

**Annex 1.** Global and EU regional economic assessments previous to RCPs and SSPs scenarios

Reference	GCMs Emission scenarios Climate projections	Biophysical model (estimation of potential changes in crop yields)	Economic model	Regional Scope	CO2 fertilization	Time Horizon	Farm-level Adaptation measures
<b>Global economic impact assessments</b>							
<b>IPCC FAR (1990)</b>							
<b>Tobey et al. (1992)</b>		Crop responses to climate change obtained from external studies	SWOPSIM (PE)	Global (13 regions)	No		No
<b>Kane et al. (1992)</b>		Crop responses to climate change obtained from external studies	SWOPSIM (PE)	Global (13 regions)	No		No
<b>Rosenzweig and Parry (1994)</b>	3 Low resolution GCMs (GISS; GFDL; UKMO)	Crop models and a decision support system developed by IBSNAT* (1989) (DSSAT v2.1)	BLS	Global (34 regions)	Yes	2060	Yes
<b>IPCC SAR (1995)</b>							
<b>Special Report on Regional Impacts of Climate Change (IPCC, 1997)</b>							
<b>Parry et al. (1999)</b>	5 Higher resolution GCMs 1 emission scenario 2 climate change scenarios <ul style="list-style-type: none"> <li>• HadCM2- IS92a (four ensemble members)</li> <li>• HadCM3 -IS92a</li> </ul>	DSSAT (v2.1)	BLS	Global (34 regions)	Yes	2020; 2050; 2080	Yes
<b>IPCC TAR (2001)</b>							
<b>Fischer et al. (2002)</b>	4 GCMs 5 SRES emission scenarios 12 climate change scenarios <ul style="list-style-type: none"> <li>• HadCM3-(A2;B2;B1; A1FI)</li> <li>• CSIRO-(A2;B2;B1;A1B)</li> <li>• CGCM2-(A2;B2)</li> <li>• NCAR-(A2;B2)</li> </ul>	Agro-ecological zones (AEZ) MODEL	BLS		Yes	2080	Yes

Reference	GCMs Emission scenarios Climate projections	Biophysical model (estimation of potential changes in crop yields)	Economic model	Regional Scope	CO2 fertilization	Time Horizon	Farm-level Adaptation measures
<b>Parry et al. (2004)</b>	1 GCMs 4 SRES emission scenarios 7 climate change scenarios <ul style="list-style-type: none"> <li>• <i>HadCM3- A1FI</i></li> <li>• <i>HadCM3-A2 with 3 ensemble members' (a,b,c)</i></li> <li>• <i>HadCM3- B1a,</i></li> <li>• <i>HadCM3-B2 with 2 ensemble members (a; b)</i></li> </ul>	DSSAT (v2.1)	BLS	Global (34 regions)	Yes	2020; 2050; 2080	Yes
<b>Fisher et al. (2005)</b>	5 GCMs 5 SRES emission scenarios 14 climate change scenarios <ul style="list-style-type: none"> <li>• <i>HadCM3-(A2;B2;B1; A1FI)</i></li> <li>• <i>ECHAM-(A2;B2)</i></li> <li>• <i>CSIRO-(A2;B2;B1;A1B)</i></li> <li>• <i>CGCM2-(A2;B2)</i></li> <li>• <i>NCAR-(A2;B2)</i></li> </ul>	FAO/IIASA agro-ecological zone model (AEZ)	BLS	Global	Yes	2080	Yes
<b>IPCC AR4 (2007)</b>							
<b>Nelson et al. (2009)</b>	2 GCMs 1 SRES emission scenario 2 climate change scenarios (with and without CO2 fertilization) <ul style="list-style-type: none"> <li>• <i>NCAR- A2</i></li> <li>• <i>CSIRO- A2</i></li> </ul>	DSSAT (v4.0)	IMPACT (PE)	Global (281 FPU)	Yes	2050	Yes
<b>Nelson et al. (2010)</b>	2 GCMs 2 SRES 4 climate change scenarios <ul style="list-style-type: none"> <li>• <i>CSIRO-(A1B; B1)</i></li> <li>• <i>MIROC-(A1B; B1)</i></li> </ul>	DSSAT (v4.5)	IMPACT (PE)	Global (281 FPU)	No	2050	Yes
<b>Hertel et al. (2010)</b>	_____	Synthesis of values from the literature for the GTAP regions and six commodities	GTAP (CGE)	Global (34 regions)	Yes	2030	No

