**Supplementary Material S2.** LULC trajectories correction

Of the nineteen LULC maps generated for different years (see Appendix A), we excluded four LULC where cloud cover occurred as this class represents an aleatory variable that cannot be represented in a meaningful statistical distribution and corrected accordingly. We have resampled the remaining fifteen LULC to the coarser dataset, Landsat-2, at 60 m spacing, referenced to the same grid system and performed the correction.

The 60 m pixels in the resampled LULC maps have been generated by calculating the percentage of the 60 m square covered by each class (Ci) based on the distribution of the class (e.g. urban) in the 10 m LULC data derived from Sentinel-2 and in the 30 m LULC data derived from Landsat-8 and Landsat-5.

Considering the size of the resulting LULC images (1,514 row and 1,270 columns), a total of 1,922,780 trajectories (Mtot) has been analyzed across fifteen different times (T) starting from class at initial time (C1975) until the ending time (C2020):

Where r is the row and c is the column of the pixel.

The analysis, discussed in Section 4 of the paper, has been preceded by a correction of classes (Ci) appearing only once in the trajectories (i) and of illogical transitions in the trajectories (ii).

1. Removal of single classes in the trajectories

For class appearing only once at time CT in any trajectory Mrc, the modal value of M of the three closest dates, backwards and forward, has been considered to replace CT.

The removal of the single classes occurrence of a class has happened in 534,123 trajectories (28% of the total number of trajectories).

1. Removal of illogical transition

On the output produced in (1), the following changes have been considered as illogical transitions, especially over a short time interval:

* Artificial surfaces (CT) > Forests and seminatural areas (CT+1) which has been found in 4,678 trajectories.
* Artificial surfaces (CT) > Wetlands (CT+1) which has been found in 2,455 trajectories.

In this case CT has been replaced by the modal value of the time interval before T. A total of 7,133 illogical transition have been identified (<0.004% of the trajectories analyzed).

Figure S2 presents the ten most common sequences, where all the sequences are ordered by the initial states. As it can be observed, the most common sequences are those that present permanence of the same land use/cover throughout the entire period. However, many sequences indicate complex interchanges between artificial surfaces, agricultural areas and forest and seminatural areas.

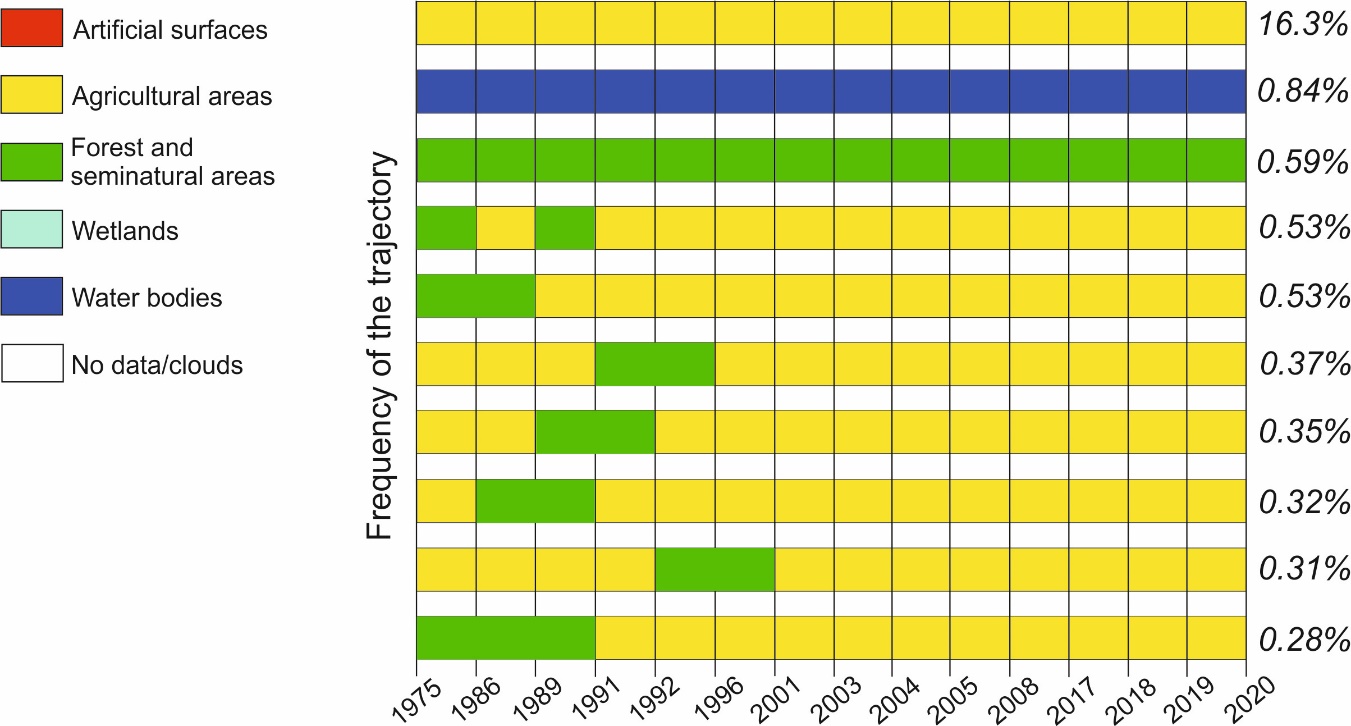


Figure S2. The five common trajectories observed within the Hanoi Province between 1975-2020 with indication of the cumulative frequency. Together they account for ~20% of the trajectories in Hanoi.