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Applied Systems Analysis  
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WITH FUNDING FROM  
AUSTRIAN  
DEVELOPMENT  
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EAST AFRICAN COMMUNITY  
LAKE VICTORIA  
BASIN COMMISSION

One people,  
One Destiny

# Water Futures and Solutions Workshop

Entebbe, December 4-6 2018  
Dr. Simon Langan



Towards Innovative Solutions through  
Integrative Water Futures Analysis

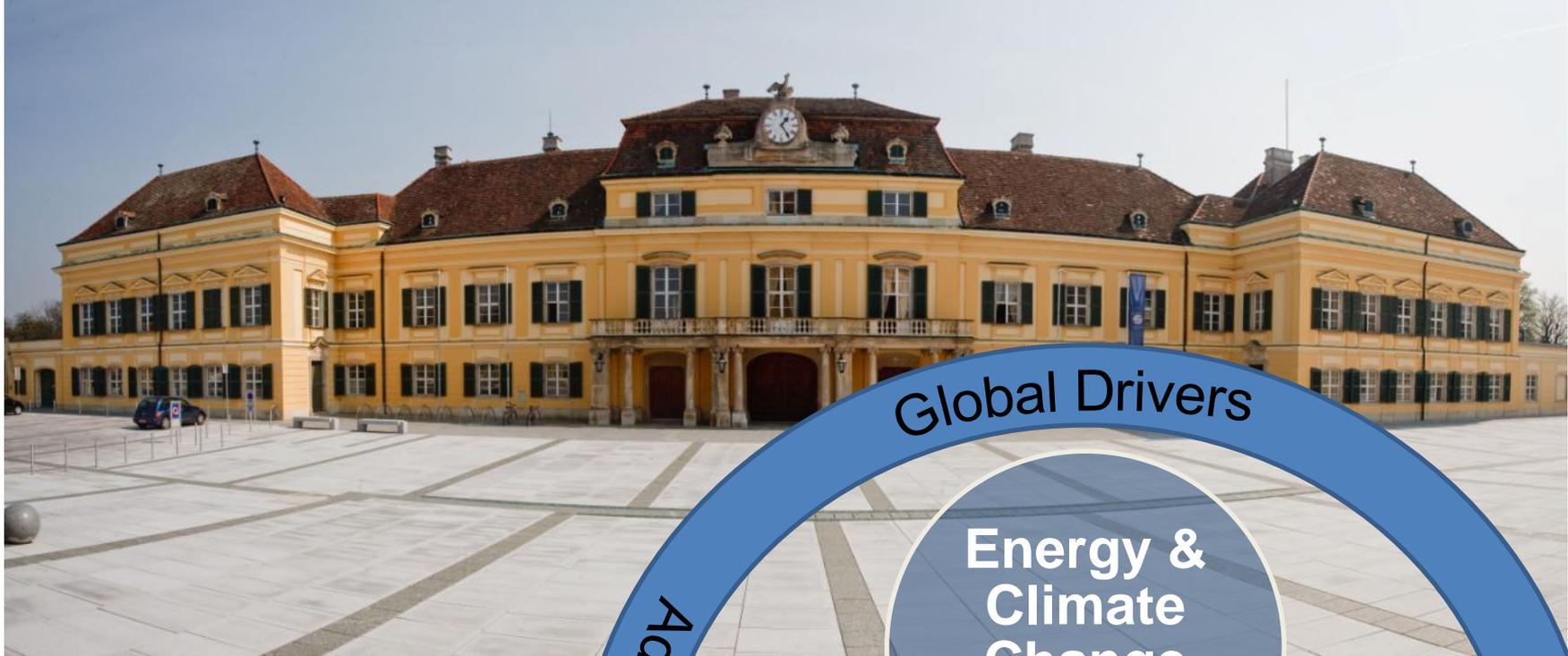


IIASA, International Institute for Applied Systems Analysis

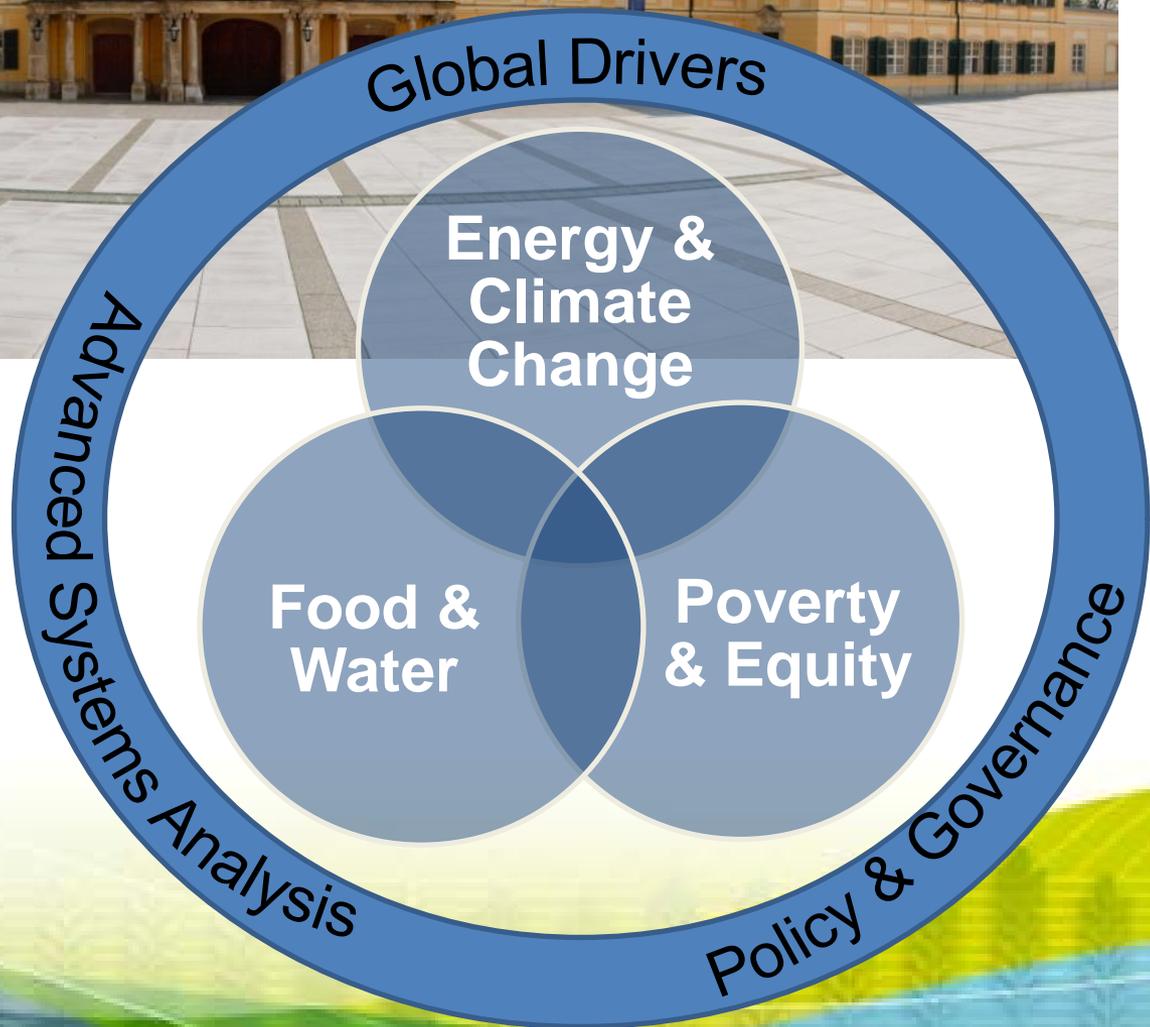


@wfas\_iiasa

science for global insight



# IIASA - RESEARCH FOR A CHANGING WORLD



# World Economic Forum 2017

## Top 5 Global Risks in Terms of Impact

<http://reports.weforum.org/global-risks-2017/the-matrix-of-top-5-risks-from-2007-to-2017/>

