CropBase-CFFRC

9th December 2012

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Research Group

Programme Director	Prof Sue Walker *(from Jan 2013)*
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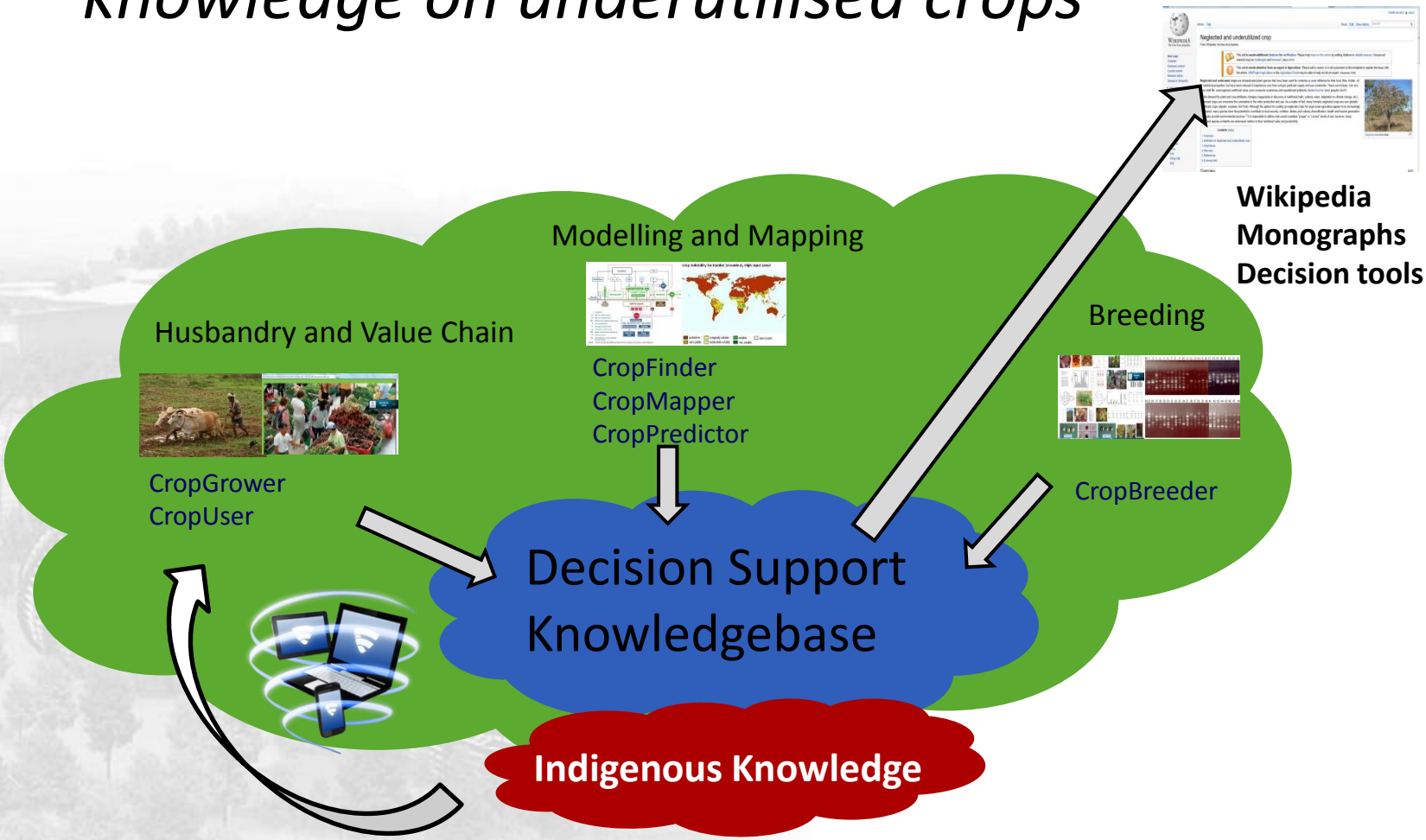
