



**PART 3: Trees Outside Forests from the air:
A guide for identification**



The following guide has two main objectives:

Provide practical examples of how to interpret any situation in terms of the various classes currently used by the FAO-FRA and the complementary sub-classes that are proposed in this report to take into account the existence of Trees Outside Forests.

Provide a wide range of illustrations to underline the fact that TOF and Other Land with TOF are encountered almost everywhere on earth, from the humid tropics to the boreal zone through the arid and temperate areas of the middle latitudes, in rich economically developed countries as in poor developing countries.

Practical considerations:

The images are extracted from Google Earth. The analysis has been executed without GIS analysis software. Width and length, area, and tree cover percentage are estimated at the scale of the image but are based on visual appreciation.

For each image, and unless stated otherwise, the analysis does not take into account the land-use / land-cover areas outside the image.

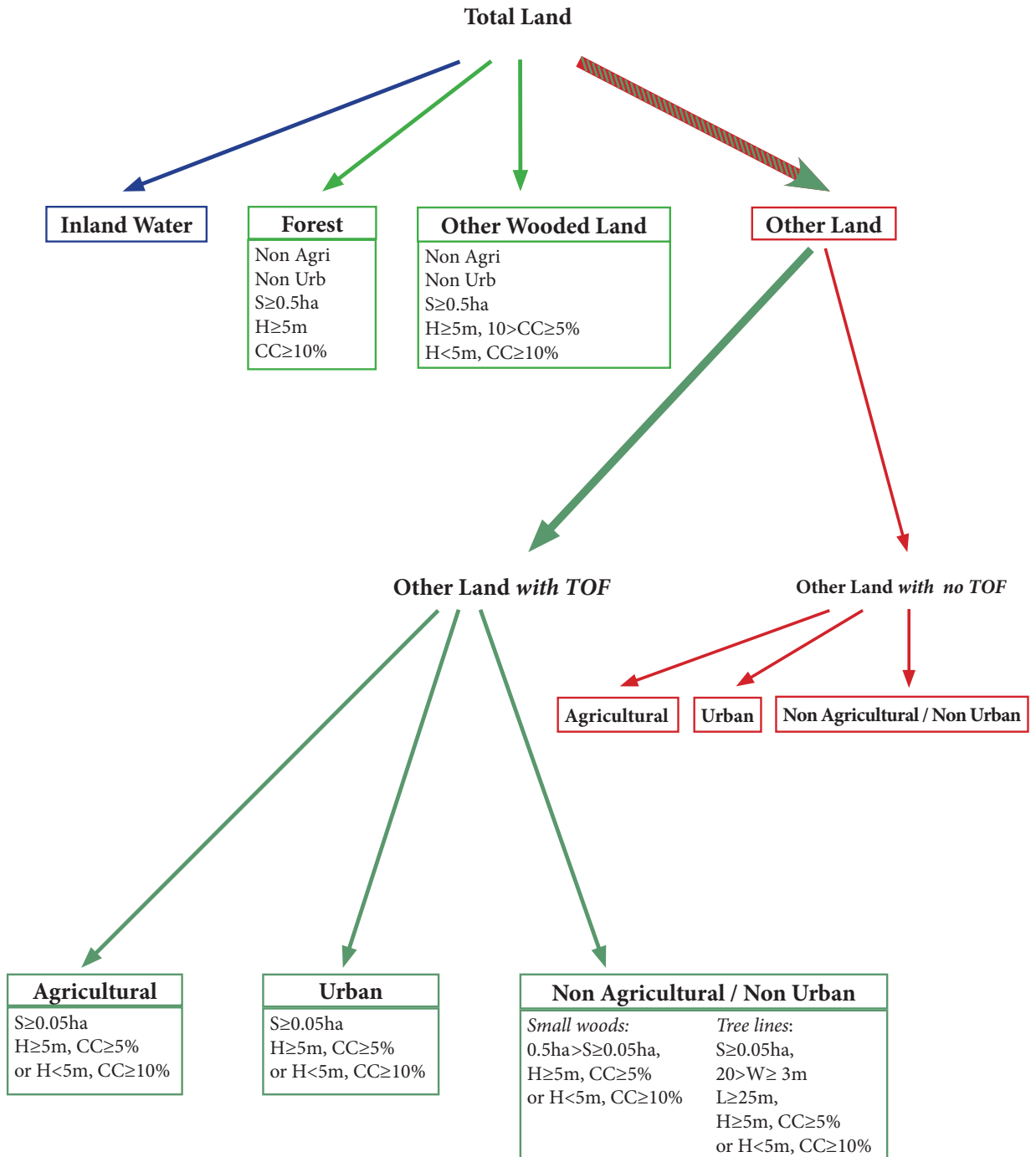
For some illustrations, when appropriate, two interpretations are provided. Generally one interpretation focuses on the image as a whole, while the second focuses on details to allow the identification of specific OLwTOF subsets. The choice between these two interpretations is a choice of resolution / scale targeted for the assessment. In practice, this choice will mainly depend on the time and financial constraints of the assessment.

When trees and shrubs are present, the tree presence is generally considered first for the thresholds.



TOF:
Trees and shrubs on land that is NOT:
FOREST
or
OTHER WOODED LAND

OTHER LAND *with TOF* (OLwTOF):
Other Land *with TOF* - AGRI (OLwTOF - AGRI)
Other Land *with TOF* - URB (OLwTOF - URB)
Other Land *with TOF* Non AGRI/ URB (OLwTOF - Non A/U):
OLwTOF - Non A/U subset 1: small woodlands
OLwTOF - Non A/U subset 2: linear tree formations



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.....Trees on land predominantly under agricultural use

TOF AGRI

1.1. Agroforestry parklands



Case 1: Agroforestry parkland, Niger (13°27'28"N ; 7°01'28"E)

A: OL_{wTOF} - AGRI
(OL_{wTC})

B: OL_{wTOF} - URB
(OL_{wTC})



A: Mosaic of crop fields and pastures with a relatively low cover of trees and shrubs (canopy cover: ca. 20%). All trees and shrubs here are TOF.

The area is classified as **Other Land with TOF** because land is mainly used for agriculture; trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

In addition the area is also classified as **Other Land with Tree Cover** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$ and the area is $\geq 0.5\text{ ha}$.

B: Urban area with houses and home gardens with trees (canopy cover: ca. 25%). All trees here are TOF.

The area is classified as **Other Land with TOF** because land is under urban land-use; trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

In addition the area is also classified as **Other Land with Tree Cover** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$ and the area is $\geq 0.5\text{ ha}$.



Case 2 : Agroforestry parkland, Burkina Faso (12°13'37"N ; 1°41'05"W)

OLwTOF - AGRI
(OLwTC)



Mosaic of crop fields, scattered houses, pastures and paths, with trees and shrubs homogeneously distributed in small groups or isolated (canopy cover: ca. 20 %) . All trees and shrubs here are TOF.

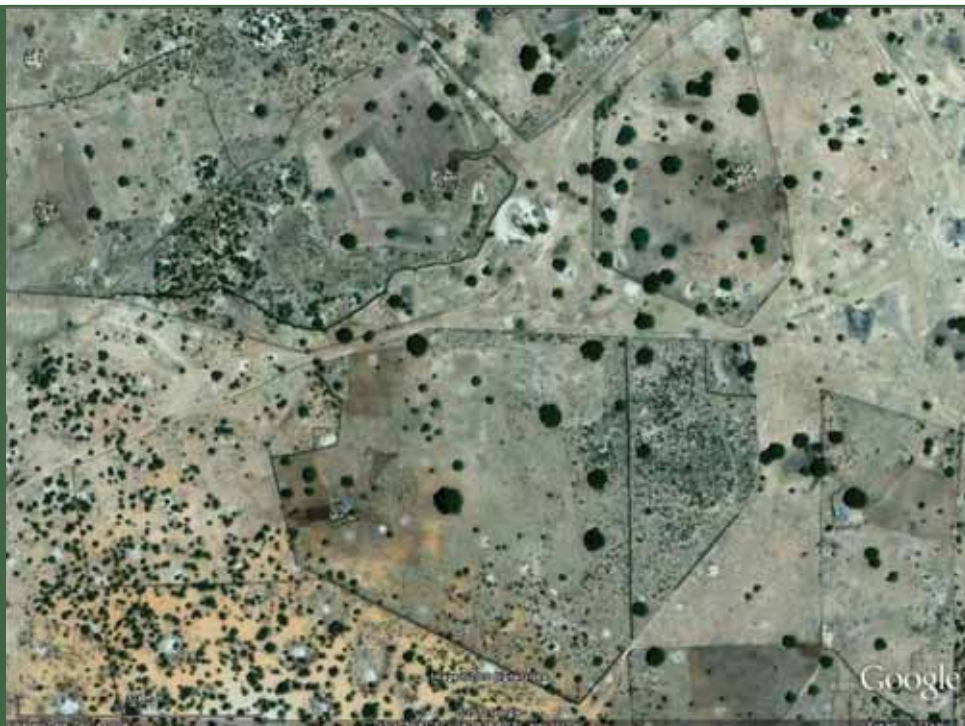
The whole area is classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

In addition the area is also classified as **Other Land with Tree Cover** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$ and the area is ≥ 0.5 ha.



Case 3: Agroforestry parkland, Namibia (17°32'50"S ; 14°39'26"E)

OLwTOF - AGRI
(OLwTC)



Mosaic of crop fields, houses, pastures and paths, with scattered trees and shrubs (canopy cover: ca. 20 %). All trees and shrubs here are TOF.

The whole area is classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

In addition the area is also classified as **Other Land with Tree Cover** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$ and the area is $\geq 0.5\text{ ha}$.

Note: Different zones can be identified based on their appearance and tree density, but they all belong to the same category (Other Land with TOF – AGRI), so there is no need to separate them.



Case 4: Agroforestry parkland, Senegal (15°06'02"N ; 16°24'51"W)

OLwTOF - AGRI
(OLwTC)



Mosaic of crop fields, pastures and paths, with isolated trees or shrubs homogeneously distributed. There is also a village with home gardens and large trees. All trees here are TOF.

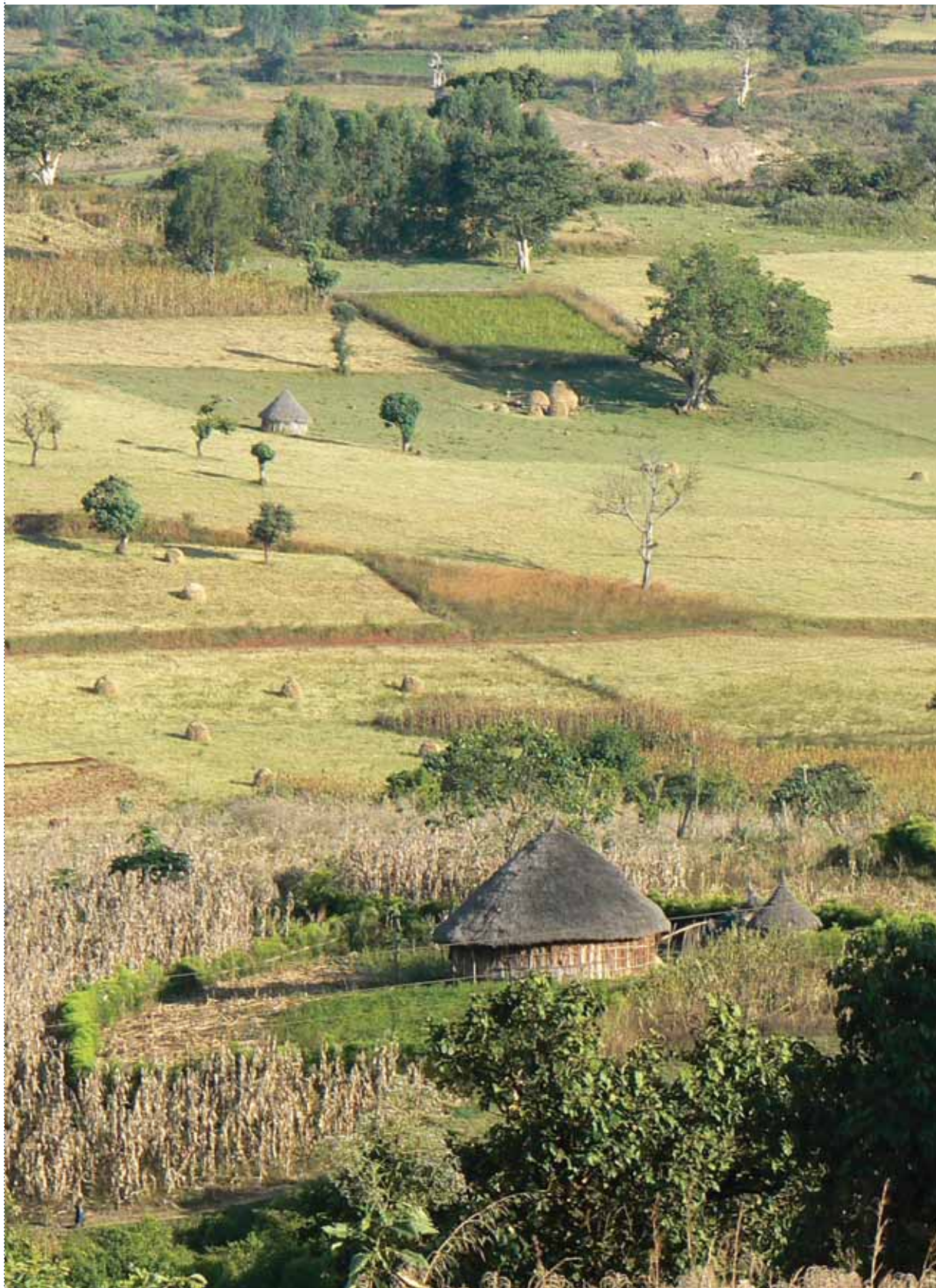
The whole area is classified as **Other Land with TOF** because the land is mainly used for agriculture, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

In addition the area is also classified as **Other Land with Tree Cover** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$ and the area is ≥ 0.5 ha.

Note: Different zones can be identified based on their appearance and tree density, but they all belong to the same category (Other Land with TOF – AGRI), so there is no need to separate them.



1.2. Trees scattered in mixed cropping systems



Case 5: Trees scattered in mixed cropping systems, Northern India (24°29'04"N ; 82°28'12"E)

Interpretation 1:

OL_wTOF - AGRI
(OL_wTC)



Mosaic of crop fields, houses, roads and pastures with trees in small groups or isolated (canopy cover: < 5 %). All trees are TOF.

