

## **List of crop modelling studies as collected for the Global yield gap atlas project**

The information about the crop modelling studies in the following consists of

- 1) Main author
- 2) Year
- 3) Title

We may supply these available articles and reports as zipfiles per country. For this, please send an Email to Joost Wolf, Wageningen University ([joost.wolf@wur.nl](mailto:joost.wolf@wur.nl)) and please indicate for which country(ies) you would like to receive these zip-files.

### **General for Sub-Saharan Africa and South Asia**

Adejuwon, 2004. Assessing the Suitability of the EPIC Crop Model for Use in the Study of Impacts of Climate Variability and Climate Change in West Africa

Devkota, N.R. and Timsina, J., 2005. Crop and Pasture modelling using DSSAT (ver 4.0) with the focus on CERES-Maize. CSIRO Technical Report. Griffith, NSW, Australia. 62 p.

ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), 1984. Agrometeorology of Sorghum and Millet in the Semi-Arid Tropics: Proceedings of the International Symposium, 15-20 Nov 1982, ICRISAT Center, India. Patancheru, A.P. 502324, India: ICRISAT.

Jaggard et al., 2012. Possible changes to arable crop yields by 2050

Knox et al., 2011. What are the projected impacts of climate change on food crop productivity in Africa and S Asia?

JRC, 2003. Crop yield monitoring in Eastern Africa. Bulletin.

EARS, 2008. Forecasted maize yields. West African countries.

Gbegbelegbe, 2011. Climate change adaptation strategies for maize and wheat production in Sub-Saharan Africa: a quantitative assessment using crop simulation and spatial modeling

Harvest Choice, 2011. Regional Corn Modeling at a High Resolution Scale: A Yield Based Approach and Blue vs Green Water Assessment

Humphreys, E and Timsina, J (Editors) (2002). Modelling irrigated cropping systems, with special attention to rice-wheat sequences and raised bed planting. Proceedings of a workshop held at CSIRO Land and Water, Griffith on 25-28 February 2002. CSIRO Land and Water, Griffith, NSW 2680, Australia. 118 pp.

ICRISAT, 2006. Impacts of Sorghum and Millet Research in West and Central Africa (WCA): A Synthesis and Lessons Learnt

List of publications on the use of ORYZA2000 (rice) model.

Rojas, MARS, JRC. Crop monitoring in Eastern Africa.

J. Timsina and E. Humphreys (2003). Performance and application of CERES and SWAGMAN Destiny models for rice-wheat cropping systems in Asia and Australia: a review. CSIRO Land and Water Technical Report 16/03. CSIRO Land and Water, Griffith, NSW 2680, Australia. 57 pp.

Timsina, J., Humphreys, E., 2006. Performance of CERES-Rice and CERES-Wheat models in rice-wheat systems: a review. *Agricultural Systems* 90: 5-31.

Timsina, J., Humphreys, E., 2006. Applications of CERES-Rice and CERES-Wheat models in research, policy, and climate change studies in Asia: a review. *International Journal of Agricultural Research* 1(3): 202-225.

Timsina J, Jat M.L., Majumdar K., 2010. Rice-maize systems of South Asia: current status, future prospects and research priorities for nutrient management. *Plant and Soil* 335, 65-82.

## **Bangladesh**

Basak et al., 2010. Assessment of the effect of climate change on boro rice production in Bangladesh using DSSAT model.

Basak, 2010. Climate Change Impacts on Rice Production in Bangladesh: A Modeling Study.

Karim et al., 1996. Assessing impacts of climatic variations on food grain production in Bangladesh

Mahmood, 1998. Air temperature variations and rice productivity in Bangladesh: a comparative study of the performance of the YIELD and the CERES-Rice models

Mahmood et al., 2003. The CERES-Rice Model-Based Estimates of Potential Monsoon Season Rainfed Rice Productivity in Bangladesh

O'Callaghan et al., 1994. Some factors limiting the yield of wheat in Bangladesh

Pasuquin, J.M., Timsina, J., Witt, C., Buresh, R.J., Dobermann, A., Dixon, J. The expansion of rice-maize systems in Bangladesh: anticipated impact on fertilizer demand. IFA Crossroads 2007. CD-ROM Proceedings. Bali, Indonesia, 18 December, 2007, IPNI organizer.

