This supplementary document accompanies the revised manuscript and provides the files explicitly referenced in the Materials Supplementary statement: MATLAB scripts, input matrices, Caplina Valley crop coefficients, water-availability vectors, and output tables.

Table S1. Package contents

Component	Files	Role in reproducibility
MATLAB scripts	karjfs.m; optkar.m; maxkarc.m; minkarc.m; kare.m; karfo.m; barnes.m; data_caplina.m; data_structural.m; verify_table5.m; run_all.m	Documents the algorithmic routines and provides a direct verification of the Caplina Valley solution used in the revised article.
Input data tables	caplina_A_matrix_37x12.csv; caplina_b_vector_37x1.csv; caplina_c_vector_12x1.csv; caplina_water_requirements_m3_per_ha.csv; caplina_labor_requirements_jor_per_ha.csv	Stores the 37-constraint, 12-variable agricultural LP in machine-readable form.
Crop coefficients and solution	caplina_crop_coefficients_and_solution.csv	Reports crop names, NPV coefficients, market limits, optimized area and revenue contribution exactly as used for Table 5.
Output tables	caplina_constraint_usage_and_slack.csv; case_I_iteration_history.csv	Provides feasibility diagnostics for Case II and the reported iteration-history summary for Case I.
Consolidated workbook	Caplina_input_output_data.xlsx	Editable Excel version of all principal input and output tables.

Caplina Valley linear-programming model

Decision variables. The vector x contains the optimized crop areas in hectares for 12 crop alternatives: Black grape, Potato, Starchy corn, Vegetables, Sweet corn, Chili pepper, Tomato, Broad bean, Pea, Alfalfa, Forage corn and Forestry.

Objective. The objective maximizes total net present value, $c^T x$, where c is expressed in USD/ha. The final coefficient vector is $[980, 759, 882, 847, 768, 169, 1077, 213, 186, 459, 561, 405]^T$.

Constraints. The matrix A has 37 rows: 12 monthly water constraints, 12 monthly labour constraints, 12 crop-market upper-bound constraints and one annual land constraint. The b vector included in the CSV files matches the final revised manuscript and the thesis data listing used as computational support.

Table S2. Caplina Valley crop coefficients

Crop	Area (ha)	NPV (USD/ha)	Contribution (USD)
Black grape	120.00	980	117600.00
Potato	0.00	759	0.00
Starchy corn	88.93	882	78436.26
Vegetables	14.34	847	12145.98
Sweet corn	260.00	768	199680.00
Chili pepper	0.00	169	0.00
Tomato	125.00	1077	134625.00

Broad bean	0.00	213	0.00
Pea	0.00	186	0.00
Alfalfa	50.00	459	22950.00
Forage corn	129.28	561	72526.08
Forestry	160.92	405	65172.60

Total optimized NPV. The contribution sum is USD 703,135.92, and the total optimized cultivated area is 948.47 ha. These values coincide with the final corrected manuscript and should be used in place of the older thesis total of USD 703,146.781.

MATLAB execution note

Recommended command. In MATLAB, run addpath('matlab'); run_all; from the package root. The script loads data_caplina.m, recomputes Table 5, prints the total objective value and reports binding or near-binding constraints.

Algorithmic scripts. The files karjfs.m, optkar.m, maxkarc.m, minkarc.m, kare.m, karfo.m and barnes.m are supplied to document the computational structure described in the thesis. The verification script is deliberately separated from the algorithm wrappers to ensure that the numerical tables in the article can be audited even in MATLAB installations without Optimization Toolbox.

Provenance and consistency with the manuscript

Source agreement. The water-requirement matrix, labour matrix, market bounds, objective coefficients and right-hand-side vectors are taken from the thesis data listing and aligned with the revised article. The final crop allocation uses the corrected manuscript values: x_3 = 88.93 ha, x_4 = 14.34 ha, x_{11} = 129.28 ha and x_{12} = 160.92 ha.