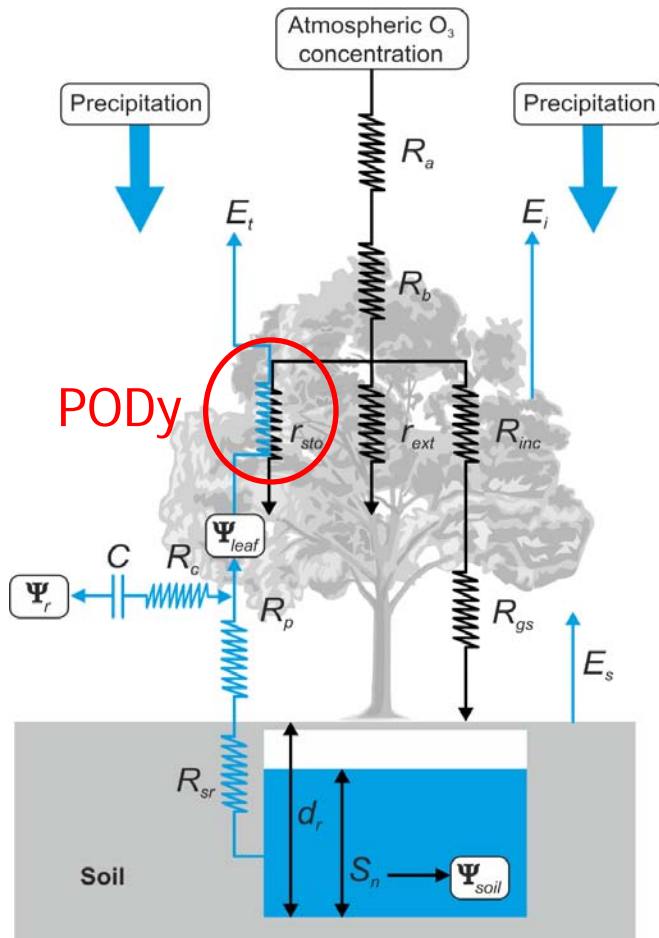


The DO₃SE model

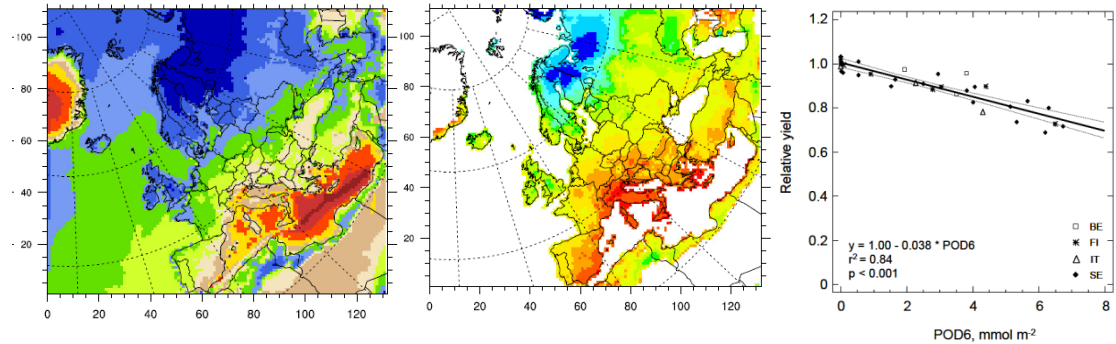


Ozone dry deposition and stomatal O₃ flux model

Human health