Rosenzweig presentation. Biophysical Simulation of Climate Change Impacts on Bangladeshi Rice

Roy et al., 2009. Future Climate Change and Moisture Stress: Impact on Crop Agriculture in South-Western Bangladesh

Timsina et al., 1998. Cultivar, Nitrogen and Moisture effects on Rice-Wheat sequence: experimentation and simulation.

Timsina, J., Humphreys, E., Quayyum, M.A., Saleque, M.A., Panaullah, G.M., Haq, F., and Connor, D.J., 2002. Nutrient and Water Management for Sustainable Rice-Wheat Cropping Systems in Bangladesh and Australia Final Report (July 2002) of ACIAR Project #9432 submitted to ACIAR, Canberra, Australia. University of Melbourne/CSIRO/BARI/BIRRI joint publication. The University of Melbourne, Victoria 3010, Australia. 118 page.

Timsina, J., Godwin, D., Connor, D.J., 2000. Water management for mungbean within rice-wheat cropping systems of Bangladesh: a simulation study (using SWAGMAN Destiny - model). CD-ROM Proceedings of the Third International Symposium on Systems Approaches for Agricultural Development (SAAD 3), November 8-10, 1999. Lima, Peru.

Timsina, J., Humphreys, E., Smith, D.J., Godwin, D., Quayyum, M.A., Connor, D.J., 2001. Simulation of yield and environmental impacts of wheat after rice in Bangladesh and Australia. Proc. 10th Aus. Agron. Conf., Hobart. <http://www.regional.org.au/asa/2001/>

## **Burkina Faso**

CEEPA, 2006. Climate change and crop water use and productivity in Burkina Faso

Kambire et al., 2010. Modeling of Maize Yields in the South-Sudanian Zone of Burkina Faso - West Africa

Mishra et al., 2008. Sorghum yield prediction from seasonal rainfall forecasts in Burkina Faso

Siband et al., 1999. Analysis of the yield of two groups of tropical maize cultivars. Varietal characteristics, yield potentials, optimum densities.

Thornton et al., 1997. Estimating millet production for famine early warning: an application of crop simulation modelling using satellite and ground-based data in Burkina Faso

Van Noordwijk et al., 1994. Risk management in crop production and fertiliser use with uncertain rainfall; how many eggs in which baskets.

Wilkins et al., IFDC. Maize Yield Prediction in Burkina Faso.

Zougmore, 2003. Integrated water and nutrient management for sorghum production in semi-arid Burkina Faso.

Terrasson, Isabelle, Fisher, Myles J., Andah, Winston and Lemoalle, Jacques, 2009. Yields and water productivity of rainfed grain crops in the Volta Basin, West Africa.

## **Ethiopia**

CEEPA, 2006. Climate change and crop water use and productivity in Ethiopia.

Erkossa et al., 2011. Soil fertility effect on water productivity of maize in the upper blue Nile basin, Ethiopia

Giorgis et al.. Estimating crop water use and simulating yield reduction for maize and sorghum in Adama and Miesso districts using the CROPWAT model

Senay & Verdin, 2003. Characterization of yield reduction in Ethiopia using a GIS-based crop water balance model.

## **Ghana**

Tinsley, 2009. Increasing Rice Productivity for the Kpong Irrigation Project, Akusa – Asutsuare, Ghana.

Buri et al., 2009. Lowland Soils for Rice Cultivation in Ghana

Fosu-Mensah. Modelling impact of climate change on maize (*Zea mays* L.) yield under rainfed condition in sub-humid Ghana.

Sagoe, 2006. Climate change and root crop production in Ghana.

Kra & Ofori-Anim, 2010. Modeling maize planting date to minimize irrigation water requirements.

??, University Bonn, 2007. Modelling sorghum growth and grain yield.

MacCarthy et al., 2009. Modeling the impacts of contrasting nutrient and residue management practices on grain yield of sorghum (*Sorghum bicolor* (L.) Moench) in a semi-arid region of Ghana using APSIM.