2013	2014	2015	2016	2017
Major systemic financial failure	Fiscal crises	Water crises	Failure of climate-change mitigation and adaptation	Weapons of mass destruction
Water supply crises	Climate change	Rapid and massive spread of infectious diseases	Weapons of mass destruction	Extreme weather events
Chronic fiscal imbalances	Water crises	Weapons of mass destruction	Water crises	Water crises
Diffusion of weapons of mass destruction	Unemployment and underemployment	Interstate conflict with regional consequences	Large-scale involuntary migration	Major natural disasters
Failure of climate-change mitigation and adaptation	Critical information infrastructure breakdown	Failure of climate-change mitigation and adaptation	Severe energy price shock	Failure of climate-change mitigation and adaptation

■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

# WFaS brief history

“There is a water crisis today. But the crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people—and the environment—suffer badly”

World Water Vision Cosgrove and Rijsberman 2000, WWC

- Establishment of WFaS with UNESCO
- 2013 Established as a phased partnership approach led from IIASA
- 2016 finalization of global ‘Fast Track’ Approach
- 2016 establishment of first ‘regional node’ (E. Africa)



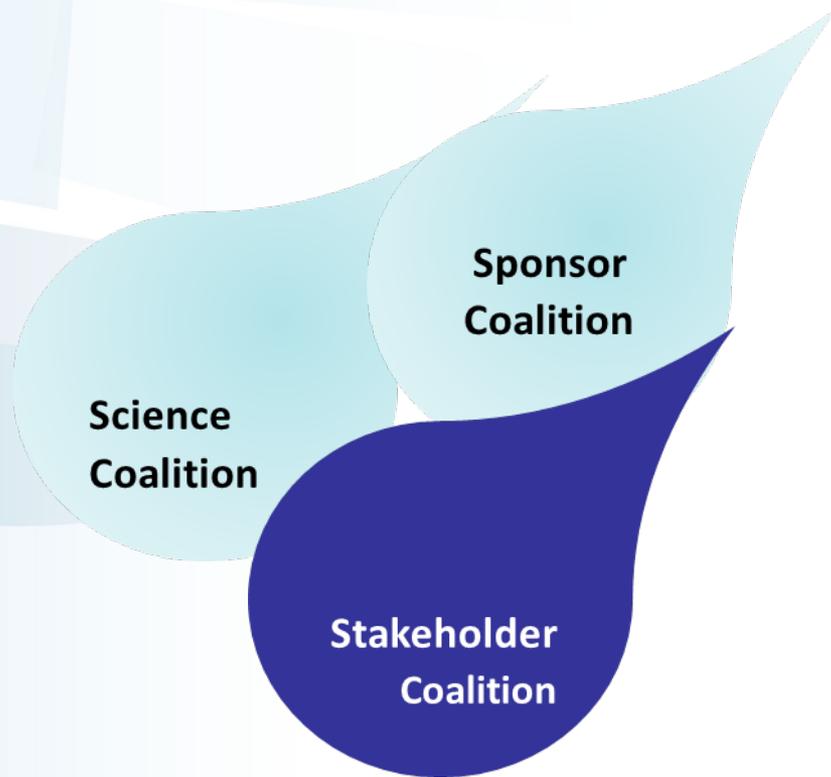
International  
Water Association



Austrian  
Development Cooperation



# Water Futures and Solutions (WFaS)



**Three major components**

**Work feeds into global effort on SDG's, UNFCC and beyond**



International Water Association



Austrian  
Development Cooperation

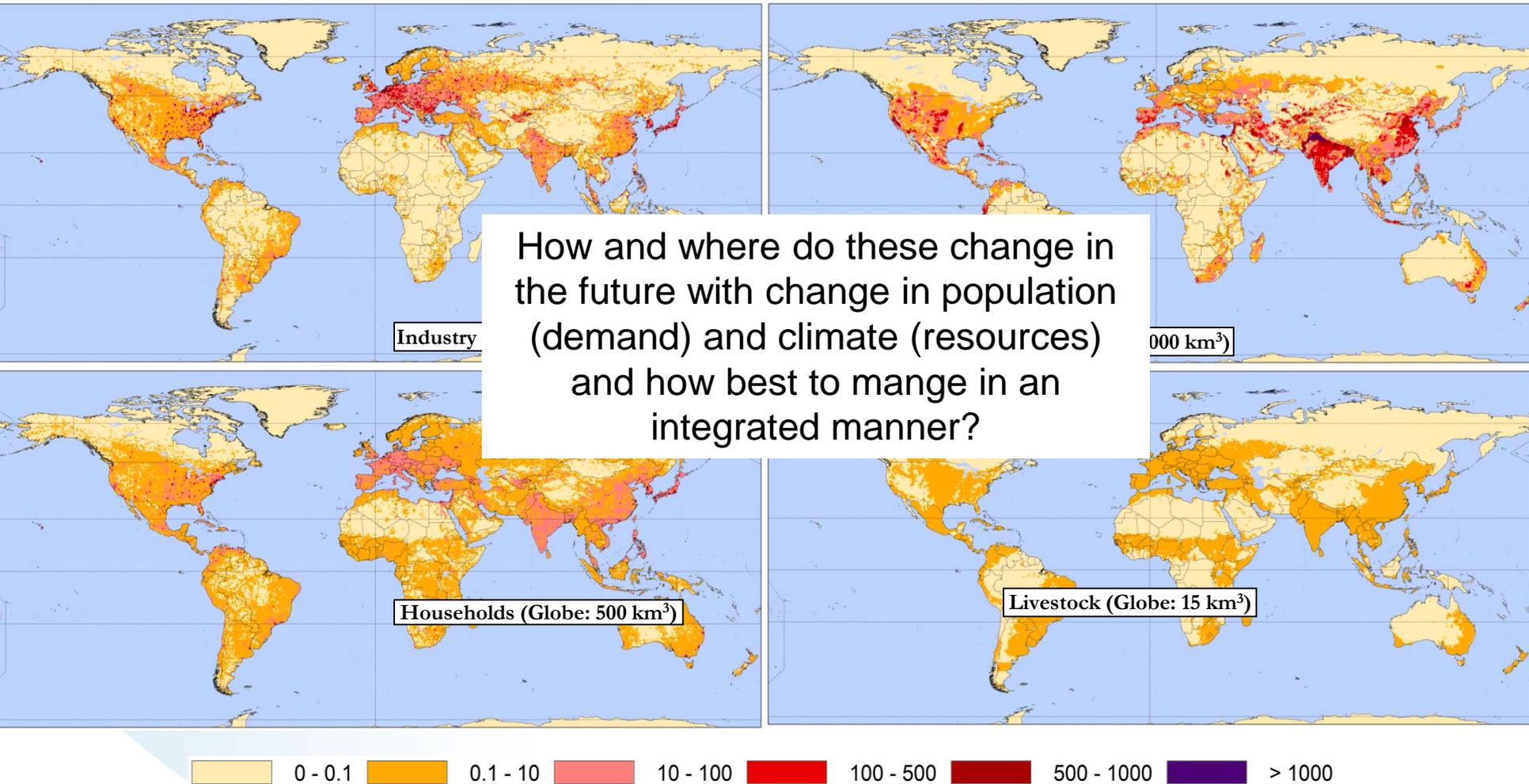


# Context: A rapidly changing world

- Up to 2 billion more people by 2050
- Need to produce 70 percent more food
- With increasing development energy and food demands are rising. Water demands to meet these are expected to rise by 55 percent
- Set against a background of a more variable and changing water resource availability
- Up to 40 percent of the worlds population will live in severe water stressed regions
- Increased migration

