

# INTEGRATED MARTELOSCOPES VIRTUAL TOURS

## VIRTUAL TOUR CREATION MANUAL

# PICTURE SHOOTING:

## Placement

- One panoramic shot from the center of each quadrant or stand.
- In case of quarters of similar characteristics or typology one picture will be enough for each typology.

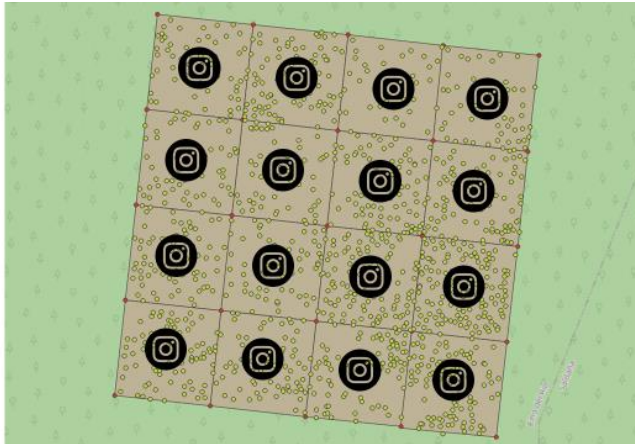



Figure 1 : Schematic representation of a marteloscope representing the sixteen 1000m<sup>2</sup> quadrants and a panoramic camera  in the center of the quadrants.

## Camera:

There are three basic ways to shoot a panoramic picture in forestry.

- Panoramic 180°360° camera with tripod (cost 200 to 2000 Eu)
- Smartphone with Street view (APP) + tripod + smartphone adaptor (Figure 2)
  - (cost: 10 to 200 Eu)
    - **Tutorial**
      - Browse in internet: (i.e.) “Smartphone + panoramic adaptor”

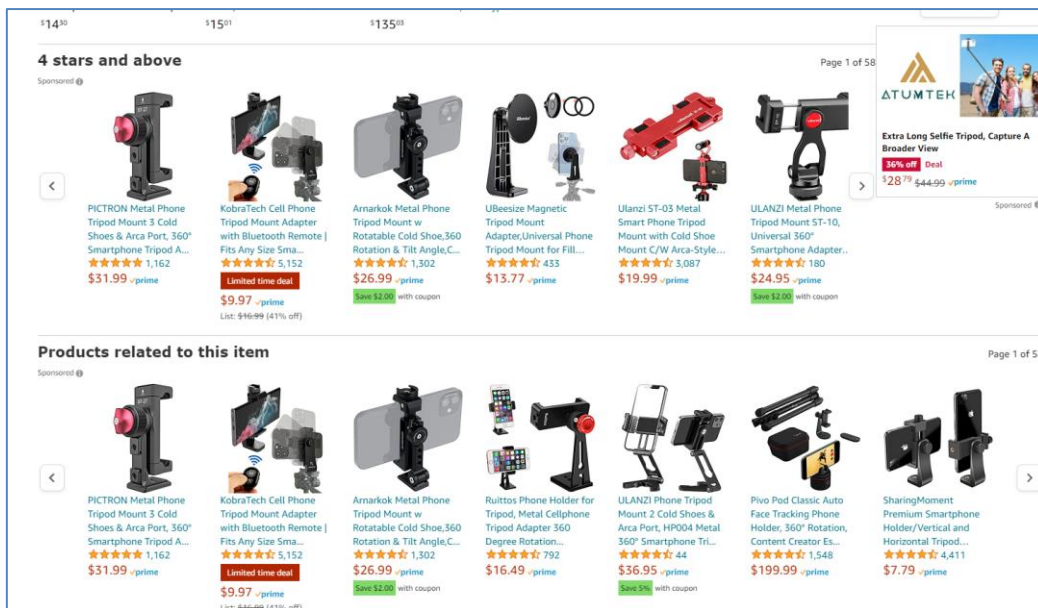


Figure 2: Tripod nodal head adaptors for panoramic images shooting with Smartphone (ex. Internet browsing: “panaramic image adaptor + Smartphone”)

1. Reflex camera + tripod + nodal head (200 – 300Eu) + photostitching software (comercial or free)

- **Tutorial**

The best quality panoramic pictures are obtained shoopting a series of overlapping pictures with a reflex camera and photo-stitching the pictures with a specific software) (**tutorial**)<sup>1</sup>. Shooting a series of overlapping pictures is also possible with a smartphone and the Street view App. Good quality panoramics are also obtained in this process. Both processes, are time consuming and require a specific nodal head or camera adaptor (Figure 2). Using specific panoramic cameras no photo-stitching software and stitching process will be needed.

