Sustainable Trade Toolbox

MATS Deliverable 2.3

MATS
making agricultural trade sustainable

Funded by
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Summary

Within the MATS project, WP2 aims to design an enhanced analytical framework for forthcoming analyses in the different work packages. Task 2.3 feeds into this broader analytical framework providing an analysis of relevant frameworks, approaches, methods, and tools to assess agri-food trade from a sustainability perspective and with a systemic view. Deliverable 2.3 presents the results of the Task in the form of a compilation of instruments within a toolbox format. This toolbox is proposed to be used under a food systems perspective to better address the challenges placed by agri-food trade on sustainability and human wellbeing.

To obtain the list of instruments, a first stage of defining criteria was applied, considering specific keywords for the searching process and the potential usefulness of the instrument. The criteria were applied when consulting various sources to identify and select relevant instruments. Finally, the information is presented in the form of a collection of factsheets, designed around descriptors that facilitate navigation and an efficient use of the toolbox.

The toolbox comprises 114 instruments that range from guiding principles and approaches to specific methods, tools, and sets indicators. It is important to note that this toolbox will be updated after the completion of all data-based analyses in MATS. An interactive search system will be added to enhance the use of the toolbox. The updated version of the toolbox will eventually be available for wide use in research, policy and practice.

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[1] R = Report, P = Prototype, D = Demonstrator, O = Other

[2] PU = Public, CO = Confidential, only for members of the consortium (including the Commission Services)

Content

1. Introduction

Within the MATS project, WP2 aims to derive an enhanced analytical framework that will provide theoretical and methodological guidance for MATS' forthcoming analyses related to

- the linkages between agri-food trade, sustainability, and human wellbeing (WP3);
- the role of institutional, regulatory, and legal frameworks on the impacts of agri-food trade in sustainability (WP4);
- and the design of transition pathways for desirable changes in trade relations, policies, instruments and practices (WP5).

To contribute to the design of the analytical framework for MATS, Task 2.3 aims to provide an analysis of relevant frameworks, approaches, methods, and tools to assess agri-food trade from a sustainability perspective and with a systemic view. This task is informed, on the one hand, by the main findings of the review of linkages between agri-food trade, sustainability, and human wellbeing made in WP1; on the other hand, is informed by the results of Task 2.2 which analyses the computational models being used to assess agri-food trade.

Finally, the results of Task 2.3 are presented in Deliverable 2.3 in the form of a set of tools that can be used for the assessment of the impacts of agri-food trade. Deliverable 2.3 is another steppingstone in the sequence of deliverables within WP2 building towards the analytical framework (D2.4).

Having in mind the description of Task 2.3 and MATS intention to apply the rigor of systems thinking to better tackle and address challenges placed by agri-food trade to sustainability and human wellbeing, this Deliverable (D2.3) is framed under a food systems perspective.

The first section of the report introduces the food systems approach as a suitable framing to assess the agri-food trade under a systemic view. Next, the criteria and considerations taken to identify and select instruments for the Toolbox are described in the methodology section. Finally, the third section corresponds to the Toolbox itself, including a brief presentation of the factsheets' structure to facilitate the consultation of instruments using the descriptors designed for that purpose.

The present report is the first version of the toolbox (D2.3). It will be updated after the completion of all data-based analyses in MATS. An interactive search system will be added to enhance the use of the toolbox. The updated version of the toolbox will eventually be available for wide use in research, policy and practice.

2. Food system approach to assessing agri-food trade under a systemic view

Addressing sustainability challenges linked to food systems requires acknowledging the interdependencies that shape systems dynamics and thus the delivery of outcomes such as food security, environmental and economic sustainability, and human wellbeing (Global Panel on Agriculture and Food Systems for Nutrition, 2020).

In this regard, MATS applies the rigor of systems thinking by adopting a food systems approach that, among other things, sheds light on the socio-economic and environmental externalities and interlinkages between agricultural trade and how food is produced, processed and consumed (FAO, WFP, & IFAD, 2012; Global Panel on Agriculture and Food Systems for Nutrition, 2016, 2020; HLPE, 2017, 2020; IPES-Food, 2015, 2017, 2018, 2021). This allows the identification of key leverage points to foster positive and reduce negative impacts of agri-food trade on sustainability and human wellbeing, thus informing more coherent agricultural trade policies and actions.

The food systems approach is operationalized through frameworks designed to guide food systems agents – farmers, practitioners, investors, decision-makers, researchers, enterprises, etc. – in addressing food and agriculture challenges more systemically, including those posed by agricultural trade.