Dilys et al., 2006. Modeling Sorghum yield in response to inorganic fertilizer application in semi-arid Ghana.

Kpongpor, 2007 (PhD thesis). Spatially explicit modeling of sorghum (*Sorghum bicolor* (L.) Moench) production on complex terrain of a semi-arid region in Ghana using APSIM

Craufurd et al., 2000. Testing drought tolerant plant types of upland rice in Ghana using participatory methods.

Gumma et al., 2009. Spatial models for selecting the most suitable areas of rice cultivation in the Inland Valley Wetlands of Ghana using remote sensing and geographic information systems.

Terrasson, Isabelle, Fisher, Myles J., Andah, Winston and Lemoalle, Jacques, 2009. Yields and water productivity of rainfed grain crops in the Volta Basin, West Africa.

## **India**

Aggarwal et al., 2010. Impacts of climate change on growth and yield of rice and wheat in the Upper Ganga Basin.

Amgain, L.P., Timsina, J., & Bijay-Singh, 2008a Simulation of growth and yield of rice under different levels of nitrogen and irrigation in Punjab, using CSM-CERES-Rice model. *J. Inst. Agric. And Animal Sci* 28:15-26.

Amgain, L.P., Timsina, J., & Bijay-Singh, 2008b Simulation of growth and yield of wheat under different levels of nitrogen and irrigation in Punjab, using CSM-CERES-Wheat model. *J. Inst. Agric. and Animal Sci* 28:29:41-51.

Arora, V.K., 2006. Application of a rice growth and water balance model in an irrigated semi-arid subtropical environment. *Agricultural Water Management* 83, 51–57.

Attri & Rathore, 2003. Simulation of impact of projected climate change on wheat in India.

Chowdary et al., 2004. A coupled soil water and nitrogen balance model for flooded rice fields in India.

Das, L., Lohar, D., Sadhukhan, I., Khan, S. A., Saha, A., Sarkar, S., 2007. Evaluation of the performance of ORYZA2000 and assessing the impact of climate change on rice production in Gangetic West Bengal. *Journal of Agrometeorology* 9, 1-10.

Geethalakshmi et al., 2011. Climate change impact assessment and adaptation strategies to sustain rice production in Cauvery basin of Tamil Nadu.

Huda, 1987. Simulating Yields of Sorghum and Pearl Millet in the Semi-Arid Tropics.

Kar et al., 2007. Spectral properties analysis and crop growth simulation modelling in rice.

Kumar et al., 2009. Modelling environmental effects on phenology and canopy development of diverse sorghum genotypes.

Lal et al., 1998. Vulnerability of rice and wheat yields in NW India to future changes in climate.

Mall & Aggarwal, 2002. Climate change and rice yields in diverse agro-environments of India I. Evaluation of impact assessment models.

- Mall et al., 2006. Impact of climate change on Indian agriculture: a review.
- Mathauda et al., 2000. Impact of projected climate change on rice production in Punjab (India).
- Mithra et al., 2003. The development of a cassava growth model in India.
- Murty MVR, Piara Singh, Wani SP, Khairwal IS and Srinivas K., 2007. Yield Gap Analysis of Sorghum and Pearl Millet in India Using Simulation Modeling. Global Theme on Agroecosystems Report no. 37. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi- Arid Tropics. 82 pp.
- Nain et al., 2004. Use of CERES-Wheat model for wheat yield forecast in central Indo-Gangetic Plains of India.
- Patel & Shekh, 2005. Sensitivity analysis of CERES-Wheat model to various weather and non-weather parameters for wheat (CV.GW-496).
- Pathak et al., 2003. Trends of climatic potential and on-farm yields of rice and wheat in the Indo-Gangetic plains.
- Pathak, H., Timsina, J., Humphreys, E., Godwin, D., Bijay-Singh, Shukla, A.K., Matthews, R.B. 2004. Simulation of rice crop performance and water and N dynamics, and methane emissions for rice in northwest India using CERES Rice model. CSIRO Technical Report # 23/04, Griffith, NSW, Australia, 111 p.
- Priya & Shibasaki, 1998. National spatial crop yield simulation using GIS based crop production model.
- Rao & Saxton, 1995. Analysis of soil water and water stress for pearl millet in an Indian arid region using the SPAW Model.
- Soundharajan, B., Sudheer, K.P., 2009. Deficit irrigation management for rice using crop growth simulation model in an optimization framework. Paddy Water Environment 7, 135–149.
- Srivastava et al., 2010. Assessment on vulnerability of sorghum to climate change in India.
- Subash & Ram Mohan, 2012. Evaluation of the impact of climatic trends and variability in rice–wheat system productivity using Cropping System Model DSSAT over the Indo Gangetic Plains of India.
- Subash & Ram Mohan, 2011. A Simple Rationally Integrated Drought Indicator for Rice–Wheat Productivity.
- Sudhir-Yadav, Tao Li, Humphreys, E., Gill, G., Kukal, S.S., 2011. Evaluation and application of ORYZA2000 for irrigation scheduling of puddled transplanted rice in northwest India. Field Crops Res. 122, 104-177.

