

# **Assessment of climate change and population growth impact on coastal Mediterranean aquifers**

**(ACCICMA)**

Project proposal

Group A: AUDREY POLARD

ONS OUESLATI

ELFRIDA CARSTEA

TEMITAYO EWEMOJE

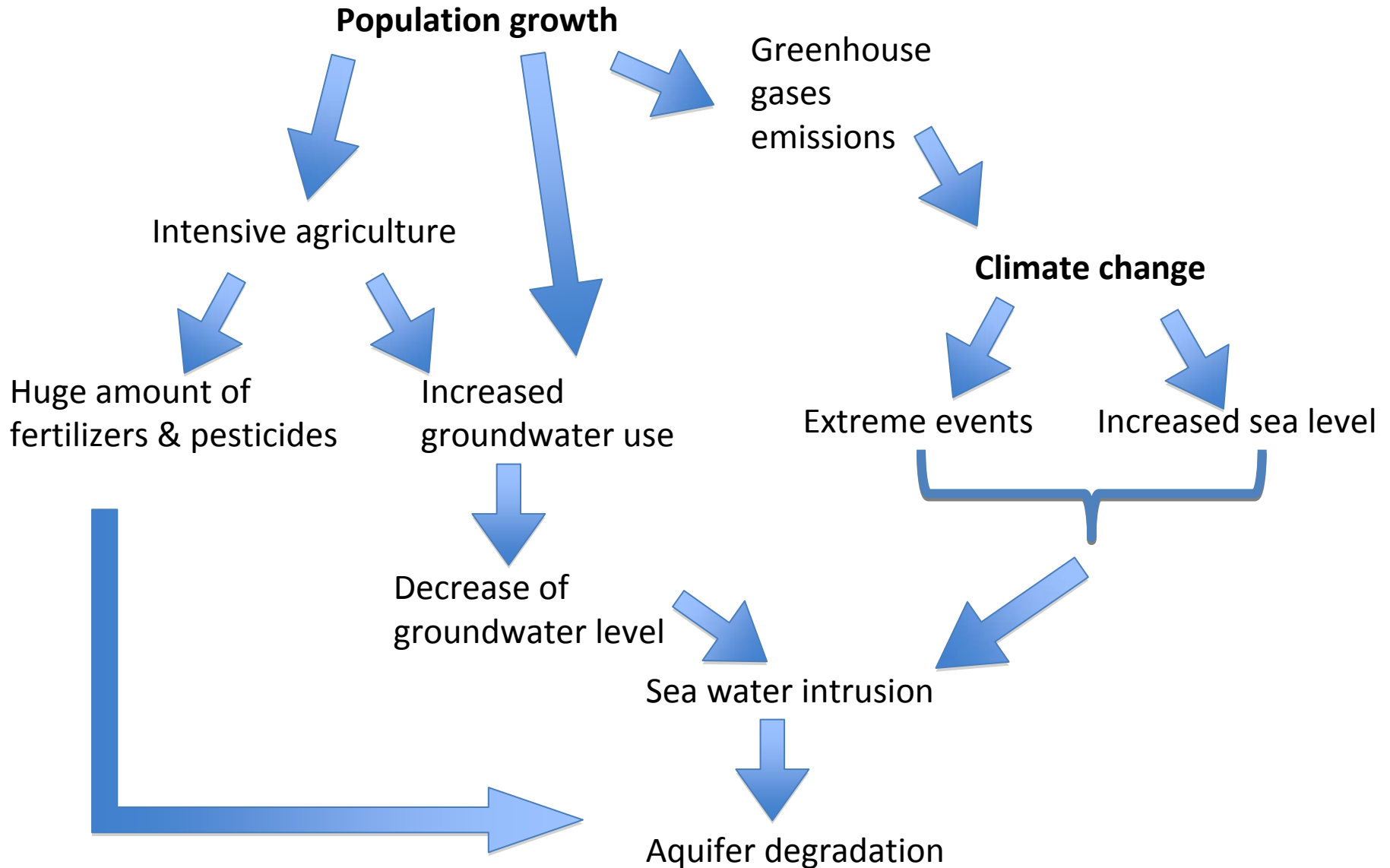