Ecosystems

Flux-R relationships

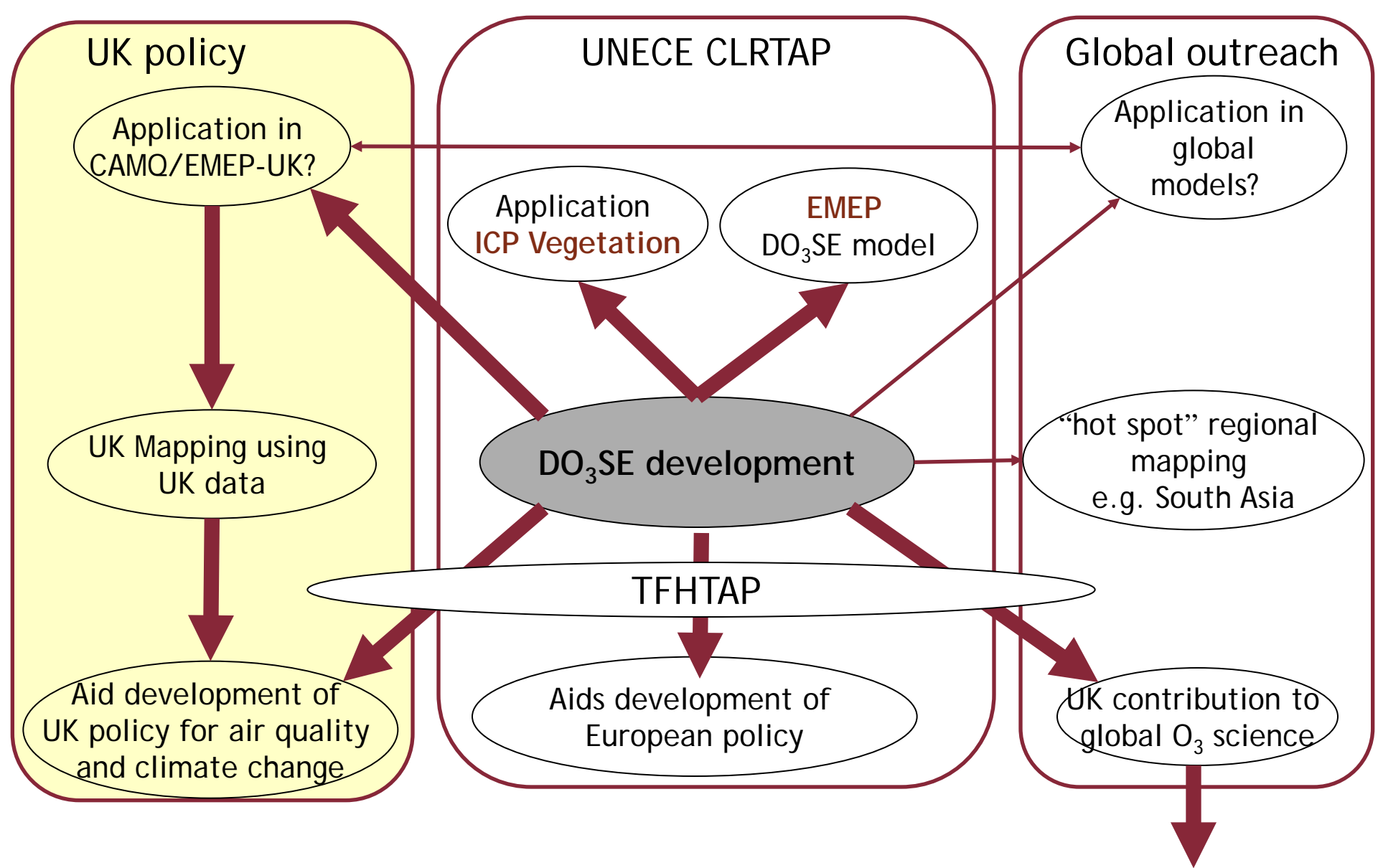


$$1/R_{sto} = g_{max} * f_{phen} * f_{light} * \max(f_{min}, \{f_{temp} * f_{VPD} * f_{SW}\})$$

