Nature4Cities Virtual Forum with NBS experts
May 19th 2020 – 11:00-11:30
Session 2 - Create your NBS project

How to collect data to feed your NBS project assessment?

Eva Raggi (RINA C) – Civil Engineer at Rina Consulting. She coordinated the data collection on Nature4Cities pilot sites

Session 2 – Create your NBS project

#B - How to collect data to feed the NBS holistic assessment process?

Part 1	**N4C Data collection methodologies (10 min.)**
	Eva Raggi (RINA C) coordinator of the pilots' data collection
Part 2	**Città Metropolitana di Milano experience (5 min.)**
	Cinzia Davoli & Giulia Garvaglia (CMM) municipality's responsibles for N4C project
Part 3	**Open discussion with technical experts (15 min.)**
	Eva Raggi (RINA C) – Data collection processes
	Cinzia Davoli & Giulia Garvaglia (CMM) – Milano Metropolitan Area experience
	Ferran Roure (EUT), Lorenzo Elia, M. Cortese & D. Perfido (R2M) technical experts for drone flights
	Clément Murgue (TRS) technical expert for Satellite Imagery analysis

Objectives & Framework

OBJECTIVE OF N4C DATA COLLECTION

- to feed the **holistic assessment process** of NBS

- to apply and test **49 Urban Performance Indicators** and **8 methodologies & tools** integrated within the N4C platform

FRAMEWORK OF N4C DATA COLLECTION

10 Demonstration cases   ⟶   Milano Metropolitan Area - 4 querries

Alcala de Henares - 2 sites

Szeged - 3 sites

Municipality of Çankaya (Ankara) – 1 site

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Dedicated intervention in the second part of this session
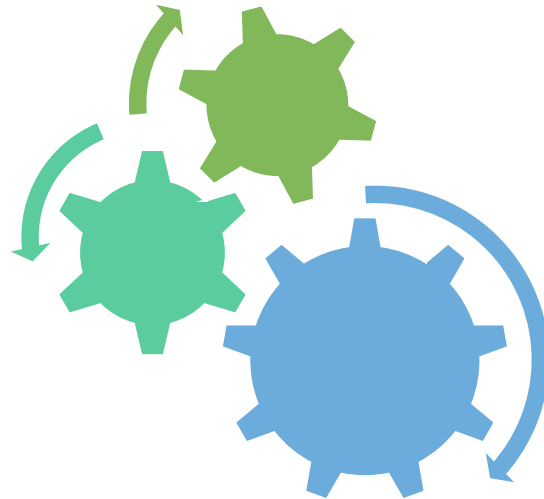
Data collection process

WHICH WERE THE STEPS FOR THE DATA COLLECTION PROCESS?

