Food and Agriculture Organization
of the United Nations

# INTRODUCTION

## Upscaled and context-tailored tools to improve water management practices

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*Land and Water Division (NSL), FAO*
*Tunis, 12 December 2022*

Regional gathering
Tunis, 12 – 16 December 2022

ITALIAN AGENCY
FOR DEVELOPMENT
COOPERATION

# WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?

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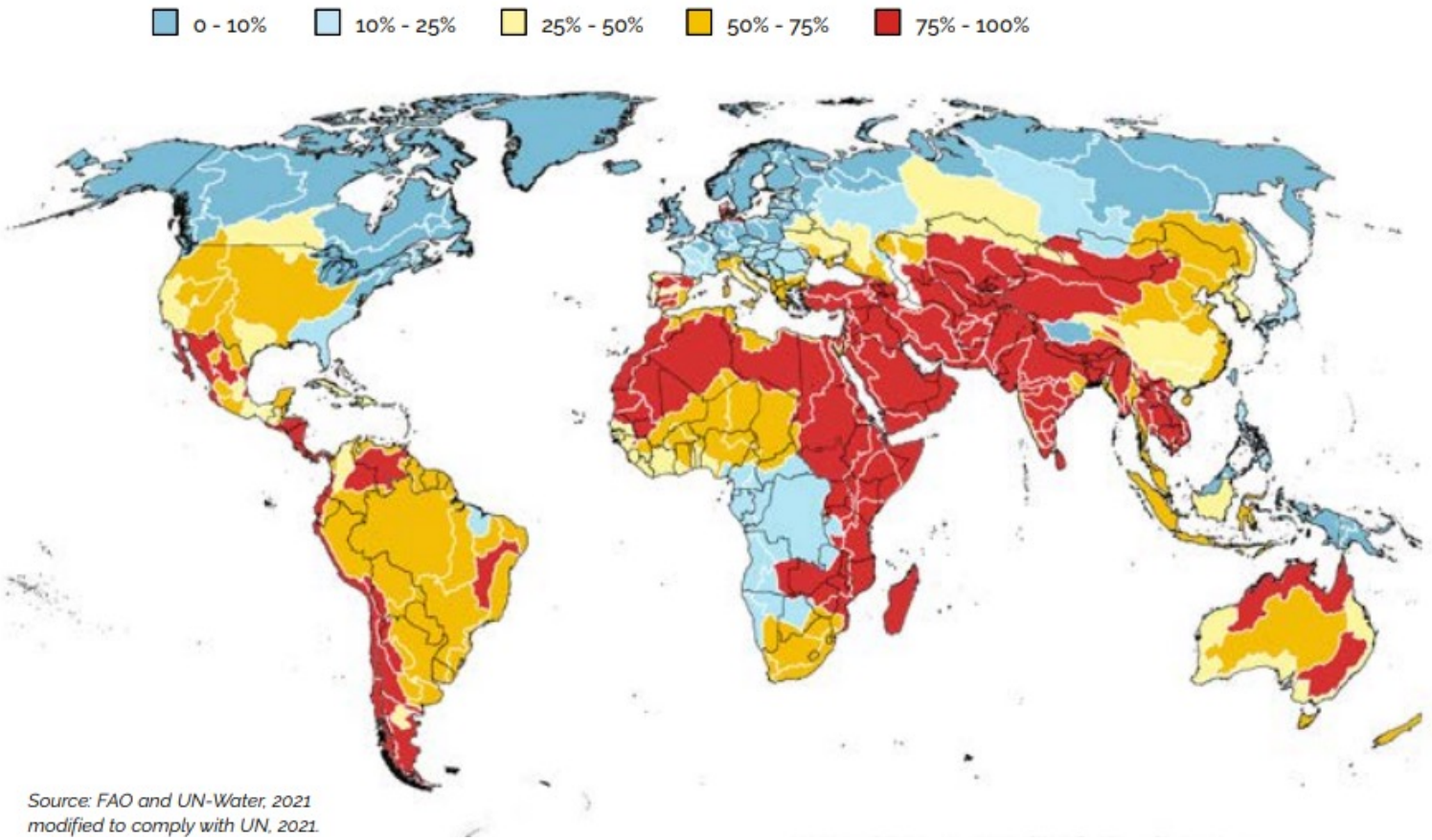
**MAP S.9** LEVEL OF WATER STRESS DUE TO THE AGRICULTURAL SECTOR BY BASIN, 2018