Sudhir-Yadav, Humphreys, E., Tao Li, Gill, G., Kukal, S.S., 2012. Evaluation of tradeoffs in land and water productivity of dry seeded rice as affected by irrigation schedule. *Field Crops Res.* 128, 180-190.

Timsina, J., Pathak, H., Humphreys, E., Godwin, D., Bijay-Singh, Shukla, A.K., and Singh, U., 2004. Evaluation of, and yield gap analysis in rice using, CERES Rice ver. 4.0 in northwest India. In: CD-ROM Proceedings of 4th International Crop Sci. Congress, Brisbane, September 26 – October 1, 2004.

Timsina, J., Godwin, D., Humphreys, E., Yadvinder-Singh, Bijay-Singh, Kukal, S.S., Smith, D., 2008. Evaluation of options for increasing yield and water productivity of wheat in Punjab, India using the DSSAT-CSM-CERES-Wheat model. *Agricultural Water Management* 95 (9), 1099-1110.

Timsina, J., 2007. Procedures for evaluating crop models and datasets intended for model applications. *J. Inst. Agric. and Animal Sci.* Vol. 28:1-13.

Timsina, J., Singh, U., Singh, Y., 1996. Addressing sustainability of rice-wheat system: analysis of long-term experimentation and simulation. *Proceedings of the Second International Symposium on Systems Approaches for Agricultural Development (SAAD 2)*. December 6-8, 1995. IRRI, Los Baños, Philippines. M. J. Kropff et al. (eds.). Kluwer publications series. 465p.

## **Kenya**

Amboga S C at el. Factors Influencing Maize Production and Productivity in the Central Kenya Highlands

Bernard, 2008. Simulation of maize production using a pixel based weather generator: Case of Lake Naivasha catchment.

JRC, 2009. MARS bulletin. Crop monitoring in Kenya. August 2009.

Karanja, 2006. CROPWAT model analysis of crop water use in six districts in Kenya.

Keating & Grace. Using Biophysical Simulation Models to Assess the Performance of Agricultural Systems in Risky Environments

Keating et al., 1990. Simulation of plant density effects on maize yield as influenced by water and nitrogen limitations.

Ketiem et al., 2008. Modelling effects if climate change on maize production in Kenya: a case study of two agro-climate zones.

Kimurto et al., 2010. Crop Conceptual Model for Predicting of Bread Wheat in Semi-Arid Kenya

J. E. Lewis, J. Rowland & A. Nadeau, 1998. Estimating maize production in Kenya using NDVI: Some statistical considerations, *International Journal of Remote Sensing*, 19:13, 2609-2617

Mantel & Van Engelen, 2000. Assessment of the impact of water on productivity of maize in Kenya: an integrated modelling approach.

Odworu et al., 2010. Forecasting yield and profitability of maize cropping system using simulation models in Uasin Gishu, Kenya.

O. Rojas, 2007. Operational maize yield model development and validation based on remote sensing and agro-meteorological data in Kenya, *International Journal of Remote Sensing*, 28:17, 3775-3793

Rojas, 2006. Operational maize yield model development and validation based on remote sensing and agro-meteorological data in Kenya.