Data collection process
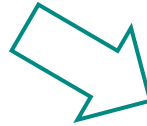

Data Consistency Management
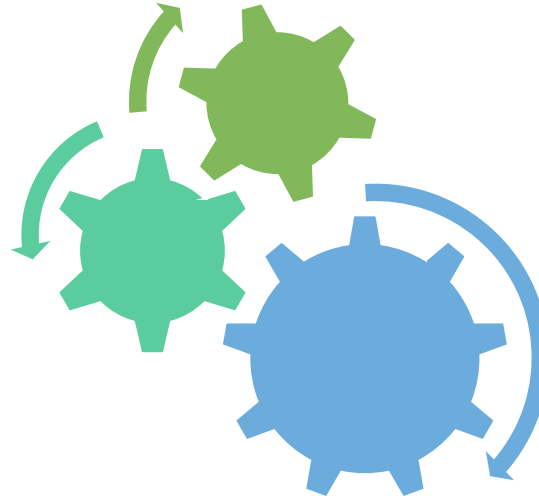
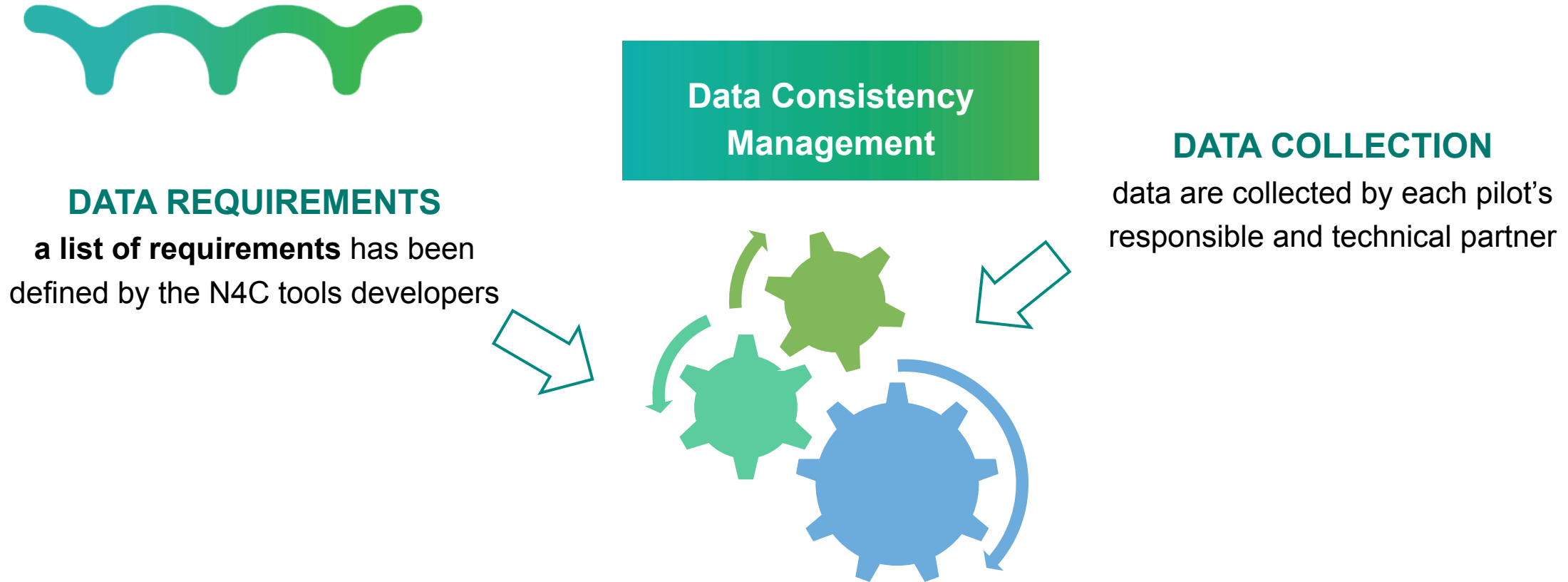# Data collection process

DATA REQUIREMENTS

a list of requirements has been defined by the N4C tools developers

Data Consistency Management

Data collection process

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data are collected by each pilot's responsible and technical partner

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DATA MANAGEMENT

data are managed with excel sheets (complete with proper tracking code) and **organised within EMDESK** to ensure that tool developers have promptly access to available data

Data collection process

Data Consistency Management

DATA REQUIREMENTS

a list of requirements has been defined by the N4C tools developers

DATA COLLECTION

data are collected by each pilot's responsible and technical partner

DATA CHECK

tools developers reviewed the data collected and addressed any issues emerging in order to **ensure accuracy**, **validity and relevance of the data**.

DATA MANAGEMENT

data are managed with excel sheets (complete with proper tracking code) and **organised within EMDESK** to ensure that tool developers have promptly access to available data