$$1/R_{sto} = g_{min} + m * An * \frac{RH\%}{Ca} * f_{SW}$$

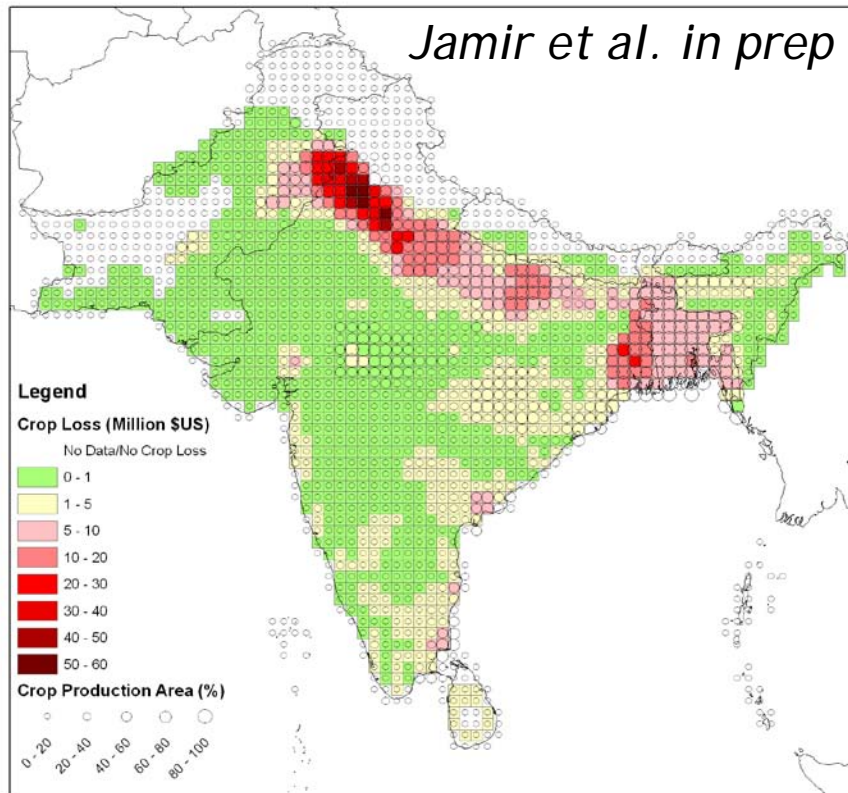
Recently updated to include a Penman-Monteith soil moisture module - SWAT model

.....dynamic growth based on Photosynthesis (DGVM links)



RAPIDC
GAP Forum
SLCP and co-benefits of air quality and climate change mitigation

O₃ seems likely to be posing a serious threat in South Asia



Wheat, Rice, Soybean, Potato

European AOT40 dose-response relationships

FAO crop production, distribution and producer price data for 2000

MATCH modelled O₃ concentrations for 2000

Loss estimated at **US\$ 3.9 Billion**

India (US\$ 3.1), Pakistan (US\$ 0.35) and Bangladesh (US\$ 0.4)

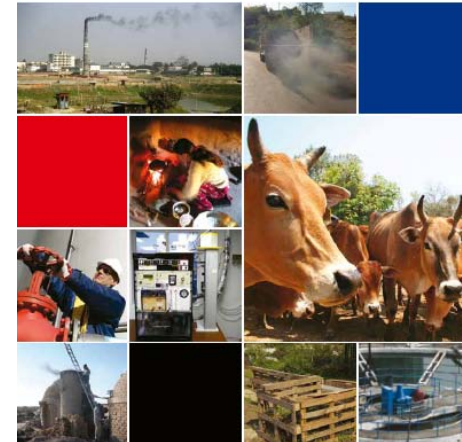
Mitigation..reduce O₃ levels and limit climate change.....
One option may be to tackle short-term climate forcers....

- Review scientific literature on BC and O₃
- Focus on small number of carefully identified measures
- Assess the extent of near-term global and regional climate protection
- Estimate co-benefits on health and **O₃ induced crop yield loss**
- Examine how the measures can be widely implemented