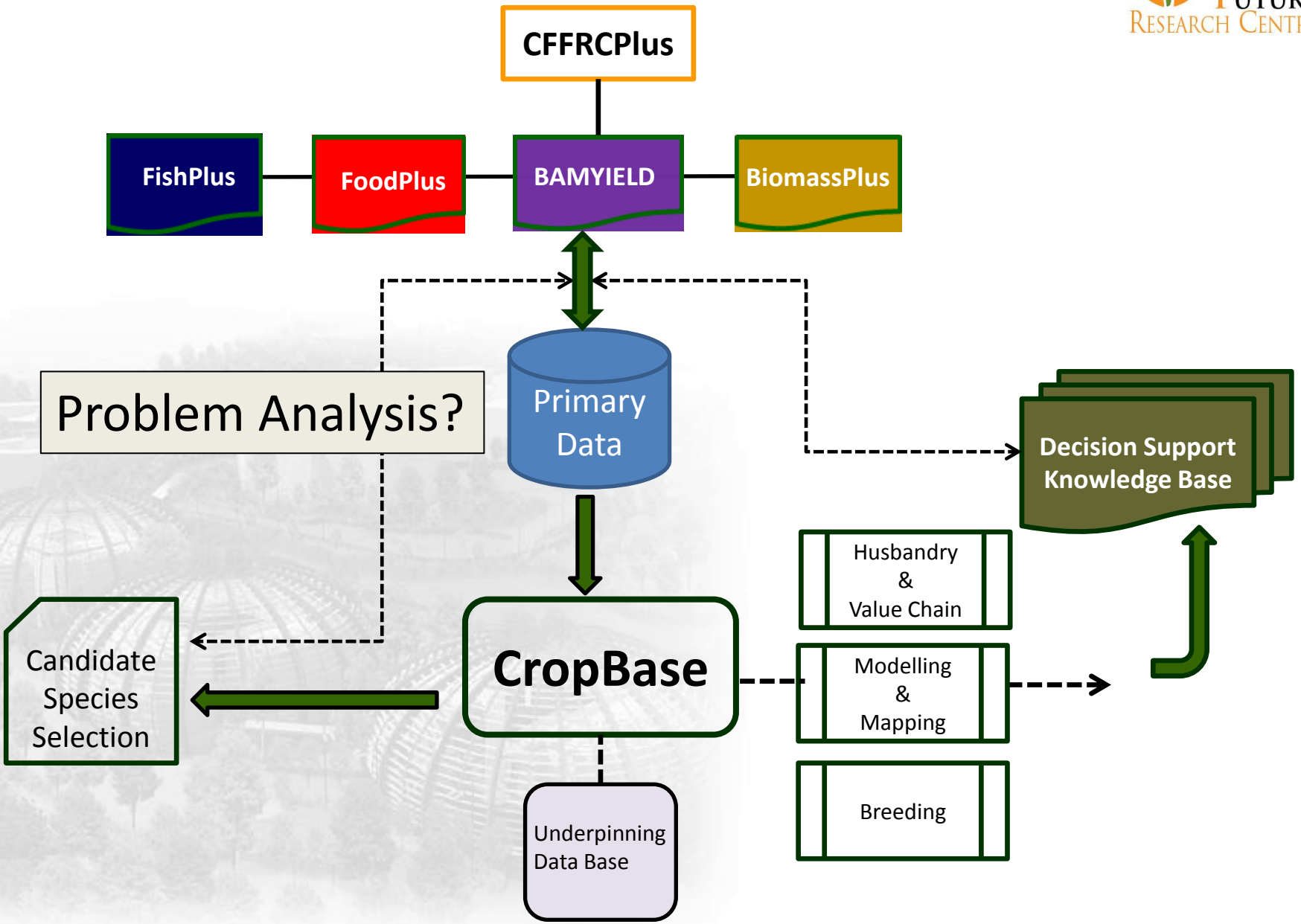
Principle Investigator	Dr. Tim Brailford
Principle Investigator	Dr. Tuong Thuy Vu
Programme Manager	
Post-Doc	Dr Asha Karunaratne
Software Consultant	Mr. Ben Phear