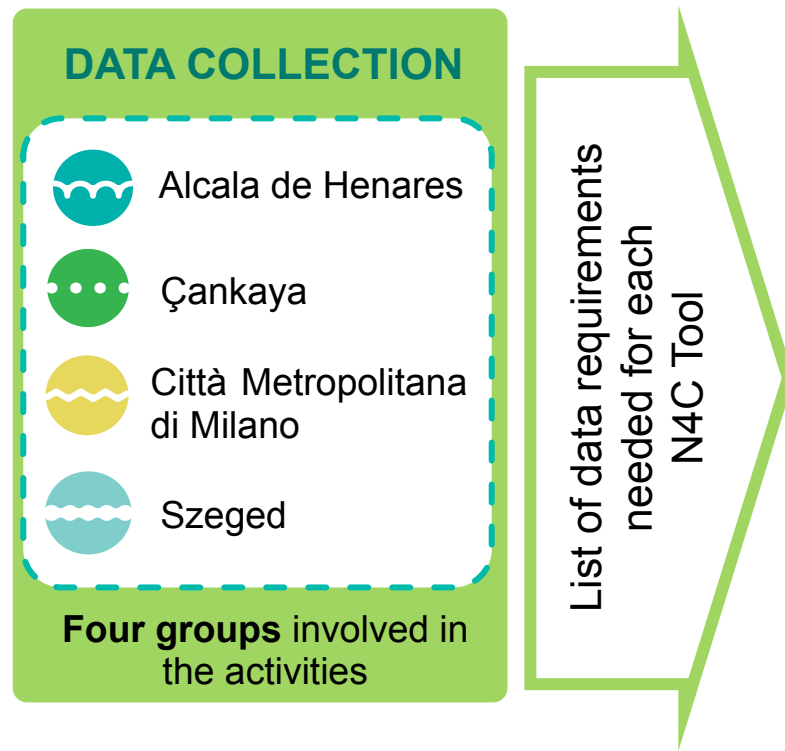# Data collection process

DATA COLLECTION

- Alcala de Henares
- Çankaya
- Città Metropolitana di Milano
- Szeged

Four groups involved in the activities

Data collection process

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List of data requirements needed for each N4C Tool

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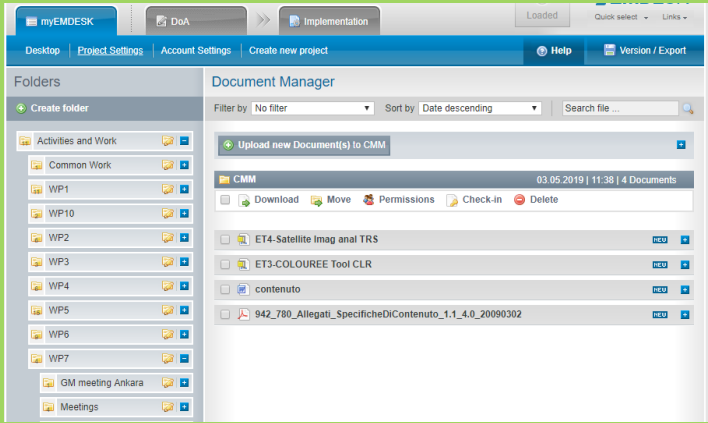
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METHODOLOGIES ADOPTED:

1. Data collection from **Public data sources & Municipalities' owned data**

2. Data collection from **high-resolution satellite imagery analysis**

3. Data generation from **aerial inspection by drone**

4. **Citizens' related data** organisation through **Citizens' Say tool**

Data collection process

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Data are collected and saved on EMDESK for each city and tool

Data collection methodologies

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2. Data collection from **high-resolution satellite imagery analysis** (technical expert TERRANIS)

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Dedicated session tomorrow
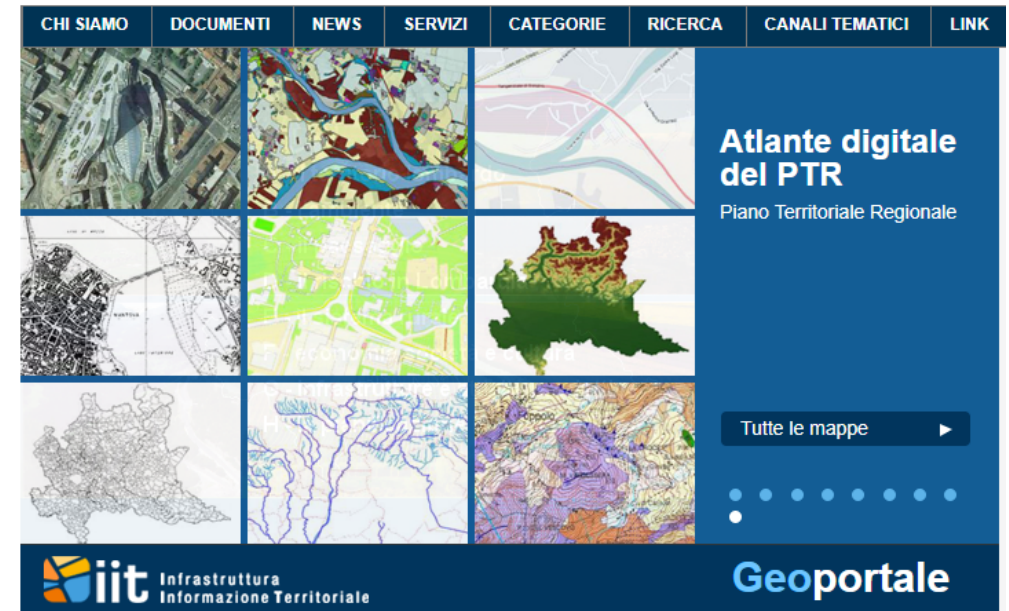
Data collection methodologies

