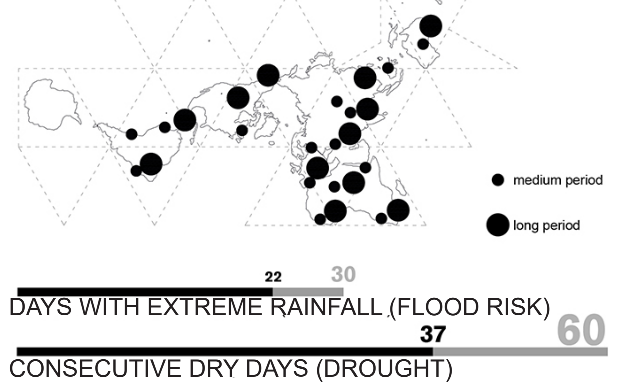
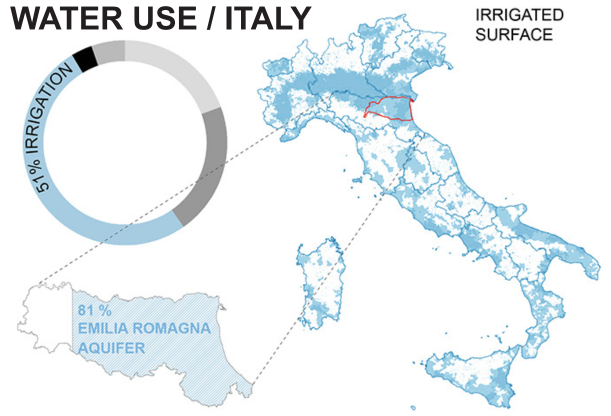
DROUGHT EVENTS / WORLD [F.1]



WATER USE / ITALY



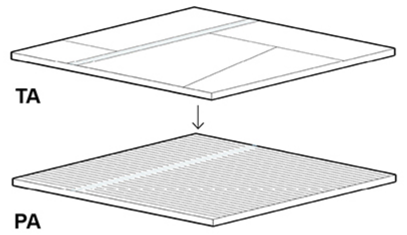
AGRICULTURE EVOLUTION /

WATER CONSUMPTION
100% ⟶ **70%**

CONSECUTIVE DRY DAYS
32 ⟶ **60**

FROM TRADITIONAL **(TA)** TO PRECISION AUTOMATIZED AGRICULTURE **(PA)**

	TA	PA
Geometry:	area	linear
Perception:	diffuse ⟶	punctual
Term of use:	solitarian	cooperative
Generating:	property	land aptitudes