The whole area is classified as **Other Land with TOF** because the land is mainly used for agriculture, the combined trees and shrubs canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

Interpretation 2:

A: OL_wNoTOF

B: OL_wTOF - AGRI



A: Mosaic of crop fields, houses, roads and pastures with no or rare isolated trees or shrubs. All trees are TOF.

The area is classified as **Other Land with No TOF** because the land is mainly used for agriculture (thus: Other Land), and the tree canopy cover is < 5%.

B: Mosaic of crop fields with isolated trees and shrubs (canopy cover: > 5 %). All trees and shrubs are TOF.

The area is classified as **Other Land with TOF** because the land is mainly used for agriculture, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.



Case 6: Trees scattered in mixed cropping systems, Ethiopia (9°00'54"N ; 34°33'57"E)

Interpretation 1

A: OLwTOF - AGRI

B: OLwTOF - AGRI
(OLwTC)
or FOREST

C: OLwTOF - AGRI
or NON A/U
subset 2



A: Mosaic of crop fields, houses, and pastures with trees in small groups or isolated (canopy cover: < 5%). All trees are TOF.

The area is classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

B: Large and dense patches of trees with an irregular mixed tree cover (canopy-cover: ca.95 %). Because the patches are large (≥ 0.5 ha) and there are no obvious signs of field activity, **field checking** is necessary to identify the land-use.

If **agricultural** use is predominant, all trees are TOF and B patches are classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. The largest B patches can be further classified as **Other Land with Tree Cover**, because their area is ≥ 0.5 ha, and their tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the smallest B patches are classified as **Other Land with TOF** (OLwTOF - Non A/U subset 1) because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha, while the largest B patches are classified as Forest because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha

In this particular case, **field checking** reveals that B

patches are made up of coffee agroforest plots (agriculture); all trees are thus TOF and all B patches are classified as **Other Land with TOF**, the largest patches being also classified as **Other land with Tree Cover**.

C: Trees and shrubs in linear tree formation. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the linear formation width is ≥ 3 m with a length ≥ 25 m.

Interpretation 2:

A+: OLwTOF - AGRI
(OLwTC)

A-: OLwNoTOF

B: OLwTOF - AGRI
(OLwTC)
or FOREST

C: OLwTOF - AGRI
or NON A/U
subset 2



A is further divided :

A+: Patches of trees in crop fields and pastures, or in gardens around houses with trees in small groups or isolated (canopy cover: > 20 %). All trees are TOF.

The A+ patches are classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

The largest A+ patches can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

A-: Mosaic of crop fields and pastures, with no or scarce isolated trees. All trees are TOF.

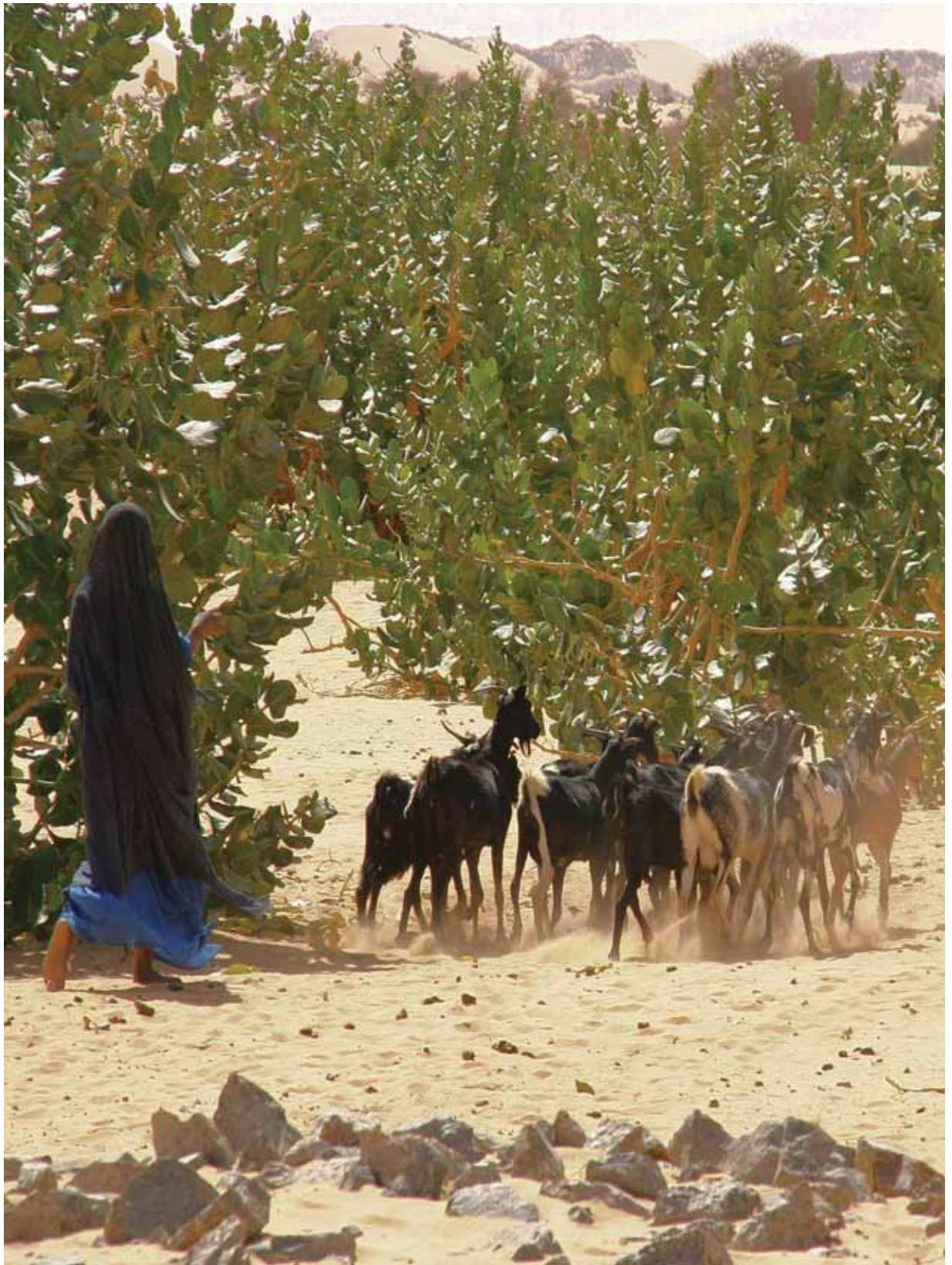
The A- patches are classified as **Other Land with No TOF** because the land is mainly used for agriculture and housing structures (thus: Other Land), but the tree canopy cover is $< 5\%$.

B and C are similar to interpretation 1.



1.3. Trees on pasture land



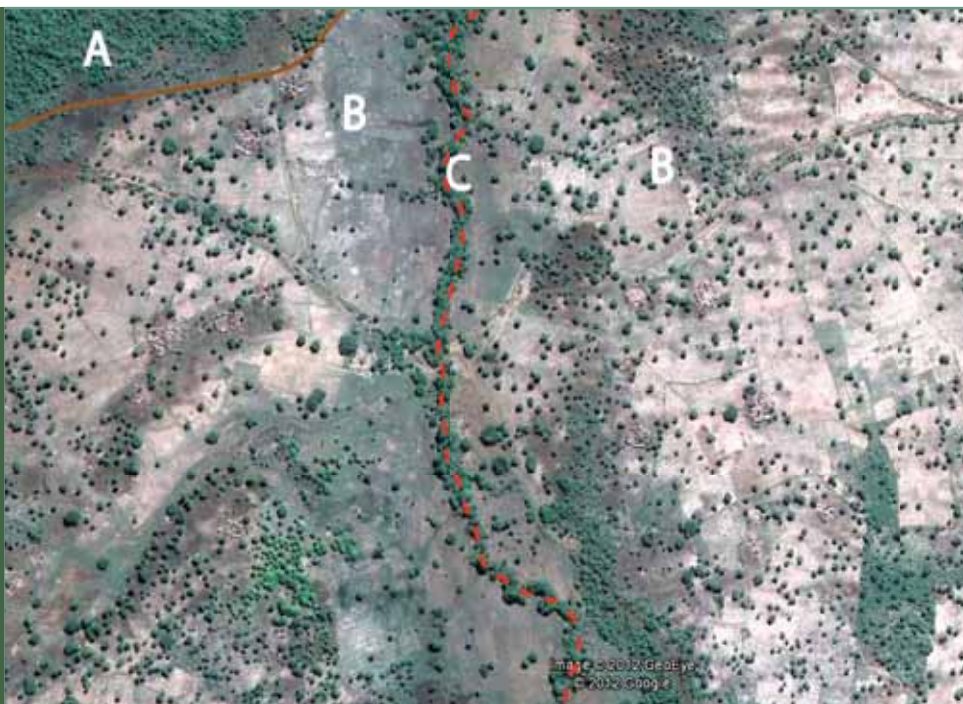


Case 7: Trees on pasture land, Burkina Faso (11°03'38"N ; 3°46'29"W)

A: OLwTOF - AGRI
(OLwTC)
or FOREST
or OWL

B: OLwTOF - AGRI
(OLwTC)

C: OLwTOF - Non A/U
subset 2



A: Large area with no obvious human use, with a dense and irregular shrub cover and some trees. Because the area is large (≥ 0.5 ha), has no obvious main use, and the tree and shrubs combined canopy cover is high (ca. 70%), **field checking** is needed to identify the land-use and the canopy cover of trees (*that reach 5 m high, or that are able to reach 5 m high in situ*):

If the *tree canopy cover* $\geq 10\%$.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because the tree canopy cover is $\geq 10\%$ and the area is ≥ 0.5 ha.

If **non-agricultural use**, the area is classified as **Forest**, because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

If the *tree canopy cover* is between 5 and 10%.

If **agricultural use** predominant, all trees and shrubs are TOF and the area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

If **non-agricultural use**, the area is classified as **Other Wooded land**, because trees are ≥ 5 m high, the combined tree and shrub canopy cover is between 5 and 10%, and the area is ≥ 0.5 ha.

B: Mosaic of crop fields, paths and houses with trees in small groups or isolated (canopy cover: ca. 20%). All trees are TOF.

The area is classified as **Other Land with TOF** because the main use of the land is agriculture, trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

C: Wild trees forming a narrow corridor along a stream. All trees are TOF because the tree line width is < 20 m.

The area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, the area is ≥ 0.05 ha, and the linear formation width is ≥ 3 m with a length ≥ 25 m.

Case 8: Trees on pasture land, Missouri, USA (39°31'21"N ; 93°06'15"W)

Interpretation 1

- A: OLwTOF - AGRI (OLwTC)
- B: OLwTOF or FOREST
- C: OLwTOF or FOREST
- D: OLwTOF - AGRI or NON A/U, subset 2
- E: OLwNoTOF



A: Large patches of trees (≥ 0.5 ha), in small groups in garden and pastures. All trees are TOF.

The area is classified as **Other Land with TOF** because the land is mainly used for pasture (thus: Agriculture) and housing structures, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

B: Large areas with dense tree canopy cover, following a linear pattern; because the width is ≥ 20 m and there are no obvious signs of field activity even though the surrounding area is mostly pasture and agriculture, **field checking** is necessary to identify the land-use.

If **the trees have a predominant agricultural use**, then all trees are TOF and the land is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, the area is ≥ 0.05 ha and the length is ≥ 25 m. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **the trees do not have a predominant agricultural**

use, the B areas are classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

C: Large and dense patches of trees with an irregular mixed tree cover; because the patches are large (≥ 0.5 ha), the canopy cover is dense and there are no obvious signs of field activity, **field checking** is necessary to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the C areas are classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha

D: Trees and shrubs in narrow linear formation. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20 m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3m$ with a length $\geq 25m$.

E: Mosaic of crop fields, roads and pasture, with trees isolated or in small groups (canopy cover slightly above 5%). All trees here are TOF.

The land is classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.



E has been further divided to extract small woods (**A-**). **B**, **C** and **D** are similar to interpretation 1. **A** has been renamed to **A+**.



A+: identical to **A** in interpretation 1

A-: Small patches of trees (<0.5 ha) more or less scattered in crop fields and pastures. All trees are TOF, either because their use is predominantly agricultural, or if not predominantly agricultural, because patches do not reach the area threshold for Forest and Other Wooded Land.

If **the trees have a predominant agricultural use**, then the **A-** patches are classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

If **the trees do not have a predominant agricultural use**, **A-** patches are also classified as **Other Land with TOF**, but this time this is because their tree canopy cover is $\geq 5\%$, and their area is < 0.5 ha and ≥ 0.05 ha.



B, C, D are similar to interpretation 1



-E: Mosaic of crop fields, roads and pastures with some rare isolated trees or shrubs. All trees are TOF. The area is classified as **Other Land with No TOF** because the land is mainly used for agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$.

Case 9: Trees on pasture land, Spain (39°14'56"N ; 6°35'35"W)

A: OL_wTOF - AGRI
(OL_wTC)

B: OL_wNoTOF



A: Pastures with an homogenous tree cover. This is a typical landscape of the so-called “Dehesa” agroforestry system. All trees here are TOF.

The whole area is classified as **Other Land with TOF** because the land is mainly used for pasture (thus: Agriculture), the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

In addition, the area can be further classified as **Other Land with tree cover** because the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

B: Area with houses, pasture and crop fields, with no or scarce isolated trees. All trees are TOF.

The area is classified as **Other Land with No TOF** because the land is used for agriculture and habitation (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 10: Trees on pasture land, New Zealand (43°25'56"N ; 174°14'35"E)

Interpretation 1

OLwTOF - AGRI
(OlwTC)



Mosaic of pastures, with trees isolated or in small groups (canopy cover slightly below 10 %). All trees are TOF.

The whole area is classified as **Other Land with TOF** because the land is mainly used for pasture (thus: Agriculture), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

Interpretation 2

A: OLwTOF - AGRI
(OlwTC)

B: OLwNoTOF



A: Mosaic of pastures with trees isolated or in small groups (canopy cover: ca. 15 %). All trees are TOF.

The area is classified as **Other Land with TOF** because the land is mainly used for pasture (thus: Agriculture), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

The area can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

B: Mosaic of pasture and crop fields, with no or scarce isolated trees. All trees are TOF.

The land is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$.