*Source: FAO and UN-Water, 2021*
*modified to comply with UN, 2021.*

# WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?

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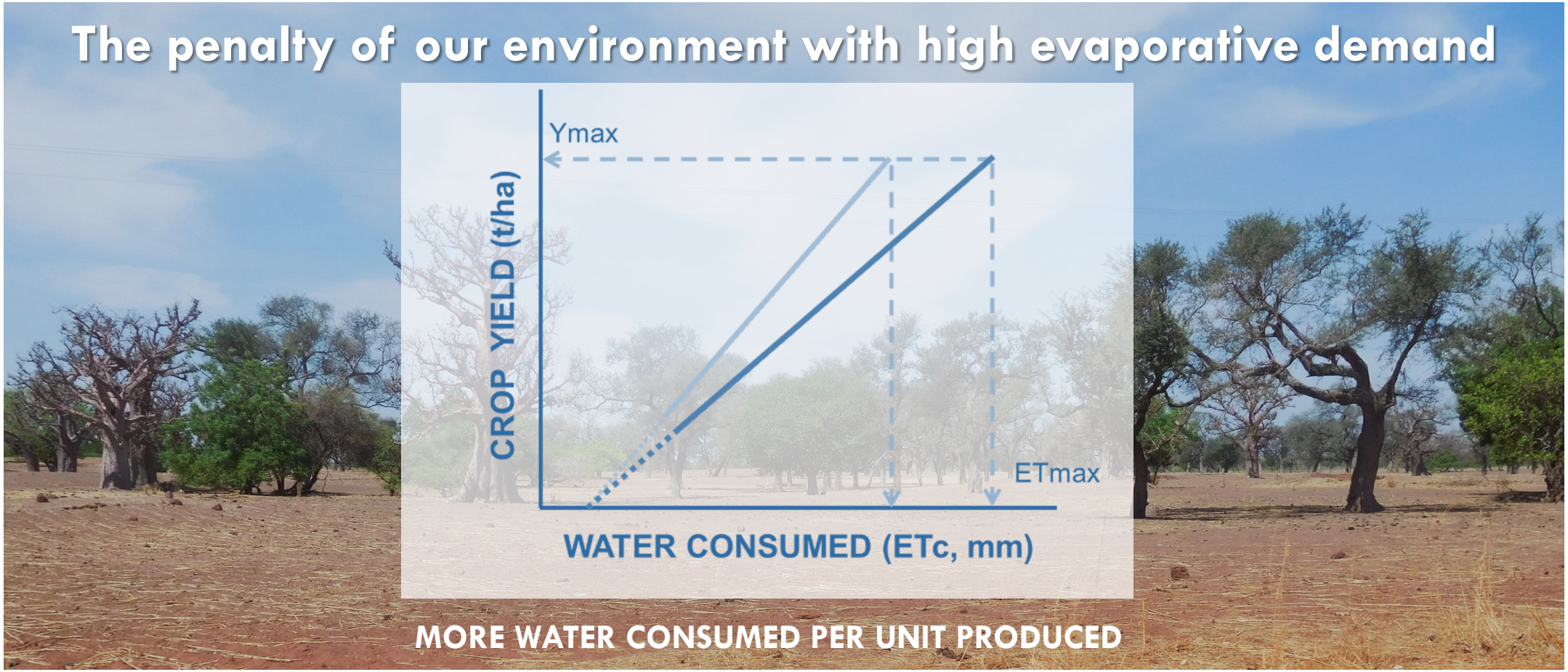
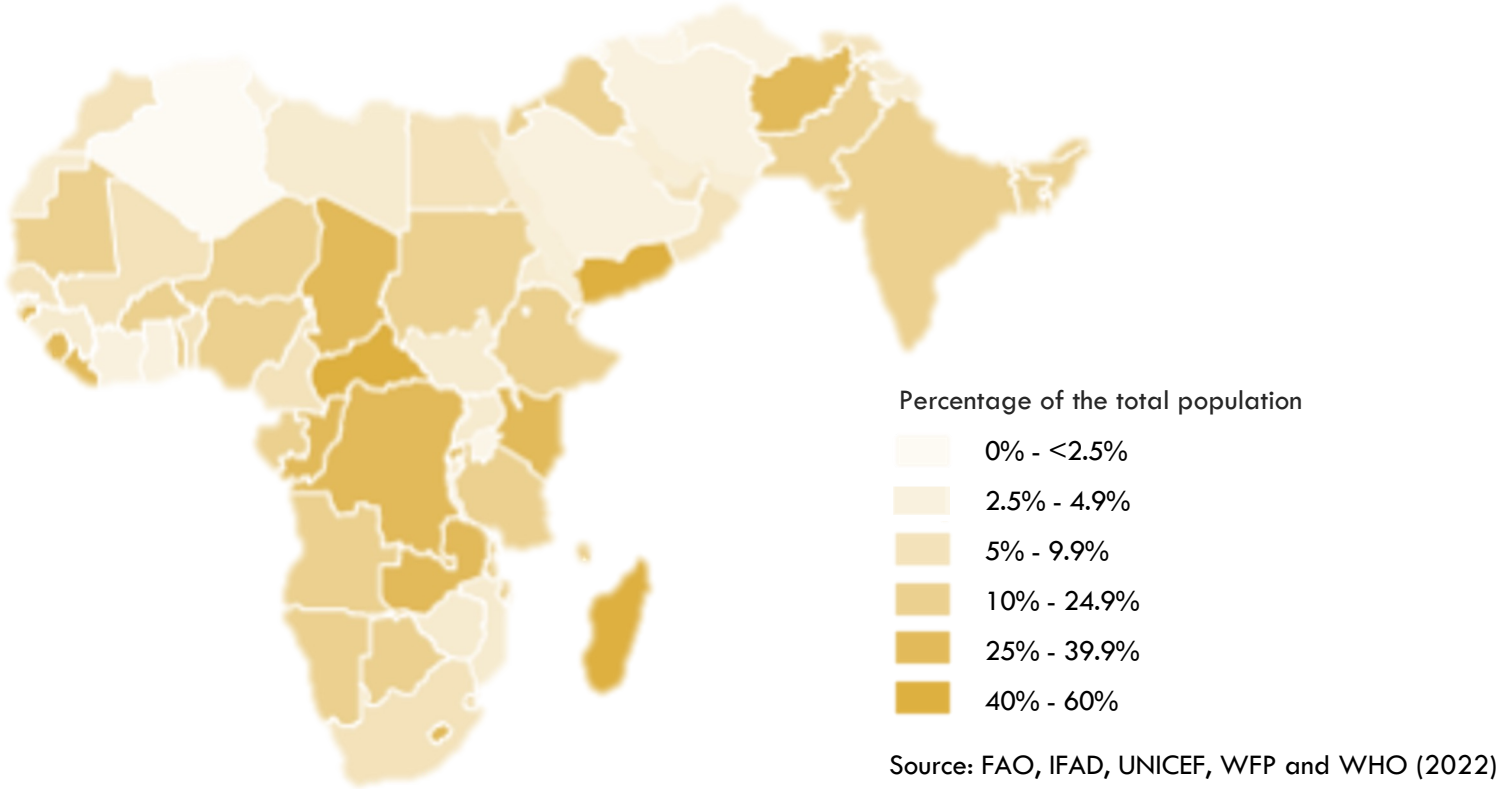


# WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?

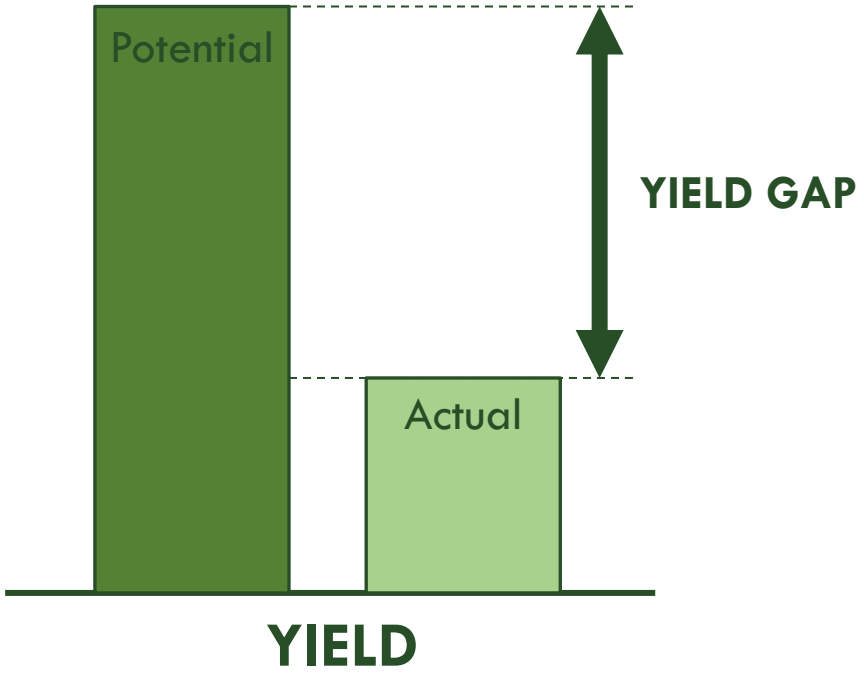
## FAO HUNGER MAP

Prevalence of Undernourishment 2019-2021

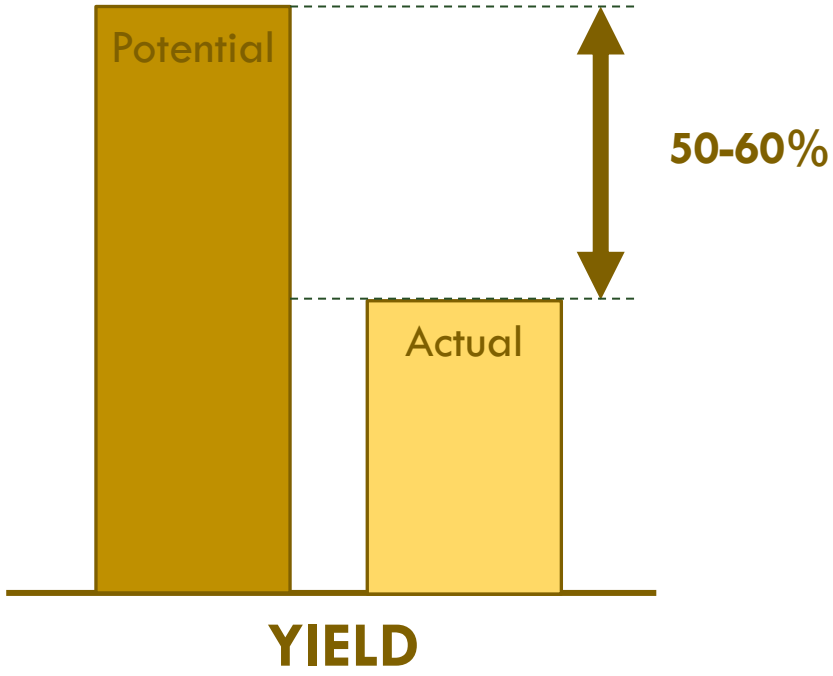



Source: FAO, IFAD, UNICEF, WFP and WHO (2022)

# WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?

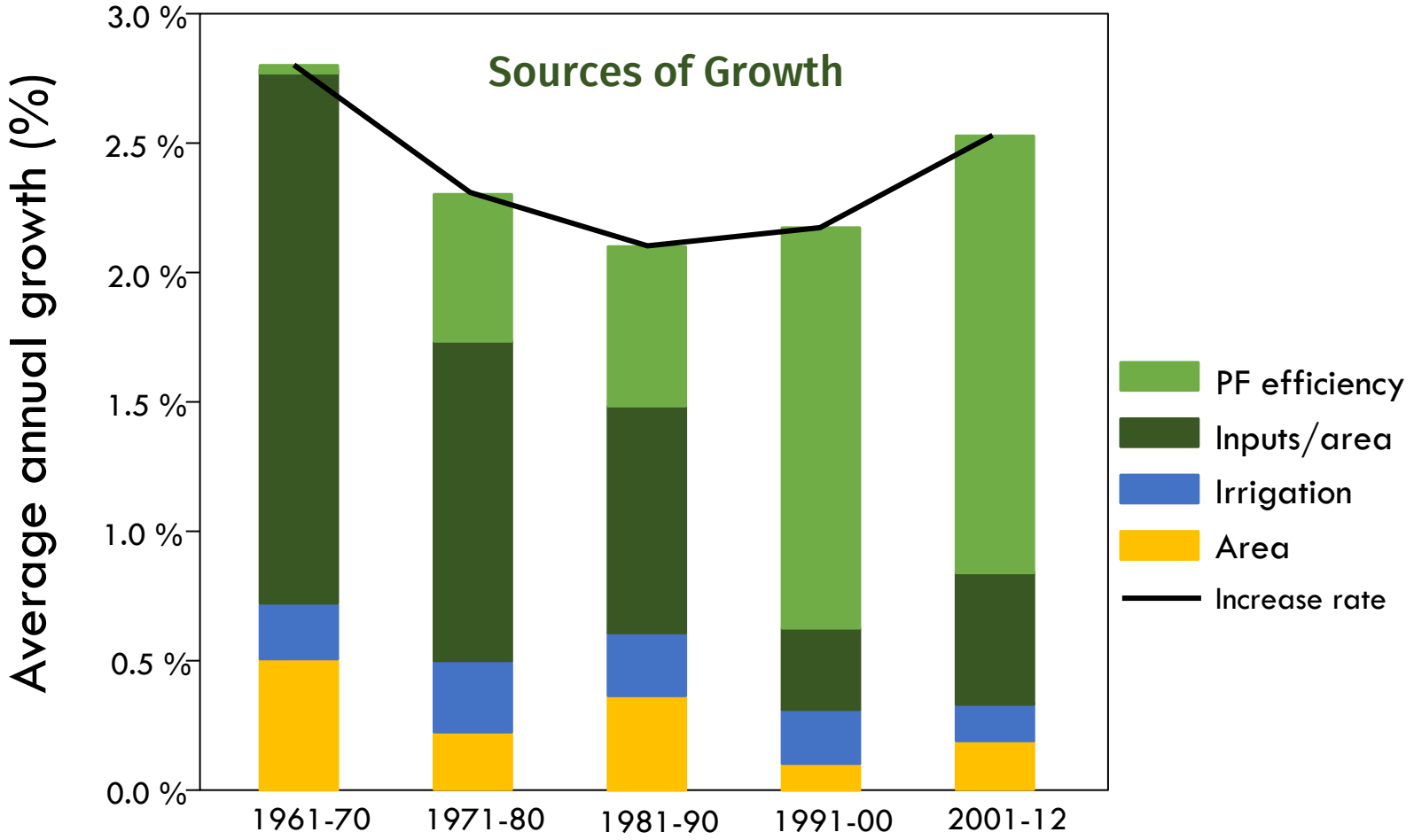



**Irrigated rice (Mali and Niger)**




Source: Global Yield Gap Atlas (2022)

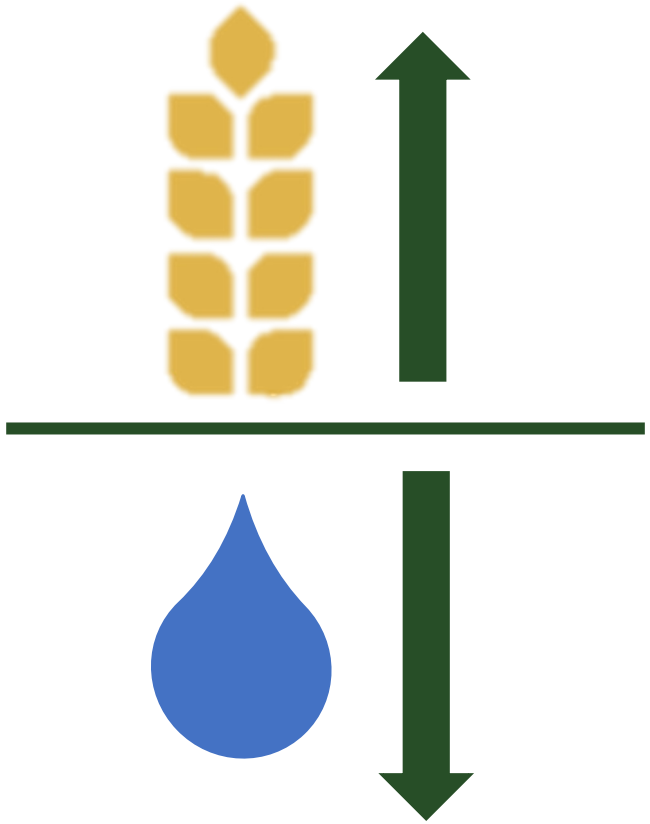
# WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?




Fuglie (2015)