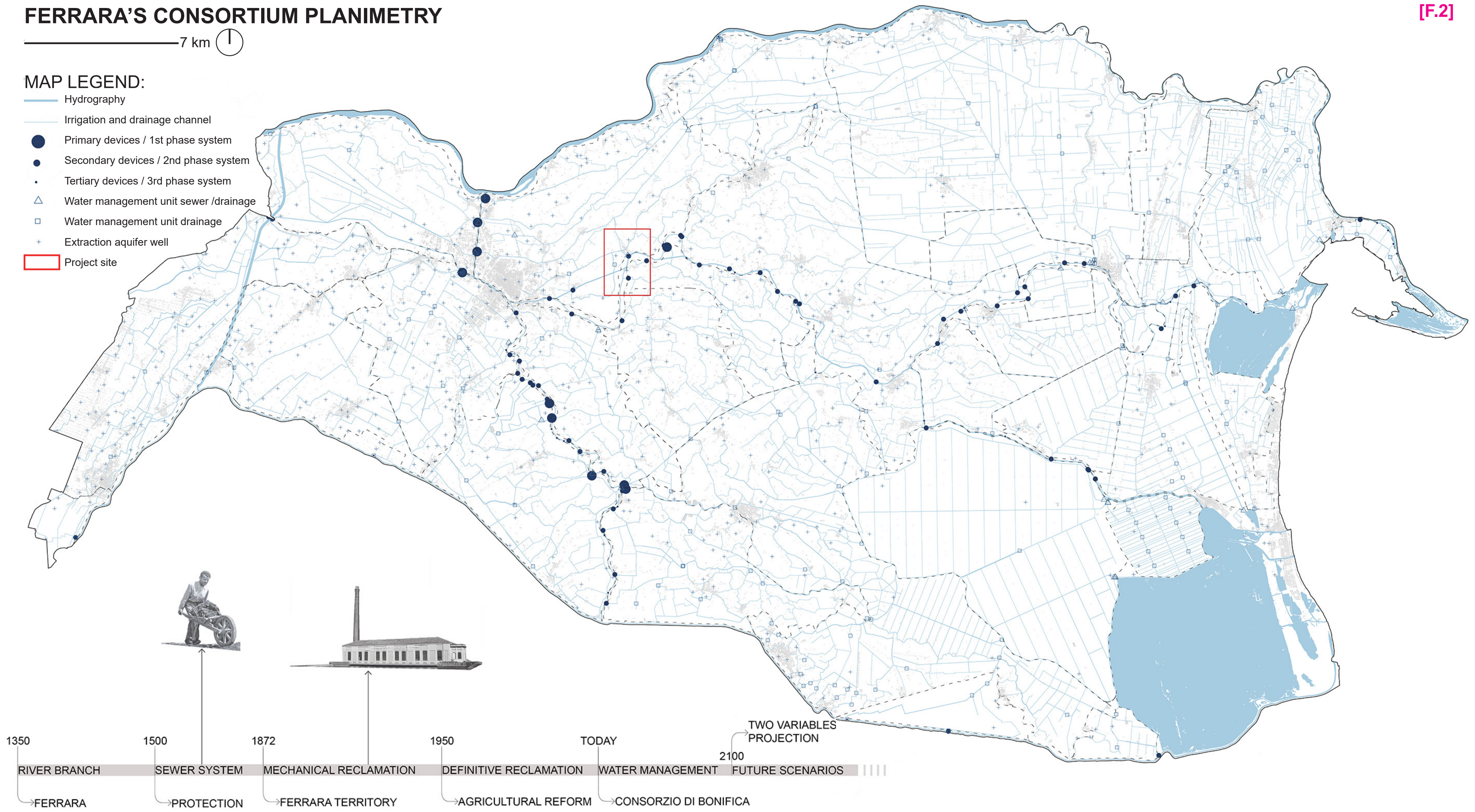


SCENARIO'S APPROACH [F.4]

2 VARIABLES MATRIX GENERATION

VARIABLE 01: DRY DAYS SCENARIO	VARIABLE 02: AGRICULTURE TECHNIQUES	
	TRADITIONAL AGRICULTURE + RCP 8.5 IPCC SCENARIO	PRECISION AGRICULTURE + RCP 8.5 IPCC SCENARIO
	TRADITIONAL AGRICULTURE + RCP 2.6 IPCC SCENARIO	PRECISION AGRICULTURE + RCP 2.6 IPCC SCENARIO

FERRARA'S CONSORTIUM PLANIMETRY [F.2]