Case 11: Trees on pasture land, France (49°17'52"N ; 0°02'31"E)

A: OLwTOF - AGRI
or FOREST

B: OLwTOF - AGRI
or Non A/U
subset 2

C: OLwTOF - AGRI
(OLwTC
pro-parte: C+)

D: OLwNoTOF

E: OLwTOF - AGRI
or FOREST



A: Large dense tree patches; because patches are large (≥ 0.5 ha) and the canopy cover is dense, **field checking** is necessary to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha

B: Trees in lines (in yellow on the picture). Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is < 20 m.

The area is in any case classified as **Other Land with TOF** because the tree canopy cover is $\geq 5\%$, and the linear formation width is ≥ 3 m with a length ≥ 25 m.

C: Pastures and crop fields with scattered trees (C) or with a high density of trees (C+). All trees are TOF.

All C patches are classified as **Other Land with TOF** because the land is mainly used for agriculture, trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

In addition, all C+ patches can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

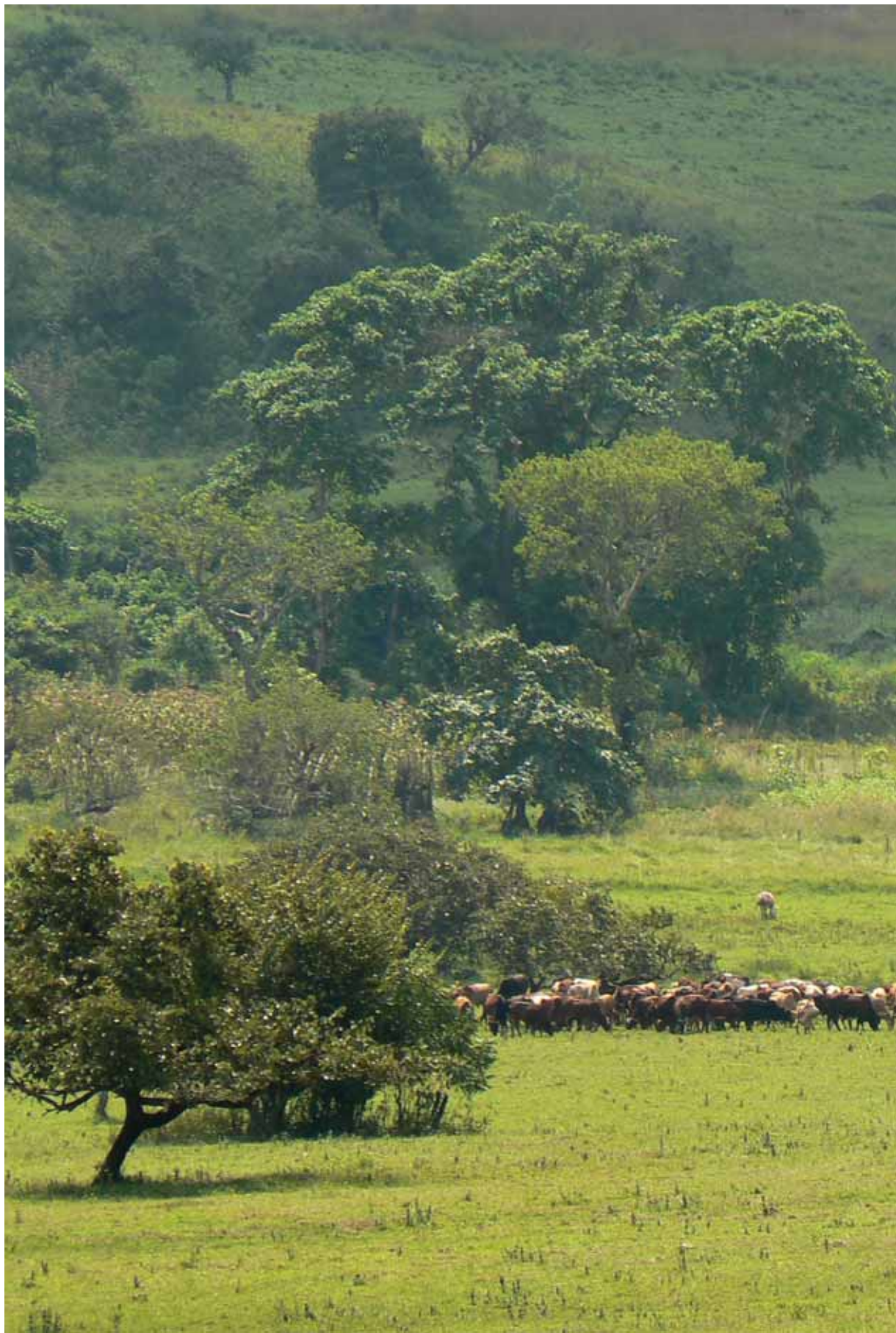
D: Patches of pasture and crop fields, with no or scarce isolated trees. All trees are TOF.

All D patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: *Other Land*), but the tree canopy cover is $< 5\%$.

E: Large (width ≥ 20 m) linear tree formation (red line on the picture); **field checking** is necessary to identify the land-use.

If trees have a predominant **agricultural use**, then all trees are TOF and the area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, the area is ≥ 0.05 ha and the length is ≥ 25 m. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If trees have a predominant **non-agricultural use**, then the area is classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.



1.4. Trees in hedges



Case 12: Trees in hedges, Kerry County, Ireland (53°05'41"N ; 7°18'37"W)



A: OLwNoTOF

B: OLwTOF - AGRI
or NON A/U,
subset 2

Mosaic of crop fields, houses, roads, and pastures, with trees, either isolated or in linear formation.

A: Mosaic of pasture and crop fields, with no or scarce isolated trees. All trees are TOF.

All A patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), but the tree canopy cover is < 5%.

B: Trees and shrubs in linear formation forming hedges around fields and pastures, or along small paths and roads (yellow line in the picture). Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the combined trees and shrub canopy cover is $\geq 10\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.



Case 13: Trees in hedges, Guinea (11°13'15"N ; 12°25'23"W)

- A: OLwNoTOF
- B: OLwTOF
- C: OLwTOF -- AGRI
or URB
or NON A/U,
subset 2



Mosaic of crop fields, houses, paths and pastures with trees isolated or in linear formation.

A: Mosaic of pasture and crop fields, with no or scarce isolated trees. All trees are TOF.

The A patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), and the tree canopy cover is < 5%.



B: Mosaic of small patches of houses, pasture and home gardens with scattered trees (canopy cover: ca. 10-15 %). All trees are TOF.

All B patches are classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures (thus: Other Land), trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

C: Trees and shrubs in linear formation forming hedges around fields, pastures, or houses. Trees here are TOF, either because they have a predominant agricultural / urban use or, if they have a predominant non-agricultural / non-urban use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5m$ high, the combined trees and shrubs canopy cover is $\geq 10\%$, and the linear formation width is $\geq 3m$ with a length $\geq 25m$.

Note: If we consider the settlement as a whole (delineated by a blue line on the picture), merging B patches and C tree lines, its area can not only be classified as **Other Land with TOF** (a mix of TOF-AGRI and TOF-URB), but also as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

1.5. Tree crops in monoculture plantations



Case 14: Tree crops in monoculture plantations, India (30°12'16"N ; 77°19'40"E)

A: OL_wTOF - AGRI
or NON A/U,
subset 1

B: OL_wTOF
or FOREST

C: OL_wTOF - AGRI
or NON A/U
subset 2

D: OL_wTOF - AGRI
or NON A/U
subset 2

E: OL_wNoTOF



A: Small patches of trees. All trees and shrubs are TOF, either because their use is predominantly agricultural, or, if their use is predominantly non-agricultural, because the patches are too small to qualify as Forest (< 0.5 ha).

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$, but less than 0.5ha

B: Large and dense patches of trees with regular tree cover; because the patches are large ($\geq 0.5\text{ha}$) and the canopy cover is dense, **field checking** is necessary to identify the land-use.

If **trees have a predominant agricultural use**, then all trees are TOF and the B patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **trees have a predominant non agricultural use**, then B patches are classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.

In this particular case, it seems that most of these patches are poplar plantations, so these patches have to be classified as Forest.

C: Trees in linear pattern forming hedges around crop fields and plantations. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.

D: Scattered trees following a discontinuous linear formation along the main roads. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.

E: Crop fields and building areas with no or scarce isolated trees. All trees are TOF.

All E patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), and the tree canopy cover is $< 5\%$.

Case 15: Tree crops in monoculture plantations, Orchards, Spain (39°39'25"N ; 0°30'19"W)

A: OL_{wTOF} - AGRI
(Ol_{wTC})

B: OL_{wTOF}
or OWL

C: OL_{wTOF} - URB
(Ol_{wTC})



A: Mosaic of orchards. All trees are TOF.

The area is classified as **Other Land with TOF** because the main use of the land is agriculture, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.



B: Relatively large areas with no obvious human use, with an irregular shrub cover and with some isolated trees (tree canopy cover $< 5\%$). Because the area is large ($\geq 0.5ha$), has no obvious main use, and the tree and shrub combined canopy cover is higher than 10 %, **field checking** is needed to identify the land-use:

If **agricultural use** (pasture) predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree and shrub canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

If **non-agricultural use** predominant, the area is classified as **Other Wooded Land**, because trees are $\geq 5m$ high, the combined tree and shrub canopy cover is above 10 %, and the area is ≥ 0.5 ha.

C: Urban area with trees around houses and roads.

The land is classified as **Other Land with TOF** because the land is predominantly used for housing structures, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

Case 16: Tree crops in monoculture plantations, Chiapas, Mexico (39°39'25"N ; 0°30'19"W)

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B: OL_wNoTOF

C: OL_wTOF
or FOREST

D: OL_wTOF - AGRI
or NON A/U
subset 2



A: Large and dense mosaic of tree plantations with regularly distributed tree cover; because the patches are large ($\geq 0.5\text{ha}$) and the tree cover is dense, **field checking** is necessary to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as Forest because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$

In this case, **field checking** shows that the area is covered by mango orchards. The area is thus classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Crop fields with no or scarce isolated trees. All trees are TOF.

All B patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), but the tree canopy cover is $< 5\%$.

C: Large and dense patch of trees with an irregular

mixed tree cover (canopy cover: ca. 60 %); because the patches are large ($\geq 0.5\text{ha}$) and the tree canopy cover is dense ($\geq 10\%$), **field checking** is necessary to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree $\geq 10\%$.

If **non-agricultural use**, classified as Forest because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$

In this case, **field checking** reveals that the area is an agroforest all trees here are TOF because the area is a complex agroforest with fruit trees, coffee and cocoa trees. The area is then classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

D: Trees and shrubs in linear formation along the road. They are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.

Case 17: Tree crops in monoculture plantations, Crete (35°14'33"N ; 25°05'10"E)

A: OL_wTOF - AGRI
(OL_wTC)

B: OL_wNoTOF

C: OL_wTOF - AGRI
(OL_wTC)
or FOREST



A: Mosaic of orchards. All trees are TOF.

The area is classified as **Other Land with TOF** because the main use of the land is agriculture, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



B: Crop fields with no or scarce isolated trees. All trees are TOF.

All B patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), and the tree canopy cover is $< 5\%$.

C: Area with an irregular tree and shrub canopy cover (canopy cover between 25 and 50 %). In this case, the image quality is not good enough to determine the content of the area, whether it consists of old orchards or natural areas.

If the use is **predominantly agricultural**, the C patches are classified as **Other Land with TOF** because the main use of the land is agriculture, trees are $\geq 5\text{m}$ high, the combined tree and shrub canopy cover is $\geq 10\%$, and the area is $\geq 0.05\text{ ha}$. They can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If natural areas with **no predominant agricultural** use such as pasture, the C patches are classified as **Forest**, because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.



Case 18: Tree crops in monoculture plantations, Sumatra, Indonesia (3°30'03"N ; 98°49'14"E)

A: OL_wTOF - AGRI
(OL_wTC)

B: OL_wNoTOF

C: OL_wTOF - URB
(OL_wTC)

D: OL_wNoTOF



A: Large mosaic of oil palm trees with a regular and very dense tree cover. All trees are TOF.

The whole area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree $\geq 10\%$.



B: Crop fields with no or scarce isolated trees. All trees are TOF.

All B patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), but the tree canopy cover is $< 5\%$.

C: Settlement area with homegardens, houses and roads.

The area as a whole is classified as **Other Land with TOF** because the land is mainly used for housing structures and homegardens, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.



D: Area with no or scarce isolated trees, probably a flooded area. All trees are TOF.

The area is classified as **Other Land with No TOF** because the tree cover is below the canopy cover threshold and cannot be classified as Forest or Other Wooded Land (thus: Other Land), and the tree canopy cover is $< 5\%$.



1.6. Trees in homegardens



Case 19: Homegardens, Karnataka, India (14°01'54"N ; 74°30'59"E)

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B: OL_wNoTOF

C: OL_wTOF - AGRI
OR NON A/U
subset 2



A: patches of trees with a dense, irregular tree cover, with small grassland patches and houses. Because the patches are large (≥ 0.5 ha) the canopy cover is dense, even though human activity signs are present, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the land is classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

Field checking reveals that A patches are made up of a juxtaposition of homegardens, thus agricultural use, so that A patches should be classified as **Other Land with TOF**. They can be further classified as **Other Land with Tree Cover**.

B: Crop fields, pastures and houses with no or scarce isolated trees. All trees are TOF.

All B patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), but the tree canopy cover is $< 5\%$.



C: Trees and shrubs in linear formation forming hedges around fields or pastures. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20 m.

The area is in any case classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the linear formation width is ≥ 3 m with a length ≥ 25 m.



Case 20: Homegardens, truffle orchards, France (45°17'58"N ; 0°52'30"E)

A: OLwNoTOF

B: OLwTOF - AGRI
(OLwTC) or FOREST

C: OLwTOF - AGRI
(OLwTC) or FOREST

D: OLwTOF - AGRI or
NON A/U subset 1

E: OLwTOF - AGRI -
URB

F: OLwTOF - AGRI or
NON A/U subset 2



A: Mosaic of crop fields with some houses, with no or scarce isolated trees (canopy cover below 5 %). All trees are TOF.

All A patches are classified as **Other Land with No TOF** because the land is used for agriculture and housing structures (thus: Other Land), and the tree canopy cover is < 5%.

B: Large patches with dense and very regular tree canopy cover. Because the patches are large ($\geq 0.5\text{ha}$), the canopy cover is dense and even though human activity signs are present, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the land is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$

Field checking reveals that B patches are truffle orchards, thus agricultural use, so in this case the B patches should be classified as **Other Land with TOF**.

They can also be further classified as **Other Land with Tree Cover**.

C: Large patches with dense and irregular tree canopy cover. Because the patches are large ($\geq 0.5\text{ha}$), the canopy cover is dense, **field checking** is needed to identify the land-use.