Collection of public and municipalities' owned data

Public sources: official existing databases, public statistics, public monitoring data, reports and previous researches

Municipalities' owned databases: internal works and analyses, financial records, meeting minutes and internal reports.
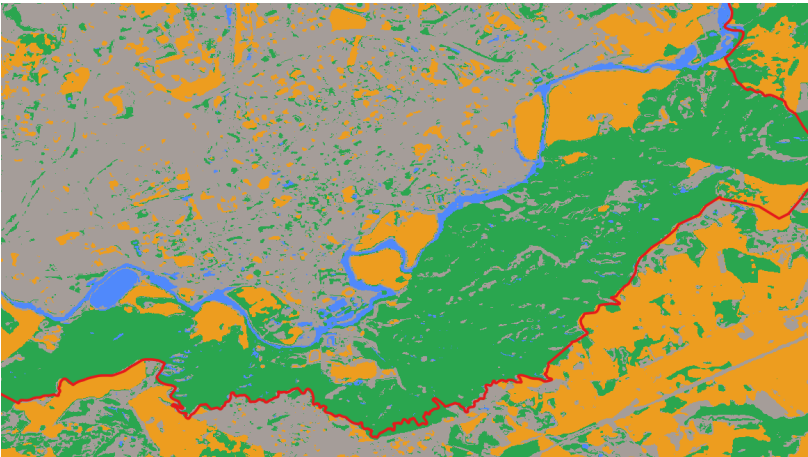
CHI SIAMO | DOCUMENTI | NEWS | SERVIZI | CATEGORIE | RICERCA | CANALI TEMATICI | LINK

Atlante digitale del PTR
Piano Territoriale Regionale

Tutte le mappe ▶

iit Infrastruttura Informazione Territoriale

Geoportale

e.g. http://www.geoportale.regione.lombardia.it/en/home

Data collection methodologies

High resolution satellite imagery analysis - TerraNIS

Data generated directly:
Landcover maps with 4 classes (Water, Bare soil, Artificialized area and vegetation)

TOPIC	CHALLENGES	SUB-CHALLENGES	INDICATORS	Role of the Satellite Imagery Analysis
ENVIRONMENT	4 GREEN SPACE AND BIODIVERSITY	4.1 Biodiversity	4.1.1 | UGSP - Urban Green Space Proportion	Input provided: UPI Directly Calculable
		4.2 Urban space development and regeneration	4.2.1 | BAF - Biotope Area Factor	Use as an input for other tools. Differentiation between public and private green spaces is needed
			4.2.2 | CGS - Connectivity of green spaces	Use as an input for other tools. Specific use of each green spaces is needed
SOCIAL	9 URBAN PLANNING AND GOVERNANCE	9.1 Urban planning and form	9.1.1 | AS - Areal Sprawl	Input provided: UPI Directly Calculable

Data generated indirectly:
Landcover map can be used by other N4C tools to calculate other UPI

Data collection methodologies

High resolution satellite imagery analysis - TerraNIS

Technical details:

Step 1
Satellite data acquisition
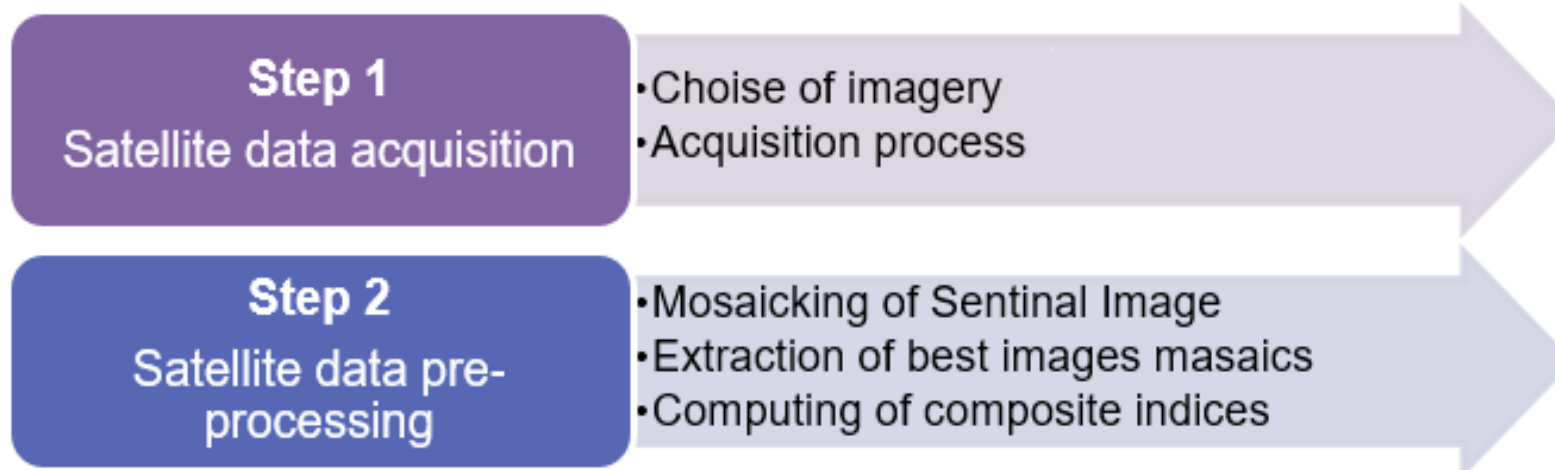
- Choise of imagery
- Acquisition process

Sentinel 2 HR images (10m resolution)
TERRANIS developed **automated scripts** to download SENTINEL imagery time series from PEPS portal (Plateforme d'Exploitation des Produits)

Data collection methodologies

High resolution satellite imagery analysis - TerraNIS

Technical details:

Step 1
Satellite data acquisition

- Choise of imagery
- Acquisition process

Step 2
Satellite data pre-processing

- Mosaicking of Sentinal Image
- Extraction of best images masaics
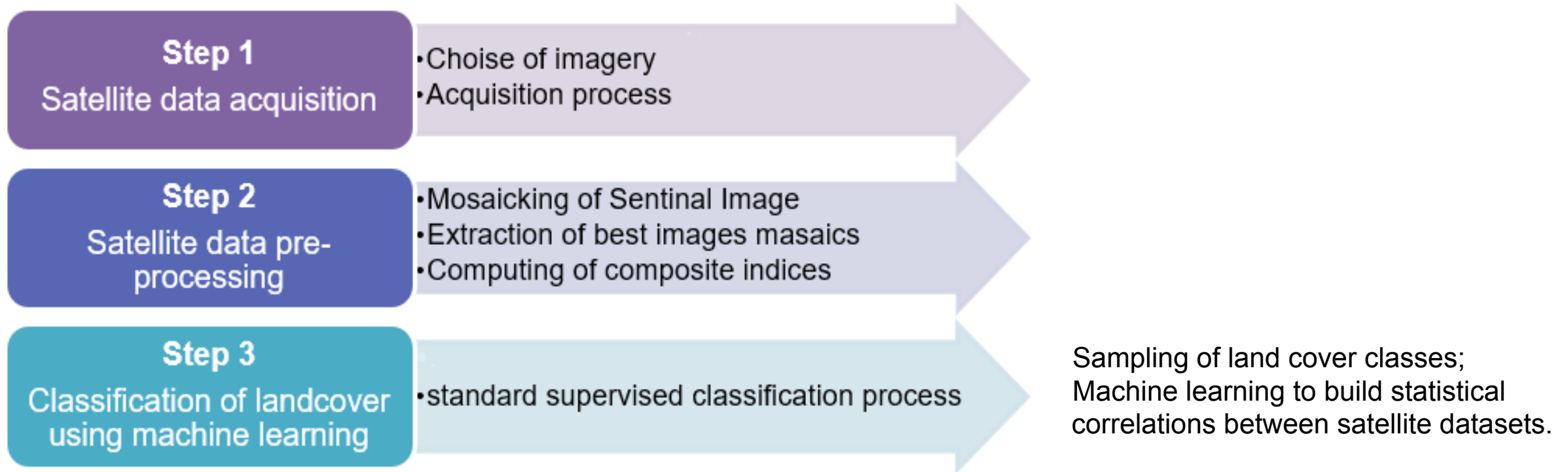- Computing of composite indices

TERRANIS developed **python scripts** to combine all the downloaded images and calculate composite indices, required for classification of pixels into landuse classes

Data collection methodologies

High resolution satellite imagery analysis - TerraNIS

Technical details:

Step 1
Satellite data acquisition
- Choise of imagery
- Acquisition process

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Satellite data pre-processing
- Mosaicking of Sentinal Image
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Step 3
Classification of landcover using machine learning
- standard supervised classification process

Sampling of land cover classes;
Machine learning to build statistical correlations between satellite datasets.