# CONTEXT – state of the art

- Climate change has been intensely studied at global scale



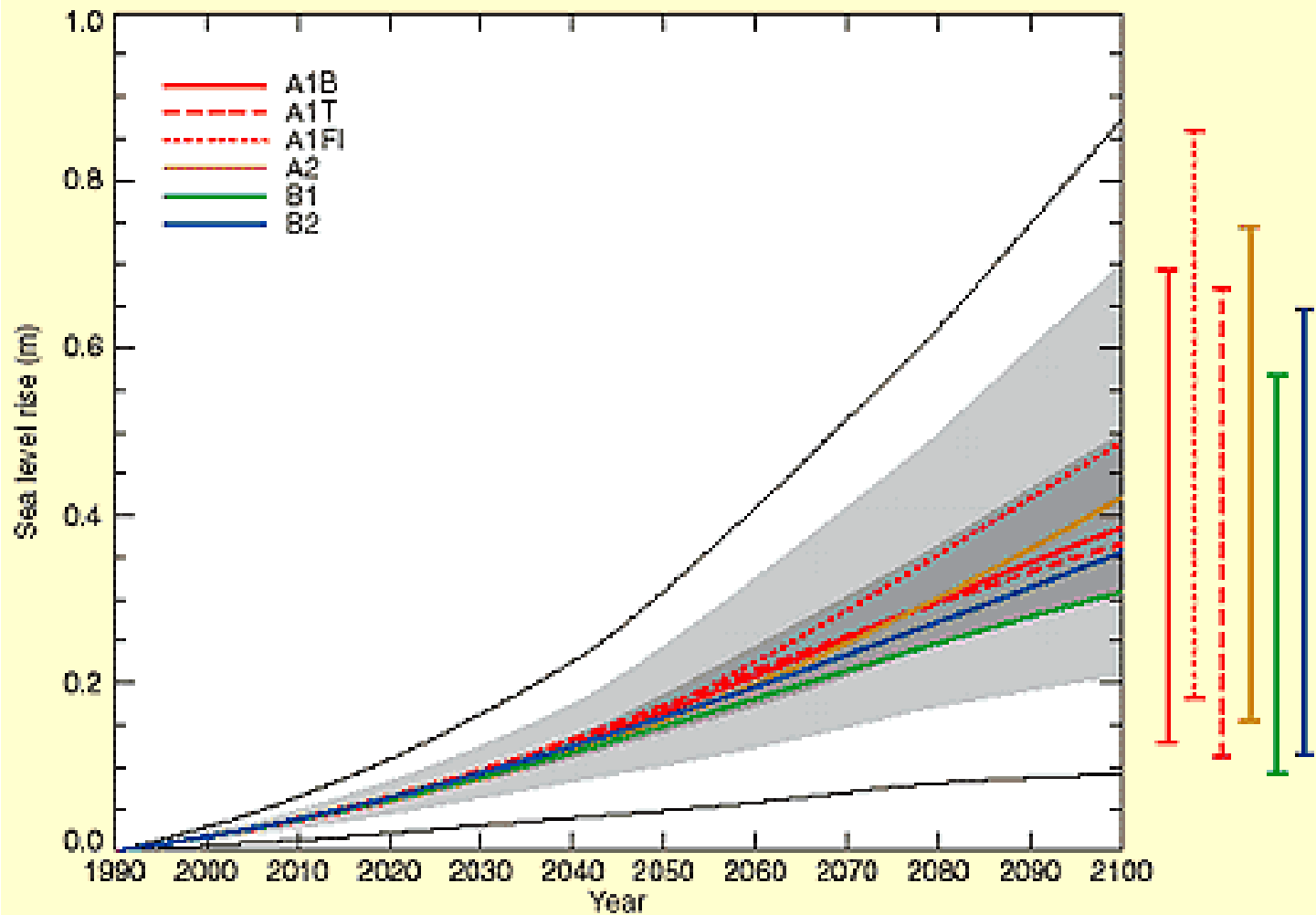
**Few studies which incorporate  
climate change effect at micro  
scale**