**What actions –policies/investments supported by evidence for interaction?**

# Context - Water Use today



Wada et al.  
(2013; ERL)

# Solutions for a water secure East Africa in 2050

Looking into mid- to long term water resources management

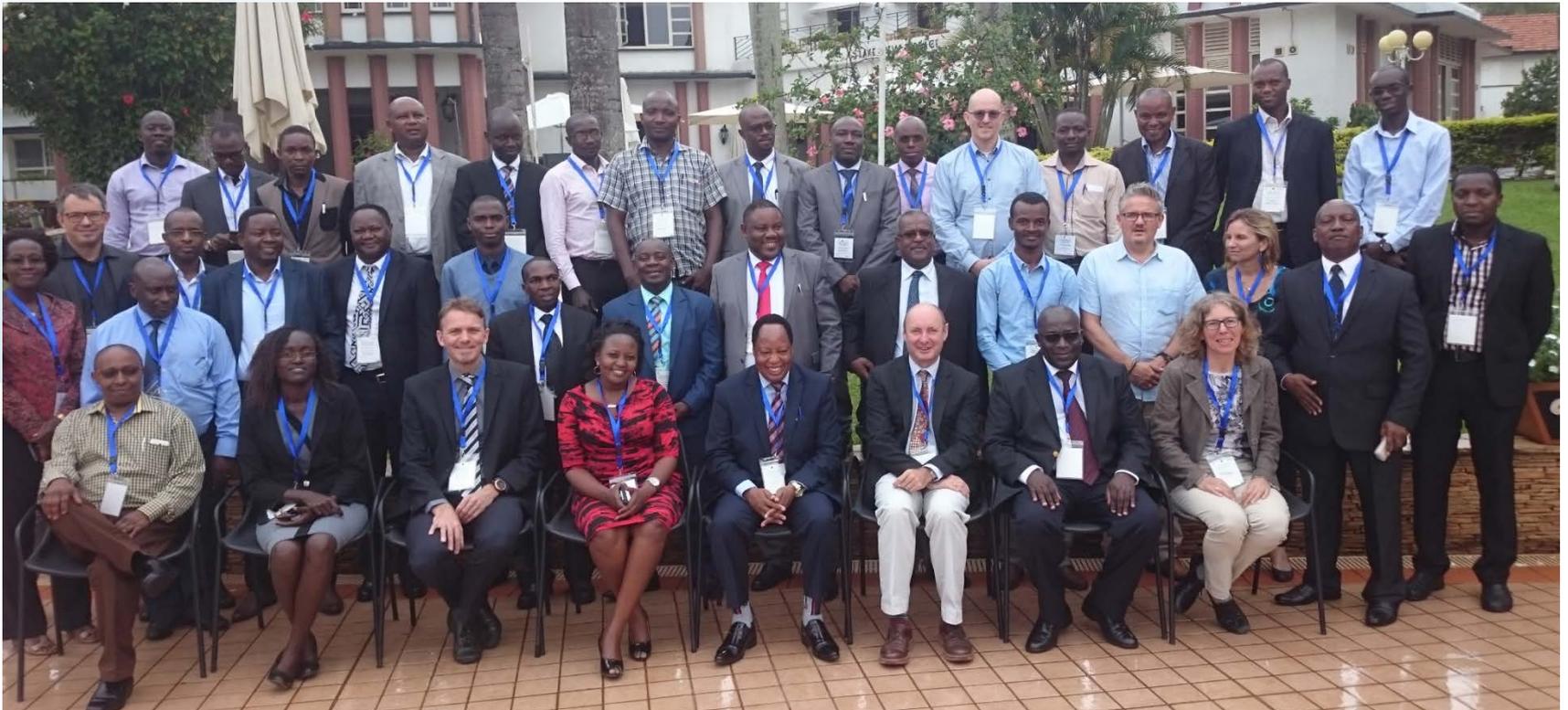
- Approaches, tools and techniques
- Understanding key determinants
- Unlock collaboration, mutual benefits



# WFaS LAICO, December 2017

50+ participants from:

- Government, transboundary organisations
- Academia
- Civil society organisations
- Business representatives



# Meeting framed by and explored:

## major drivers:

*How will the Lake Victoria Basin be transforming in order to achieve the EAC Vision 2050?*

- creating qualitative storylines of key drivers.
- quantifying major drivers.

