RICCAR

Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

Climate proofing agriculture in the Arab region: What can we do already now?

Prof. Dr. Dieter Prinz
Consultant
GIZ-ACCWaM
Germany

High Level Conference on Climate Change Assessment and Adaptation in the Arab Region – Beirut, Lebanon – 26-28 September 2017

What is Climate Proofing Agriculture?

Definition

The incorporation of climate change issues into agricultural / land use planning procedures at national, sectoral, and project level in order to increase resilience to climate change impacts

Which approaches?

- **Pre-active CC adaptation management:** Acting according to acute challenges, but simultaneously planning for future vulnerabilities.
- **No-regret/low-regret approach:** Preferring options that deliver net socio-economic benefits irrespective of the nature of future climate; concentrate on win-win opportunities & synergies.
- **Adaptive management:** We have to apply flexible management approaches that adjust as (climatic) circumstances change.

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

Steps of Climate Proofing Agriculture

STEP 1

- **Vulnerability screening** (potential impacts + adaptive capacity) of rural areas

STEP 2

- Assessing **biophysical & socio-economic** impacts of Climate Change in agriculture

STEP 3

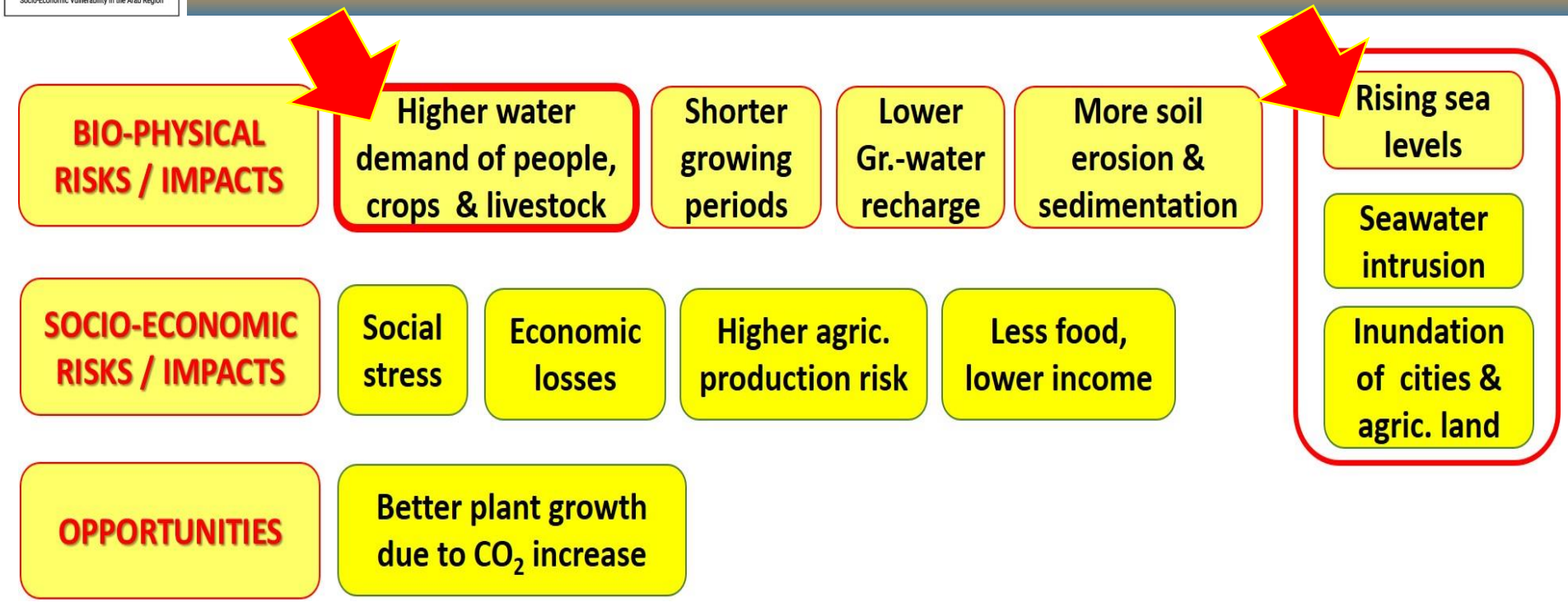
- Identifying and prioritizing **suitable technical & policy options** of CC adaptation