The results were then enhanced using open data such as Open Street Map

Data collection methodologies

Aerial inspection by drones – EURECAT & R2M

High resolution georef. aerial images
- Geographic information analysis
- Mapping application
- **NDVI map:** Vegetation identification, Green areas health status
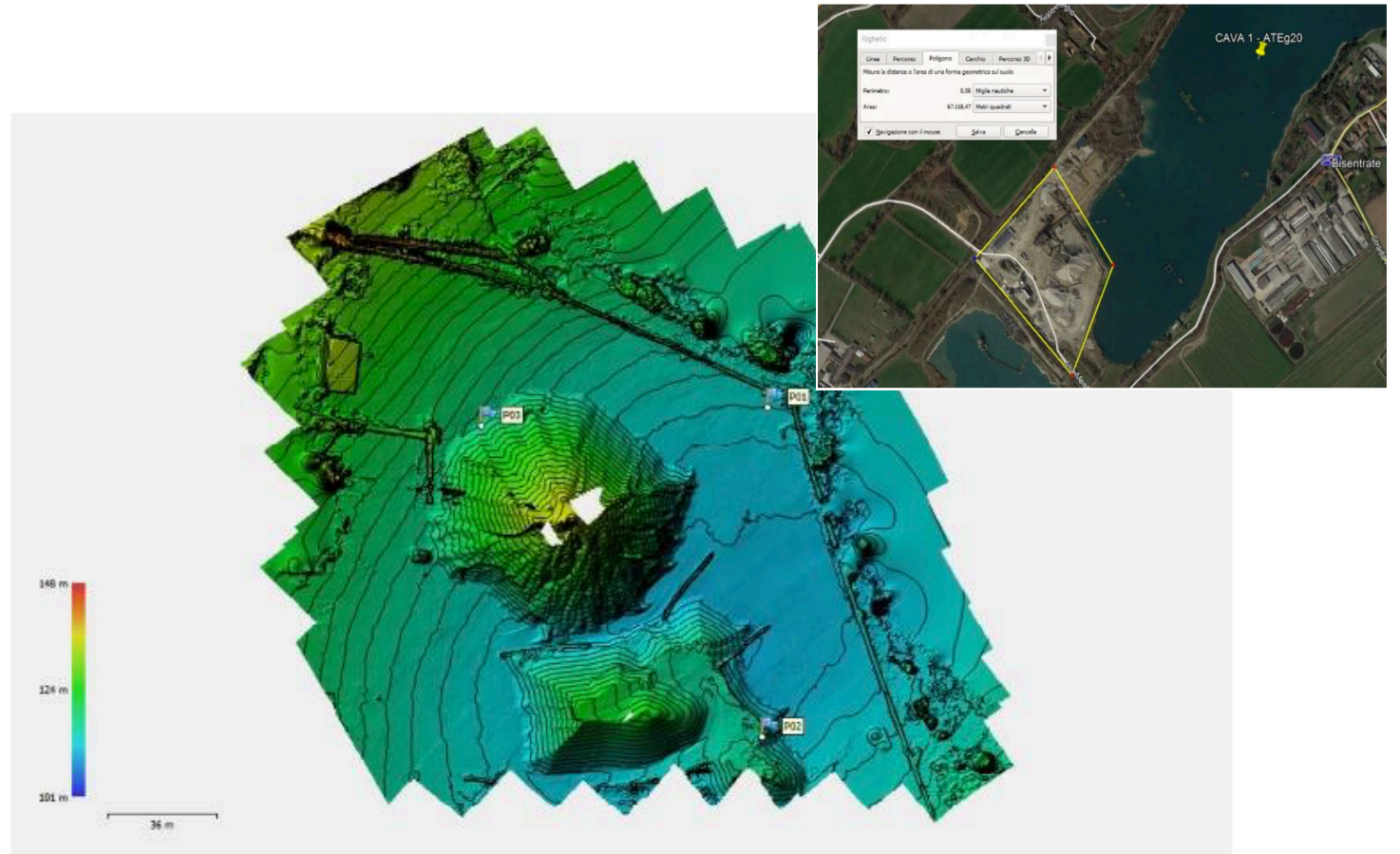
Dense point cloud (3D)
- 3D reconstructions