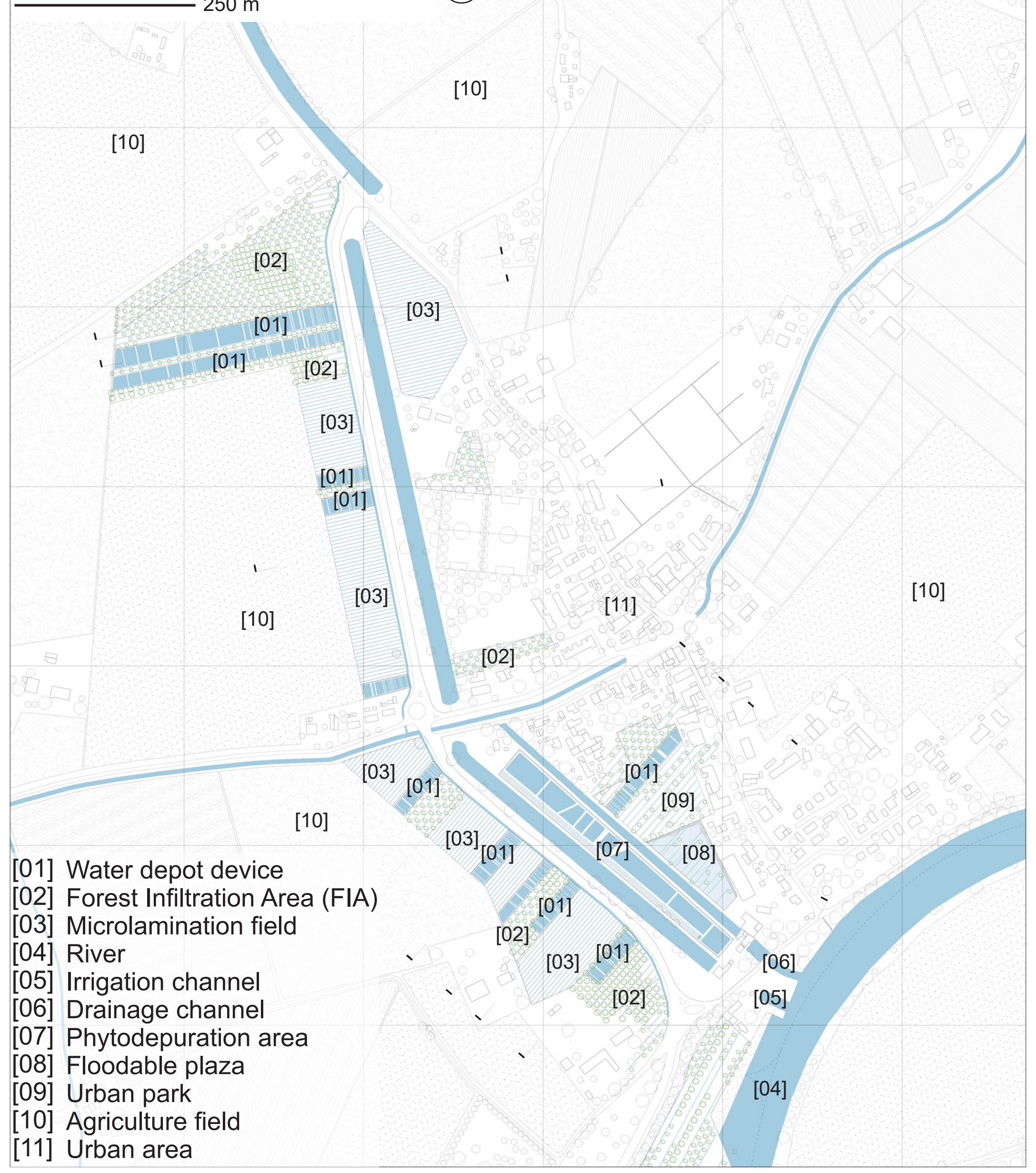
Introduction
Climate change will make water resource management more complicated and agriculture will go through prolonged periods of water stress due to altered atmospheric precipitation cycles [F.1]. The fundamental condition to ensure the future balance of the system is the collection and reuse of water. The objective of this research is to safeguard agricultural production in response to drought events through a spatial strategy and landscape design actions capable of collecting excess water during flood episodes and reusing it during dry periods. The case study of the Consorzio di Bonifica della Pianura di Ferrara (Ferrara Land Reclamation Consortium) was considered, where the landscape is composed of an articulated water management system and agriculture covers more than 80% of the usable surface area. The operational assumptions are based on the climate change mitigation and adaptation strategy produced by the Emilia-Romagna Region.

Strategy and project actions
The first strategic step concerns the mapping of water management infrastructural works throughout the territory of the Land Reclamation Consortium in order to select those areas that, after the insertion of storage devices, would be able to satify the entire water district demand. The second operational step concerns the selection within the previously identified areas of those agricultural areas that present low productivity values [F.3]. The selection is carried out through the historical analysis of land productivity by means of remote sensing data. The third step uses the scenario approach [F.4], for which alternative developments are generated that are linked to two variables with concrete project implications: (1) IPCC climate change drought projections, scenarios RCP2.6 and RCP8.5 and (2) the evolution of agricultural technology from traditional to precision farming. The scenario approach makes it possible to generate more project alternatives and, from a quantitative point of view, to adjust water needs by expanding or decreasing the areas of intervention over time. Following the strategic actions, three small-scale case studies are studied, in particular the case study of Baura is presented here [F.5]. The proposed interventions are aimed at phytodepuration and subsequent water storage [F.6].