According to the goals of the present project, we shot the pictures with a simple panoramic camera<sup>2</sup> using a basic camera tripod or a camera stick (selfie stick).

<sup>1</sup> <http://sostenible.palencia.uva.es/content/virtual-forest-tours>

<sup>2</sup> Ricoh Theta SC2 and Ricoh Theta X



*Figure: 3 . Panoramic picture shooting with camera stick (selfie stick). Marteloscope Vietnam National University of Forestry (Xuân Mai, Chương Mỹ, Vietnam, april 2023).*

For all the panoramic cameras specific user manuals and video-tutorials are easily found in the official webpages of the camera or in the internet<sup>3</sup>.

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<sup>3</sup> [https://support.theta360.com/en/manual/v/content/shooting-photo/shooting\\_photo\\_02.html](https://support.theta360.com/en/manual/v/content/shooting-photo/shooting_photo_02.html)



## EDITING IMAGES

Using specific panoramic cameras normally no photoediting is needed. In our case, only in some cases colour correcting was performed. A simple free photo editing software<sup>4</sup> was used in this cases. No further panorama editing was performed. The tripod, selfie stick and other imperfections were not corrected. All the panoramic pictures were resized to 7.5 MP (4K) (2/1: 6000 to 3000 pixels).

## CREATING POINTS OF INTEREST - Martelscopes

A specific walkthrough cannot be created without specialise commercial virtual tour programs<sup>5</sup>. No specific virtual tour software or platform was used for the virtual tour creation. According to the goals of this project a simple protocol was designed based on free use platforms.

In a first step, for each marteloscope, google maps point of interest were created (browse: add missing place to Google map).

Also in this part of the process, many tutorial and videos can be easily found in the internet (example below: [link](#)<sup>67</sup>).

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<sup>4</sup> <https://www.irfanview.com/>

<sup>5</sup> <https://www.g2.com/categories/virtual-tour/free>

<sup>6</sup> <https://support.google.com/local-guides/answer/6320846?hl=en&co=GENIE.Platform%3DDesktop>

