Global sensitivity analysis on irrigation scheduling

**Problem:** There are so many factors involved in water circulation between soil, plant, and atmosphere where irrigation decision making is based on some of them. But how is the uncertainty in these information effecting irrigation scheduling?

**Extreme example**

- **Crop type:** Cotton
- **Soil type:** Silty Loam
- **Station:** Mildura Airport

**Uncertain Factors:**
1. Dew point temperature
2. Min temperature
3. Max temperature
4. Solar radiation
5. Wind speed
6. Rainfall
7. Extractable soil water
8. Crop coefficient
9. Depletion Factor
10. Root Zone

In this example, uncertainty in various information is leading to more than one month difference in irrigation timing. Which one is the right decision?

In this case, most sensitive factors are:
- Crop coefficient
- Soil water content
- Root depth
- Wind speed

Rainfall is potentially suspicious to uncertainty in wet seasons for other scenarios with different crops and locations.

**Sobol sensitivity ranges for Cotton with silty-loam soil at Mildura Airport weather station**

**More Information**

Arash Parehkar
PhD Candidate
aparehkar@student.unimelb.edu.au
Level 3, 333 Exhibition street, Water Group
Department of infrastructure engineering
Supervisors: Andrew Western, Dongryeol Ryu