STEP 4

- Developing a **strategy** (measures + policy); **implementation, monitoring, feedback**

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

STEP 2: Assess Biophysical & Socio-economic Impacts of Climate Change in Agriculture



Climate Proofing Agriculture: Guidelines

1. Climate change adaptation (CCA) has to be an integral part of national water sector strategies, plans and investment decisions (IWRM based).
2. All options proposed have to be extensively studied regarding their economic perspective and applicability.

   We distinguish between technical and policy CCA options.

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

STEP 3: Identify and Prioritize Suitable Technical Options of Climate Change Adaptation. Topic: 'Higher Water Demand'

What can we do already now?

TECHNICAL OPTIONS	EXAMPLES
Demand Management	High water use efficiency, reduction of water / ET losses, avoiding pollution
Water Conservation	Deficit irrigation, supplemental irrigation, soil & water conservation, etc.
More Water Storage	Construction of tanks, ponds, reservoirs; managed aquifer recharge;
(Rain) Water Harvesting	Rooftop WH, Micro- & Macro-catchments, floodwater harvesting, groundwater dams
Water Re-use (with or without treatment)	Greywater, municipal wastewater, industrial process water, agricultural drainage water,
Use of Marginal Quality Water	Low salinity water can be used for many tree and bush crops, incl. date palms
Crop & Variety Selection	Short cycle crops, drought / salt tolerant crops and crop varieties
Agricultural Production Mode	Changes in planting time, agroforestry, improved animal husbandry, aquaculture

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

STEP 3: Identify and prioritize suitable policy options of Climate Change Adaptation. Topic: 'Higher Water Demand'

The eight ‚**Golden Nuggets**' in agricultural CC adaptation, related to water demand

A water policy favouring Integrated Water Resources Management (IWRM)

Strengthening agricultural extension service (better staffing, improved facilities, more training)

Incentives / loans to farmers for investments in modern irrigation systems and water storage

Applied research & demonstrations regarding new methods, such as WH, groundwater dams

Adequate finance for construction of reservoirs (e.g. for floodwater collection) and aquifer recharge

More stress on enforcement of laws & regulations to curb water pollution by industry, agriculture, etc.