## challenges and solutions

*What are the major water management challenges associated with the EAC vision 2050 and how can these be addressed?*

- identify and discuss challenges and trade-offs.
- identify and discuss solutions and synergies.



Agriculture,  
livestock  
and fishery



Industry &  
Commerce  
(energy)



Surface  
and  
Ground  
Water



Socioeconomic  
Trends &  
Domestic  
Water

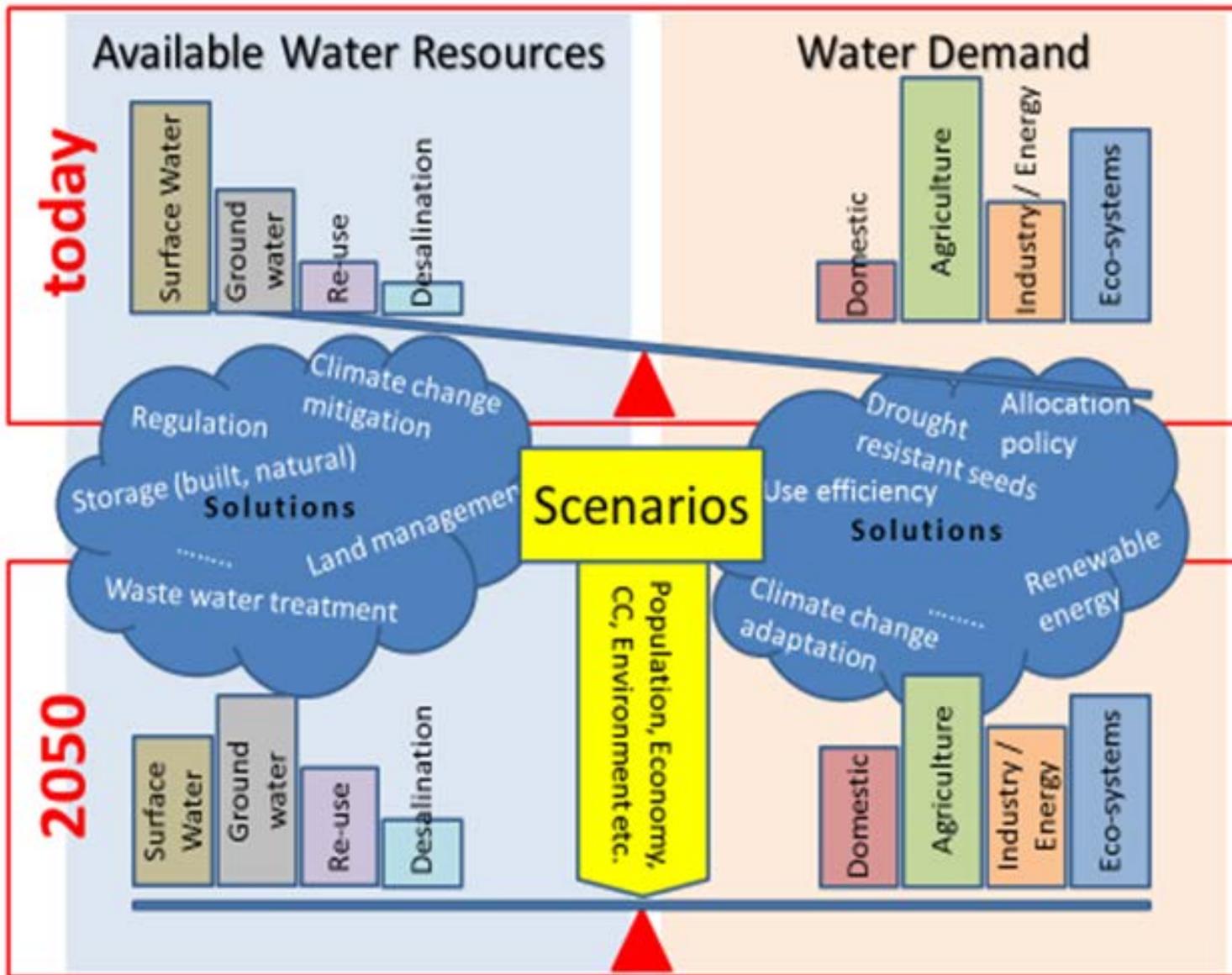
# Understanding development scenarios:

## Draft story lines:

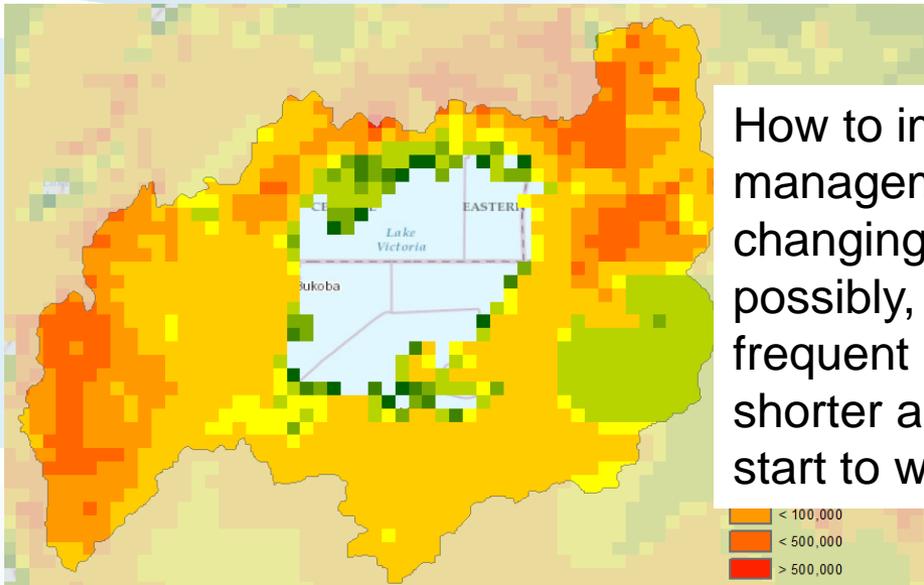
- Socio-economic trends and domestic water, Simon Langan
- Surface water and ground water resources, Peter Burek
- Agriculture, livestock and fishery, Sylvia Tramberend
- Industry incl. energy, manufacturing and commerce, Clarissa Mulders / Robert Burtscher