CropBase

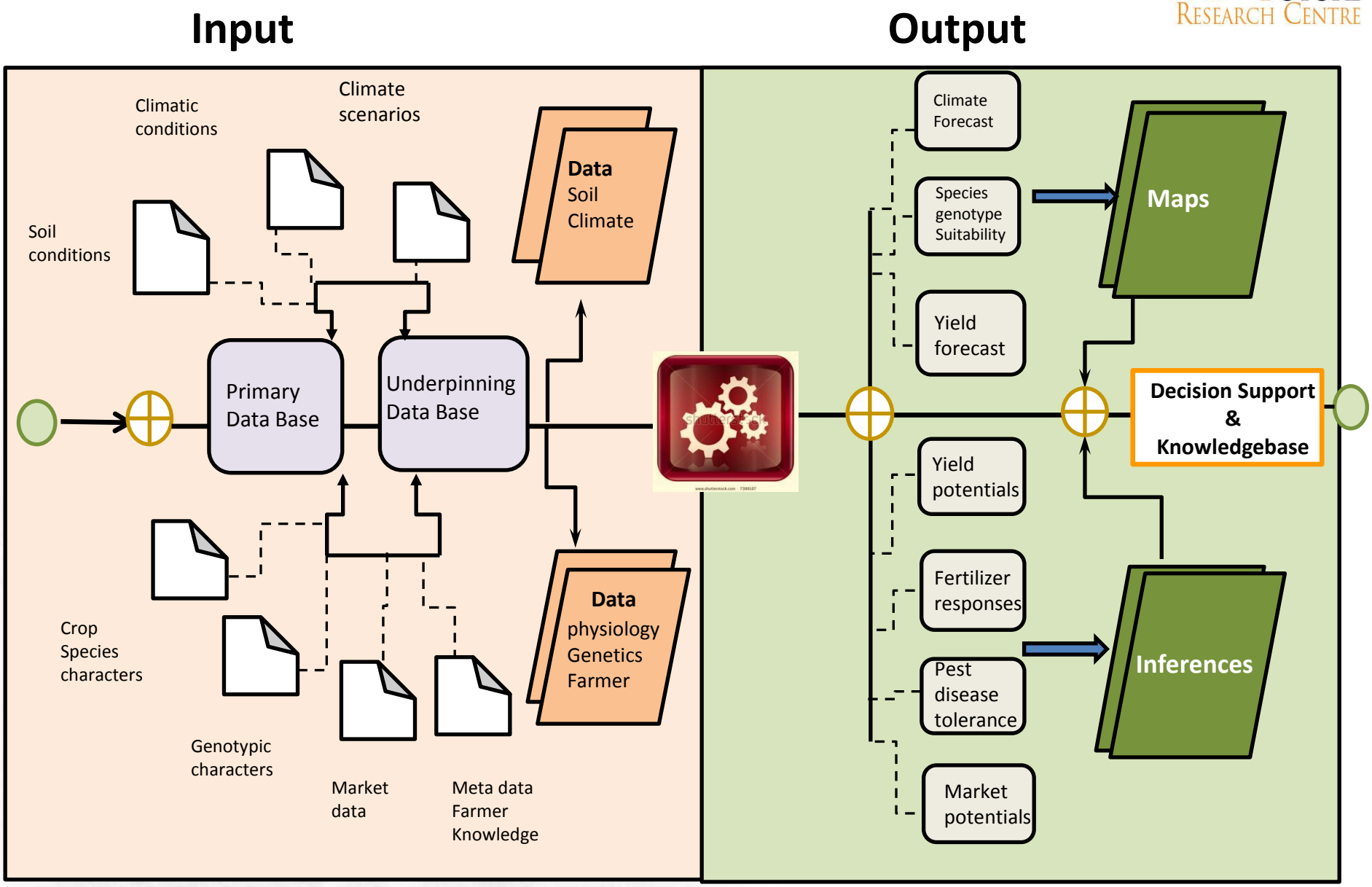
"Web-based platform for decision support and knowledge on underutilised crops"



Link to CFFRCPlus



CropBase data flow architecture



Husbandry and Value Chain

This allows you to monitor : Resource to plan and evaluate

-What tasks you are doing within each season?