If agricultural use predominant, all trees are TOF and the C patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. They can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the C patches are classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$

D: Small patches of trees (<0.5 ha) with dense tree canopy cover, in crop fields. All trees are TOF, either because their use is predominantly agricultural, or if not predominantly agricultural, because patches do not reach the area threshold for Forest and Other Wooded Land.

The D patches are in any case classified as **Other Land with TOF** because their tree canopy cover is $\geq 5\%$, and their area is <0.5 ha but ≥ 0.05 ha.

E: Patches of houses and buildings with trees isolated or in small groups. All trees are TOF.

The E patches are classified as **Other Land with TOF** because the land is mainly used for agriculture and housing structures (thus: Other Land), the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

They can be further classified as **Other Land with Tree Cover**, because their area is ≥ 0.5 ha, and their tree canopy cover is $\geq 10\%$.

F: Trees and shrubs in linear formation forming hedges around fields. Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is < 20 m.

The area is in any case classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the linear formation width is ≥ 3 m with a length ≥ 25 m.



1.7. Trees in agroforests of the Humid Tropics

Note: because of their tree density and their more or less irregular canopy cover, agroforests in the humid tropics most often cannot be distinguished from forests using only the land-cover criterion. Field checking or an expert knowledge of the land-use in the assessed area is absolutely needed



Case 21: Trees in agroforests, India (12°52'18"N ; 75°05'42"E)



A: OLwTOF - AGRI
(OLwTC)
or FOREST

B: OLwNoTOF - AGRI
or NON A/U
subset 2

A: A matrix with a dense, irregular tree cover, with some small crop fields, grassland patches and houses. Because the area is large ($\geq 0.5\text{ha}$), and the canopy cover is dense; **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the whole area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$

Field checking reveals that the area is a juxtaposition of coffee agroforest plots, thus agricultural use, so in this case the area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Patches of crop fields with no or scarce isolated trees. All trees are TOF.

The B patches are classified as **Other Land with No TOF** because the land is used for agricultural activities and housing structures (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 22: Trees in agroforests, Guinea-Bissau (11°59'11"N ; 16°13'16"W)

A: OLwTOF - AGRI
(OLwTC)
or FOREST

B: OLwTOF - URB

C: OLwNoTOF



A: A large treed patch with a dense, irregular tree and palm cover, with some bare soil (canopy cover: ca. 80 %). Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF, and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$.

Field checking reveals that it is an oil palm agroforest, thus agricultural use, so in this case the area should be classified as **Other Land with TOF** and **Other Land with Tree Cover**.

B: Houses and buildings with isolated trees. All trees here are TOF, and the area is classified as **Other Land with TOF** because the land is in an urban context, where trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$.



C: Area with mostly bare soil or herbaceous vegetation, with no or scarce isolated trees. All trees are TOF.

The area is classified as **Other Land with No TOF** because the tree canopy cover is $< 5\%$.

Case 23: Trees in agroforest, Sulawesi, Indonesia (1°26'16"N ; 125°05'18"E)

OLwTOF - AGRI
(OLwTC)
or FOREST



Area with relatively dense and irregular palm tree cover with some small grassland patches. *Because the area is large (≥ 0.5 ha) and the canopy cover is dense, even though there are obvious sign of human activity interlinked with the trees, **field checking** is needed to identify the land-use.*

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha

Field checking reveals that it is an area of coconut agroforestry, thus agricultural use, so in this case the area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

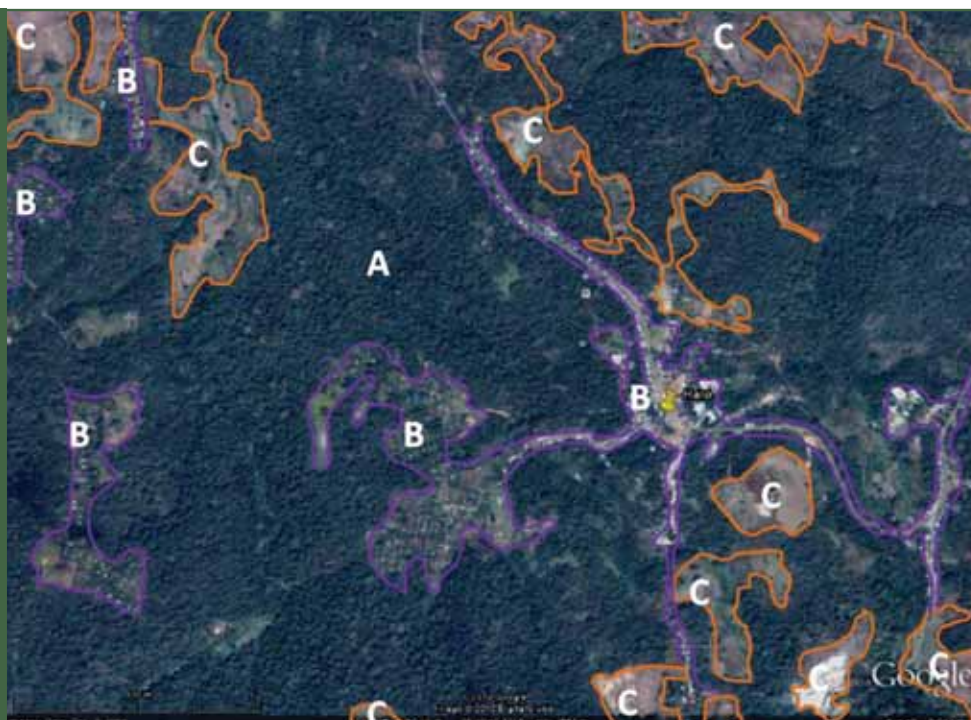


Case 24: Trees in agroforest, Haro, Jima zone, Ethiopia (7°48'52"N ; 36°40'47"E)

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B : OL_wTOF - URB
- AGRI

C: OL_wNoTOF



A: Large treed area with dense, irregular tree cover with a few bare soil patches. Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF, and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$.

Field checking reveals that it is a coffee agroforest, thus agricultural use, so in this case the land should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Houses, roads and paths with trees, isolated or in small groups. All trees here are TOF.

The B patches are classified as **Other Land with TOF** because the land is in an urban and agricultural context, where trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. They can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

C: Crop fields and paths with no or scarce isolated trees. All trees are TOF.

The C patches are classified as **Other Land with No TOF** because the land is used for urban activities and housing structures (thus: Other land), and the tree canopy cover is $< 5\%$.



Case 25: Trees in agroforest, Guinea (7°26'58"N ; 9°06'21"W)

- A: OL_wTOF - AGRI (OL_wTC) or FOREST
- B: OL_wTOF - URB - AGRI
- C: OL_wNoTOF



A: A matrix with a dense, irregular tree and palm cover with some bare soil and herbaceous vegetation patches. Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are signs of human activity (houses and fields) interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the land is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.

Field checking reveals that it is a mixed agroforest (coffee, cocoa, kola nut, etc), thus agricultural use, so in this case the area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Village with houses and roads, with some trees, isolated or in small groups. All trees here are TOF and the area is classified as **Other Land with TOF** because the land is in an urban and agricultural context, where trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

C: Crop fields and paths with isolated trees. All trees here are TOF and the C patches are classified as **Other Land with TOF** because the land is mainly used for agriculture, where trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

D: Large patches with a dense cover of palm trees. Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity interlinked with the trees, **field checking** is needed to identify the land-use (same possibilities than in A).

Field checking reveals that D patches are Oil-palm plantations, thus agricultural use, so that D patches should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

E: Small patches of palm trees ($<0.5\text{ ha}$) with dense tree canopy cover close to crop fields. All trees are TOF.

The E patches are classified as **Other Land with TOF** because the land is mainly used for agriculture, the tree canopy cover is $\geq 5\%$, and the area is $<0.5\text{ ha}$ but $\geq 0.05\text{ ha}$.

Case 26: Trees in agroforest, Sumatra, Indonesia (1°46'16"S ; 103°12'48"E)

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B : OL_wNoTOF

C: OL_wTOF - URB



A: A matrix of tree vegetation with a dense and irregular tree canopy cover and some small grassland patches. Because the area is large (≥ 0.5 ha) and the canopy cover is dense, even though there are obvious signs of human activity interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

In this particular case, field checking reveals that the whole area is a rubber agroforest, so this area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Large patches of crop fields with no or scarce isolated trees. All trees are TOF.

The B patches are classified as **Other Land with No TOF** because the land is used for agriculture activities (thus: Other Land), and the tree canopy cover is $< 5\%$.

C: Village with houses along a main road with trees, isolated or in small groups.

All trees here are TOF and the land is classified as **Other Land with TOF** because the land is in an urban and agricultural context, where trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

Case 27: Trees in agroforest, Sumatra, Indonesia (5°00'40"S ; 104°06'32"E)

Interpretation 1

OLwTOF - AGRI
(OLwTC)



The image can be interpreted in two different ways, depending on the resolution chosen for the assessment.

Complex mosaic of crop fields, houses and coffee agroforestry plantations. The coffee agroforestry system in this case is based on a cycle made up of two phases. The first phase is a plantation of vegetables with young coffee and Erythrina trees. The second phase is the mature coffee-Erythrina plantation. Because of the predominantly agricultural and urban use of the area, all the trees here are TOF.

The whole area is classified as **Other Land with TOF** because the main use of the land is agriculture, the trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

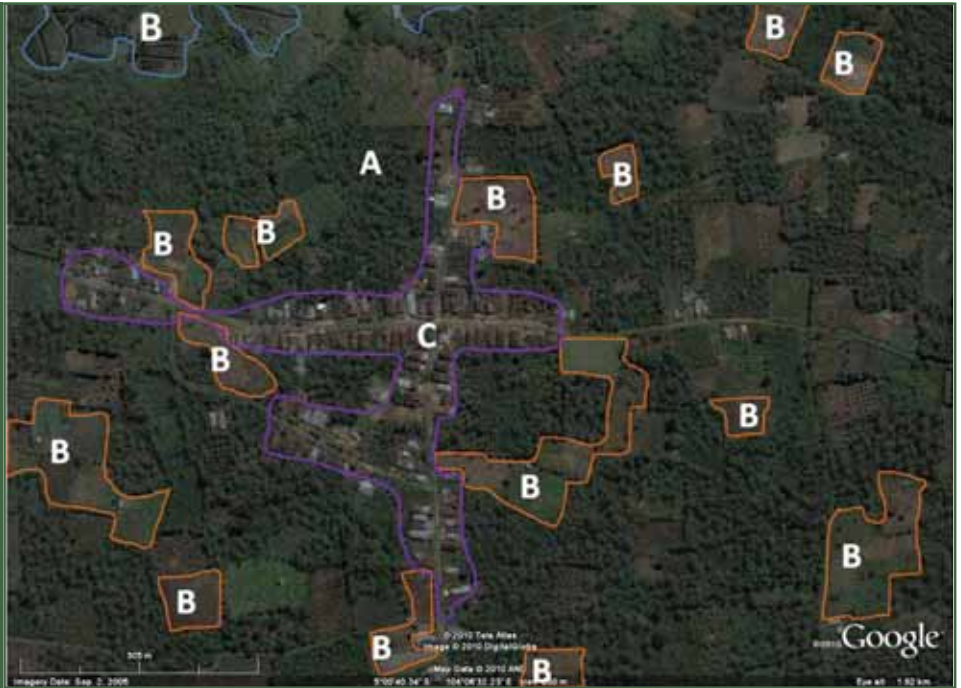


Interpretation 2

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B: OL_wNoTOF

C: OL_wTOF - URB



A: A matrix of treed vegetation with a dense, irregular tree canopy cover and some small bare soil and small crop field patches. *Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity (houses and fields) interlinked with the trees, **field checking** is needed to identify the land-use.*

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.

Field checking reveals that it is a coffee agroforest, thus agricultural use, so in this case the land should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Large area of crop fields and paths with no or scarce isolated trees. All trees are TOF.

The B patches are classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$.

C: Village with houses and roads with isolated trees or in small groups. All trees here are TOF.

Area C is classified as **Other Land with TOF** because the land is mainly used for housing, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



Case 28: Trees in agroforest, Mexico (15°03'46"N ; 92°20'12"W)

A: OLwTOF - AGRI
(OLwTC)
or FOREST

B : OLwTOF - URB



A: Matrix of treed vegetation with a dense and irregular tree canopy cover and some scattered houses. Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity (houses) interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$.

Field checking reveals that it is a coffee agroforest, thus agricultural use, so in this case the area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Village with houses and roads, with trees isolated or in small groups (canopy cover: ca.30 %). All trees here are TOF and the area is classified as **Other Land with TOF** because the land is in an urban and agricultural context, where trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.



Case 29: Trees in agroforest, Sumatra, Indonesia (5°03'15.86»S 103°50'02.15»E)

A: OL_wTOF - AGRI
(OL_wTC)
or FOREST

B: OL_wNoTOF



A: A matrix of treed vegetation, with a dense and irregular tree canopy cover and some small grassland patches. Because the area is large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there are obvious signs of human activity interlinked with the trees, **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ha}$.