Wamari et al., 2012 . Use of Aquacrop model to predict maize yields under varying rainfall and temperature in a semi-arid environment in Kenya. *J. Meteorol. Rel. Sci.*, 6, 23 –32.

## **Mali**

Badini & Dioni, 2004. Application of rainfall analysis, biophysical modeling and GIS to agroclimatic Decision Support in Madiama commune, Mali (West Africa)

Dingkuhn et al., 2008. A model of sorghum photoperiodism using the concept of threshold-lowering during prolonged appetence

Folliard et al., 2004. Modeling of sorghum response to photoperiod: a threshold–hyperbolic approach.

Foltz et al., 2012. The Sahel’s silent maize revolution: analyzing maize productivity in Mali at the farm level.

Kouressy et al., 2008. Potential contribution of dwarf and leaf longevity traits to yield improvement in photoperiod sensitive sorghum.

Kouressy et al., 2005. Photoperiodism of African sorghum, a response to rainfall variability.

Kouressy et al., 2008. Adaptation to diverse semi-arid environments of sorghum genotypes having different plant type and sensitivity to photoperiod.

Vaksmann et al., 1997. Influence of night temperature on photoperiod response of a West African guinea sorghum landrace.



## **Niger**

Moussa & Amadou (CEEPA), 2006. Using the CROPWAT model to analyse the effects of climate change on rainfed crops in Niger.

Akponikpe, 2008. Millet response to water and soil fertility management in the Sahelian Niger : experiments and modeling.

Akponikpe et al., 2011. Spatial fields' dispersion as a farmer strategy to reduce agro-climatic risk at the household level in pearl millet-based systems in the Sahel: A modeling perspective

Akponikpe et al., 2010. Use of the APSIM model in long term simulation to support decision making regarding nitrogen management for pearl millet in the Sahel.

Soler, 2008. Determining optimum planting dates for pearl millet for two contrasting environments using a modelling approach

Ben Mohamed et al., 2002. Impact of climate change on agricultural production in the Sahel – Part 1. Methodological approach and case study for millet in Niger.

Fechter et al., 1991. An evaluation of the SWATRER and CERES-Millet models for southwest Niger.

Manyame, 2006. On-farm yield and water use response of pearl millet to different management practices in Niger.

## **Nigeria**

Sawa & Ibrahim, 2011. Forecast Models for the Yield of Millet and Sorghum in the Semi Arid Region of Northern Nigeria Using Dry Spell Parameters

Adejuwon, 2005. Food crop production in Nigeria. I. Present effects of climate variability

## **Tanzania**

Arndt et al., 2011 Climate change, agriculture and food security in Tanzania.

Gowing et al., 2003. Developing improved dryland cropping systems for maize in semi-arid Tanzania. Part II. Use of a model to extrapolate and add value to experimental results.

Kaliba, A.R.M., H. Verkuijl, W. Mwangi, A.J.T. Mwilawa, P. Anandajayasekeram, and A.J. Moshi, 1998. Adoption of Maize Production Technologies in Central Tanzania. Mexico, D.F.: International Maize and Wheat Improvement Center (CIMMYT), the United Republic of

Tanzania, and the Southern Africa Centre for Cooperation in Agricultural Research (SACCAR).

Lyamchai et al., 1997. Estimating maize yield in northern Tanzania by adapting SIMCOY, a temperate-zone simulation model.

Rowhani et al., 2011. Climate variability and crop production in Tanzania.

Tibanyenda et al., 2005. Using PARCHED-THIRST software and seasonal rainfall forecasts to forecast maize yield.

Tumbo et al., 2004. Maize Yield Simulation Under Rain-fed and Rainwater Harvesting Systems using Parched-Thirst Model.

### **Uganda**

Wasige, 2009. Assessment of the Impact of Climate Change and Climate Variability on Crop Production in Uganda.

### **Zambia**

Kambikambi, 2004 (CEEPA). CROPWAT exercise report for Zambia.

Dimes et al., 2008. Climate change impact on crop productivity in the semi-arid tropics of Zimbabwe in the 21st century.

Van Keulen, 1984. Potential Wheat Yields in Zambia-A Simulation Approach.