forest (in capital letters).

<i>Forest Functions</i>	<i>Production of space</i>	<i>Space effects on the forest</i>
<b>Timber supply</b>	<ul style="list-style-type: none"> <li>• Field surveys to identify, quantify and map forest resources, i.e. the composition (main species useful as industrial roundwood), accessibility, property, volume, etc.</li> <li>• Selection of different management practices (e.g., excluding the coppice system) and limitations to the rights of local communities</li> <li>• Selective felling of tree species, transformation and transport of timber</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of forest parcels, e.g. through different colors and numbers marked in the field</li> <li>• Accessibility, through roads, slopes, cables, etc., for increasing cut and yards.</li> <li>• Sawmills and warehouses for timber</li> <li>• Change in forest composition (e.g., conifers instead of broadleaves, pure instead of mixed forests), forest structure (e.g., even-aged instead of uneven-aged forests), age structure, etc.</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE APPEARANCE OF A PRODUCTIVE “HIGH FOREST” SYSTEM</b></p>
<b>Fuelwood</b>	<ul style="list-style-type: none"> <li>• Field surveys to identify, quantify and map forest resources, i.e. the composition (main species useful as fuelwood), accessibility, property, volume, etc.</li> <li>• Selection of different management practices (e.g., the coppice system) and limitation of the rights of local communities</li> <li>• Selective cutting of coppice and transport of fuelwood</li> <li>• Production of charcoal</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of forest parcels, e.g. through different colors and numbers marked in the field</li> <li>• Accessibility, through roads, slopes, cables, etc., for increasing cut and yards.</li> <li>• Charcoal production areas</li> <li>• Change of forest composition (e.g., broadleaves instead of conifers), forest structure (e.g., even-aged instead of uneven-aged forests), age structure, etc.</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE APPEARANCE OF A PRODUCTIVE “COPPICE” SYSTEM</b></p>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• Traditional slash-and-burn around local communities</li> <li>• Mechanical deforestation</li> <li>• Cutting stumps</li> <li>• Parceling out of the new area</li> <li>• Replacement of common property rights with individual property rights</li> </ul>	<ul style="list-style-type: none"> <li>• Deforestation halo around the villages</li> <li>• Progressive expansion of clearings and pioneer frontier</li> <li>• Replacement of forested areas with croplands, pastures, human settlements or even new forest plantations</li> <li>• New roads, villages and human settlements and activities.</li> </ul> <p style="text-align: center;"><b>THE ORIGINAL FOREST SPACE DISAPPEARS REPLACED BY OTHER SPACES</b></p>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>• Space representation of the forest as a sacred space, deputed to specific myths and rites (e.g., initiation rites).</li> <li>• Specific legislation (e.g., Romans <i>luci</i>) to protect and manage sacred forest areas</li> <li>• Specific legislation (e.g., natural parks) to protect and manage forest tourism areas</li> <li>• Space representation of the forest as a “recreational zone”</li> <li>• Planning and implementation of specific equipment for a “cultural fruition” of the forest space</li> </ul>	<ul style="list-style-type: none"> <li>• Sacred forests, including construction of temples, religious markers (e.g., crosses) and identification of other spaces deputed to religious activities</li> <li>• Marked itineraries, viewpoints and protected areas to increase the tourist use of the forest</li> <li>• “Enhanced Forests”: i.e., adventure parks with suspended equipped paths or virtual reality (i.e., simulations of changes over time)</li> <li>• Forest as “trial space”: hunting, orienteering, war games, etc.</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE APPEARANCE OF A “SACRED” OR RECREATIONAL SPACE</b></p>

<i>Forest Functions</i>	<i>Production of space</i>	<i>Space effects on the forest</i>
<b>Protective</b>	<ul style="list-style-type: none"> <li>• Studies and field surveys to identify, quantify and map the forest potential to prevent and act against landslides, avalanches, wind erosion, etc.</li> <li>• Selection of specific management practices (e.g., excluding the clearcut system) to increase the protective function</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of the forest parcels deputed to specific protective function</li> <li>• Effects related to a change in forest management practices, e.g., (i) on a mountainside, taller stumps left after felling the trees, in order to reduce avalanches; (ii) near the coastline, a forested “green belt” (i.e., with maritime pine) to limit soil erosion; (iii) along rivers or in alluvial areas, a forested belt to prevent possible flooding and erosion</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE APPEARANCE OF A PROTECTIVE AREA AGAINST NATURAL DISTURBANCES</b></p>
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>• Studies and field surveys to identify, quantify and map the forest biodiversity potential</li> <li>• Specific legislation to protect and manage natural forest areas and their different resources</li> <li>• Planning and implementation of specific infrastructure for biodiversity preservation</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of the forest areas deputed to this specific function: natural parks, ecological corridors, buffer zones, reserves, etc.</li> <li>• Limiting the forest management practices and, in some cases the access to the area, to protect, increase and study natural resources (“naturalization”)</li> <li>• Linking of forest areas through ecological corridors, bridges for animal species over highways and railways, river corridors, etc.</li> <li>• Limiting the use of non-wood resources, including animals (e.g., selective hunting or birdwatching), other vegetation, pharmaceutical plants, etc.</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE APPEARANCE OF A “NATURAL”, PROTECTED, WELL-DEFINED RESERVE</b></p>
<b>Carbon storage-sink</b>	<ul style="list-style-type: none"> <li>• Studies and field surveys to identify, quantify and map the forest carbon stock and stock change, also through the use of forest models</li> <li>• Specific legislation to increase and manage the carbon resources, through carbon credits, clean development mechanisms and international agreements (e.g., Kyoto Protocol)</li> <li>• Afforestation, reforestation and other activities aimed to increase the forest carbon stock capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Expansion of the forest area</li> <li>• Use of specific tree species (i.e., fast growing species), Short Rotation Forests (SRFs)</li> <li>• Specific management practices aimed to increase the forest carbon storage capacity (i.e., “Kyoto Forests”)</li> </ul> <p style="text-align: center;"><b>THE FOREST ASSUMES THE ROLE OF CARBON STORAGE</b></p>