Segmented orthophotos (2D)
- 2D georeferenced maps
- Urban features detection

Geometric information
- Surface, volume,
- distance between elements

Data collection results

1. The methodologies proposed allowed to collect and generate most of the data required to perform the field-test activities

2. To optimise the data collection it was necessary to investigate:

   ➢ which were the data needed for each tool

   ➢ which Urban Performance Indicators (UPI) should be calculated for each demonstration case

   ➢ which data are common to more than one tool

   ➢ which data are not relevant for a specific democase

Data collection results

1. About **220 data** were properly collected, passed the final check of tools developers and will be used to assess the NBS
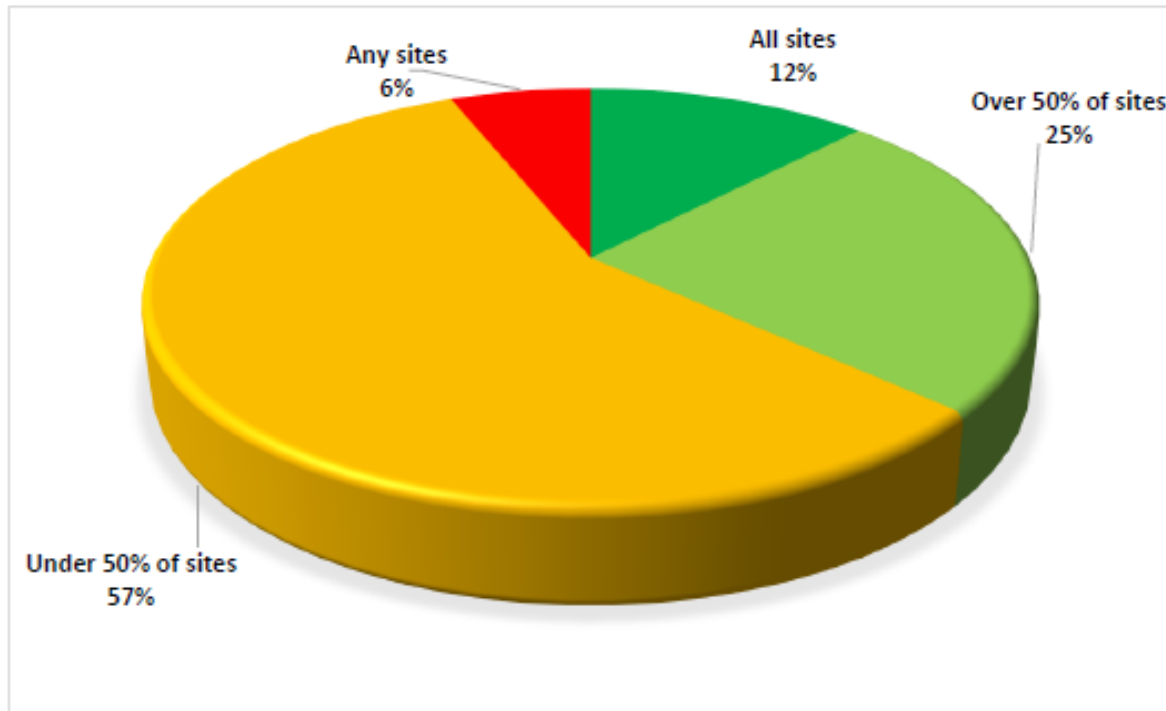

Figure 62: Overview of calculable UPIs in N4C pilots

- ➤ **6 UPIs** on 49 UPI can be calculate in every pilots

- ➤ **12 UPI** on 49 UPI can be calculated at least in 5 pilots

- ➤ **28 UPI** on 49 UPI can be calculated at least in 1 pilot

- ➤ **3 UPIs** on 49 UPI cannot be assessed.

Data collection results

Some additional considarations

1. There was no single process to be followed in every case (iterative process to overcome weaknesses)

2. A common practical limitation consists in data provided not in the right format or sufficiently detailed

3. Specific data regarding soil, water, economic aspects were more problematic, the data are often not available by the municipality without conduct specific inspections and analysis with qualified personnel.

4. In some cases to compensate the lack of some data and allow NBS assessment a few default values have been used.

Thank you for your attention!

NATURE 4 CITIES

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