## WHY IS NEEDED TO IMPROVE WATER MANAGEMENT PRACTICES?

**WATER PRODUCTIVITY =**



# UPSCALED AND CONTEXT-TAILORED TOOLS

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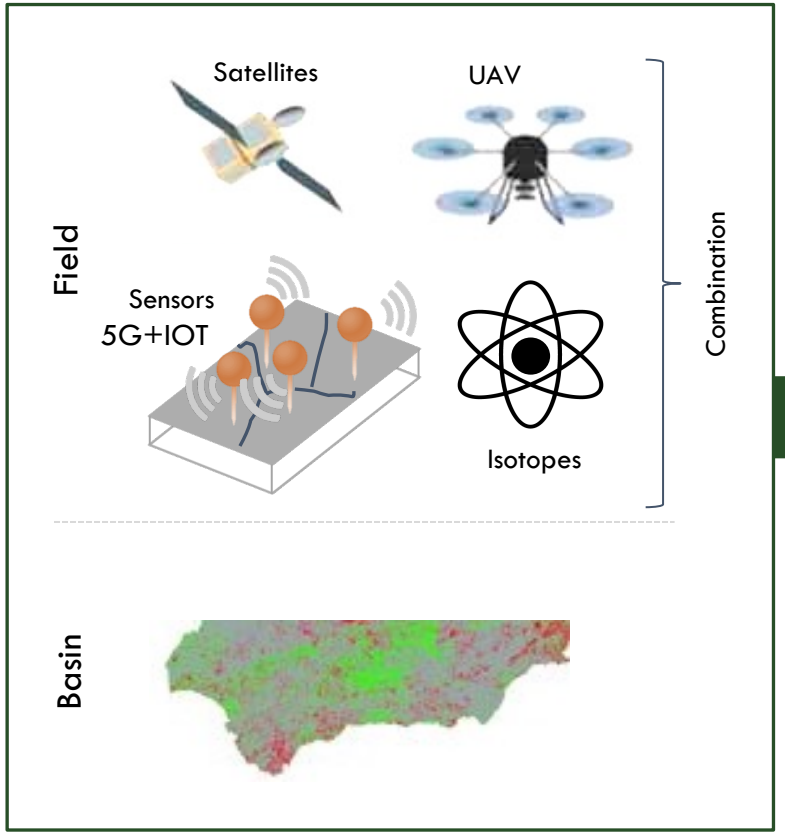
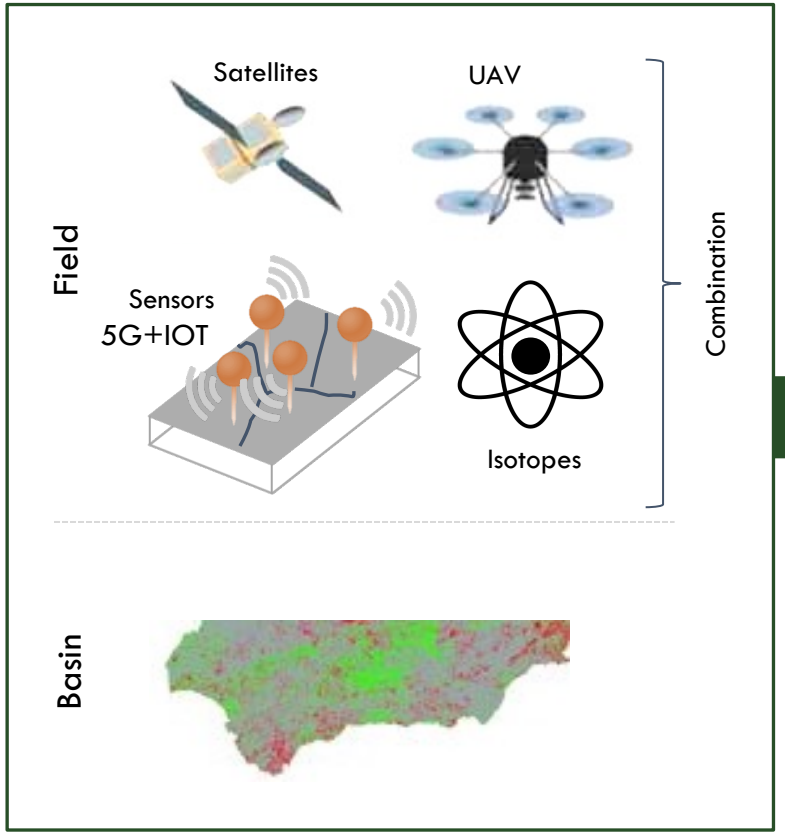



| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 12 | 2015 | 274 | 2 | 10.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.4 | 91.4 | 10 | 1.03 | 1.8 | 1.8 | 1.8 | 100 | 19.5 | 21.120 | -9.9 | 0.000 | 100 | 0.00 |
| 20 | 12 | 2015 | 275 | 2 | 13.7 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.4 | 91.4 | 2 | 1.03 | 3.3 | 3.3 | 3.3 | 100 | 19.5 | 21.315 | -9.9 | 0.000 | 100 | 0.00 |
| 21 | 12 | 2015 | 276 | 2 | 18.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.4 | 91.4 | 0 | 1.03 | 9.6 | 9.6 | 9.6 | 100 | 19.5 | 21.515 | -9.9 | 0.000 | 100 | 0.00 |
| 22 | 12 | 2015 | 277 | 2 | 13.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.4 | 91.4 | 2 | 1.03 | 2.9 | 2.9 | 2.9 | 100 | 19.5 | 21.710 | -9.9 | 0.000 | 100 | 0.00 |
| 23 | 12 | 2015 | 278 | 3 | 10.1 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.5 | 91.5 | 16 | 1.02 | 3.2 | 3.2 | 3.2 | 100 | 19.5 | 21.878 | -9.9 | 0.000 | 100 | 0.00 |
| 24 | 12 | 2015 | 279 | 3 | 11.4 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.5 | 91.5 | 8 | 1.02 | 2.8 | 2.8 | 2.8 | 100 | 19.5 | 22.060 | -9.9 | 0.000 | 100 | 0.00 |
| 25 | 12 | 2015 | 280 | 3 | 15.5 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.5 | 91.5 | 0 | 1.02 | 5.2 | 5.2 | 5.2 | 100 | 19.5 | 22.259 | -9.9 | 0.000 | 100 | 0.00 |
| 26 | 12 | 2015 | 281 | 3 | 13.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.5 | 91.5 | 2 | 1.02 | 4.7 | 4.7 | 4.7 | 100 | 19.5 | 22.454 | 1.5 | 0.347 | 100 | 0.06 |
| 27 | 12 | 2015 | 282 | 3 | 15.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.5 | 91.5 | 0 | 1.02 | 5.4 | 5.4 | 5.4 | 100 | 19.5 | 22.652 | 1.8 | 0.405 | 100 | 0.07 |
| 28 | 12 | 2015 | 283 | 3 | 16.6 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.6 | 91.6 | 0 | 1.02 | 5.5 | 5.5 | 5.5 | 100 | 19.5 | 22.850 | 2.1 | 0.471 | 100 | 0.08 |
| 29 | 12 | 2015 | 284 | 3 | 13.3 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.6 | 91.6 | 3 | 1.02 | 4.8 | 4.8 | 4.8 | 100 | 19.5 | 23.042 | 2.4 | 0.547 | 100 | 0.09 |
| 30 | 12 | 2015 | 285 | 3 | 8.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.6 | 91.6 | 27 | 1.02 | 0.8 | 0.8 | 0.8 | 100 | 19.5 | 23.187 | 2.7 | 0.634 | 100 | 0.11 |
| 31 | 12 | 2015 | 286 | 3 | 14.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.6 | 91.6 | 0 | 1.01 | 4.9 | 4.9 | 4.9 | 100 | 19.5 | 23.385 | 3.1 | 0.736 | 100 | 0.13 |
| 1 | 1 | 2016 | 287 | 3 | 14.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.6 | 91.6 | 0 | 1.01 | 4.6 | 4.6 | 4.6 | 100 | 19.5 | 23.582 | 3.6 | 0.852 | 100 | 0.14 |
| 2 | 1 | 2016 | 288 | 3 | 15.5 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 0 | 1.01 | 1.8 | 1.8 | 1.8 | 100 | 19.5 | 23.778 | 4.1 | 0.985 | 100 | 0.17 |
| 3 | 1 | 2016 | 289 | 3 | 11.2 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 9 | 1.01 | 1.0 | 1.0 | 1.0 | 100 | 19.5 | 23.957 | 4.7 | 1.136 | 100 | 0.19 |
| 4 | 1 | 2016 | 290 | 3 | 10.2 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 15 | 1.01 | 3.2 | 3.2 | 3.2 | 100 | 19.5 | 24.123 | 5.4 | 1.307 | 100 | 0.22 |
| 5 | 1 | 2016 | 291 | 3 | 10.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 11 | 1.01 | 3.1 | 3.1 | 3.1 | 100 | 19.5 | 24.297 | 6.2 | 1.501 | 100 | 0.25 |
| 6 | 1 | 2016 | 292 | 3 | 14.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 0 | 1.01 | 5.0 | 5.0 | 5.0 | 100 | 19.5 | 24.493 | 7.0 | 1.721 | 100 | 0.28 |
| 7 | 1 | 2016 | 293 | 4 | 16.3 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 0 | 1.01 | 4.5 | 4.5 | 4.5 | 100 | 19.5 | 24.689 | 8.0 | 1.967 | 100 | 0.32 |
| 8 | 1 | 2016 | 294 | 4 | 16.1 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 0 | 1.00 | 4.5 | 4.5 | 4.5 | 100 | 19.5 | 24.885 | 9.0 | 2.241 | 100 | 0.36 |
| 9 | 1 | 2016 | 295 | 4 | 12.7 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 4 | 1.00 | 3.4 | 3.4 | 3.4 | 100 | 19.5 | 25.072 | 10.1 | 2.530 | 100 | 0.41 |
| 10 | 1 | 2016 | 296 | 4 | 13.1 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.7 | 91.7 | 3 | 1.00 | 3.1 | 3.1 | 3.1 | 100 | 19.5 | 25.260 | 11.2 | 2.823 | 100 | 0.45 |
| 11 | 1 | 2016 | 297 | 4 | 13.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 2 | 1.00 | 4.8 | 4.8 | 4.8 | 100 | 19.5 | 25.451 | 12.3 | 3.120 | 100 | 0.50 |
| 12 | 1 | 2016 | 298 | 4 | 16.6 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 0 | 1.00 | 5.6 | 5.6 | 5.6 | 100 | 19.5 | 25.645 | 13.3 | 3.422 | 100 | 0.54 |