Reference	GCMs Emission scenarios Climate projections	Biophysical model (estimation of potential changes in crop yields)	Economic model	Regional Scope	CO2 fertilization	Time Horizon	Farm-level Adaptation measures
<b>Calzadilla et al. (2013)</b>	Climate changes data from Falloon and Betts (2006) and Stott et al. (2006). Based on 1GCM / 2 SRES emission scenarios: HadGEM1-TRIP-(A1B;A2) 6 scenarios: <ul style="list-style-type: none"> <li>• <i>Precipitation-only</i></li> <li>• <i>Precipitation-CO2</i></li> <li>• <i>Precipitation-temperature-CO2</i></li> <li>• <i>Water-only</i></li> <li>• <i>Water-land</i></li> <li>• <i>All-factors</i></li> </ul>	Regional crop yield responses to changes in precipitation and temperature are based on Rosenzweig and Iglesias (1994) CO2 fertilization effect on crop yields are based on information presented by Tubiello et al. (2007) Runoff elasticities of water supply estimated by Darwin et al. (1995)	GTAP-W (CGE)	Global (34 regions)	Yes	2020; 2050	No
<b>European regional economic impact assessments</b>							
<b>Ciscar (2009)</b>	2 GCMs 3RCMs 2 SRES (A2 and B2) 5 climate change scenarios: 1 scenario for 2020: <ul style="list-style-type: none"> <li>• <i>RCA driven by ECHAM4 (A2)</i></li> </ul> 4 scenarios for 2080: <ul style="list-style-type: none"> <li>• <i>HIRHAM driven by HadAM3h (A2;B2)</i></li> <li>• <i>RCAO driven by ECHAM4 (A2;B2)</i></li> </ul>	DSSAT - for Europe World yield changes based on Parry et al 2004	GTAP and GEM-E3 (CGE)	Europe (5 regions)	Yes	2020; 2080	Yes
<b>Ciscar et al. (2011)</b>	2 GCMs 2 RCMs 2 SRES 4 climate change scenarios <ul style="list-style-type: none"> <li>• <i>HIRHAM driven by HadAM3h (A2;B2)</i></li> <li>• <i>RCAO driven by ECHAM4 (A2;B2)</i></li> </ul> All climate data come from PRUDENCE project	DSSAT	GEM-E3 (CGE)	Europe (5 regions)	Yes	2080 (2010)**	Yes
<b>Shrestha et al. (2013)</b>	2GCMs 2 RCMs 1 SRES 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadRM3Q0 driven by HadCM3 (A1B)</i></li> <li>• <i>HIRHAM5 driven by ECHAM5 (A1B)</i></li> </ul>	BIOMA platform	CAPRI (PE)	Europe (280 NUTS 2 region Global ( 77 countries in 40 trade blocks	Yes	2020	Yes

Reference	GCMs Emission scenarios Climate projections	Biophysical model (estimation of potential changes in crop yields)	Economic model	Regional Scope	CO2 fertilization	Time Horizon	Farm-level Adaptation measures
<b>Blanco et al. (2014a)</b>	2GCMs 2RCMs 1SRES 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadRM3 driven by HadCM3 (A1B)</i></li> <li>• <i>HIRHAM5 driven by ECHAM5 (A1B)</i></li> </ul>	WOFOST (BIOMA platform)	CAPRI (PE)	Europe (280 NUTS 2 region Global ( 77 countries in 40 trade blocks	Yes	2030	No

\*International Benchmark Sites Network for Agrotechnology Transfer; \*\* Quasi-static analysis / economic effects of future climate change (projected for the 2080s) on the 2010s economy.