<sup>7</sup> <https://www.wikihow.com/Add-Places-to-Google-Maps>

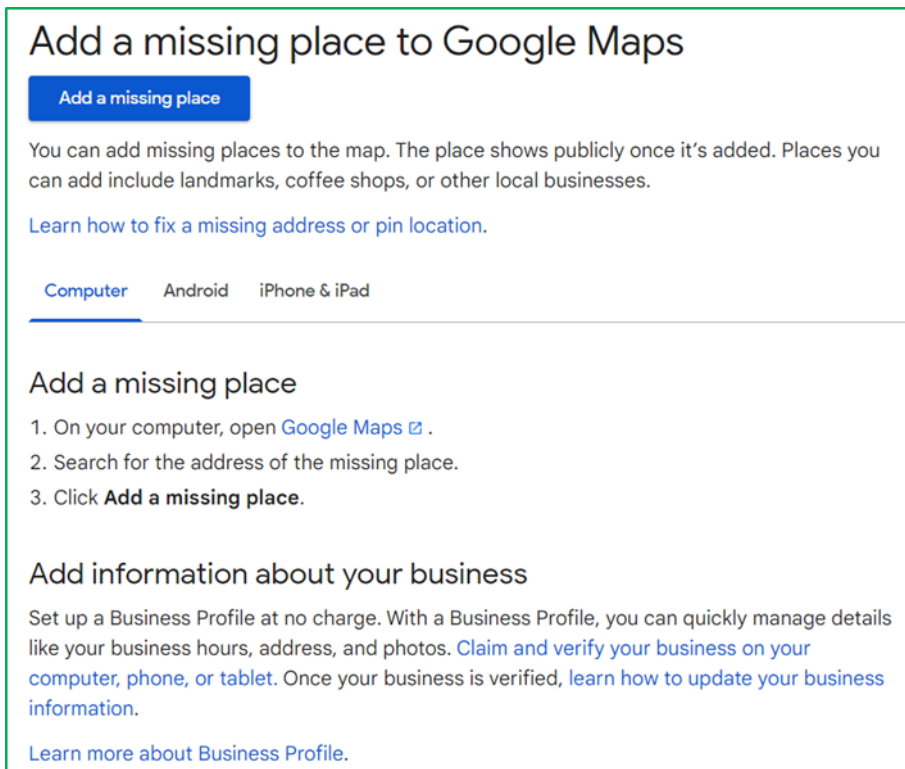


Figure 4. Screenshot from the internet browsing “add missing place to Google map)<sup>8</sup>



<https://youtu.be/CArfZC4mDt0>

<sup>8</sup> <https://support.google.com/local-guides/answer/6320846?hl=en&co=GENIE.Platform%3DDesktop>

## UPLOADING PANORAMAS

Once the point of interest is created and published, the next step will be to upload the panoramas in a logical order. Google maps defines specific requirements for photo-sphere publishing<sup>9</sup>.

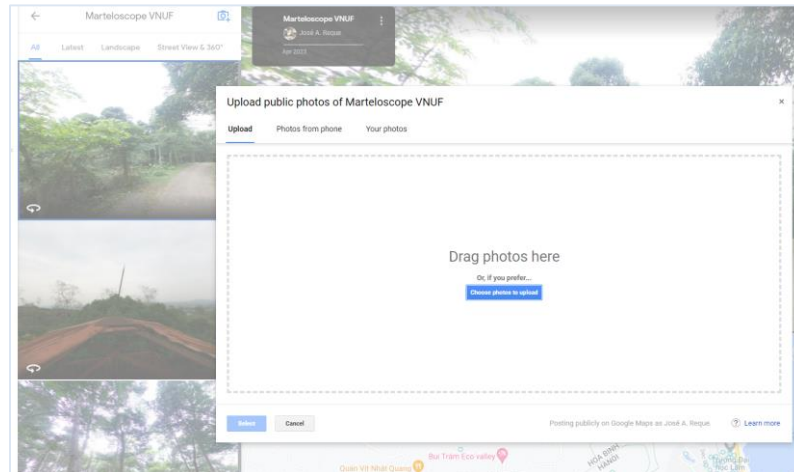


Figure 5. Screenshot of the process of uploading the point of interest: Marteloscope VNUF

Multiple tutorials and video-tutorial can easily be found in the internet.

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<sup>9</sup> <https://support.google.com/maps/answer/7012050?hl=en>

## Create & publish Photo Spheres to Google Maps

You can create Photo Spheres using a 360 camera, or a DSLR system and stitching software such as PTGui, or Autopano. [Find a list of recommended 360 cameras here.](#)

### Popular equipment to use with a DSLR system

DSLR camera	Canon	<ul style="list-style-type: none"><li>• Rebel series: XSi/450D, T1i/500D, T2i/550D, T3i/600D, T4i/650D, XS/1000D, T3i/1100D</li><li>• xxD series: 20D, 30D, 40D, 50D, 60D, 70D</li><li>• xD series : 6D, 7D, 5D series</li></ul>
	Nikon	<ul style="list-style-type: none"><li>• D5000, D5100</li><li>• D90, D7000, D7100</li><li>• D200, D300, D300s</li><li>• D600, D700, D800, D810</li></ul>
Fisheye lens		<ul style="list-style-type: none"><li>• Canon 8-15mm f/4L fisheye lens (Canon mount only)</li><li>• Sigma 8mm f/3.5 EX DG fisheye lens</li></ul>
Panoramic head		<ul style="list-style-type: none"><li>• Nodal Ninja Ultimate R10 with compact 90° rotator</li><li>• 360Precision</li><li>• Acrattech Spherical Panoramic Head (Sigma lens only)</li><li>• Tom Shot 360 (Sigma lens only)</li></ul>
Remote switch		RS-60E3, RS-80N3, MC-30, MD-DC2

