

Summary of the ICCAP Workshop by Prof. Dr. Osman TEKINEL

* This article is the text used in the slide presentation of the late Prof. Osman Tekinel for summing-up in the Closing Session of the Workshop on November 23, 2004. Only numbers for the sections and for the items were added for the proceedings.

1. Initial Research Topics of the Project

(According to the Interim Report of ICCAP, published in March 2004)

- 1) Climate Sub-Group
- 2) Hydrology Sub-Group
- 3) Irrigation and Drainage Sub-Group
- 4) Crop Productivity Sub-Group
- 5) SWAP Sub-Group
- 6) C/N budget Sub-Group
- 7) Vegetation Sub-Group
- 8) Socio-Economic Sub-Group
- 9) New Sub-Groups under reviewing in TÜBİTAK
 - a. Salinity
 - b. Livestock
 - c. Women and Agriculture

2. Progresses of the works Sub-Groups

1) Climate Sub-Group

They have analyzed precipitation data of Turkey

They have developing GCM (General Circulation Model) and RCM (Regional Climate Model)

2) Hydrology and Water Resource Sub-Groups

Distributed hydrological model was developed and modified. By field survey in the lower Seyhan Plain is clear that irrigation is feeding groundwater.

A saturated-unsaturated density depended flow model for simulation salt water-intrusion was developed to investigate influence of sea level rise; some laboratory experiments were carried.

3) Irrigation and Drainage Sub-Group

Basic data for irrigation scheme were collected.

Questionnaires were conducted at 20 water users associations in Lower Seyhan Plain.

Present irrigation efficiency of scheme was to be below 50%.

Lower part of irrigation district suffers from severe salinity problems

The cost for rehabilitation of infrastructure also immense burden for all WUAs.

4) Crop Productivity Sub-Group

SWAP and C/N Budget group

In the Lower Seyhan Plain on site observation in a maize field (water budget, transpiration) is continued and data are being accumulated. Obtained data will be used to determine parameters for plant growth models such as the SWAP.

To analyze an effect of climatic change on physiology of wheat, on-site trial with different sowing

time in Çukurova region are being carried out.

To determine CO₂ emission from irrigated area and natural vegetation area.

5) Vegetation Sub-Group

Vegetation in the Seyhan (and Ceyhan) basin has wide ecologic diversity

Seven permanent investigation plots were selected in each basin. Each plot represents region's typical vegetation. Productivity will be investigated in those plots.

Main vegetation belts on the high mountains. They had also studied on the plain, natural vegetation is barely found due to high cultivation pressure at the coastal zone of the plain a complex wetland system is formed.

6) Socio-Economic Sub-Group

Input-output model was used to analyze, the impact of agricultural crop production in Turkish economy.

In the next stage, national econometric model must forecast the impact of climate variability on production.

Legal institution of land ownership for pasture was studied.

3. Workshop Program for Last Two Days

1) Climate

Temporal variations of the atmospheric branch of the hydrological cycle over Turkey.

Observation of Synoptic scale meteorological and associated dust transport events lower the Çukurova basin and its impact on vegetation.

Prediction of Regional Climate change around Turkey.

Rainfall and temperature trends to extremes over the Mediterranean.

2) Socio- Economics

The research methodology.

Economic indicators of investigated farms in Adana and Konya provinces.

Econometric analysis on the interrelation among rural industries structures, agricultural productivities and climate changes

3) Vegetation

Natural vegetation of Seyhan River.

Effects of global warming on the species compositions and vegetation in arid areas.

4) Hydrology and Water Resources

Vulnerability of water resources to climate changes.

Impact of sea level rise by the global warming on soil and groundwater.

Hydro-geological conceptualization of Seyhan Basin with regards to vulnerability of the climate changes.

5) Irrigation and Drainage

Result of territory canal monitoring in LSIP.

Soil salinity assessments in LSIP using field measurement data, satellite data and archived data.

Irrigation efficiency under LSIP.

Application of irrigation measurement performance assessment model for LSIP.

The efficiency of WUA management in the LSIP.

6) Crop Productivity

Forest communities along the altitudinal gradient.

Classification methodology for Land cover mapping of Seyhan Plain using spectral, spatial and ancillary data.

Climate changes in Eastern Mediterranean and agriculture.

Water use on maize field.

Estimation of soil water evaporation, using matric potential measurement.

Simulation of evapotranspiration using SWAP Model.

Simulation of Crop productivity in Seyhan plain under changing global climate using the SWAP model.

Spring wheat productivity under increased temperatures in Çukurova.

Photosynthetic and productivity of first and second crop maize.

Modeling the impact of climate change on wheat production.

4. Expected Outcomes for the Future

The purpose of the project on the subject of “Impact of Climate Change on Agricultural Production System in Arid Area” is the prediction of the agricultural production and agricultural policy for the future.

- 1) Development evaluation and simulation models for quantitative analysis of relationship among micrometeorology, soil, water, plant growth and salinity, which would be useful in arid areas.
- 2) Basic structure of basin hydrological regime and water balance in irrigated region, which can evaluate the role of irrigation on hydrological environment.
- 3) Development of a tool for integrated vulnerability assessment on agriculture in arid areas.
- 4) Regional –level climate change scenarios with less uncertainty linked with global climate change.
- 5) Prediction of changes in hydrological cycle and water resources availability in arid areas, and prediction of crop response of the regional climate change and consequent irrigation water demand changes, corresponding to soil condition, farming system, irrigation management, etc.
- 6) Socio-economical evaluation of climate change impacts on regional agricultural production system and identification of important elements and critical points for agricultural production and irrigation management in arid areas.

5. Conclusion

- 1) This Project needs further innovated approach in each discipline and in the manner of cross-disciplines reinforces consistency of spatial and temporal scales between the different working groups.
- 2) The working groups need to be conceived as “Component” of one whole “System” and not only “thematic groups”.
- 3) The spatial and temporal scale of the future climate is the loading scaling context.
- 4) Try to maintain equilibrium among the different degree of “uncertainties” (or “accuracy”). It is not worth to be very detailed and very accurate in one case and very course and very approximate in another case.
- 5) Reinforce consistency in the uses of mechanistic and statistical modeling approaches within the different working groups.
- 6) All team members have always to bare in their minds a share vision of the project goal (what will happen under the new climate?) and maintain a robust cause effect relationship.
- 7) Reinforce consistency in the definitions and the terminology used by the different working groups.

[Thank you very much for your attention]