DATA TOOLS METHODS for

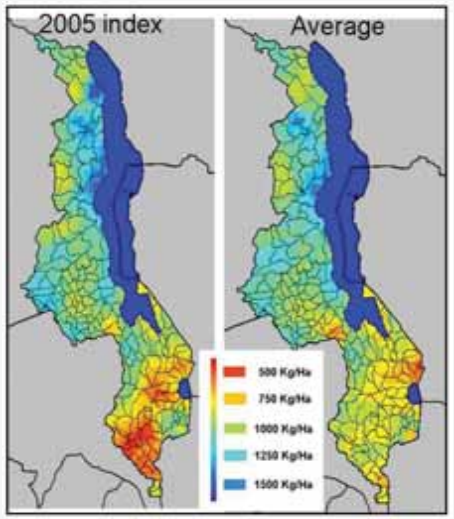
climate impact assessment in agriculture and planning of climate change adaptation practices

Weather based indices for crop insurance

FAO tools help to derive an effective weather-based crop yield index for crop insurance. The approach proposes to compute a crop specific water balance to derive value-added crop-weather variables that can be combined with other data (e.g. remote sensing inputs, farm inputs such as fertilizer use). The methodology uses gridded information that is not too sensitive to individual missing stations, provided sufficient data points are available.

The methodology has demonstrated the possibility of producing weather based maize yield index for crop insurance for any point in Malawi every ten days starting from planting time. Real-time maize yield indices covering the whole country can be objectively produced. The maize yield index satisfies all the desirable criteria for maize crop insurance in Malawi. First estimates of Index can be provided at planting time and updated in real time throughout the season. More specific products for crop insurance can be prepared using criteria provided by insurance experts, and the methodology can easily be extended to other crops.

Further information available at:
http://www.fao.org/nr/climpag/aw_2_en.asp



Maps showing local maize yield index (kg/ha) and average index

For further information:

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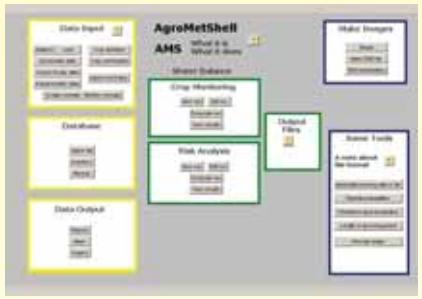
FAO Climate Offer

Crop monitoring and forecasting

The “CM Box” (Crop Monitoring Box) is a toolbox for agro-meteorological crop monitoring and forecasting. It is an automated software suite with a “visual menu” that offers easy access to database that holds all the data needed to analyse the impact of weather on crops. The tool is useful for risk analysis, monitoring and forecasting crop production, which is an essential input to food security planning. The tool can compare maps of current yield expectations with historical average conditions.

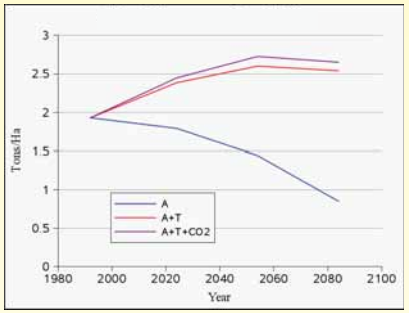
The CM Box is meant to offer an easy solution to rapidly setting up an operational crop monitoring and forecasting system. In the initial phase, reference data as well as real-time satellite and weather data can be provided by FAO based on international sources, but over the period, more and more national data can be used. Interested countries receive a combination of training, hardware, software customized for local use, as well as the real-time data required to operate the system in-country. The package can be tailored to suit the countries’ specific requirements, based on national preferences as well as available expertise, methods and data. For further details and documentation visit:
http://www.fao.org/nr/climpag/aw_6_en.asp



Climate Impact Assessment Methodology

FAO is developing an integrated impact assessment methodology (toolbox) to asses climate change impacts on agriculture. The methodology comprises four main components: a downscaling method for processing Global Climate Model (GCM) output data, a hydrological model for irrigation water resources estimation, a crop growth model to estimate crop yields and a Computable General Equilibrium (CGE) Model to simulate the effect of changing agricultural yields on national economies. The integrated toolbox for country wide studies will be available together with user manual, tutorials and sample data after real-life tests in two countries in Africa in 2011.