### Create multiple Photo Spheres

Figure 6. Screenshot from the internet browsing “publish photospheres to google maps”<sup>10</sup>

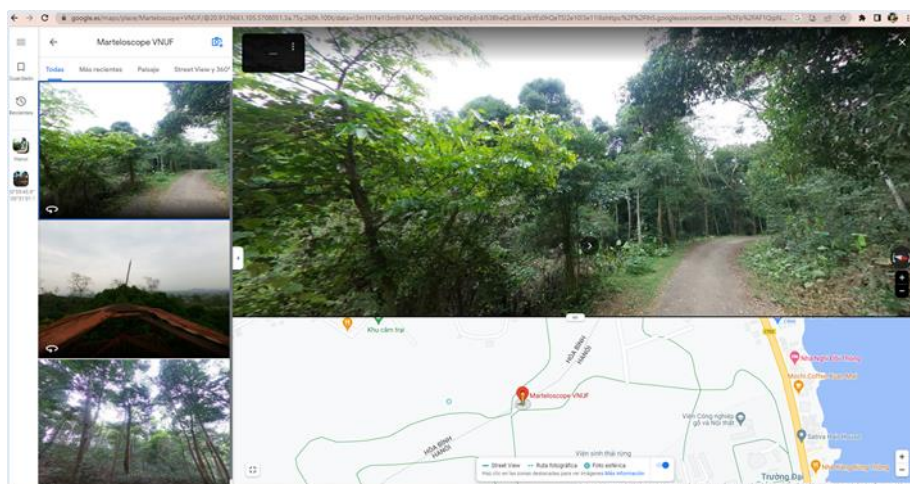
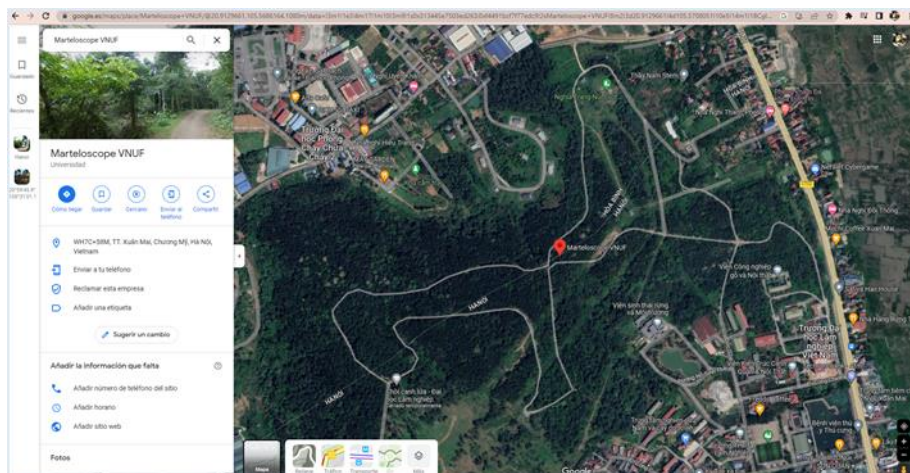
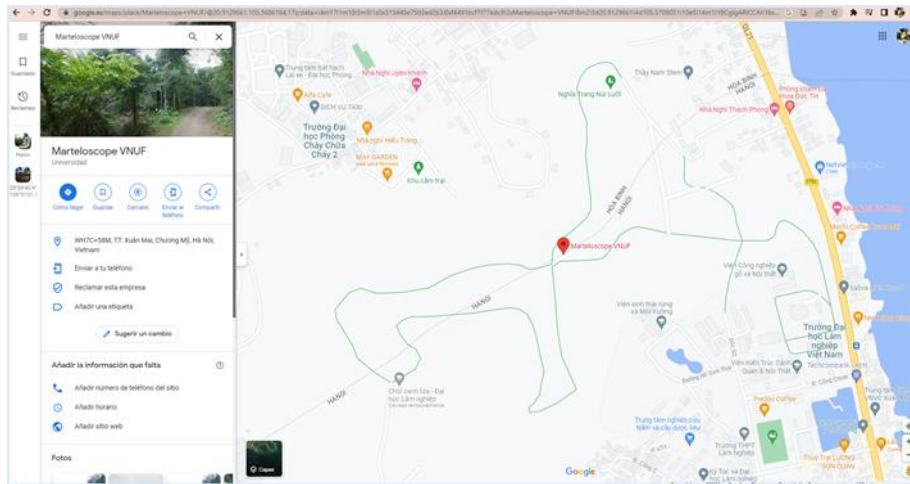
Before publishing all the panoramic pictures were resized to a maximum of 7.5 MP (4K) with a 2:1 aspect ratio and no more than 75 megabytes in size ([link](#)). A free image viewer was used in resizing<sup>11</sup>.