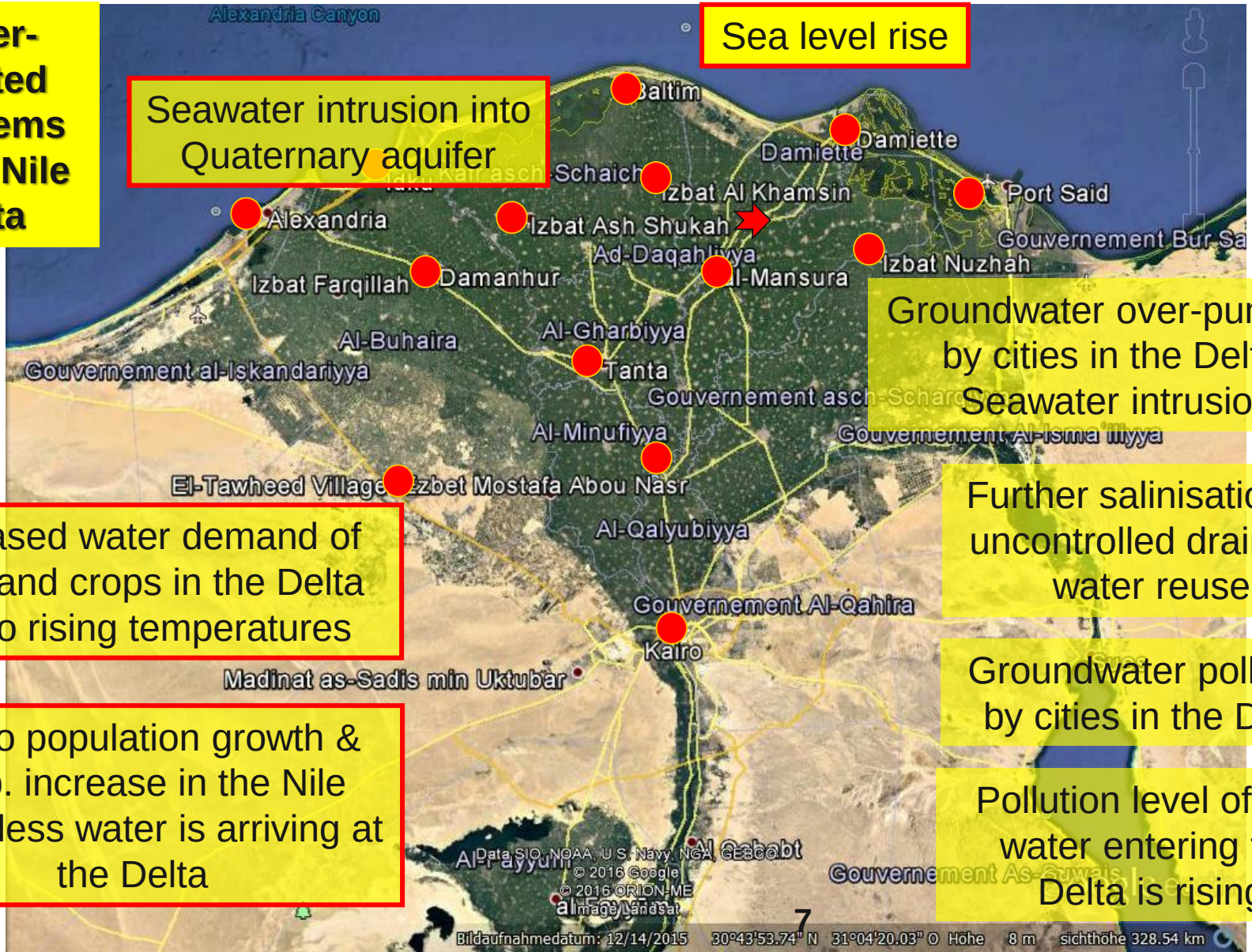
A water policy favouring water harvesting, water re-use and the use of marginal water

Stakeholder involvement in planning and operation of CCA programmes. Improved exchange of data.