In this particular case, **field checking** reveals that this is a Damar agroforestry system, thus agricultural use, so this area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

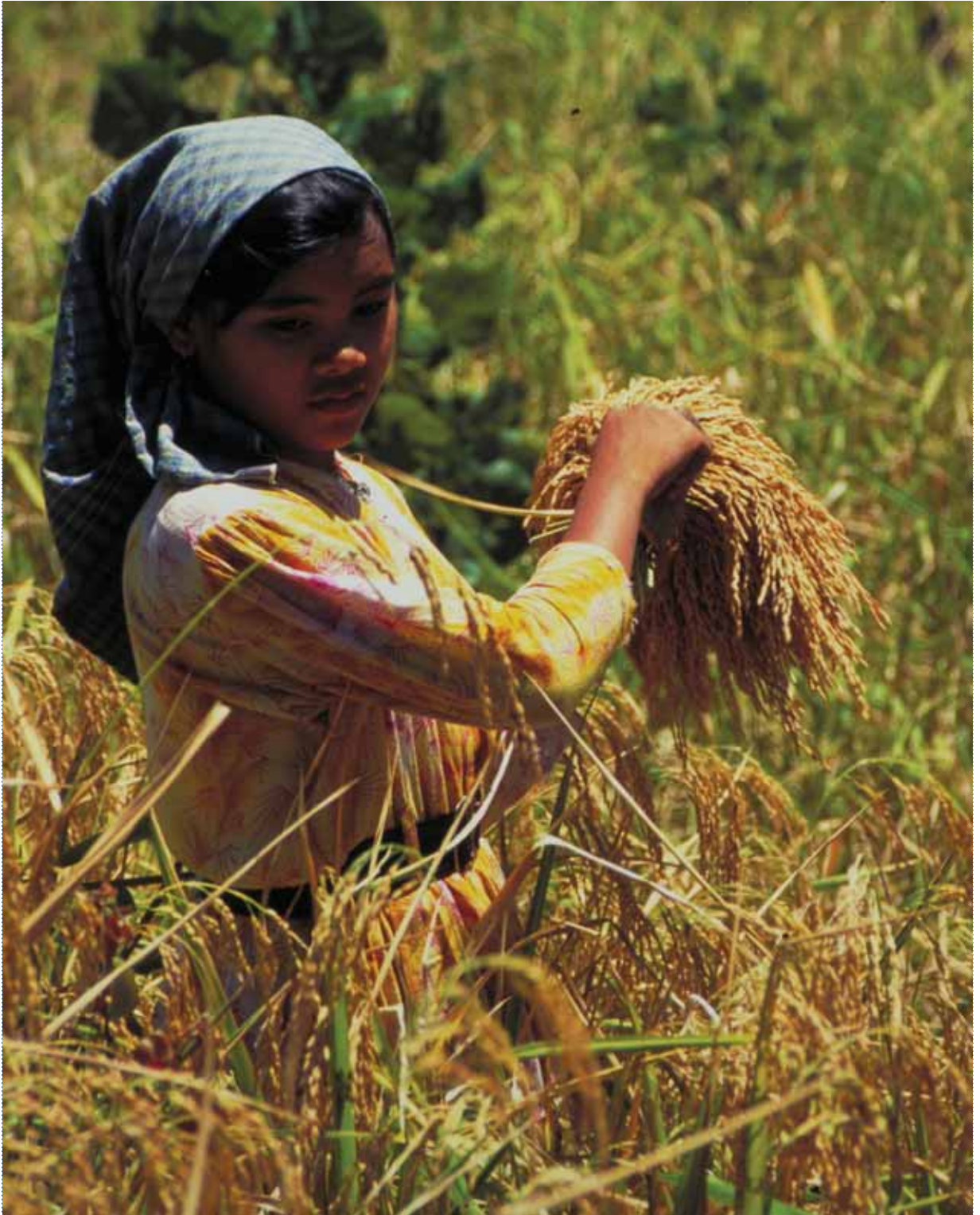
B: Large crop fields with no or scarce isolated trees. All trees are TOF.

The B fields are classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other land), and the tree canopy cover is $< 5\%$.



1.8. Trees in shifting cultivation systems (Humid Tropics)

Shifting cultivation in the humid tropics produces an ever changing landscape. If looked at a certain time, there are areas with trees and areas without trees, but the system is dynamic and interlinked, and this has to be taken into consideration when mapping areas with TOF or without TOF.



Case 30: Trees in shifting cultivation system, Guinea (10°06'47"N ; 12°13'04"W)

OL_wTOF - AGRI
(OL_wTC)
or FOREST



An intricate and complex matrix of crop fields, housing structures, areas with irregular tree cover and grassland patches. This is a typical pattern of shifting cultivation in the humid tropics. Trees are dominant in the fallow part of the system, which alternates crops and fallows. Trees are thus an integral part of this agricultural system.

The first option that comes to mind is delineation of the treed areas, the crop field areas, the herbaceous fallow areas, the bare soil areas, and the village area.

However this option would miss the fact that except for the village area, all these land cover categories are constantly moving their location and borders – a given area is a crop field this year, a herbaceous fallow the year after, a tree fallow two years after, a bare soil patch 15 year after, and again a crop field 16 years after. This is much as in a “Forest” where timber harvesting is followed by a bare soil phase and then by a young treed vegetation - that does not satisfy the canopy cover thresholds of a “Forest” but is still considered as a “Forest”.

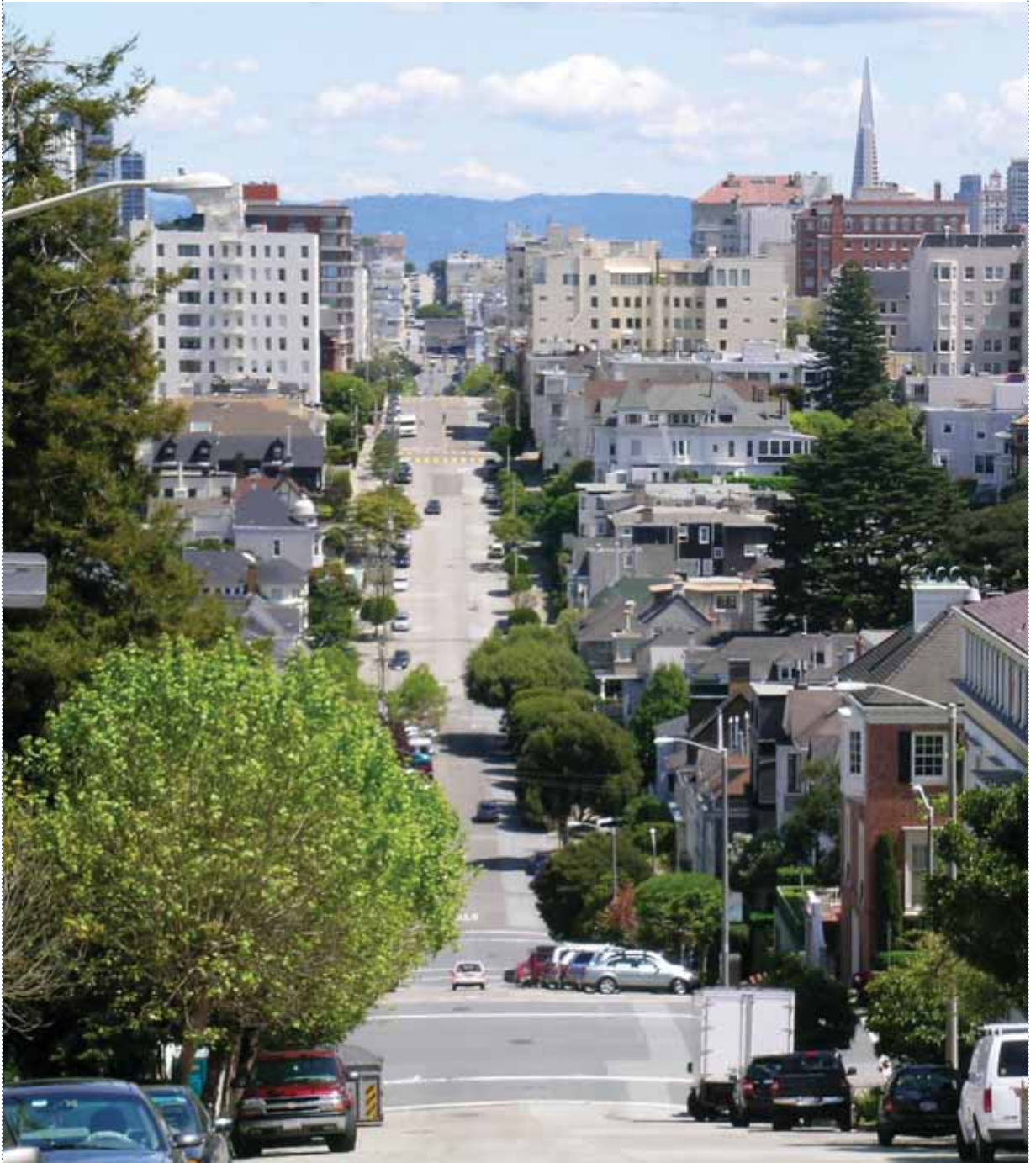
The second option, the only option that respects the dynamic nature of shifting cultivation as an agricultural systems is to consider the area as a whole. This report thus fully supports this second option.

The whole area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. Moreover, it should be classified as **Other Land with Tree Cover**, because the area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.



TOF-URB

2.1. Trees in large urban centers



Case 31: Trees in large urban center, Darwin, Australia (12°30'04"S ; 130°58'46"E)

OL_wTOF - URB
(OL_wTC)



Treed residential urban matrix, with abundant trees planted in private gardens, along houses and along streets. All trees here are TOF because the land has a predominant urban land-use.

The whole area is classified as **Other Land with TOF** because the land is in an urban context, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



Case 32: Trees in large urban center, Harbin, China (45°44'56"N ; 126°38'05"E)

OLwTOF - URB
(OLwTC)



Urban matrix with scarce trees planted along buildings and streets, in a linear structure or in small groups. All trees here are TOF, because the land has a predominant urban land-use.

The whole area is classified as **Other Land with TOF** because of its urban context, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.



Case 33: Trees in large urban center, Montpellier, France (43°37'23"N ; 3°52'01"E)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)

C: OL_wNoTOF



Urban matrix made up of houses, buildings, roads and residential green areas. Trees are planted in linear structure along buildings, parking lots and streets, in small groups in green areas or more or less isolated in gardens. All trees are TOF because the land has a predominant urban land-use. The whole area may be interpreted as **Other Land with TOF** (and as **Other Land with Tree Cover**). If needed, a finer resolution may also lead to the following interpretation:

A: Large tree patches with dense and irregular tree cover. The main use of the land is recreational, so all trees here are TOF.

The A patches are classified as **Other Land with TOF** because of their urban land-use, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

They can be further classified as **Other Land with Tree Cover**, because their area is $\geq 0.5\text{ ha}$, and their tree canopy cover is $\geq 10\%$.



B: Urban area with trees planted along building and streets. Trees, isolated or in small groups, are planted in small green areas. All trees here are TOF.

The area is classified as **Other Land with TOF** because of its urban context, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

C: Large area ($\geq 0.5\text{ha}$) with no trees.

This area is classified as **Other Land with No TOF** because of its urban context (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 34: Trees in large urban center, Hamburg, Germany (53°34'33"N ; 9°56'54"E)

Interpretation 1:

OL_wTOF – URB
(OL_wTC)



Treed urban matrix, with abundant trees planted along houses, buildings and along streets, in linear formation or in small groups in urban parks. All trees here are TOF, because the land has a predominant urban land-use.

The whole area is classified as **Other Land with TOF** because the land is in an urban context, trees are $\geq 5m$ high, tree canopy cover is $\geq 5\%$, and area is $\geq 0.05ha$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5 ha$, and tree canopy cover is $\geq 10\%$.



Interpretation 2:

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)

C: OL_wNoTOF



A: Treed urban matrix, with abundant trees planted along buildings, houses and along streets, in linear structure or isolated in urban plots. All trees here are TOF because the land has a predominant urban land-use.

The area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



B: Large patches ($\geq 0.5\text{ ha}$) with dense and irregular tree cover. The main use of the land is recreational. All trees here are TOF because the land has a predominant urban land-use.

The B patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

C: Large area ($\geq 0.5\text{ ha}$) with no or scarce isolated trees. All trees are TOF.

The C patches are classified as **Other Land with No TOF** because the land is used for urban activities (thus: Other land), and the tree canopy cover is $< 5\%$.



Case 35: Trees in large urban center, Christchurch, New-Zealand (43°31'33"S ; 172°35'39"E)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)
or FOREST

C: OL_wNoTOF



A: urban matrix, with abundant trees along streets, in private gardens, on parking lots. All trees here are TOF, because the land has a predominant urban land-use.

The area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



B: Large forest-like patch with dense, irregular tree cover. Because the patch is large ($> 0.5\text{ha}$) and the canopy cover is dense, even though there is human activity nearby, **field checking** is needed to identify the land-use.

If **urban use** predominant (recreational), all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-urban use**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.



C: Sport ground with no trees.

The area is classified as **Other Land with No TOF** because the land is used for urban activities (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 36: Trees in large urban center, Western Malaysia (5°30'33"N ; 100°25'44"E)



A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)

C: OL_wNoTOF

A: Treed urban matrix, with abundant trees planted along buildings, houses and along streets, in linear structure or isolated in urban plots. All trees here are TOF because the land has a predominant urban land-use.

The area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

B: Large patches (≥ 0.5 ha) with dense and irregular tree cover. The main use of the land is recreational. All trees here are TOF, because the land has a predominant urban land-use.

The B patches are classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

They can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

C: Large area (≥ 0.5 ha) with no or scarce isolated trees. All trees are TOF.

The C patches are classified as **Other Land with No TOF** because the land is used for urban activities (thus: Other land), and the tree canopy cover is $< 5\%$.



Case 37: Trees in large urban center, Marrakech, Morocco (31°37'42"N ; 8°00'04"W)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)



A: Treed urban matrix, with abundant trees planted along buildings, houses and along streets, in linear structure or isolated in urban plots. All trees here are TOF because the land has a predominant urban land-use.

The area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover**, because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

B: Large patch (≥ 0.5 ha) with dense and irregular tree cover. The main use of the land is recreational. All trees here are TOF because the land has a predominant urban land-use.

The area is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.



Case 38: Trees in large urban center, Namibia (17°47'05"S ; 15°41'35"E)

OLwTOF – URB



Urban matrix with scarce trees scattered along buildings and roads, isolated or in small groups. All trees here are TOF because the land has a predominant urban land-use.

The whole area is classified as **Other Land with TOF** because of its urban context, trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

A precise evaluation of the canopy cover would be necessary to know if the area qualifies as **Other Land with Tree Cover** or not...



Case 40: Trees in large urban center, Niger (13°30'09"N ; 7°46'32"E)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wNoTOF

C: Inland Water



A: Urban area with trees and shrubs along buildings, houses and streets, either isolated or in small groups (canopy cover: ca. 20 %). All trees are TOF because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

B: Patches of urban area with no or scarce isolated trees. All trees are TOF, because of the predominant urban land-use.

The B patches are classified as **Other Land with No TOF** because the land is used for urban activities (thus: Other Land), and the tree canopy cover is $< 5\%$.

C: A water reservoir, classified as Inland Water.



Case 41: Trees in large urban center, Senegal (12°33'55"N ; 16°17'45"W)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wNoTOF



Urban matrix of houses, buildings and roads. Trees are planted scattered among the buildings, and roads, in small groups in green areas or isolated in gardens. All trees are **TOF**.

A: Urban area with trees and shrubs along buildings, houses and streets, either isolated or in small groups (canopy cover: ca. 25 %). All trees are TOF *because of the predominant urban land-use*.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

B: Patches of urban area and crop fields with no or scarce isolated trees. All trees are TOF, because of the predominant urban land-use.