-When you are doing them?

-How ?

-Why?

-Marketing potentials?

-Value chain?

Socio-economic models

Meta Data: QC

Mapping and Modelling

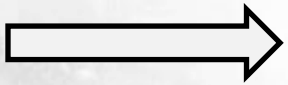
Thuy Vu Tuong, Asha Karunaratne, Sue Walker

Deploy crowd-sourcing data collection solutions from various communities

Integrate multi-scale geospatial analysis into crop simulation

Crop-Climate modelling

Adaptation strategies



Tools

Data mining
Crowd Sourcing
Mapping tools
Crop Models
Climate Models

Breeding

Sean Mayes

Geospatially locate existing genetic data

Generate new data where needed

DArT Sequencing / gene capture approaches

Sequenced based and agricultural important gene approach to compare random and non-random genetic sampling for distance data

Genetic analysis and geographical distances

Breeding schema; common adaptation, genetically diverse

What Crop Models?
What Climate Models?

Some initial thoughts……

AquaCrop

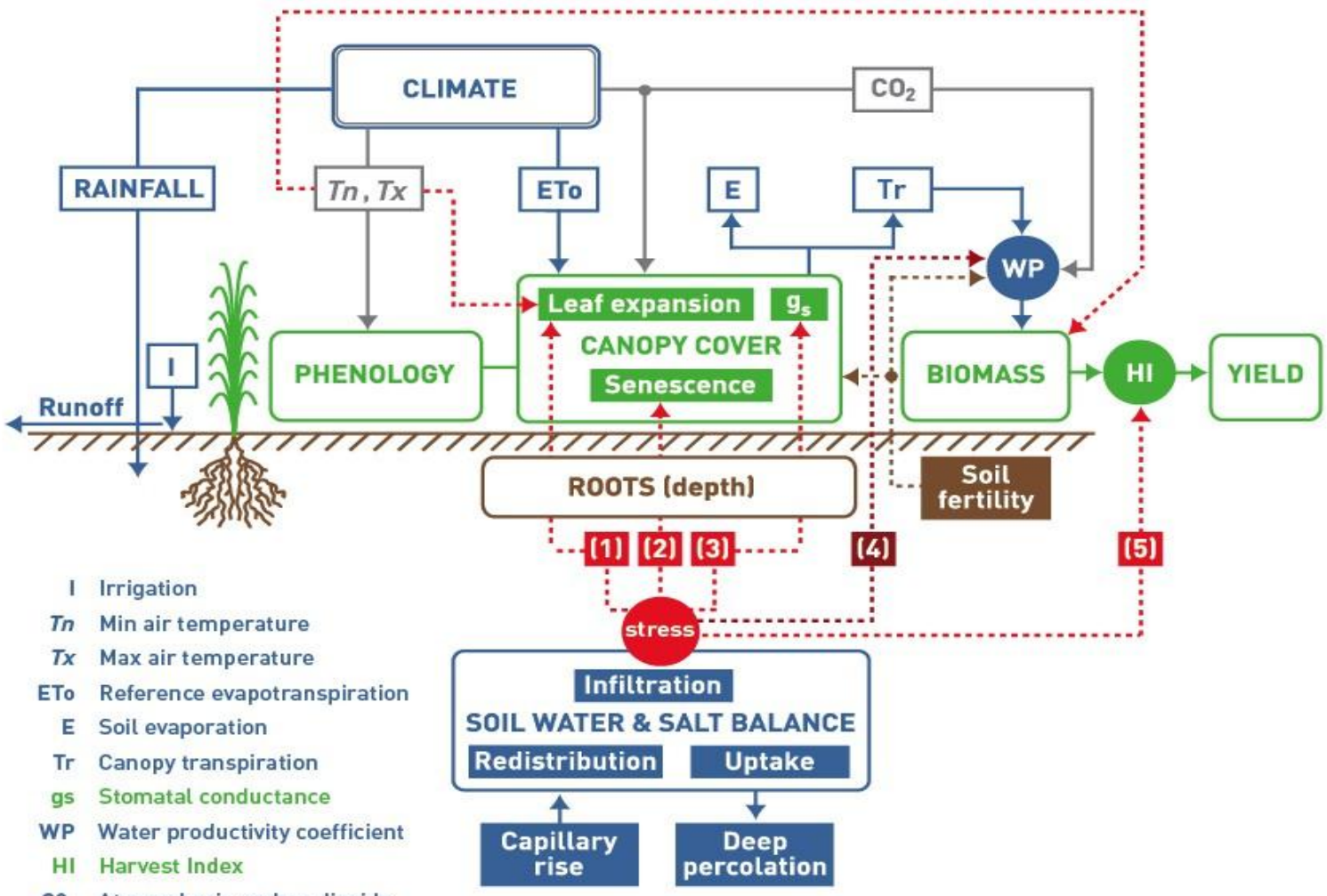
AQUACROP

A new model for crop prediction under water deficit conditions

-Explicit and mostly intuitive, and maintains an optimum balance between simplicity, accuracy and robustness