The point of interest (in our case a forest stand or marteloscope) will now be displayed in the google maps platform together with the panoramic pictures. An easy shift from the aerial view to the geo-referenced ground panoramic view is now possible.

<sup>10</sup> <https://support.google.com/local-guides/answer/6320846?hl=en&co=GENIE.Platform%3DDesktop>

<sup>11</sup> <https://www.irfanview.com/>





Figures 7. Screenshots of the virtual tour – point of interest MARTELOSCOPE VNUF (Vietnam) [link<sup>12</sup>. Above: google map, middle: google satellite, below: panoramic 180°x360° view. The virtual tour includes a first image taken from outside of the forest, a second shot from the top of a wildfire observation tower and several pictures shot from inside of the forest.](https://www.google.es/maps/place/Marteloscope+VNUF/@20.9129661,105.5708051,3a,75y,260h,100t/data=!3m1!1e1!3m9!1sAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS!2e10!3e11!6shttps://www.googleusercontent.com/%2Fp%2FAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS%3Dw203-h100-k-no-pi-10-va315.8-ro-0-fo100!7i6000!8i3000!9m2!1b1!2i37!4m1!1m10!3m9!1s0x313445e7503ed263:0xf4491bcf777edc9!2sMarteloscope+VNUF!8m2!3d20.9129661!4d105.5708051!10e5!14m1!1BCgRgARICAA!16s%2Fp%2F11t_tj0_5s!3m6!1s0x313445e7503ed263:0xf4491bcf777edc9!8m2!3d20.9129661!4d105.5708051!10e5!16s%2Fp%2F11t_tj0_5s?entry=ttu)