The B patches are classified as **Other Land with No TOF** because the land is used for urban activities or agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 42: Trees in large urban center, Singapore (1°19'05"N ; 103°47'46"E)

OL_wTOF – URB
(OL_wTC)



Treed urban matrix, with abundant trees planted along houses, buildings and streets, in linear formation or in small groups in urban parks and gardens (canopy cover: ca. 35 %). All trees are TOF because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



Case 43: Trees in large urban center, Los Angeles, USA (33°48'17"N ; 118°05'20"W)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)

C: OL_wNoTOF



A: Treed urban matrix, with abundant trees planted along houses, buildings and streets, in linear formation or in small groups in urban parks and gardens (canopy cover: ca. 35 %). All trees are TOF, because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



B: A golf course on the left and a urban park on the left, forming a large “green area” with a relatively dense tree cover (canopy cover: ca. 50%). The main use of the land is recreational, in an urban context, so all trees here are TOF.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

C: Relatively large patches ($\geq 0.5\text{ ha}$) with no or scarce isolated trees. All trees are TOF because of the predominant urban land-use.

The C patches are classified as **Other Land with No TOF** because the land is used for urban activities or agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$.

Note: A and B are obviously different. However they belong to the same category and could thus have been merged...

Case 44: Trees in large urban center, Los Angeles, USA (33°46'30"N ; 117°59'38"W)



A: OL_wNoTOF

B: OL_wTOF – URB
(OL_wTC)

A: Urban matrix with no or scarce isolated trees. All trees are TOF *because of the predominant urban land-use.*

The area is classified as **Other Land with No TOF** because the land is used for urban activities (thus: Other Land), and the tree canopy cover is < 5%.

B: Parking lot with homogeneously distributed trees (canopy cover: ca. 15 %), mainly for shading. All trees are TOF, *because of the predominant urban land-use.*

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are ≥ 5m high, the tree canopy cover is ≥ 5%, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is ≥ 10%.



Case 45: Trees in large urban center, South Western, India (12°51'57"N ; 74°51'00"E)

Interpretation 1:

OL_wTOF – URB
(OL_wTC)



Treed urban matrix with a few bare soil patches and with abundant trees and palms in small groups close to houses, buildings and streets (canopy cover: ca. 60%). All trees are TOF *because of the predominant urban land-use.*

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



Interpretation 2:

A: OL_wTOF – URB
(OL_wTC)

B: OL_wTOF – URB
(OL_wTC)
or FOREST



A: Treed urban matrix with a few bare soil patches and with abundant trees and palms in small groups close to houses, buildings and streets (canopy cover: ca. 45%). All trees are TOF because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

B: Large patches with dense and irregular tree and palm cover. Because the area is large ($\geq 0.5\text{ha}$) and wide ($\geq 20\text{m}$), and the canopy cover is dense, even though it is in an urban context, **field checking** is needed to identify the land-use.

If **agricultural use or urban use** predominant, all trees are TOF and the B patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If the use is predominantly **non-agricultural/non-urban**, the B patches are classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.



Case 46: Trees in large urban center, San Diego, California, USA (33°11'23"N ; 117°12'50"W)

OL_wTOF – URB
(OL_wTC)



Urban landscape with buildings, houses and streets, with trees and shrub isolated, in small groups in gardens or in a small orchard (Oranges).

All trees and shrubs here are TOF and the land is classified as **Other Land with TOF** because the land is used for urban activities, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.





2.2 Trees in small urban centers



Case 47: Trees in small urban center, China (35°40'04"N ; 119°47'02"E)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wNoTOF



A: Urban matrix with trees along houses and streets, isolated or in small groups (canopy cover: ca. 30 %). All trees are TOF because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

B: A mosaic of crop fields with no or scarce isolated trees. All trees are TOF because of the predominant agricultural land-use.

The area is classified as **Other Land with No TOF** because the land is used for agricultural activities (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 48: Trees in small urban center, Eastern India (25°08'42"N ; 86°35'23"E)



- A: OL_wTOF – URB (OL_wTC)
- B: OL_wNoTOF
- C: OL_wTOF – AGRI (OL_wTC)
- D: OL_wTOF – AGRI or Non A/U, subset 2

A: Treed urban matrix, with scattered crop fields and ponds, and with abundant trees, isolated or in small groups, along houses, forming hedges of crop fields, or close to the streets (tree canopy cover: ca. 20 %). All trees are TOF *because of the predominant urban land-use*.

The area is classified as **Other Land with TOF** because of its urban context (thus: Other Land), trees are ≥ 5m high, the tree canopy cover is ≥ 5%, and the area is ≥ 0.05 ha.

It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is ≥ 10%.



B: Crop fields with no or scarce isolated trees. All trees are TOF *because of the predominant agricultural land-use*.

The area is classified as **Other Land with No TOF** because the land is used for agricultural activities (thus: Other Land), and the tree canopy cover is < 5%.

C: Home-gardens and orchards forming independent and relatively large (> 0.5 ha) treed patches in the agricultural matrix, with a relatively dense tree cover (canopy cover: ca. 20 to 50 %, depending on the considered patch). All trees are TOF *because of the predominant agricultural land-use*.

The C patches are classified as **Other Land with TOF** because the land is used for agricultural activities (thus: Other Land), trees are ≥ 5m high, the tree canopy cover is ≥ 5%, and the area is ≥ 0.05 ha.

They can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is ≥ 10%.



D: Trees in linear formation. All trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are ≥ 5m high, the tree canopy cover is ≥ 5%, and the linear formation width is ≥ 3m with a length ≥ 25 m.

Case 49: Trees in small urban center, Chiapas, Mexico (14°58'39"N ; 92°15'55"W)

A: OL_wTOF – URB
(OL_wTC)

B: OL_wNoTOF

C: OL_wTOF – AGRI
(OL_wTC)

D: OL_wTOF – AGRI
or Non A/U,
subset 2



A: Matrix with a dense, irregular tree cover, with small grassland patches, and a road bordered by houses. Because the area is large ($\geq 0.5\text{ha}$), and the canopy cover is dense, even though there are obvious signs of human activity (houses, paths and grasslands), **field checking** is needed to identify the land-use.

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as **Other Land with Tree Cover**, because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If the use is predominantly **non-agricultural**, the area is classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.

Field checking reveals that area A is a juxtaposition of coffee agroforest plots, thus agricultural use, so in this case the whole area should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

B: Large area ($\geq 0.5\text{ha}$) with no trees, classified as **Other Land with No TOF**.



C: Treed urban matrix, with abundant trees, isolated or in small groups scattered along houses (gardens) and streets (canopy cover: ca. 45%). All trees are TOF because of the predominant urban land-use.

The area is classified as **Other Land with TOF** because of its urban context, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

Case 50: Trees in small urban center, Namibia ($43^{\circ}35'16''N$; $5^{\circ}11'24''E$)

A: OLwTOF – AGRI
or FOREST
or OWL

B: OLwTOF – AGRI
(OLwTC)

C: OLwTOF – URB
(OLwTC)

D: OLwNoTOF



A: Large area with no obvious human use; dense and irregular shrub cover with some trees. Because *the area is large* ($\geq 0.5ha$), has no obvious main use, and the tree and shrubs combined canopy cover is dense ($\geq 10\%$), **field checking** is needed to identify the land-use:

If **agricultural use** predominant, all trees are TOF and the area is classified as **Other Land with TOF** because *trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05 ha$.*

It can be further classified as **Other Land with Green Cover** because *the tree canopy cover is $\geq 10\%$ and the area is $\geq 0.5 ha$.*

If **non-agricultural use**, the area is classified as **Forest** because *trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5 ha$.*

B: Pasture area with shrubs and scattered trees (canopy cover: ca. 15 %). All trees and shrubs are TOF, *because of the predominant agricultural land-use.*

The area is classified as **Other Land with TOF** because, *trees are $\geq 5m$ high, the combined tree and shrub canopy cover is $\geq 10\%$, and the area is $\geq 0.05 ha$.*

It can be further classified as **Other Land with Tree Cover** because *area is $\geq 0.5 ha$, and tree canopy cover is $\geq 10\%$.*

C: Urban matrix made up of houses, buildings and streets, with abundant shrubs and scattered trees (canopy cover: ca. 30 %). All trees and shrubs are TOF, *because of the predominant urban land-use.*

The land is classified as **Other Land with TOF** because *the land is used for urban activities, trees are $\geq 5m$ high, the combined tree and shrub canopy cover is $\geq 10\%$, and the area is $\geq 0.05 ha$.*

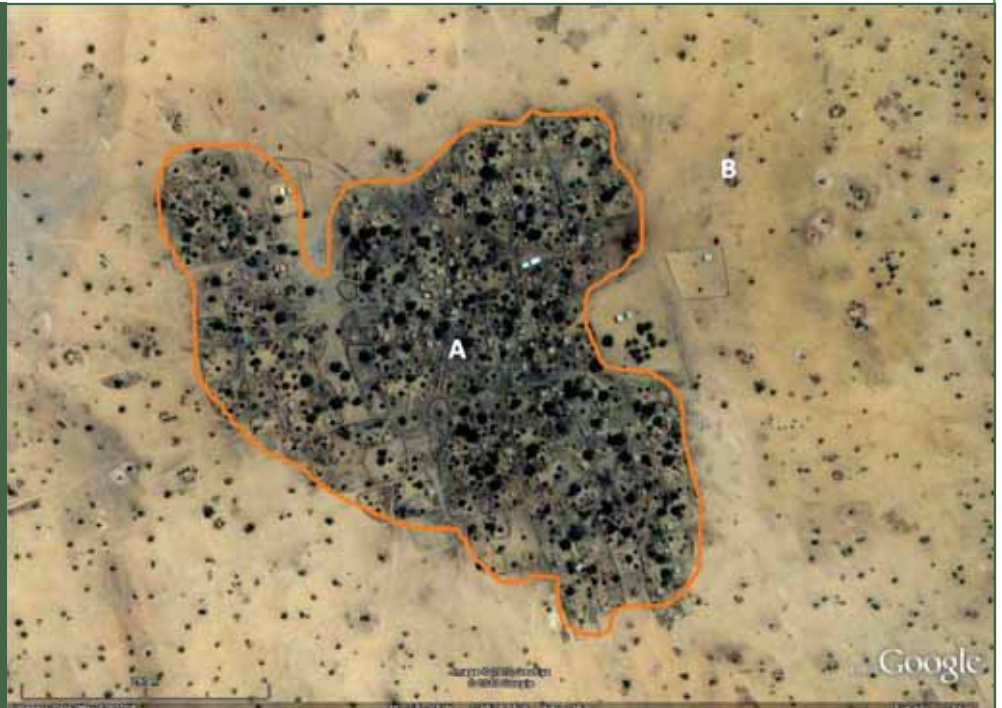
It can be further classified as **Other Land with Green Cover** because *area is $\geq 0.5 ha$, and the tree canopy cover is $\geq 10\%$.*

D: Two large patches ($\geq 0.5ha$) with no trees, classified as **Other Land with No TOF**.

Case 51: Trees in a small urban center, Niger (14°02'52"N ; 2°49'28"E)

A: OL_wTOF – URB
(OL_wTC)

C: OL_wTOF – AGRI



A: Small urban matrix of houses, gardens and paths with shrubs and trees (canopy cover: ca. 20 %). All trees and shrubs are TOF because the predominant use of the land is urban.

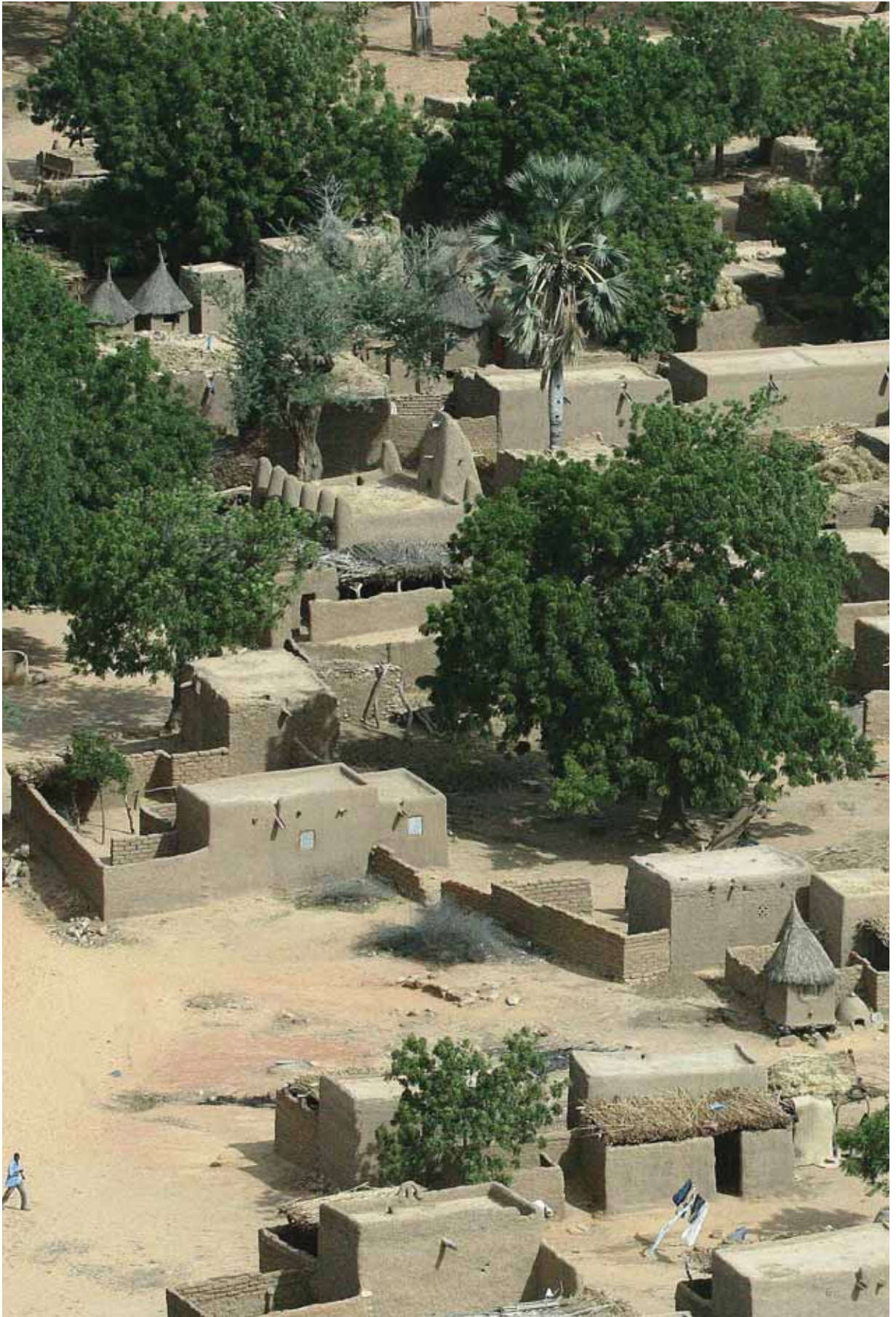
The area is classified as **Other Land with TOF** because the land is used for urban activities, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and the tree canopy cover is $\geq 10\%$.