# Integrated approach

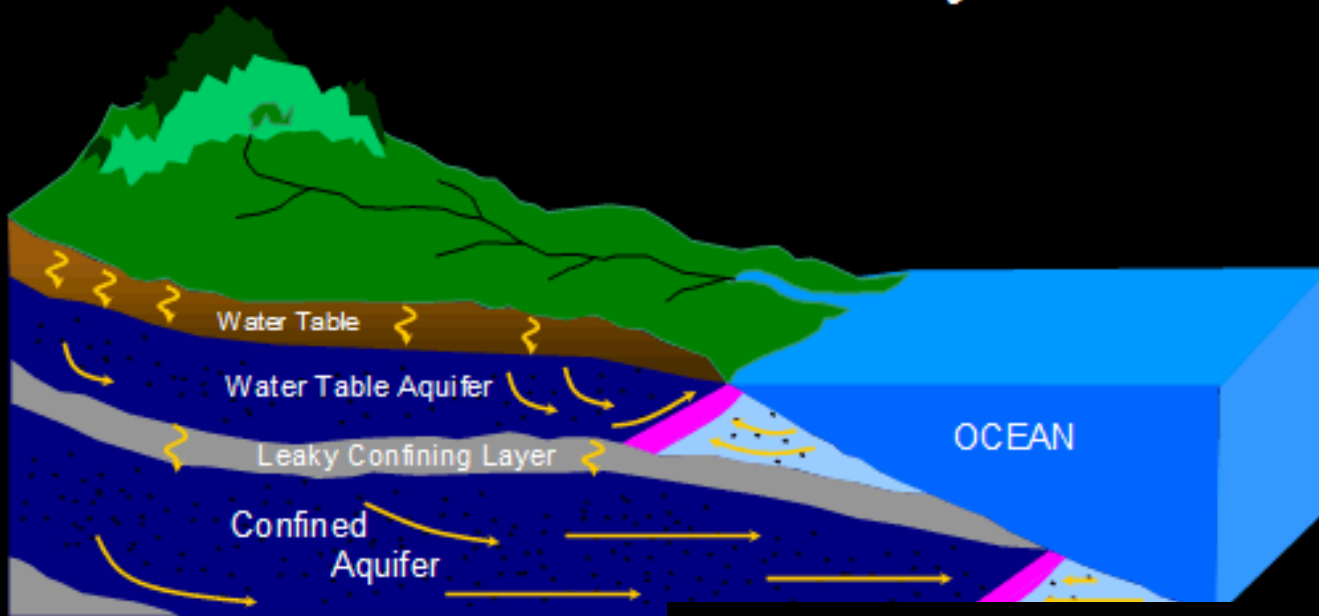


# IPCC 2001

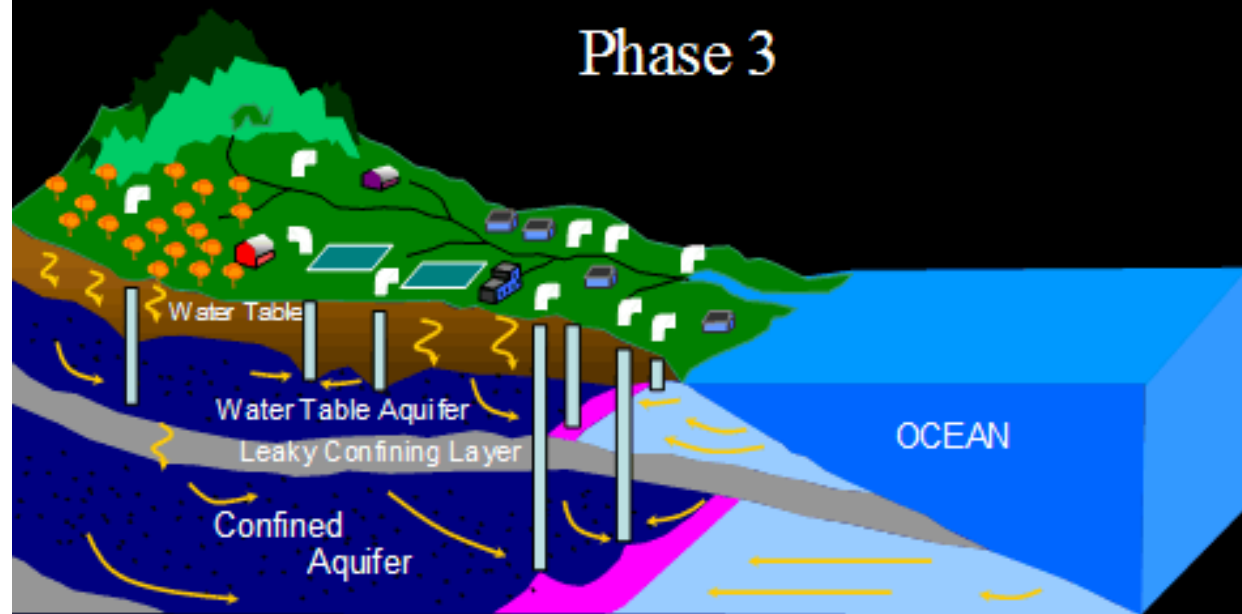
## ESTIMATES FOR SEA-LEVEL RISE



# Natural System



# Seawater Intrusion Phase 3



# CONTEXT – social value

- Public health
- Drinking water more expensive
- Perturbation of agricultural and industrial production processes
- Population migration
- Touristic decrease
- Conflicts

