MODELING COMPONENT

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Advanced materials and support for:

- **Computable General Equilibrium models**
  - **1 global multi sectoral, multi country dynamic CGE**: MIRAGRODEP
  - **2 single country** static and dynamic CGE: PEP and IFPRI standard **CGE**: PEP1-1, PEP-1-t, Implementation available for numerous African countries (see SAM availability in the Data section

- **Partial Equilibrium models**
  - 2 **trade models** at the product/HS6 level: Excel and GAMS based;
  - **ERATO**: multi sectoral, global PE aimed to study complex value chains;
  - Stochastic single country/commodity model for price stabilization and optimal storage: **RECS toolbox**

- **Toolbox for:**
  - **Poverty Analysis.** Can be combined to any PE or CGE models to perform advanced micro-simulations;
  - **TASTE program.** Can be used to do advanced trade policy analysis and tariff reform simulations. Provide inputs for the PEs and CGEs.
  - **Econometrics tools for trade analysis** (gravity equations advanced techniques)

SUMMARY OF 2013

Nearly all 2013 goals achieved. Resources have been devoted to improve documentations and accessibility of existing materials (developed in 2012 and 2013)

New Activities performed in 2013:

- *Spatial Partial Equilibrium Model*: Still under development but will be finalized and added to the library by the end of 2013.

- *Impact Assessment Tool Box*: outputs available in the training section of the website. Strong interactions with the IA AGRODEP group;

- *Endogenous Saving behavior in CGE*: Goals achieved based on the PEP single country model;

- *A GLOBIOM model for AGRODEP*: Discussions with the IIASA experts of GLOBIOM still ongoing. Efforts on crop model training set a priority;

- *Econometrics of price transmission*: Postponed to devote more efforts to the supply elasticity analysis/estimations;

- *Regional CGE based on MIRAGRODEP*. Model with factor (capital) and goods (domestic variety) markets integrated. The ECOWAS version will be uploaded in 2014 when the SAMs are ready (finalization stage in the data module)→ MIRAGRODEP-RI (regional integration)

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2014 GOALS

- Key Milestones of the AGRODEP (phase I) project **achieved in terms of model developments**.

  (In reality more models have been delivered than initially scheduled. Initial plan: 1 global CGE, 1 single country PE, 1 deterministic multi market model.)

- 2014 will focus on **increasing the ownership** of the library by the members by providing more documentations, examples, and applications to the models to different regions/questions.

- Nevertheless, important **model innovations** will still be carried state of the art tool for key research questions.

Tools and Improvements to support model adjustments to local conditions

- Toolbox on **Demand elasticity estimations** (from the household level to the national level);
- Toolbox for producing **Food and Nutrition Security** indicators for CGE model.
- Toolbox for **SAM manipulation for CGE**: updates, disaggregation, and development for coherent regional SAMs (first stage to the final goal: open source code to develop and maintain a "GTAP-like" dataset for Africa)
- Toolbox for **consistent policy aggregators and measurements**. Focus on trade policies.
- Illustrations of model uses and implementation for different policy shocks and countries/regions

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Modeling innovations and developments

- New **stochastic commodity model** based on an extension of the RECS toolbox to analyze **intra-annual** (e.g. monthly or seasonal) issues (e.g. storage, trade policy volatility): beginning of the activity in 2014, finalization scheduled for 2015

- New **Macroeconometric** model. Currently a missing piece in the AGRODEP toolbox to tackle dynamic macroeconomic issues.

- Extension of the **MIRAGRODEP-RI** model to tackle: **labor market** integration (and worker migrations), and **monetary** integration (sub-regional current account constraints).

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2014 CHRONOGRAM

Activity	Q1	Q2	Q3	Q4
Toolbox on Demand Elasticity estimation		x	x	
Toolbox on FNS indicators for CGE and PE models	x			
Toolbox for SAM manipulations and database managements	x	x		
Toolbox for consistent policy aggregators and measurements	x	x		
New **working paper** on single country CGEs (uses, implementations..)	x			
Infra-annual stochastic PE **model** based on the RECS toolbox	x	x	x	x
Macroeconometric **model** in the context of African economies (review of literature, codes, illustration)	x	x		
MIRAGRODEP-RI: Labour Market Integration			x	
MIRAGRODEP-RI: Monetary Integration				x

ILLUSTRATIONS

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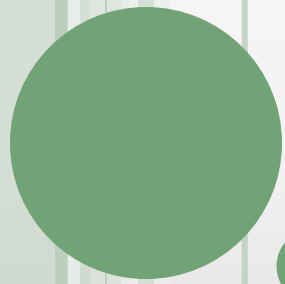
B. ILLUSTRATION TOOLBOX:
THE NEED OF CONSISTENT POLICY AGGREGATOR

○ Illustration from Laborde, Martin and Van Der Mensbrugghe regarding bias in trade policy reform assessment using traditional, non-consistent, policy aggregator (trade weighted tariff) vs the "right" (theoretically founded) approach::

Global Full Trade Liberalization. LINKAGE CGE results	Real income (%)		Terms of trade (%)	
	Trade Weighted Aggregator	Optimal Aggregator	Trade Weighted Aggregator	Optimal Aggregator
World total	0.50	0.88	0.00	0.00
Low and middle income countries	0.58	1.30	-0.28	-0.08
Nigeria	**4.68**	**6.30**	-1.95	-1.96
Morocco & Tunisia	2.77	5.82	-2.90	-1.79
SACU	**0.96**	**2.25**	0.04	0.00
R. of Sub Saharan Africa	**-0.44**	**-0.55**	**-1.75**	**-2.13**
High income countries	0.48	0.76	0.08	0.02

- Macroeconometric models
  - Starting from Tinbergen (1939)
  - Extended by Klein and Goldberger (1955)
  - Cowles Commision approach
  - Useful when studying various policy actions such as public expenditures or taxation, but also forecasting
  - Widely used in central Banks and ministries of finance (particularly in Africa, Welfe, 2013)
  - PROMES model used at the CBWAS (BCEAO)
- Main advantages
  - set of identities and systems of inter-linked behavioral equations that are fully estimated from time series data using econometric techniques (robust estimation, similar to Jorgenson, 1988)
  - Requires less data compared to CGE models