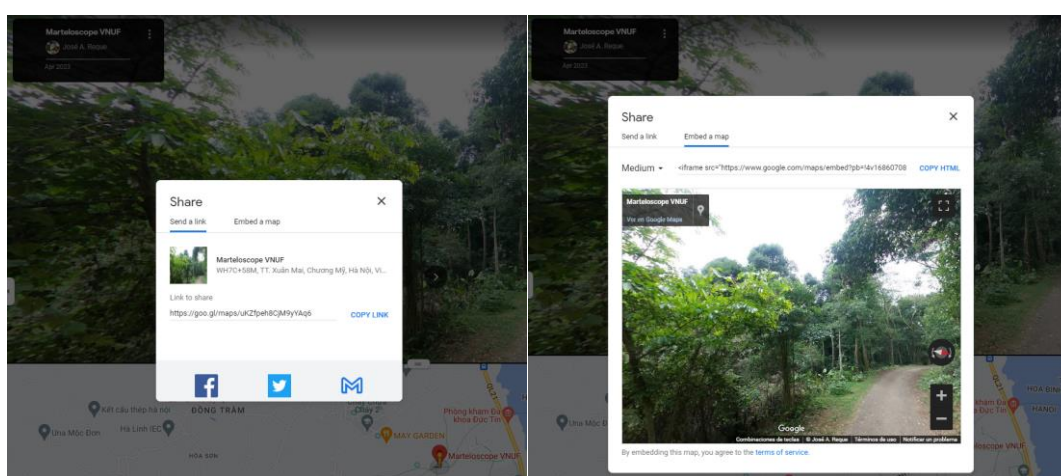
<sup>12</sup>

[https://www.google.es/maps/place/Marteloscope+VNUF/@20.9129661,105.5708051,3a,75y,260h,100t/data=!3m1!1e1!3m9!1sAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS!2e10!3e11!6shttps://www.googleusercontent.com/%2Fp%2FAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS%3Dw203-h100-k-no-pi-10-va315.8-ro-0-fo100!7i6000!8i3000!9m2!1b1!2i37!4m1!1m10!3m9!1s0x313445e7503ed263:0xf4491bcf777edc9!2sMarteloscope+VNUF!8m2!3d20.9129661!4d105.5708051!10e5!14m1!1BCgRgARICAA!16s%2Fp%2F11t\\_tj0\\_5s!3m6!1s0x313445e7503ed263:0xf4491bcf777edc9!8m2!3d20.9129661!4d105.5708051!10e5!16s%2Fp%2F11t\\_tj0\\_5s?entry=ttu](https://www.google.es/maps/place/Marteloscope+VNUF/@20.9129661,105.5708051,3a,75y,260h,100t/data=!3m1!1e1!3m9!1sAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS!2e10!3e11!6shttps://www.googleusercontent.com/%2Fp%2FAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS%3Dw203-h100-k-no-pi-10-va315.8-ro-0-fo100!7i6000!8i3000!9m2!1b1!2i37!4m1!1m10!3m9!1s0x313445e7503ed263:0xf4491bcf777edc9!2sMarteloscope+VNUF!8m2!3d20.9129661!4d105.5708051!10e5!14m1!1BCgRgARICAA!16s%2Fp%2F11t_tj0_5s!3m6!1s0x313445e7503ed263:0xf4491bcf777edc9!8m2!3d20.9129661!4d105.5708051!10e5!16s%2Fp%2F11t_tj0_5s?entry=ttu)

## CREATING THE VIRTUAL TOUR

The point of interest (in our case: Marteloscope - forest) with the uploaded panoramas can be considered a basic virtual tour: It allows to geo-reference the place, it possibilities panoramic view and it permits to move freely from one point (stand) to the other, but Google maps does not offer the option of including hotspots, complementary information or other indication in the panoramas.

In order to create the virtual tour the use of a specific user created webpage or blog is needed. For each marteloscope or forest (point of interest) the sequence of the virtual tour can now be created embedding the image together with map and complementary user defined additional information can be added. In our protocol, using google maps, the uploaded images can be shared or embedded in any ordinary webpage or blog using the “link to share” url of the google maps



Figures 8. Screenshots of the obtention of the “link to share url” (Martelscope VNUF). (link)<sup>13</sup>

The web page can now include, together with the geo-referenced map and panoramas, all the information considered necessary and required complementary information. The adjunct information can include maps, data files, texts, etc... and can easily change according to the academic level and requirements. The same process can also be used in academic – teaching platforms like Moodle or Blackboard. It will correspond to the author of the virtual to define, together with the panoramic, the logical order of the panoramas to be “visited” and the information to be displayed it’s sequence

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[https://www.google.es/maps/place/Marteloscope+VNUF/@20.9129661,105.5708051,3a,75y,260h,100t/data=!1e1!3m6!1sAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS!2e10!3e11!6shttps:%2F%2Fh5.googleusercontent.com%2Fp%2FAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS%3Dw203-h100-k-no-pi-10-ya315.8-ro-0-fo100!7i6000!8i3000!4m7!3m6!1s0x313445e7503ed263:0xf4491bcf7f77edc9!8m2!3d20.9129661!4d105.5708051!10e5!16s%2Fg%2F11t\\_tj0\\_5s?entry=ttu#](https://www.google.es/maps/place/Marteloscope+VNUF/@20.9129661,105.5708051,3a,75y,260h,100t/data=!1e1!3m6!1sAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS!2e10!3e11!6shttps:%2F%2Fh5.googleusercontent.com%2Fp%2FAF1QipNKCSbkYaDtFpEr4J53BheQnB3LaJkYEs0hQeTS%3Dw203-h100-k-no-pi-10-ya315.8-ro-0-fo100!7i6000!8i3000!4m7!3m6!1s0x313445e7503ed263:0xf4491bcf7f77edc9!8m2!3d20.9129661!4d105.5708051!10e5!16s%2Fg%2F11t_tj0_5s?entry=ttu#)



