

# CLIMAGRI – Climate Change and Agriculture

## FAO/UCEA CLIMAGRI<sup>med</sup> PROTOCOL FOR COLLABORATION

### Development of a network in the Mediterranean region on climate change and agriculture

#### Technical component (iv)

Development of a land evaluation system useful for defining climatic risk for agriculture due to climate variability and climate change in the Mediterranean area at local and national scale

#### International Consultants on Climate Change Impact Assessment

##### Report of the First Mission to Morocco

**Duration:** 10 - 15 December 2003

#### International Consultants:

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- Gabriele ANTOLINI (ARPA-SMR, Regional Agency for the Prevention and the Environment of the Emilia-Romagna Region) (e-mail: [gantolini@smr.arpa.emr.it](mailto:gantolini@smr.arpa.emr.it)).

#### Counterparts:

- National Institute of Agronomic Research (INRA), Agronomy Department, Rabat;
- National Institute of Agronomic Research (INRA), Aridoculture Center, Settat;
- National Institute of Agronomic Research (INRA), Agronomy and Physiology Unit, Settat;
- National Institute of Agronomic Research (INRA), Environment and Resources Management Unit, Settat;
- National Institute of Agronomic Research (INRA), Agrometeorological Program Unit, Settat.

#### Principal researchers involved:

- Mohammed KARROU, Head of Agronomy Department at INRA (e-mail: [karrou@ibnawam.inra.org.ma](mailto:karrou@ibnawam.inra.org.ma));
- Mohammed EL GHAROUS, Director of the Aridoculture Center at INRA (e-mail:);
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**Evaluation of the existing situation of the meteorological and agronomic sectors in terms of data availability, methodologies for analysis, logistic infrastructures and identification of a suitable counterpart for an effective transfer of methodologies:**

The National Institute of Agronomic Research (INRA) Centres in Rabat, Settat and Meknés seem to be suitable counterparts for an effective transfer of methodologies. During the last five years they have conducted studies on *Impact of climate, agro-technology and socio-economic factors on wheat, barley and grassland yields*. Most of the expertises include crop modeling, and several crop models were implemented and used to estimate crop potential yield also in relation to climate variability. Early warning systems of drought conditions were also developed. Most of data (climate, morphology, pedology, land use, land capability for agriculture, etc.) required to evaluate climatic risk for agriculture in the agricultural areas where INRA Team suggested to transfer Land Evaluation system methodologies are available or collectable. INRA researchers have constituted an interdisciplinary group to develop CLIMAGRImed activities and they ensure good facilities for data analysis, advanced GIS skills and appropriate logistic infrastructures.

**Factors which could hamper implementation of activities:**

INRA research scientists pointed out their own lack of experience in data interpolation techniques, but they can make any type of analysis at station level. This could be a critical factor during the phase of implementation of the larger project proposal we would like to draft. In any case, at the moment this is not a critical factor to reach the main objectives of CLIMAGRImed.

**Work plan and schedule of activities:**

*Preparation of data and metadata*

- Selection of the agricultural areas where to apply Land Evaluation analysis for climate risk in agriculture; during the meeting held in Settat two areas were selected: a) the region of Settat (approximately 6000 km<sup>2</sup>) 150 km south-east of Rabat which includes the most important wheat and barley areas of Morocco; b) the region of Meknés (approximately 3600 km<sup>2</sup>), 150 km east of Rabat, characterized by a more humid climate than Settat;
- Description of the selected area in terms of meteorological, climatological, pedological, and agronomic characteristics;
- Inventory of data availability;
- Selection of weather station data-sets (temperature and rainfall, at least 20-30 years) that will be used to calculate bioclimatic indexes.

*Identification of data-sets to be collected*

- During the meeting in Settat and Rabat, data required by the methods and analysis procedures developed in CLIMAGRI were briefly examined. Before the first mission of the counterparts, INRA scientists will prepare a report containing a complete list of all data collectable indicating also if they are in digital format or not.

*Data analysis*

- During the meeting in Settat and Rabat, methods which can be used to calculate bioclimatic indexes were discussed in detail. The indexes calculations, based mainly on growing degree-days and a simplified water balance model, and the procedure to analyze climate variability were also performed. A detailed work plan will be prepared during the second meeting;
- Interpolation models which can be used to spatialize temperature and rainfall data and standard procedure to obtain climatological maps will be discussed during the second meeting.

*Activities to be completed before the first mission of the counterparts*

- Before the first mission of the counterparts, preparation of data and metadata and identification of data-sets to be collected need to be completed.