| 13 | 1 | 2016 | 299 | 4 | 12.3 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 5 | 1.00 | 2.2 | 2.2 | 2.2 | 100 | 19.5 | 25.829 | 14.4 | 3.726 | 100 | 0.59 |
| 14 | 1 | 2016 | 300 | 4 | 13.2 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 3 | 1.00 | 4.6 | 4.6 | 4.6 | 100 | 19.5 | 26.016 | 15.5 | 4.035 | 100 | 0.63 |
| 15 | 1 | 2016 | 301 | 4 | 16.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 0 | 0.99 | 5.2 | 5.2 | 5.2 | 100 | 19.5 | 26.210 | 16.6 | 4.349 | 100 | 0.68 |
| 16 | 1 | 2016 | 302 | 4 | 12.3 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 5 | 0.99 | 1.2 | 1.2 | 1.2 | 100 | 19.5 | 26.393 | 17.7 | 4.666 | 100 | 0.72 |
| 17 | 1 | 2016 | 303 | 4 | 12.8 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 4 | 0.99 | 1.3 | 1.3 | 1.3 | 100 | 19.5 | 26.578 | 18.8 | 4.987 | 100 | 0.77 |
| 18 | 1 | 2016 | 304 | 4 | 12.0 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 6 | 0.99 | 1.2 | 1.2 | 1.2 | 100 | 19.5 | 26.759 | 19.8 | 5.311 | 100 | 0.82 |
| 19 | 1 | 2016 | 305 | 4 | 13.9 | 1.50 | -9 | 0 | 0 | 0 | 0 | 91.8 | 91.8 | 2 | 0.99 | 1.5 | 1.5 | 1.5 | 100 | 19.5 | 26.948 | 20.9 | 5.640 | 100 | 0.87 |
| 20 | 1 | 2016 | 306 | 4 | 18.6 | 1.50 | -9 | 0 | -9 | 0 | 0 | 91.7 | 91.7 | 0 | 0.99 | 5.3 | 5.3 | 5.3 | 100 | 19.5 | 27.140 | 22.0 | 5.974 | 100 | 0.91 |
| 21 | 1 | 2016 | 307 | 4 | 20.7 | 1.50 | -9 | 0 | -9 | 0 | 0 | 90.9 | 90.9 | 0 | 0.97 | 6.0 | 6.0 | 6.0 | 100 | 19.5 | 27.329 | 23.1 | 6.312 | 100 | 0.95 |
| 22 | 1 | 2016 | 308 | 4 | 20.3 | 1.50 | -9 | 0 | -9 | 0 | 0 | 90.1 | 90.1 | 0 | 0.96 | 7.1 | 7.1 | 7.1 | 100 | 19.5 | 27.515 | 24.2 | 6.653 | 100 | 1.00 |
| 23 | 1 | 2016 | 309 | 4 | 21.6 | 1.50 | -9 | 0 | -9 | 0 | 0 | 89.0 | 89.0 | 0 | 0.94 | 5.8 | 5.8 | 5.8 | 100 | 19.5 | 27.697 | 25.3 | 6.998 | 100 | 1.04 |
| 24 | 1 | 2016 | 310 | 4 | 19.8 | 1.50 | -9 | 0 | -9 | 0 | 0 | 87.9 | 87.9 | 0 | 0.92 | 2.9 | 2.9 | 2.9 | 100 | 19.5 | 27.876 | 26.3 | 7.345 | 100 | 1.08 |
| 25 | 1 | 2016 | 311 | 4 | 19.4 | 1.50 | -9 | 0 | -9 | 0 | 0 | 86.6 | 86.6 | 0 | 0.89 | 2.3 | 2.3 | 2.3 | 100 | 19.5 | 28.049 | 27.4 | 7.695 | 100 | 1.13 |
| 26 | 1 | 2016 | 312 | 4 | 16.6 | 1.50 | -9 | 0 | -9 | 0 | 0 | 85.4 | 85.4 | 0 | 0.87 | 1.8 | 1.8 | 1.8 | 100 | 19.5 | 28.219 | 28.5 | 8.047 | 100 | 1.18 |
| 27 | 1 | 2016 | 313 | 4 | 11.3 | 1.50 | -9 | 0 | -9 | 0 | 0 | 84.4 | 84.4 | 9 | 0.85 | 0.8 | 0.8 | 0.8 | 100 | 19.5 | 28.371 | 29.6 | 8.398 | 100 | 1.23 |
| 28 | 1 | 2016 | 314 | 4 | 11.5 | 1.50 | -9 | 0 | -9 | 0 | 0 | 83.4 | 83.4 | 8 | 0.84 | 1.4 | 1.4 | 1.4 | 100 | 19.5 | 28.520 | 30.7 | 8.751 | 100 | 1.28 |
| 29 | 1 | 2016 | 315 | 4 | 13.3 | 1.50 | -9 | 0 | -9 | 0 | 0 | 82.1 | 82.1 | 3 | 0.81 | 2.5 | 2.5 | 2.5 | 100 | 19.5 | 28.674 | 31.8 | 9.109 | 100 | 1.33 |
| 30 | 1 | 2016 | 316 | 4 | 11.6 | 1.50 | -9 | 0 | -9 | 0 | 0 | 80.8 | 80.8 | 8 | 0.79 | 1.2 | 1.2 | 1.2 | 100 | 19.5 | 28.817 | 32.9 | 9.467 | 100 | 1.37 |
| 31 | 1 | 2016 | 317 | 4 | 14.3 | 1.50 | -9 | 0 | -9 | 0 | 0 | 79.1 | 79.1 | 0 | 0.77 | 3.0 | 3.0 | 3.0 | 100 | 19.5 | 28.966 | 33.9 | 9.830 | 100 | 1.42 |
| 1 | 2 | 2016 | 318 | 4 | 17.4 | 1.50 | -9 | 0 | -9 | 0 | 0 | 76.8 | 76.8 | 0 | 0.73 | 3.8 | 3.8 | 3.8 | 100 | 19.5 | 29.108 | 35.0 | 10.194 | 100 | 1.46 |
| 2 | 2 | 2016 | 319 | 4 | 18.2 | 1.50 | -9 | 0 | -9 | 0 | 0 | 74.0 | 74.0 | 0 | 0.69 | 3.8 | 3.8 | 3.8 | 100 | 19.5 | 29.241 | 36.1 | 10.557 | 100 | 1.51 |
| 3 | 2 | 2016 | 320 | 4 | 18.5 | 1.50 | -9 | 0 | -9 | 0 | 0 | 70.8 | 70.8 | 0 | 0.64 | 3.4 | 3.4 | 3.4 | 100 | 19.5 | 29.365 | 37.2 | 10.920 | 100 | 1.55 |
| 4 | 2 | 2016 | 321 | 4 | 19.4 | 1.50 | -9 | 0 | -9 | 0 | 0 | 67.0 | 67.0 | 0 | 0.58 | 3.7 | 3.7 | 3.7 | 100 | 19.5 | 29.478 | 38.3 | 11.282 | 100 | 1.59 |
| 5 | 2 | 2016 | 322 | 4 | 16.5 | 1.50 | -9 | 0 | -9 | 0 | 0 | 63.2 | 63.2 | 0 | 0.53 | 1.3 | 1.3 | 1.3 | 100 | 19.5 | 29.580 | 39.4 | 11.642 | 100 | 1.64 |
| 6 | 2 | 2016 | 323 | 4 | 14.6 | 1.50 | -9 | 0 | -9 | 0 | 0 | 59.5 | 59.5 | 0 | 0.47 | 1.0 | 1.0 | 1.0 | 100 | 19.5 | 29.672 | 40.4 | 11.999 | 100 | 1.68 |
| 7 | 2 | 2016 | 324 | 4 | 15.0 | 1.50 | -9 | 0 | -9 | 0 | 0 | 55.2 | 55.2 | 0 | 0.42 | 0.8 | 0.8 | 0.8 | 100 | 19.5 | 29.754 | 41.5 | 12.355 | 100 | 1.73 |
| 8 | 2 | 2016 | 325 | 4 | 18.1 | 1.50 | -9 | 0 | -9 | 0 | 0 | 49.4 | 49.4 | 0 | 0.34 | 1.5 | 1.5 | 1.5 | 100 | 19.5 | 29.821 | 42.6 | 12.706 | 100 | 1.77 |
| 9 | 2 | 2016 | 326 | 4 | 16.2 | 1.50 | -9 | 0 | -9 | 0 | 0 | 43.6 | 43.6 | 0 | 0.28 | 0.7 | 0.7 | 0.7 | 100 | 19.5 | 29.874 | 43.7 | 13.052 | 100 | 1.82 |