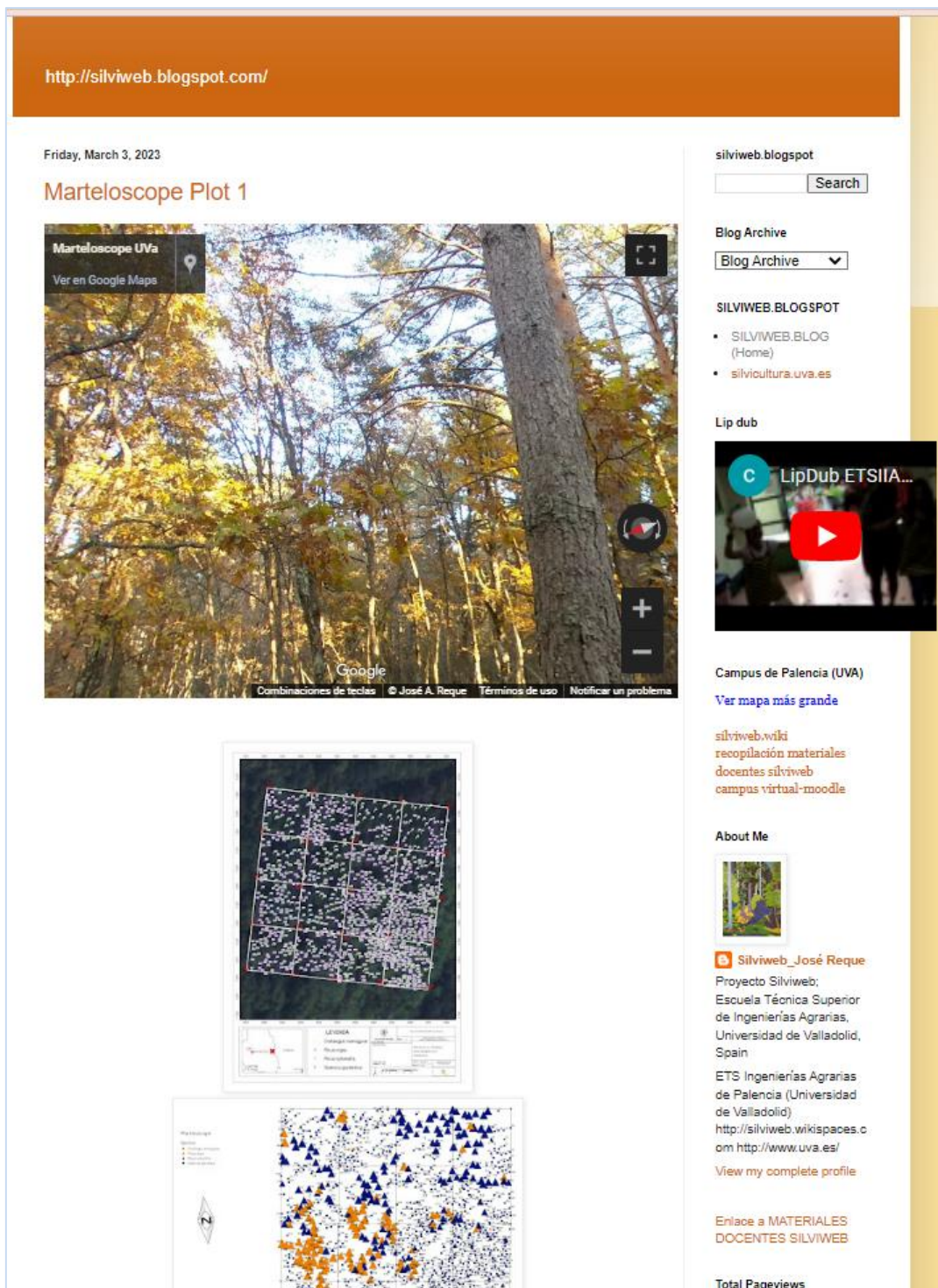


Figure 9: Example of basic free blog with the embed panoramic image and complementary information. Marteloscope UVa. <http://silviweb.blogspot.com/2020/06/test-visita-virtual.html>