-Particularly suited for perspective studies
climate change scenarios

AquaCrop Flow-Chart



AquaCrop Conceptual Framework

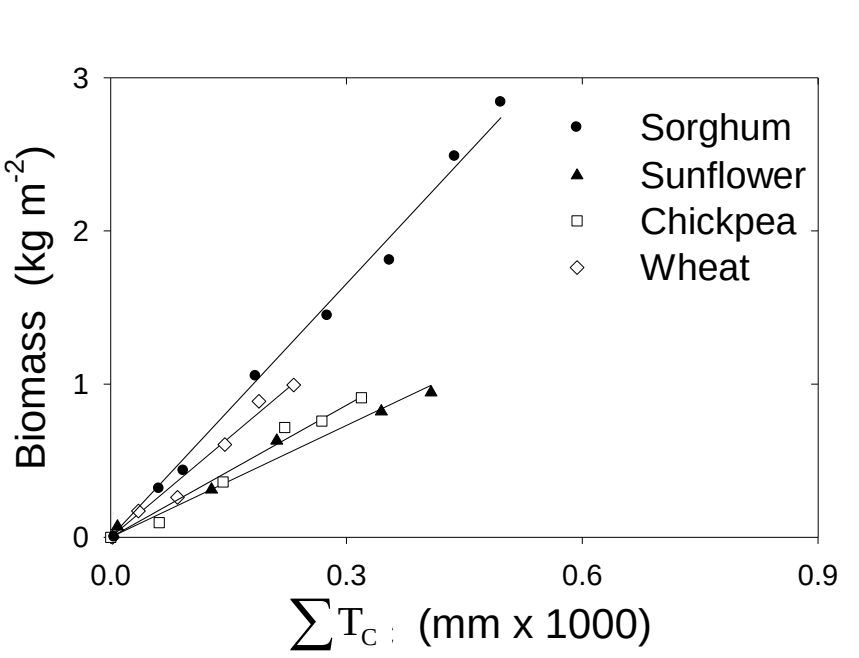
Water Productivity

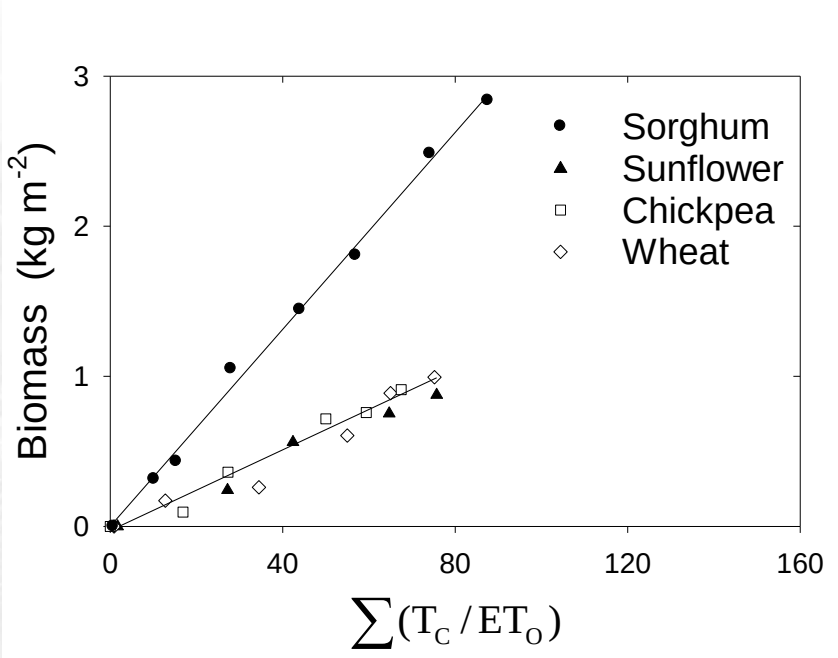