B: Pasture area with shrubs and scattered trees (canopy cover between 5 and 10 %). All trees and shrubs are TOF because the predominant land use is agriculture.

The land is classified as **Other Land with TOF** because the land is used for pasture (agriculture), trees are $\geq 5\text{m}$ high, the tree and shrub canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.





2.3. Trees in “R-urban” Area

When the human habitat is scattered, each house being associated to a large plot of land, it is sometimes difficult to identify the urban nature of an area. This is expressed here in the neologism “rurban” or “r-urban” which takes this hesitation between “rural” and “urban” into account.



Case 52: Trees in “R-urban” areas, Darwin, Australia (12°32’50”S ; 131°02’27”E)

OLwTOF – AGRI –
URB (OLwTC)



This image illustrates a transition between a forest and a treed urban area.

Mosaic of housing structures (houses and gardens), roads, crop fields with abundant trees in large groups and orchards. All trees here are TOF, because the land is in an urban and agricultural context.

The land is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

Another interpretation could be devised if a finer scale / resolution of the assessment is needed: a matrix with houses and gardens -OLwTOF - AGRI - URB (OLwTC)-, crop fields with no or rare trees -OLwNoTOF-, and patches with a dense tree cover and no house -FOREST.



Case 53: Trees in “R-urban” areas, France (50°41’20”N ; 3°07’19”E)

OL_wTOF – URB



R-urban landscape with buildings, houses, road and parking lot, with trees isolated, in small groups or in linear formation (width <20m). All trees and shrubs here are TOF.

The whole area is classified as **Other Land with TOF** because the land is used for urban activities, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



Case 54: Trees in “R-urban” areas, France (47°52’37”N ; 4°03’08”W)

A: OLwTOF - AGRI
(OLwTC)
or FOREST

B: OLwTOF - URB
(OLwTC)

C: OLwTOF - AGRI
or NON
A/U subset 2

D: OLwTOF - AGRI
(OLwTC)
or FOREST

E: OLwNoTOF



A: Large treed patches with a dense, irregular tree cover, small grassland areas and a few housing structures. Because the area is large ($\geq 0.5\text{ha}$), and the tree canopy cover is dense, even though signs of human activities are obvious, **field checking** is needed to identify the land-use:

If **agricultural use** predominant, all trees are TOF and the A patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. They can be further classified as **Other Land with Tree Cover** because their areas are $\geq 0.5\text{ha}$, and their tree canopy cover is $\geq 10\%$.

If **non-agricultural** use, the A patches are classified as **Forest** because trees are $\geq 5\text{m}$ high, tree canopy cover is $\geq 10\%$, and areas are $\geq 0.5\text{ha}$.

B: Mosaic of small crop fields, orchards, houses, roads and grassland patches with abundant trees and shrubs. All trees are TOF because of the predominant urban land-use.

The B patches are classified as **Other Land with TOF** because the land is used for agriculture and housing structures, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$.

They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

C: Trees in linear formation forming hedges around crop fields, or along roads. All trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.

D: Large patches of dense and regular tree cover. Because the patches are large ($\geq 0.5\text{ha}$), and the tree canopy cover is dense ($\geq 10\%$), even though signs of human activities are obvious, **field checking** is needed to identify the land-use:

If **agricultural use** predominant, all trees are TOF and the D patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ha}$. They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, B patches are classified as **Forest** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha

In this case **field checking** shows that B patches are fruit orchards, so they should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

E: Patches of crop fields and houses with gardens, with no or scarce isolated trees. All trees are TOF, because of the agricultural or urban land-use.

The E patches are classified as **Other Land with No TOF** because the land is mainly used for agriculture and for a few housing structures (thus: Other Land), and the tree canopy cover is $< 5\%$.



Case 55: Trees in “R-urban” areas, Montpellier, France (47°52’37”N ; 4°03’08”W)

A: OL_wTOF - URB
(OL_wTC)

B: OL_wTOF - URB
(OL_wTC)
or FOREST

C: OL_wTOF - URB
(OL_wTC)
or FOREST

D: OL_wNoTOF

E: OL_wTOF - AGRI
or NONA/U
subset 2



A: Mosaic/matrix of houses and gardens, some small crop fields, orchards, streets and roads, and grassland patches, with abundant trees and shrubs (canopy cover: ca. 30 %). All trees are TOF because of the predominant urban land-use.

The A patches are classified as **Other Land with TOF** because the land is predominantly used for housing structures, trees are $\geq 5m$ high, tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.

They can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

B: Large corridor of trees, with a dense, irregular tree cover, along a river. Because the area is large ($\geq 0.5ha$), and the tree canopy cover is dense ($\geq 10\%$), **field checking** is needed to identify the land-use:

If **agricultural use** or **urban use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as **Forest** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha;

C: Large patches of dense and irregular tree and bush cover, with a few houses. Because the patches are large ($\geq 0.5ha$), and the tree and bush canopy cover is dense, **field checking** is needed to identify the land-use:

If **agricultural use** or **urban use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, classified as **Forest** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha;

D: Mosaic of crop fields, with no or scarce isolated trees. All trees are TOF.

The D patches are classified as **Other Land with No TOF** because the land is mainly used for agriculture and some housing structures (thus: *Other Land*), and the tree canopy cover is $< 5\%$.

E: Trees in linear formation forming hedges around crop fields, or along roads (yellow dotted lines on the picture). Trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3m$ with a length $\geq 25m$.



Case 56: Trees in “R-urban” areas, Potsdam, Germany (52°23’49”N ; 13°1’25”E)

A: OL_wTOF - URB
(OL_wTC)

B: OL_wTOF - AGRI -
URB (OL_wTC)

C: OL_wTOF - URB
(OL_wTC)



A: Recreational urban park with buildings, a small lake, large tree patches with an irregular tree cover and grassland patches (average canopy cover: ca. 60%). All trees are TOF because of the predominantly urban use of the land.

The area is classified as **Other Land with TOF** because the land has a predominantly urban use, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.



B: Mosaic of small houses, roads and grassland patches with abundant trees and shrubs, isolated or in small groups along buildings and roads. All trees are TOF because of the predominantly urban and agricultural use of the land.

The B patches are classified as **Other Land with TOF** because the land is used for agriculture and housing structures, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

C: Dense matrix of houses, streets and urban kitchen gardens with abundant trees and shrubs, along streets and in gardens. All trees are TOF because of the predominantly urban use of the land.

The area is classified as **Other Land with TOF** because the land is used for agriculture and housing structures, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

It can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

Case 57: Trees in “R-urban” areas, Nicaragua (12°08'35”N ; 86°20'14”W)

OLwTOF - AGRI -
URB (OLwTC)



Mosaic of housing structures (houses and gardens), streets and roads, crop fields; abundant trees in groups (gardens and orchards). All trees are TOF *because of the predominantly urban and agricultural use of the land.*

The land is classified as **Other Land with TOF** because *trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha.*

It can be further classified as **Other Land with Tree Cover** because *area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.*



Case 58: Trees in “R-urban” areas, Montpellier, France (43°28’53”N ; 3°41’02”E)

A: OLwNoTOF

B: OLwTOF - AGRI
(OLwTC)

C: OLwTOF - AGRI
or NONA/U
subset 2

D: OLwTOF - AGRI

E: OLwNoTOF

F: OLwTOF - URB
(OLwTC)
or FOREST

G: OLwTOF - URB
or NONA/U
subset 1



A: Crop fields and highway with no or scarce isolated trees. All trees are TOF because the land is used for agriculture and urban (the highway is considered as a corridor linking urban centers) activities.

The area is classified as **Other Land with No TOF** because the land is used for agriculture and urban activities (thus: Other Land), and the tree canopy cover is < 5%.

B: Patches of trees isolated or in small groups, on crop fields and in house gardens.

The B patches are classified as **Other Land with TOF** because the land is used for agriculture and housing structures, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

C: Trees in continuous and discontinuous linear formation (width <20m), mostly along roads. All trees and shrubs here are TOF, either because they have a predominant agricultural or urban use or, if they have a predominant non agricultural – non urban use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.

D: Patch of tree crop (olive tree).

The area is classified as **Other Land with TOF** because the land is used for agriculture, trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$.

E: Vineyards with no or scarce isolated trees. Grapevine is a vine, not a tree nor a shrub.

The E patches are classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%.

F: Large patches (> 0.5 ha) with dense, irregular tree cover. Because the patches are large ($\geq 0.5\text{ha}$) and the canopy cover is dense, even though there is human activity nearby, **field checking** is needed to identify the land-use.

If **urban** or **agricultural use** predominant, all trees are TOF and the land is classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is ≥ 0.05 ha. It can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-urban** or **non-agricultural use**, the land is classified as **Forest** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.

In the present case, the **definition of “urban”** is the key, at least for the patch located in the lower left quarter of the picture: this patch is managed by the highway authority and if the highway is considered as “urban” because it links urban centers, then this patch has a urban use and should be classified as **Other Land with TOF** and as **Other Land with Tree Cover**.

G: Small (<0.5 ha) and dense patches of trees. All trees here are TOF, either because the land has a predominantly urban or agricultural use, or if the land use is not predominantly urban or agricultural, because the area of each patch is lower than 0.5 ha. In the present case, the 3 G patches are managed by the highway authority and should be considered as “urban” if a highway is considered as “urban”.

The G patches are in any case classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the area is <0.5 ha but ≥ 0.05 ha.



.....Trees Outside Forests, on land not predominantly under.....
agricultural or urban use

TOF NON A/U

3.1. Trees in smallwoods (area less than 0.5 ha) – subset 1



Case 59: Trees in small woods - Namibia (18°17'53”S ; 23°36'59”E)

Interpretation 1

A: OLwNoTOF

B: OWL

C: OLwTOF - AGRI (OLwTC) or FOREST

D: OLwNoTOF

E: OLwTOF - NONA/U subset 1



Riverbed surrounded by natural areas and paths. Some agricultural activity is visible on the right top corner but is not the predominant land use.

A: Large riverbed with a few shrubs along river streams.

With a tree canopy cover below 5%, and a combined tree and shrub canopy cover below 10%, the area is classified as **Other Land with No TOF** because it does not satisfy the minimal canopy cover thresholds, neither for Forest and Other Wooded Land, nor for Other Land with TOF. All trees and shrubs in the area are TOF.

B: Large area with scattered shrubs and small groups of trees (small woods with individual area <0.05 ha).

The land is classified as **Other Wooded Land** because the land is not predominantly under agricultural or urban use, nor classified as Forest, and because canopy cover is $\geq 10\%$, and area is ≥ 0.5 ha.

C: Large tree patches with a dense and irregular tree cover. Because the area is large (≥ 0.5 ha), and the tree canopy cover is dense ($\geq 10\%$), **field checking** is needed to identify the land-use:

If **agricultural use** predominant (pasture), all trees are TOF and the C patches are classified as **Other Land with TOF** because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area of each patch is ≥ 0.05 ha.

They can be further classified as **Other Land with Tree Cover** because area is ≥ 0.5 ha, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, C patches are classified as **Forest** because trees are ≥ 5 m high, the tree canopy cover is $\geq 10\%$, and the area of each patch is ≥ 0.5 ha.

D: Large patches with no or scarce isolated trees.

With a tree canopy cover below 5%, and a combined tree and shrub canopy cover below 10%, the D patches are classified as **Other Land with No TOF** because they do not satisfy the minimal canopy cover thresholds, neither for Forest and Other Wooded Land, nor for Other Land with TOF. All trees and shrubs in the D patches are TOF.

E: Small patches (<0.5ha) of trees and shrubs.

The E patches are classified as **Other Land with TOF** because they do not satisfy the minimal area threshold for Forest and Other Wooded Land, and because trees are ≥ 5 m high, the tree canopy cover is $\geq 5\%$, and the area of each patch is ≥ 0.05 ha but <0.5ha. All trees and shrubs are TOF.

Interpretation 2

A: OLwNoTOF

B: OWL

C: OLwTOF - AGRI
(OLwTC)
or FOREST

D: OLwNoTOF



In this interpretation, the small **E** patches (**Other Land with TOF**) are considered as an integral part of the **B** patches (**Other Wooded Land**). The areas under **A**, **C** and **D** are not modified. **B** becomes:



B: Large area with scattered shrubs and small groups of trees (small woods with individual area <0.5 ha).

The land is classified as **Other Wooded Land** because the land is not predominantly under agricultural or urban use, nor classified as Forest, and because the combined tree and shrub canopy cover is $\geq 10\%$, and the area is ≥ 0.5 ha.



Case 60: Trees in small woods - Germany (48°37'06"N ; 11°25'55"E)

A: OL_wTOF - AGRI
(OL_wTC)

B: OL_wNoTOF

C: OL_wTOF - AGRI
or NONA/U
subset 2

D: OL_wTOF - AGRI
or NONA/U
subset 1

E: OL_wTOF -
NONA/U
subset 2



A: Large patches of dense and irregular tree cover. Because the area is large ($\geq 0.5\text{ha}$), and the tree canopy cover is dense ($\geq 10\%$), **field checking** is needed to identify the land-use:

If **agricultural use** predominant, all trees are TOF and the A patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. They can be further classified as **Other Land with Tree Cover** because area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

If **non-agricultural use**, A patches are classified as **Forest** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 10\%$, and the area is $\geq 0.5\text{ ha}$.

B: Agricultural matrix forming a mosaic of crop fields, with no or scarce isolated trees. All trees are TOF.

The area is classified as **Other Land with No TOF** because the land is mainly used for agriculture and some housing structures (thus: Other Land), and the tree canopy cover is $< 5\%$.

C: Trees in linear formation (hedges) around crop fields. Trees here are TOF, either because they have a predominant agricultural use or, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.

D: Small patch ($< 0.5\text{ha}$) of trees with dense and irregular tree cover. All trees here are TOF, either because the land has a predominantly agricultural use, or if the land use is not predominantly agricultural, because the area of the patch is lower than 0.5 ha .