**Annex 2.** Global and EU regional economic assessments post RCPs and SSPs scenarios

Reference	GCMs/RCMs Emission scenarios Climate projections	Biophysical model	Economic model	Regional Scope	CO2 fertilization	Time Horizon
<b>Global economic impact assessments</b>						
<b>Nelson et al. (2013)</b>	2 GCMs 1 RCP 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> </ul>	5 Crop growth models <ul style="list-style-type: none"> <li>• DSSAT</li> <li>• EPIC</li> <li>• LPJmL</li> <li>• pDSSAT</li> <li>• PEGASUS</li> </ul>	5 CGE models <ul style="list-style-type: none"> <li>• AIM</li> <li>• ENVISAGE</li> <li>• FARM</li> <li>• GTEM</li> <li>• MAGNET</li> </ul> 4 PE models <ul style="list-style-type: none"> <li>• GCAM</li> <li>• GLOBIOM</li> <li>• IMPACT</li> <li>• MAgPIE</li> </ul>	Global	No	2050
<b>IPCC AR5</b>						
<b>Nelson et al. (2014)</b>	2GCMs 1 RCP 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> </ul>	2 Crop growth models <ul style="list-style-type: none"> <li>• DSSAT</li> <li>• LPJmL</li> </ul>	5 CGE models <ul style="list-style-type: none"> <li>• AIM</li> <li>• ENVISAGE</li> <li>• FARM</li> <li>• GTEM</li> <li>• MAGNET</li> </ul> 4 PE models <ul style="list-style-type: none"> <li>• GCAM</li> <li>• GLOBIOM</li> <li>• IMPACT</li> <li>• MAgPIE</li> </ul>	Global	No	2050

Reference	GCMs/RCMs Emission scenarios Climate projections	Biophysical model	Economic model	Regional Scope	CO2 fertilization	Time Horizon
<b>Von Lampe et al. (2014)</b>	2GCMs 1RCP 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> </ul>	2 Crop growth models <ul style="list-style-type: none"> <li>• DSSAT</li> <li>• LPJmL</li> </ul>	5 CGE models <ul style="list-style-type: none"> <li>• AIM</li> <li>• ENVISAGE</li> <li>• FARM</li> <li>• GTEM</li> <li>• MAGNET</li> </ul> 4 PE models <ul style="list-style-type: none"> <li>• GCAM</li> <li>• GLOBIOM</li> <li>• IMPACT</li> <li>• MAgPIE</li> </ul>	Global	No	2050
<b>Witzke et al. (2014)</b>	2GCMs 1RCP 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> </ul>	2 Crop growth models <ul style="list-style-type: none"> <li>• DSSAT</li> <li>• LPJmL</li> </ul>	1 PE models <ul style="list-style-type: none"> <li>• CAPRI</li> </ul>	Global	No	2050
<b>European regional economic impact assessments</b>						
<b>Blanco et al. (2014b)</b>	3GCMs 1RCP 3 Climate change scenarios (with and without CO2): <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> <li>• <i>MIROC (RCP8.5)</i></li> </ul>	<ul style="list-style-type: none"> <li>• LPJmL (Global)</li> <li>• WOFOST (EU)</li> </ul>	1 PE models <ul style="list-style-type: none"> <li>• CAPRI</li> </ul>	Europe (280 NUTS 2 region Global ( 77 countries in 40 trade blocks)	Yes	2030
<b>Frank et al. (2014)</b>	2GCMs 1RCP 2 Climate change scenarios: <ul style="list-style-type: none"> <li>• <i>HadGEM2-ES (RCP8.5)</i></li> <li>• <i>IPSL-CM5A-LR (RCP8.5)</i></li> </ul>	<ul style="list-style-type: none"> <li>• DSSAT</li> <li>• LPJmL</li> </ul>	2 PE models <ul style="list-style-type: none"> <li>• CAPRI</li> <li>• GLOBIOM -EU</li> </ul>	GLOBAL - EUROPE	No	2050