FAO, together with the World Bank and Morocco national institutions, applied a similar methodology to assess the impact of climate change on Moroccan agriculture. The study covers fifty crops, major agroecological zones, and climate change scenarios. The result provide insights for policy implications and stresses that improved management and technology can offset the negative impacts, provided sufficient water is available to counteract the increased climate water demand. For complete document visit:
http://www.fao.org/nr/climpag/pub/FAO_WorldBank_Study_CC_Morocco_2008.pdf

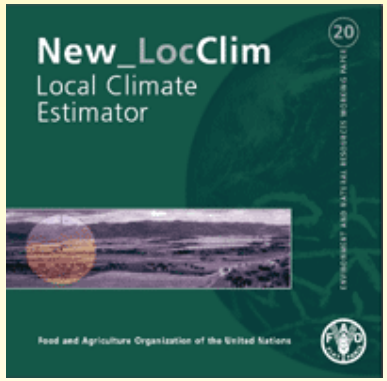


Impact of climate change on rainfed soft wheat in one agro-ecological zone of Morocco. (A–climate change; T– improved technology; CO_2 – CO_2 fertilization)

Local Climate Estimate Tool

The Local Climate Estimate Tool (New_locClim), a software program and database, provides estimates of average climatic conditions at any location on earth based on the FAOCLIM database. The programme can create climatic maps, extract data in various formats from the database for further processing and can display graphs showing the annual cycle of monthly climate and the crop calendar. The tool provides growing season characteristics based on a comparison of rainfall and potential evapotranspiration and estimates of monthly, 10-day and daily values of common climate variables.

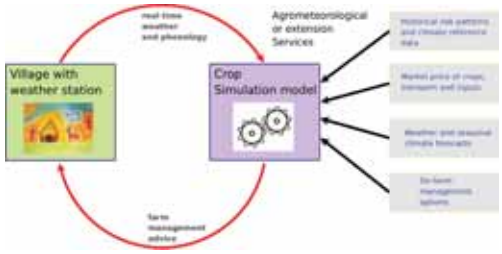
The programme includes the current updated version of the FAOCLIM database of almost 30 000 stations worldwide, but users can also process their own data and prepare maps at any spatial resolution. Computer application programs (in Microsoft Excel) are included in the CD-ROM to help simplify complex calculations. Access and download the tool at: http://www.fao.org/nr/climpag/data_5_en.asp



Farm Adaptive Dynamic Optimization (FADO)

Farm Adaptive Dynamic Optimization (FADO) refers to a combination of methodology that helps to identify, analyze and prioritize the climate related vulnerabilities and risks and optimize the adaptation practices to effectively respond to climate variability and change. The approach combines the historical climate data and modern data transmission and information sources for real-time analysis of impacts. It provides opportunities to generate viable options for farm decision making to manage the risks and opportunities at the farm level.

The four major components of the FADO methodology are: exploring knowledge on local situation of farmers’ decision problems, analysing the vulnerability and climate risks to optimize the management options, decide appropriate adaptation practices relevant to local situation and facilitate local action by communicating climate information and suitable adaptation practices to farmers. Related information is available at:
http://www.fao.org/nr/climpag/aw_5_en.asp



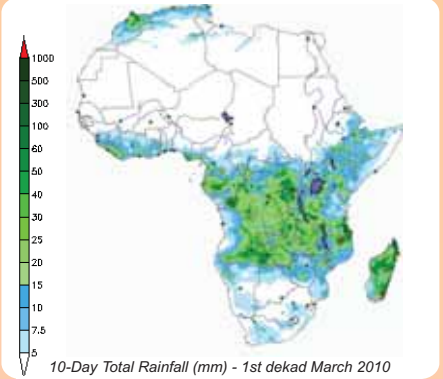
Data flow in a Farm Adaptive Dynamic Optimisation (FADO) system

FAO-Rain Fall Estimate Routine

FAO Rain Fall Estimate (FAO-RFE) for Africa is a new independent method to estimate the rainfall amount, particularly, for certain regions where the coverage of the weather stations is scarce. FAO RFE is based on the Meteosat Second Generation IR channel combined with data coming from ECMWF global forecast model and EUMETSAT MPE.

A local calibration is performed using the ground gauges, directly received as SYNOP messages and after a data validation. FAO-RFE offers 10-day and monthly rainfall totals for whole of Africa and for four regions. The methodology is currently transferred to the Sudanese Meteorological Authority.

For additional details visit:
http://geonetwork3.fao.org/climpag/FAO-RFE.php



10-Day Total Rainfall (mm) - 1st dekad March 2010

Climpag

Climpag (climate impact on agriculture) is a web portal bringing together the various aspects and interactions between weather, climate and agriculture in the context of food security. Climpag contains data, maps, methodologies and tools for better understanding and analysis of the effect of the variability of weather and climate on agriculture. The web portal covers six major thematic areas: advice and warnings, climate change, climate indicators, data and maps, hotspots and natural disasters. User friendly drop-down menu provides access to all publications, tools and methods relevant to all the thematic areas. The portal can be accessed at:
http://www.fao.org/nr/climpag/