In any case the D patch is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$, but $< 0.5\text{ ha}$.

E: Forest-like corridors of dense and irregular tree cover, following a river on both sides. All trees are TOF, because each corridor has an average width $< 20\text{m}$.

The area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, the area is $\geq 0.05\text{ ha}$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.

Cas 61: Trees in small woods - France (46°57'39"N ; 4°57'17"E)

A: OL_wTOF -
NON A/U
subset 1

B: OL_wTOF -
NON A/U
subset 2

C: OL_wNoTOF



A: Small patch (<0.5ha) of trees with a dense canopy cover.

The patch is classified as **Other Land with TOF** because it does not satisfy the minimal area threshold for Forest and Other Wooded Land, and because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the area of the patch is $\geq 0.05\text{ ha}$ but $< 0.5\text{ha}$. All trees and shrubs are TOF.



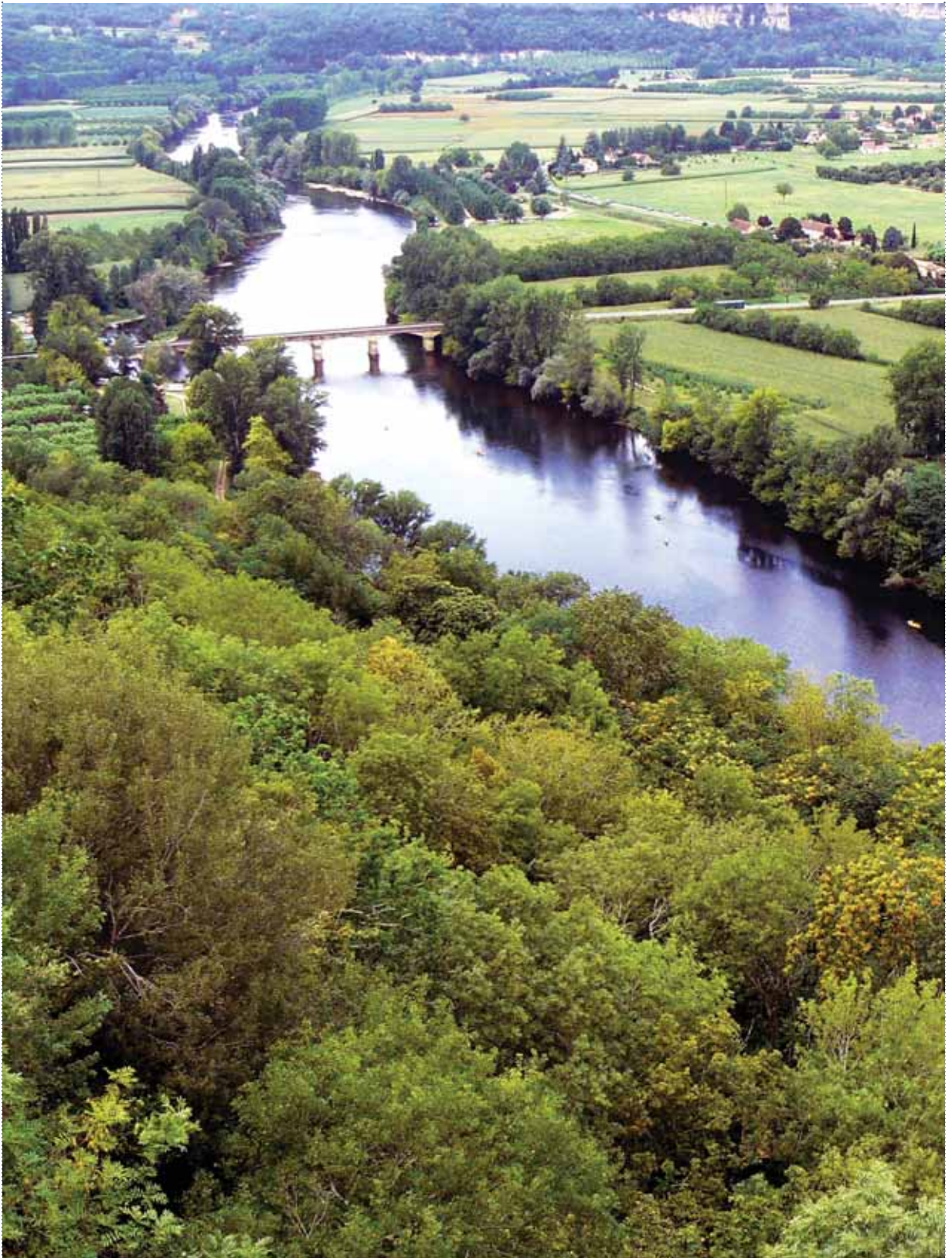
B: Trees and shrubs in narrow discontinuous linear formation, forming hedges around crop fields or a corridor along the river. All trees and shrubs here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is $< 20\text{m}$.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.

C: Agricultural matrix composed of a mosaic of crop fields with no or scarce isolated trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is $< 5\%$. All trees and shrubs here are TOF.

3.2. Trees in narrow linear formations – TOF NON A/U subset 2



Case 62: Trees in narrow linear formations – Turkey (41°25'26"N ; 27°10'57"E)

A: OL_{wNoTOF}

B: OL_{wTOF} -
NON A/U
subset 2



A: A mosaic of crop fields, with no or scarce isolated trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%. All trees are TOF.

B: Two parallel tree corridors with a dense and irregular canopy, following a river on both sides. All trees are TOF because each corridor has a width <20m.

The area is classified as **Other Land with TOF** because trees are ≥ 5m high, the tree canopy cover is ≥ 5%, and the linear formation width is ≥ 3m with a length ≥ 25m.



Case 63: Trees in narrow linear formations – Australia (32°20'01”S ; 115°52'37”E)

A: OLwTOF -
NON A/U
subset 2

B: OLwNoTOF

C: OLwTOF - AGRI
or NON A/U
subset 2

D: OLwTOF - AGRI
or NON A/U
subset 1



A: Trees and shrubs in narrow discontinuous linear formation, along a river. All trees and shrubs here are TOF because the width of the tree line is <20m.

The area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.



B: Mosaic of crop fields, with no or scarce isolated trees.

The area are classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%. All trees are TOF.



C: Trees and shrubs in narrow discontinuous linear formation, following the road or forming hedges. All trees and shrubs here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.

D: Small and dense patches of trees. All trees here are TOF, either because the land has a predominantly agricultural use, or if the land use is not predominantly agricultural, because the area of the patch is lower than 0.5 ha.

In any case the D patches are classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and their individual area is $\geq 0.05\text{ha}$, but <0.5 ha.

Case 64: Trees in narrow linear formations – France (48°25'10"N ; 7°33'44"E)

A: OLwNoTOF

B: OLwTOF - AGRI
or NONA/U
subset 2

C: OLwTOF - AGRI
or NONA/U
subset 1



A: Mosaic of crop fields, with no trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%.



B: Trees along roads or forming hedges around crop fields, in narrow continuous linear formation (width < 20m). All trees and shrubs here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$.

C: Small patch (< 0.5 ha) of linear formation (width > 20m) with a dense tree cover. Even though the width is > 20m, all trees here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the area of the patch is < 0.5 ha.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the patch area is $\geq 0.05\text{ ha}$, but < 0.5 ha.



Case 65: Trees in narrow linear formations – China (46°13'39"N ; 127°04'03"E)

A: OLwNoTOF

B: OLwTOF -
NON A/U
subset 2



A: Mosaic of crop fields, with no trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%.

B: Trees along roads, in narrow continuous linear formation (width <20m).

The area is classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{m}$. All trees are TOF.



Case 66: Trees in narrow linear formations – Morocco (29°46'52"N ; 9°48'21"W)

A: OLwNoTOF

B: OLwTOF - AGRI
or NONA/U
subset 2

C: OLwNoTOF



A: Mosaic of crop fields, with no or scarce isolated trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and tree canopy cover is < 5%. All trees are TOF.



B: Trees in continuous and discontinuous linear formation (width <20m), forming hedges around crop fields. All trees and shrubs here are TOF, either because they have a predominant agricultural use or, if they have a predominant non-agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5m$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3m$ with a length $\geq 25 m$.

C: Pasture lands and village with houses and roads, with no or scarce isolated trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture or housing structures (thus: Other Land), and the tree canopy cover is < 5%. All trees are TOF.



Case 67: Trees in narrow linear formations – Namibia (18°08'23"S ; 21°34'57"E)

A: OLwNoTOF

B: OLwTOF - AGRI

C: OLwTOF - AGRI
(OLwTC)

D : OLwTOF - AGRI
or NONA/U
subset 2



A: Mosaic of crop fields or pasture, with no or scarce isolated trees.

The area is classified as **Other Land with No TOF** because the land is used for agriculture (thus: Other Land), and the tree canopy cover is < 5%. All trees are TOF.



B: Large patches, with a dense and irregular shrub cover, and with some trees. Because the area is large ($\geq 0.5\text{ha}$), and has an obvious agricultural use, all trees and shrubs are TOF.

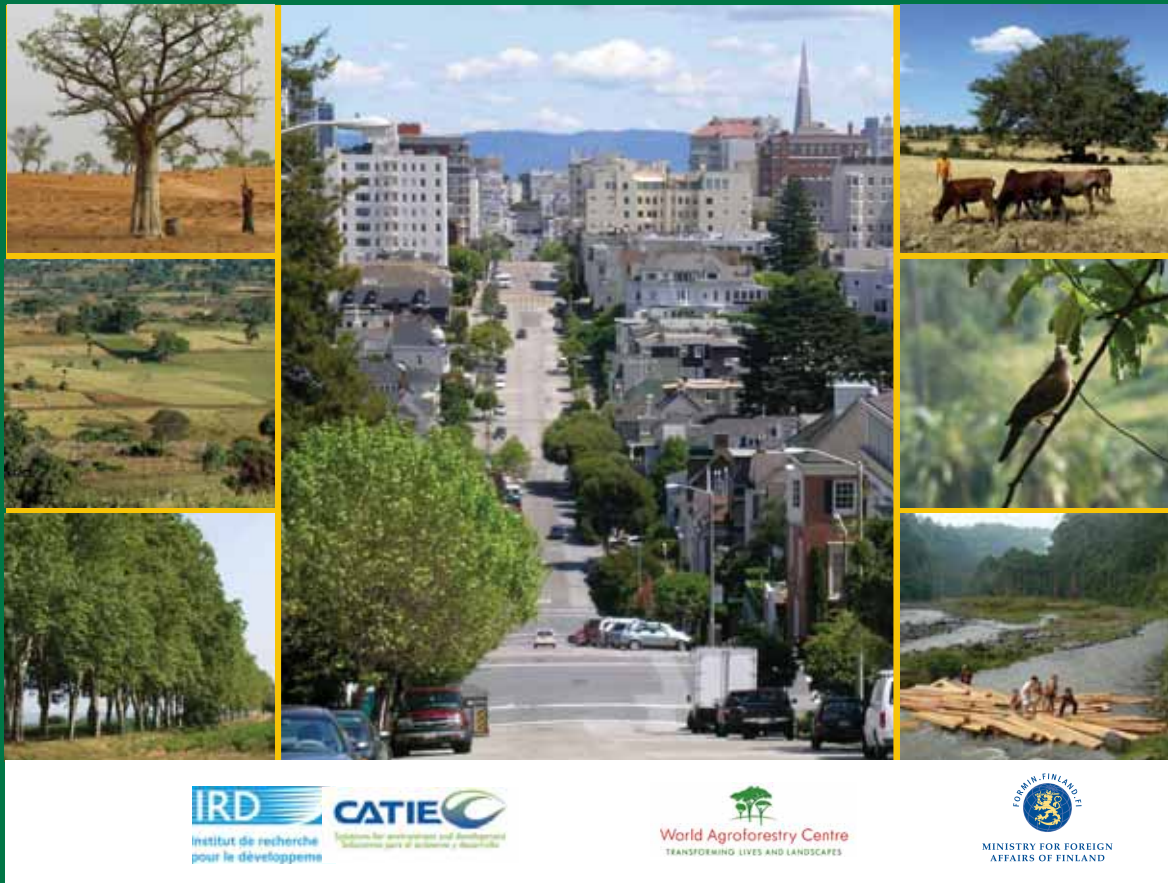
The B patches are classified as **Other Land with TOF** because the combined tree and shrub canopy cover is $\geq 10\%$, and the area is $\geq 0.05\text{ ha}$. Note that the B patches do not qualify as Other Land with Tree Cover because their tree canopy cover is below 10%.

C: Large patch, with dense and irregular tree cover. Because the area is large ($\geq 0.5\text{ha}$), and has an obvious agricultural use, all trees and shrubs are TOF.

The area is classified as **Other Land with TOF** because, the tree canopy cover is $\geq 5\%$, and the area is $\geq 0.05\text{ ha}$. It can be further classified as Other Land with Tree Cover, because the area is $\geq 0.5\text{ ha}$, and tree canopy cover is $\geq 10\%$.

D: Narrow continuous and discontinuous linear formation (width <20m) composed of trees and shrubs forming hedges around crop fields. All trees and shrubs here are TOF, either because they have a predominant agricultural use or, if they have a predominant non agricultural use, because the line width is < 20m.

The area is in any case classified as **Other Land with TOF** because trees are $\geq 5\text{m}$ high, the tree canopy cover is $\geq 5\%$, and the linear formation width is $\geq 3\text{m}$ with a length $\geq 25\text{ m}$.



FAO, in cooperation with its member countries, has monitored the world's forests at 5 to 10 year intervals since 1946. These global assessments provide valuable information to policymakers in countries, to international negotiations, arrangements and organizations related to forests and to the general public. The Global Forest Resources Assessment (FRA) is the most comprehensive assessment on forest that examines the status and trends for all types of forests in the world.

Reliable and comprehensive information on "Trees Outside Forests" - TOF - across large areas (sub-national and national levels) remains scarce. Recognizing the importance of all tree resources, FRA has included activities for the assessment of trees outside forests in the process since FRA 2000.

The Thematic Report "Towards the Assessment of Trees Outside Forests" responds to the request made by FAO member countries to support identifying methods and techniques for TOF assessment on large areas that promotes harmonization between countries, quality data and respond to the requirements related to global processes such as the CBD, UNCCD and UNFCCC.

The Thematic Report consists of three parts:

- Part I – Towards Assessing Trees Outside Forests
- Part 2 – Case Studies on Trees Outside Forests Assessment
- Part 3 – Trees Outside Forests from the air (satellite photos interpreted)