$$WP = \frac{Biomass}{\sum T_C}$$

(g m^{-2} mm^{-1})

$$WP^{*} = \left[\frac{Biomass}{\sum \left(\frac{T_C}{ET_O} \right)} \right]_{CO_2\,(2000)}$$

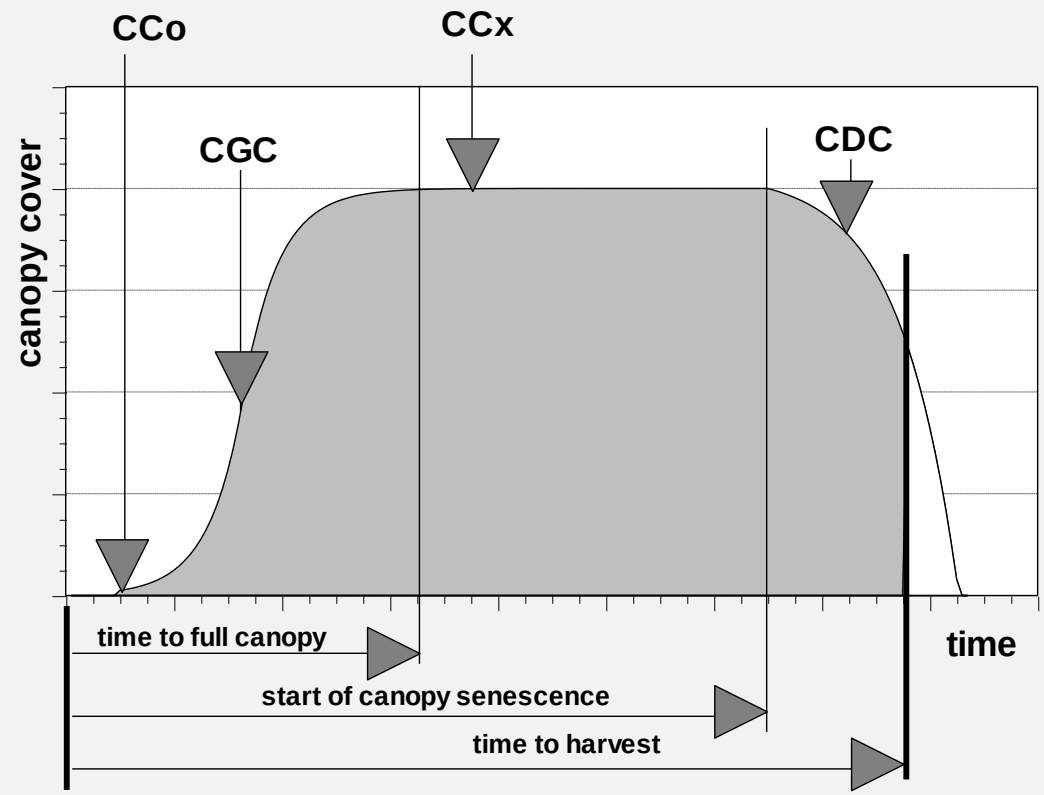
(g m^{-2})