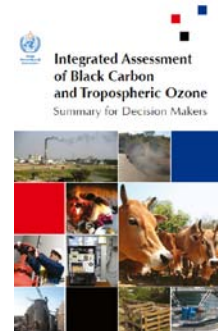
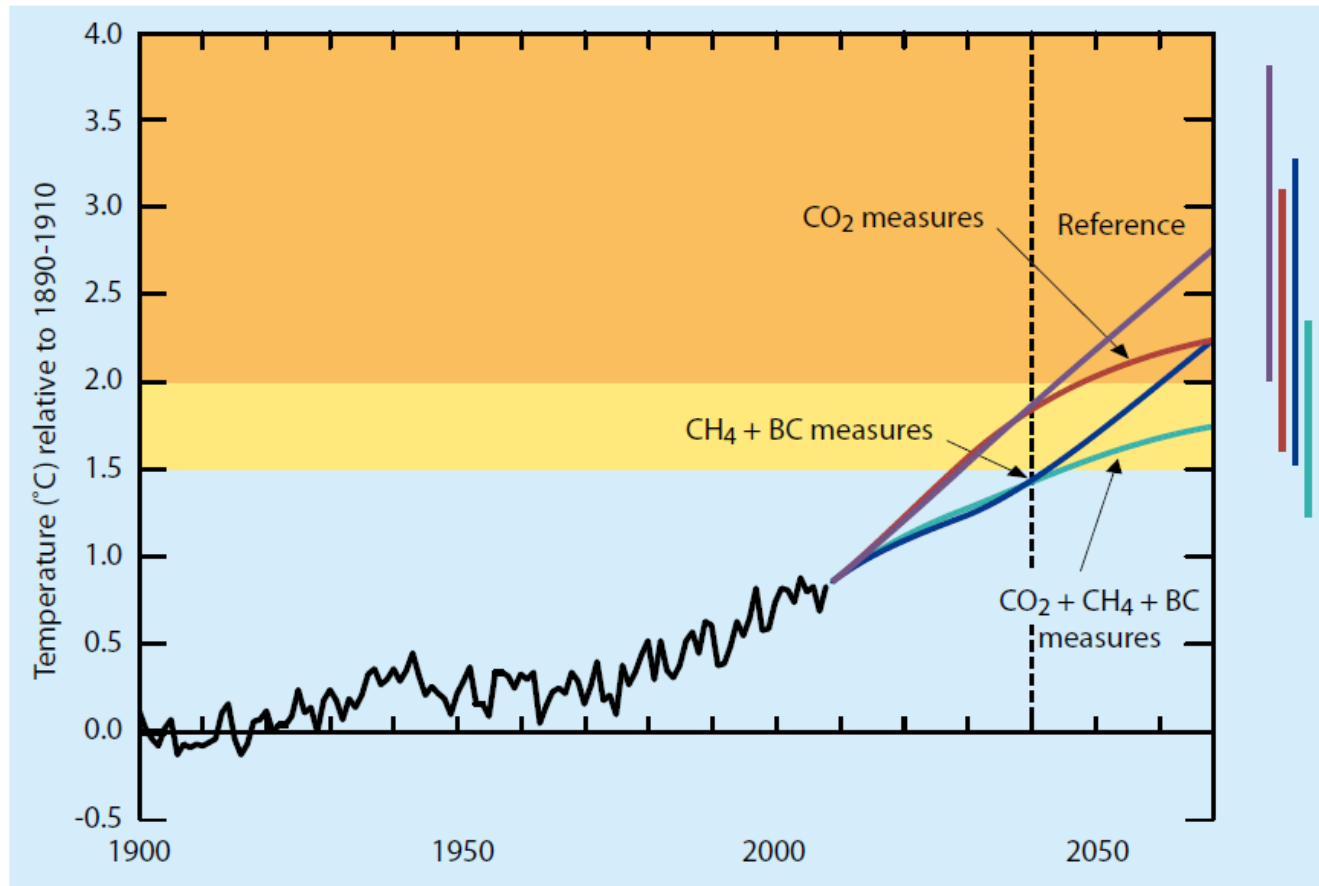
Two groups of measures - CH₄ and BC measures



**Integrated Assessment
of Black Carbon
and Tropospheric Ozone**
Summary for Decision Makers



UNEP Integrated Assessment of Black Carbon (BC) and Ozone (O₃)



Climate and Clear Air Coalition (CCAC)
National Action Plans (e.g, Bangladesh, Mexico, Ghana...)