**Quantification:** Discussion based on clue cards, validation and some hints for further research.

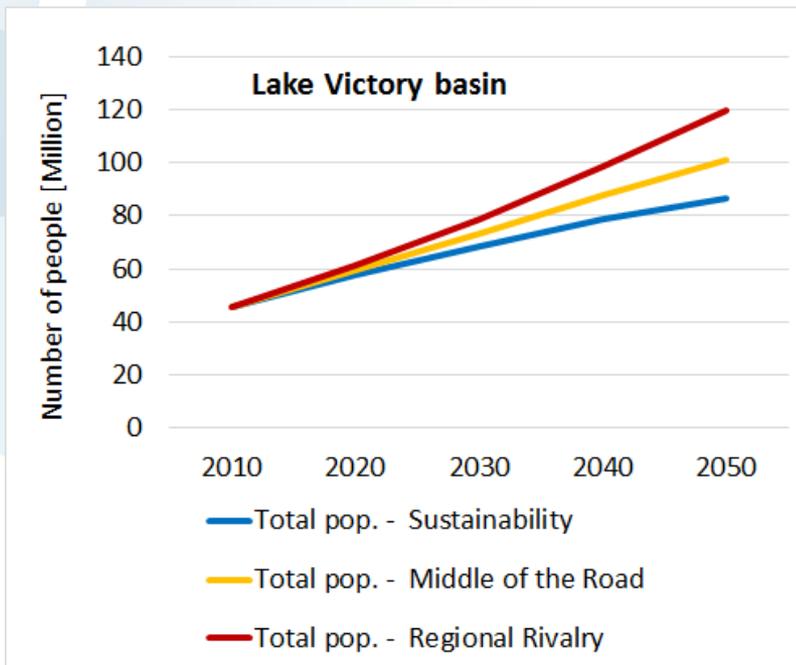
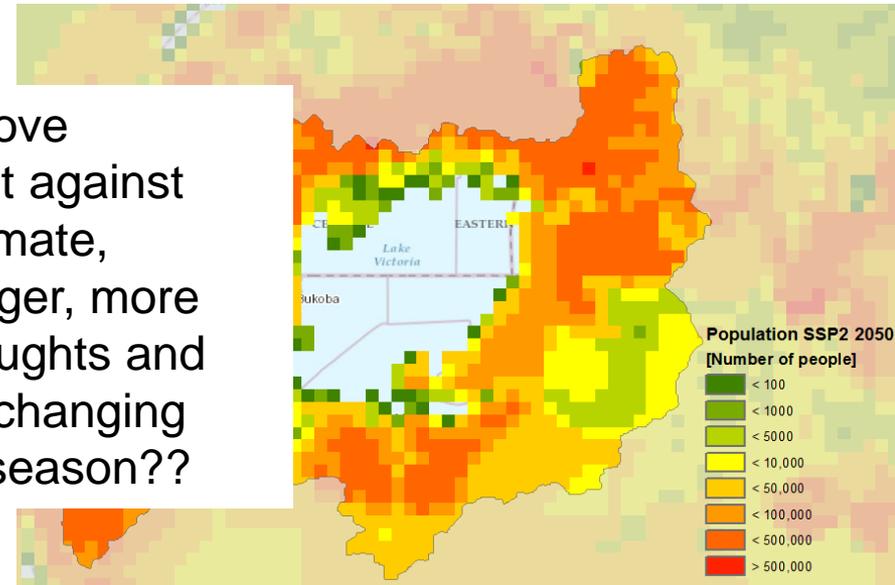
# Modeling approach



# Socio-economic change - Population



How to improve management against changing climate, possibly, longer, more frequent droughts and shorter and changing start to wet season??



## Lake Victoria basin

From 46 Mio. people in 2010 to 87 – 120 Mio. people in 2050 (depending on scenario SSP1-SSP3)

90% - 260% increase

# Who will join us next time?



# **This meeting: Sharing experience on modelling outcomes under different scenarios**

Build on your experience from the region

- Explore the results and underpinning data sets
- Discuss how to maximize the utility of the results and work
  - Key messages
  - Who would find results useful
  - What format
- Forward look

# Forward look

- Proposal to ADA pilots to scaling out for Agricultural water management
- Work in Zambezi
- Discussions with AMCOW
- YSSP and post-doc opportunities

# YSSP Program

- Program aims at advanced Ph.D students
- Runs from June 1 until August 31
- Research on issues of global environmental, economic and social change
- Interdisciplinary, international, independent
- Wide range of scientific events, including both social and natural sciences, often with important policy dimensions



# Contact

For further information

<http://www.iiasa.ac.at/yssp>



“Water is a precious resource, crucial to realizing the sustainable development goals, which at their heart aim to eradicate poverty.”  
UN Secretary-General Ban Ki-moon  
21<sup>th</sup> January 2016, Davos



**Thank you**  
**Simon Langan**