# OBJECTIVES

- Develop an integrated approach for the assessment of climate change and population growth impact on coastal aquifers
- Identify the vulnerable zones to pollution caused by contaminants and sea water intrusion
- Determine the water quality of studied coastal aquifers
- Groundwater flow simulation for “current” and “future” climate

# Work packages

- Work package 1: Assessment of vulnerable zones to pollution caused by contaminants and seawater intrusion
- Work package 2: Monitoring the water quality of the vulnerable areas
- Work package 3: Application of ground water flow and statistical downscale climate change models (VISUAL MODFLOW + SEAWAT)



# WORKPLAN - 1<sup>st</sup> year

Work package	Activities	Participant – scheduled period	Estimated results
<p>Assessment of vulnerable zones to pollution caused by contaminants and seawater intrusion</p>	<p>Exchange between partners of knowledge and information of the aquifer past and current state</p> <p>Characterize the hydro-geology of Mediterranean coastal countries from the last 3 decades</p> <p>Identify the vulnerable coastal zone for each participant country</p>	<p>Algeria, Italy, Tunisia, Turkey</p> <p>(6 months)</p> <p>Kick – off Meeting in Algeria</p> <p>Meeting in Italy</p>	<p>Past and present hydro-geological information aquifer database</p> <p>Identification of the vulnerable coastal zone for each participant country</p>

# WORKPLAN - 1<sup>st</sup> & 2<sup>nd</sup> year

Work package	Activities	Participant – scheduled period	Estimated results
Monitoring the water quality of the vulnerable areas	Monitoring the salinity level of groundwater  Evaluating the level of groundwater contamination by efficient sampling before and after applying fertilizers	Algeria, Italy, Tunisia, Turkey  (18 months)  2 Meetings in Tunisia and Turkey	Database with current aquifer quality state

# WORKPLAN -3<sup>rd</sup> year

Work package	Activities	Participant – scheduled period	Estimated results
<p>Application of ground water flow and statistical downscale climate change models (VISUAL MODFLOW + SEAWAT)</p>	<p>Simulating groundwater flow with climate change influence for “current” state of the aquifer</p> <p>Simulating the future state of the aquifer</p> <p>Transfer of information to local authorities</p> <p>Dissemination of results through conferences and published papers</p>	<p>Algeria, Italy, Tunisia, Turkey</p> <p>12 months</p> <p>Meeting in Algeria Workshop in Tunisia</p> <p>Two conferences/ each country</p>	<p>Model of the current state</p> <p>Model of the future state of the aquifer</p> <p>Public and authority awareness</p> <p>At least 1 paper in ISI journal</p>

# Consortium



# PARTICIPANTS

- Turkey: previous experience in studying sea water intrusion to aquifers
- Algeria: large Mediterranean coastal zone, significant problems with drinking water extraction
- Tunisia: significant problems with water resources
- Italy: comparison with a developed country, expertise

# PARTICIPANTS + CONTRIBUTIONS

- **Turkey (20 personnel):** Institute of Marine Sciences and Management, Berkarda Lab., Istanbul University
- **Algeria (15 personnel):** Department of Geology, Faculty of Earth Sciences, Annaba Badji Mokhtar University , Department of Civil Engineering, Faculty of Science and Engineering, Skikda University
- **Tunisia (15 personnel):** Direction Generale des ressources en eaux, Tunis, INAT: Institut National d'Agronomie de Tunis
- **Italy (10 personnel):** Water research institute, Rome
- **Existent EQUIPMENT**

# BUDGET

- Personnel: 580000 (1 PhD student, 2 Research Fellows/country)
- Equipment: 80000 (Software, PCs, water analysis equipment)
- Consumable: 60000 (GIS and climate data, lab reagents, stationary, meeting organization, field trip expenses)
- Travel: 70000 (accommodation, flight tickets/2 meetings/year, national conferences)
- Subsistence: 10000
- **TOTAL BUDGET: 800000**
- **TOTAL REQUESTED: 600000**