AquaCrop Conceptual Framework

Canopy Cover



Canopy Cover (CC) follows the exponential growth during the first half of the full development (Eq. 1) and an exponential decay during the second half of the full development (Eq. 2)

$$CC = CC_o e^{CGC \cdot t} \quad (1)$$

$$CC = CC_x - (CC_x - CC_o) \cdot e^{-CGC \cdot t} \quad (2)$$

GLAM: General Large Area Model

- Asses the impacts of climate variability and change on annual crops.
- Designed for use with regional and global climate model output and remotely sensed data.
- Combines the benefits of process-based plot-scale crop models, with the benefits of empirical models, in order to simulate yields over large areas

Current versions

-groundnut

-wheat

-Maize

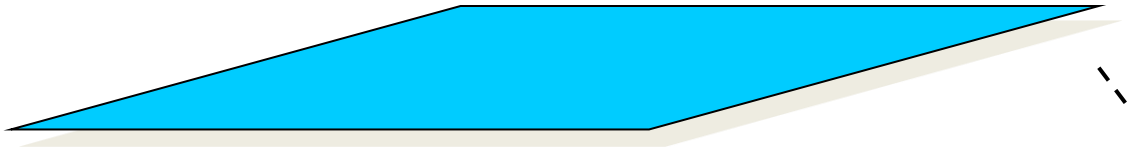
-Soybean

Walker Institute for Climate System Research

University of Reading

General Circulation Model (GCM)

HadAM3



Coupling Crop Model

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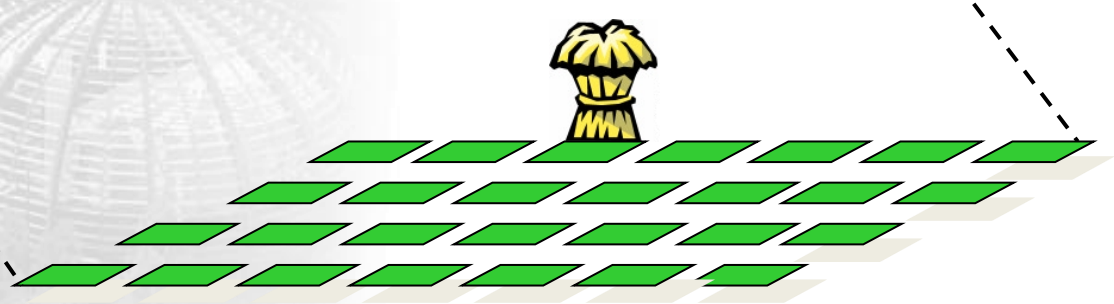
Climate Model