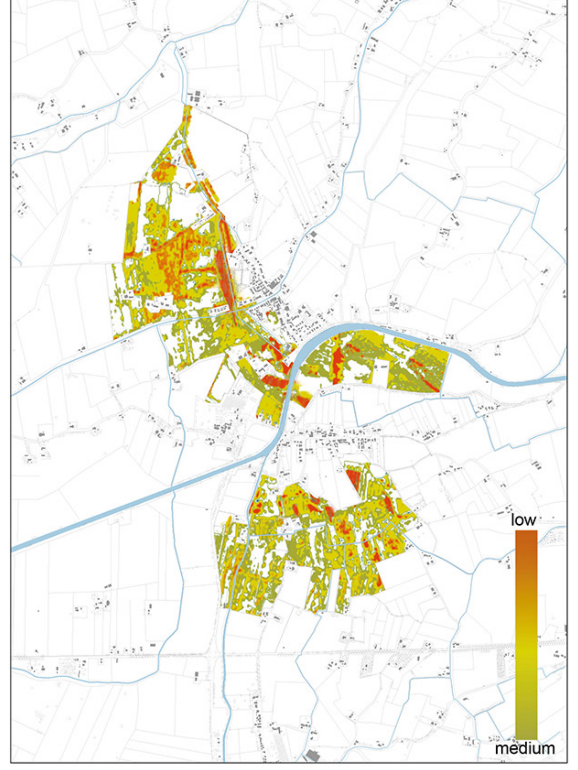
Results
The analysis of the results shows that the strategy as well as the project actions are effective for: the agricultural economy thanks to water storage; safeguarding agricultural production thanks to the selection of unproductive areas by remote sensing; reducing flood risk thanks to the increase in the water reservoir; improving the quality of the water resource thanks to wastewater treatment; reducing saltwater intrusion thanks to groundwater recharge; intensifying biodiversity thanks to the creation of new hybrid landscapes [F.7].

Conclusions
The work discussed shows how modifications of agricultural areas can play a key role in the resilience of the landscape to drought-related climate change through widespread, high-performance interventions. The consideration of soil unproductivity as a critical element of land description generates a different management approach to water criticalities, outlining new perspectives in the planning of land transformations useful for a correct arrangement of water storage and compensation devices [F.8].

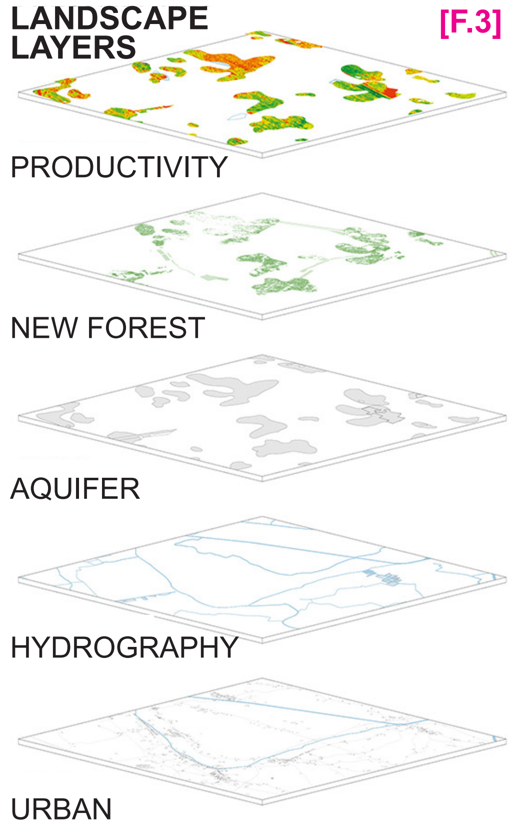
PROJECT SITE PLANIMETRY [F.5]