Case Study: Nile Delta Development
Example of Pre-active CCA Management

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

Water-Related Problems in the Nile Delta



Groundwater over-pumping by cities in the Delta: Seawater intrusion

Further salinisation by uncontrolled drainage water reuse

Groundwater pollution by cities in the Delta

Pollution level of Nile water entering the Delta is rising

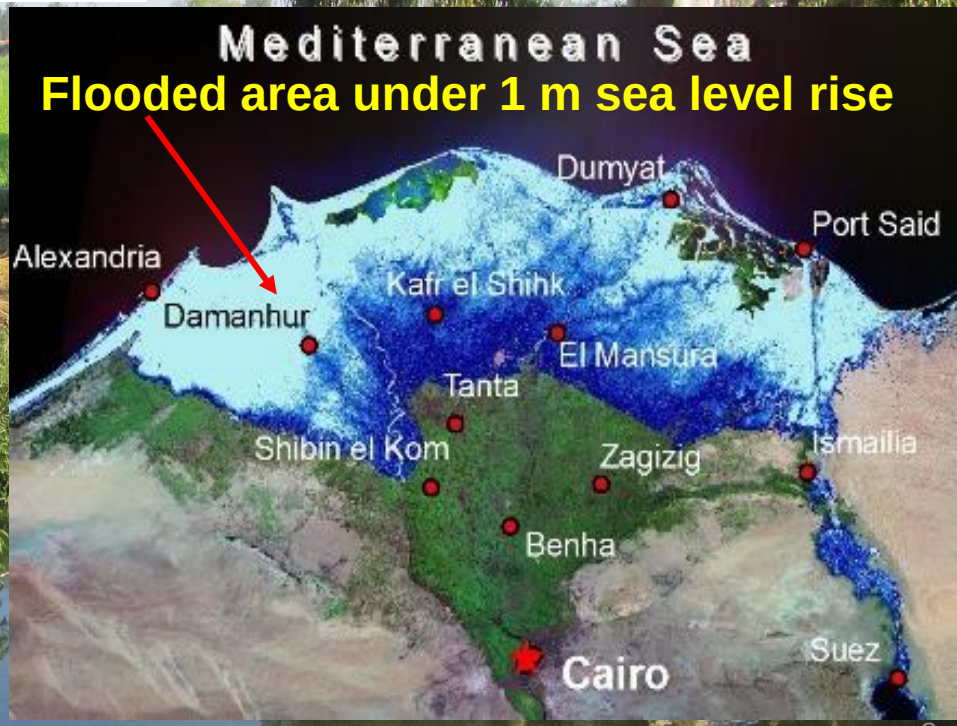
Increased water demand of cities and crops in the Delta due to rising temperatures

Due to population growth & temp. increase in the Nile valley, less water is arriving at the Delta

7

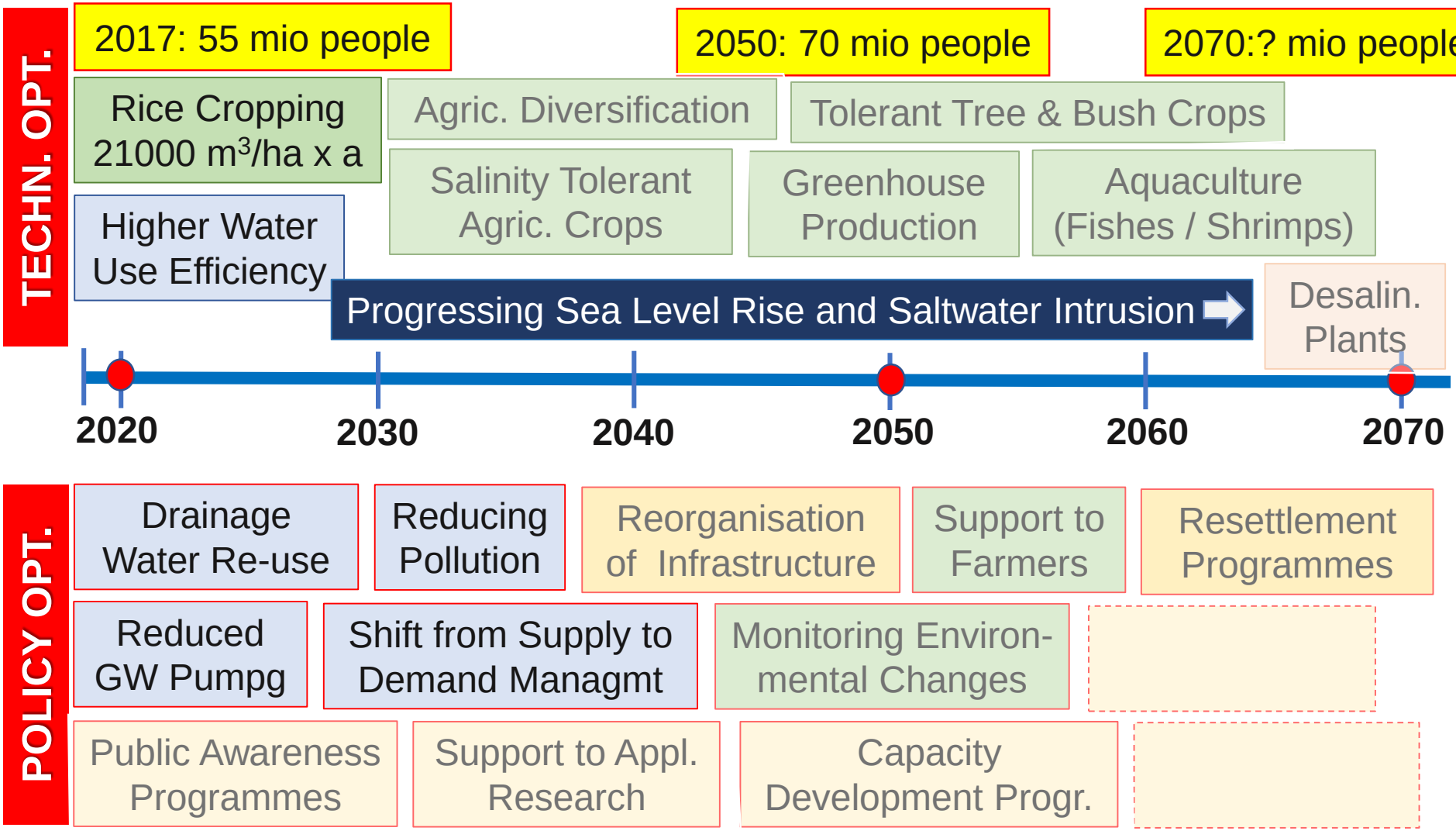
Case Study: Nile Delta Development
STEP 2: Assess the effects of Climate Change