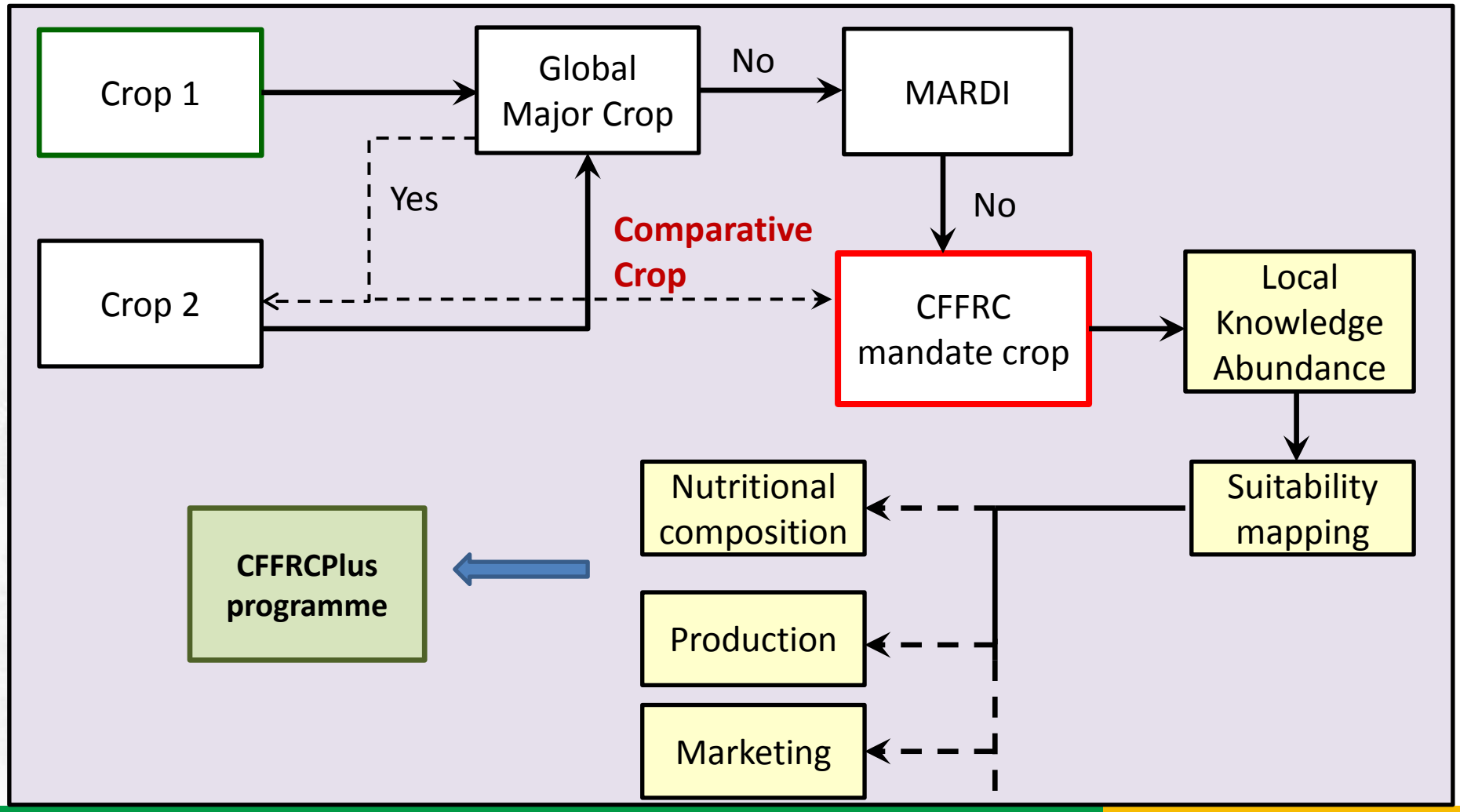
Crop Model

GLAM



Mapping and Modelling

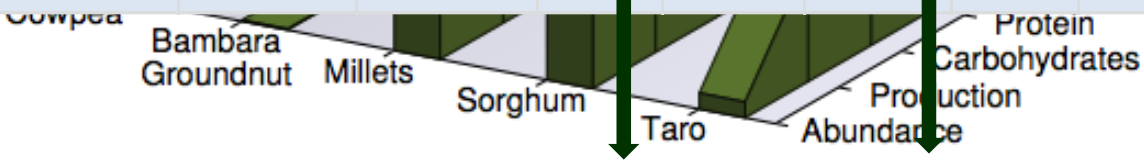
Candidate Species Selection Tool



Rank Summation Index (RSI)

FishPlus

Species	Area Rank	Production Rank	CHO Rank	Protein Rank	Lipid Rank	Fibre Rank	Energy Rank		RSI
Cowpea	3	4	3	1	4	4	3		22
Bambara groundnut	5	5	4	2	1	5	1		23
Millets	2	2	2	4	2	2	2		16
Sorghum	1	1	1	3	3	3	4		16
Taro	4	3	5	5	5	1	5		28



BiomassPlus