# UPSCALED AND CONTEXT-TAILORED TOOLS




AQUACROP

**FARMERS GUIDELINES**

**POLICY GUIDELINES**

# UPSCALED AND CONTEXT-TAILORED TOOLS

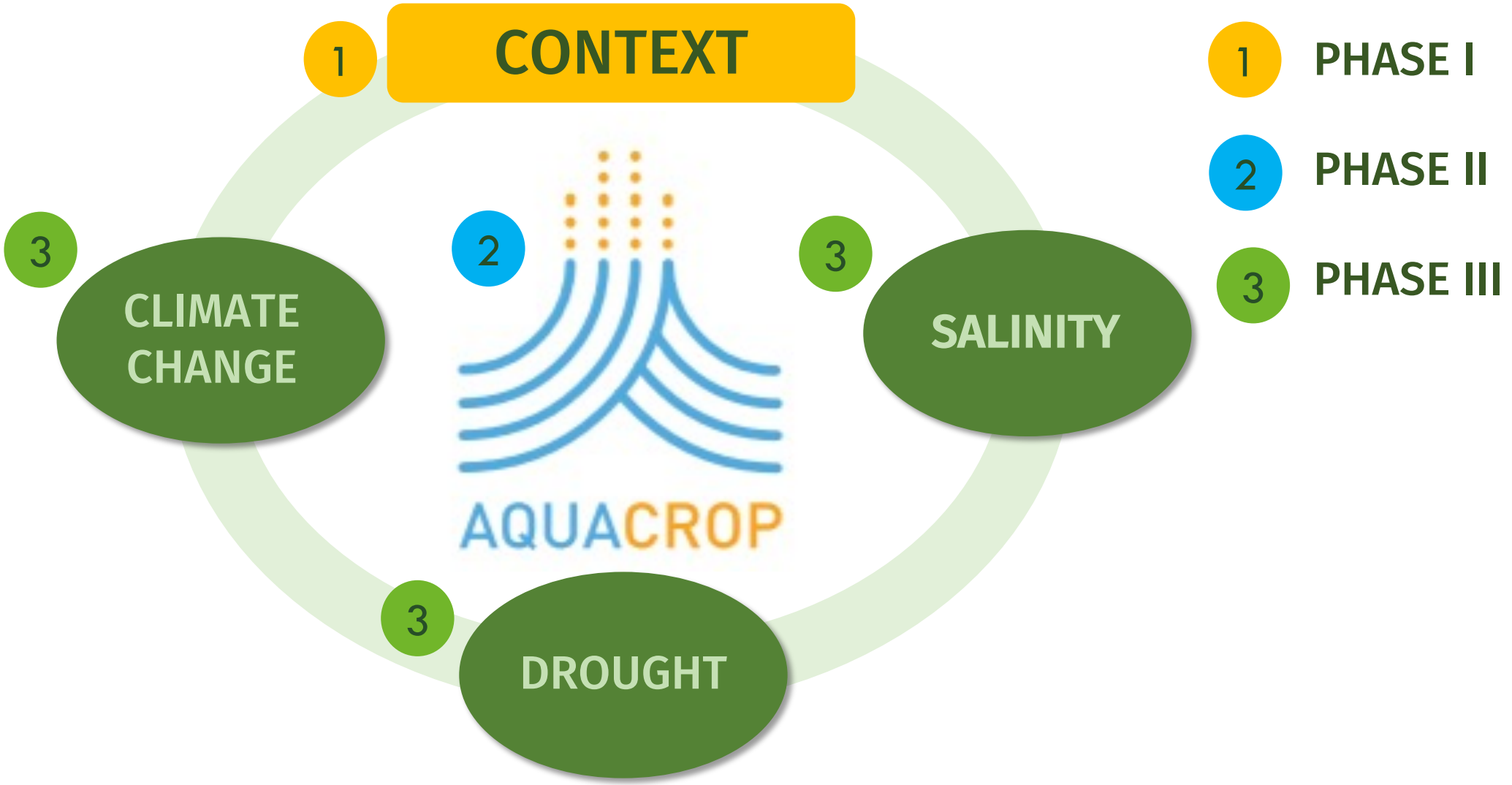
AquaCrop new Version 7.0 now available!

**Standard programme**


**Stand-alone programme**


**GitHub**

# UPSCALED AND CONTEXT-TAILORED TOOLS



# THEMATIC DAY ON WATER PRODUCTIVITY

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| | |
|---|---|
| SESSION 1 | AQUACROP ON THE GROUND |
| SESSION 2 | AQUACROP CALIBRATION AND VALIDATION |
| SESSION 3 | UPSCALING AQUACROP |
| SESSION 4 | MANAGEMENT UNDER SALINE CONDITIONS |
| SESSION 5 | MANAGEMENT UNDER FUTURE CLIMATE SCENARIOS |