- **Seawater** has intruded inland to a distance of about **50 kilometers**.
- **Saltwater** intrusion has occured already about **100 kilometers**.
- **Sea level will rise** by ~ 1 metre within this century, which will inundate about 34 % of the Delta (Ghoneim et al. 2009).



STEP 3: Identify and Prioritize Suitable Options (Pre-active CCA Management)

Options for the Nile Delta, Egypt (particularly for its northern part)

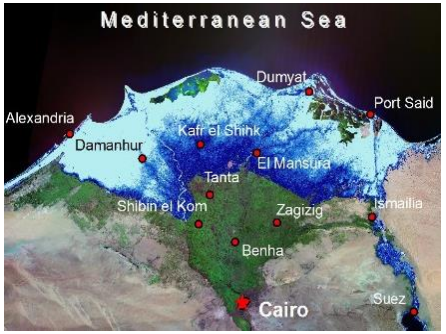


Climate proofing agriculture in the Arab region: What can we do already now? **Summary**

We identified as **present-day suitable measures**: (a) Water demand management (IWRM), (b) Water conservation, (c) Water storage, (d) Water Harvesting, (e) Water re-use with and without treatment, (f) Use of marginal quality water, and (g) Selection of suitable crops & varieties.

The ‚eight golden nuggets' were (1) An IWRM-oriented policy, (2) Strengthening agric. extension service, (3) Incentives for modern irrigation & on-farm water storage, (4) Support to applied research, (5) Financing reservoir construction & aquifer recharge, (6) Curbing water pollution, (7) Promoting water re-use, water harvesting and use of marginal water, (8) Intensified cooperation and exchange of data.

We have chosen the Nile river delta in Egypt as example of pre-active CCA management. A 1 m rise of the sea level is expected within this century, impacting large-scale saltwater intrusion.



We identified for the period 2020 to 2070 technical and policy options. The timely taking of required decisions is indispensable to overcome future problems.

All options proposed have to be extensively studied regarding their economic perspective and applicability.

Climate Proofing Agriculture in the Arab Region: What can we do already now?

Thank you for your attention!

شكرا لحسن استماعكم

prof.prinz@t-online.de