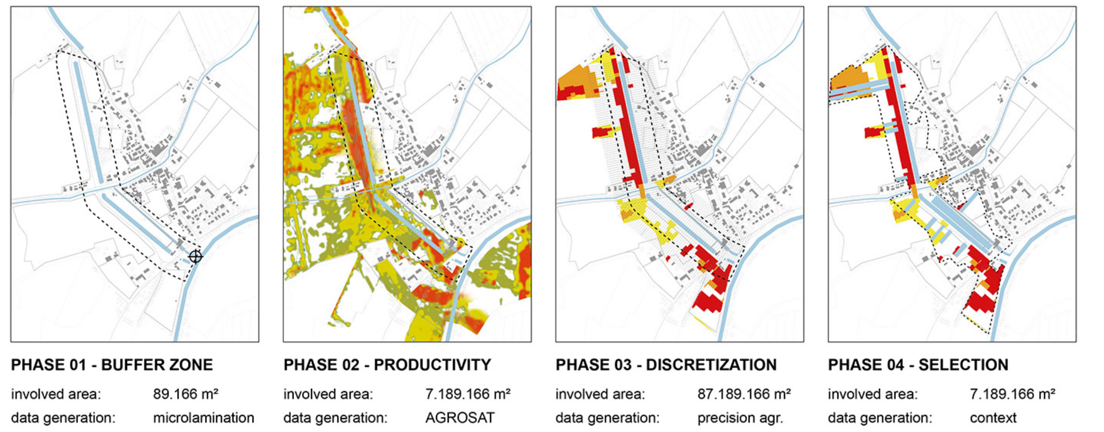


PRODUCTIVITY OVERVIEW

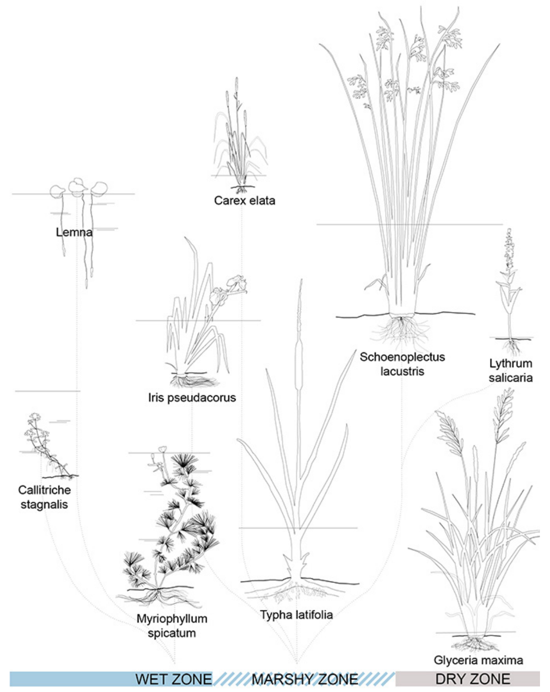


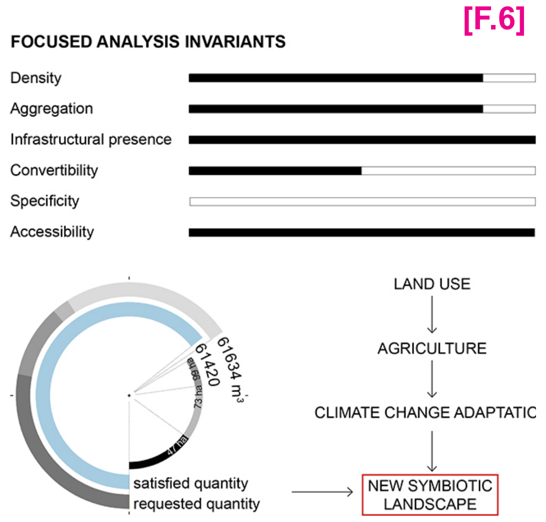
LANDSCAPE LAYERS [F.3]

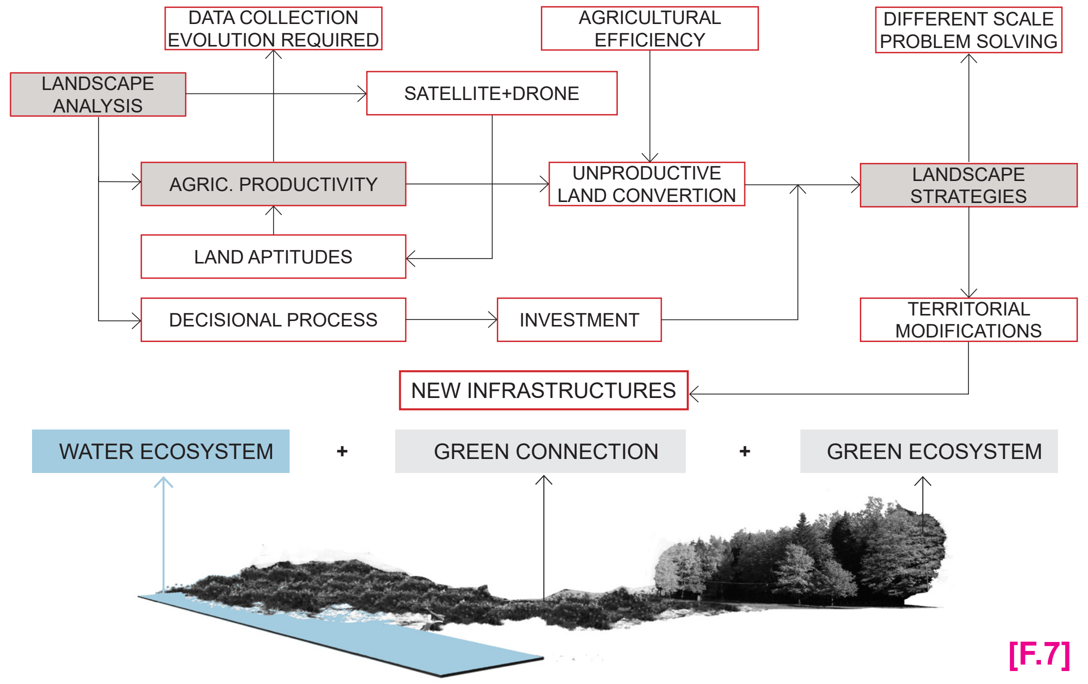




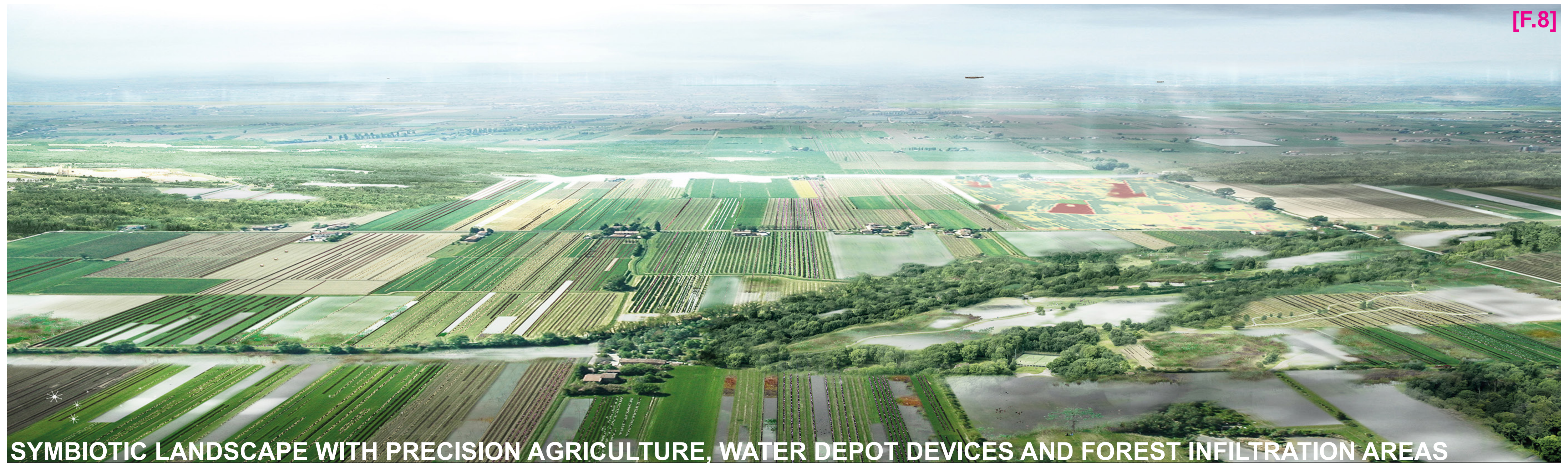
PLANT STRATEGY / WATER RESISTANCE [F.6]







[F.7]


[F.8]
SYMBIOTIC LANDSCAPE WITH PRECISION AGRICULTURE, WATER DEPOT DEVICES AND FOREST INFILTRATION AREAS


[F.8]
NEW BAURA URBAN PARK WITH WATER DEPOT DEVICES AND PHYTODEPURATION AREAS

SYMBIOTIC LANDSCAPE. A dynamic strategy between water management and land aptitudes, the Ferrara Land Reclamation Consortium case study.

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