Food systems frameworks have incorporated ideas and practices from systems thinking and complexity science (STCS) designed to deal with complex situations. The three main contributions from food systems frameworks can be summarized as:

1) Making sense of broader sustainability and human wellbeing issues related to agri-food trade;
2) Exploring food systems' dynamic behaviour;
3) Acknowledging the role of agency in how problematic aspects in food systems are framed and addressed.

These three main contributions are outlined below.

The food systems approach is introduced to support and inform a more systemic use of the different tools, methods, frameworks, and indicators comprised in the toolbox.

Different tools and methods can address different agricultural trade issues or opportunities, framed in different ways, by different agents with different interests, values, expectations, and power, attending to different parts of the system (economy, human rights, environmental sustainability, livelihoods, etc.).

It is the intent of this deliverable to cover a diverse range of tools for analysing and advancing agricultural trade as a lever for sustainability. At the same time, we like to

- support the use of these tools in more systemic ways;
- acknowledge the intricated and complex multidimensional nature of agricultural trade issues;
- recognize the emergent and non-linear dynamics of these issues;
- acknowledge the role of agents in framing situations, challenges, opportunities, and pathways forward.

2.1. Make sense of broader sustainability and human wellbeing issues related to agri-food trade

To promote a comprehensive understanding of food systems, food systems frameworks list and describe in detail the elements that help to make sense of complex food-related challenges and the way these interrelate, impacting human wellbeing and the sustainability of the broader context. In this regard, food systems are broadly understood as a set of activities – from production to consumption of food – embedded and interrelated with the broader human, social, economic, and natural context. The multidimensional context and the diverse set of drivers influence each the way food is produced, processed, marketed, and consumed; as well as their impacts over food security, social welfare, and environmental sustainability (Béné et al., 2019; Connolly-Boutin & Smit, 2016; Dury, Bendjebbar, Hainzelin, Giordano, & Bricas, 2019; Ericksen, 2008; HLPE, 2017; van Berkum, Dengerink, & Ruben, 2018).

The food system approach aims to broaden the scope of analysis of food issues, and thus aims to demonstrate how the activities and outputs from the

value chain feed back into the environmental and socioeconomic drivers that, in turn, affect those activities and outputs (Bortoletti & Lomax, 2019; Ericksen, 2008; Hubeau et al., 2017; TEEB, 2018; van Berkum, Dengerink, & Ruben, 2018). Moreover, it allows to explore the emergent and often unpredictable behaviour of food systems by making visible synergies and trade-offs between their elements - either drivers, value chain activities or outcomes (Béné et al., 2019; IOM & NRC, 2015; iPES Food, 2015; Nguyen, 2018; UNEP, 2016).

2.2. Account for food system dynamics

Food systems have dynamic, non-linear, and often unpredictable behaviour that can be understood only by exploring their trajectory through time. In this sense, some food systems frameworks use the concepts of vulnerability and resilience to describe the role of key variables – known as control variables – in driving food systems towards stability or transformation (Allen & Prosperi, 2016; Connolly-Boutin & Smit, 2016; Jackson, McNamara, & Witt, 2020; TEEB, 2018; Vallejo-Rojas et al., 2016; van Berkum et al., 2018). Transformations involve changes in the resilience of food systems (IOM & NRC, 2015), which happen when a tipping point in control variables is reached (van Berkum et al., 2018).

2.3. Acknowledge the role of agency in the framing and addressing of food system issues

The same situation can be understood in different ways, depending on who is seeing it, and which are their main values, goals, interest, and concerns (Béné et al., 2019; Bortoletti & Lomax, 2019; iPES Food, 2015; UNEP, 2016). In that regard, food systems frameworks promote spaces for dialogue and exchange among agents with different perspectives to get a comprehensive understanding of the situation to be addressed (Halbe & Adamowski, 2019; Hubeau et al., 2017; Posthumus et al., 2018; TEEB, 2018).

In creating spaces for discussion and joint reflection among agents, the influence of governance mechanisms and power relations on decision-making about how problems are framed and the best ways to address them should be acknowledged (HLPE, 2017; Nguyen, 2018; UNEP, 2016). On the other hand, it should be acknowledged that any decision implies setting boundaries – which involves determining which values, interests, and expectations prioritize over others – when describing the situation to be addressed and identifying

ways to move towards the desired transformation (Allen & Prosperi, 2016; Ericksen, 2008b; IOM & NRC, 2015; TEEB, 2018).

3. Methodology

This section outlines the three-stage methodology used to elaborate the Sustainable Agri-Food Trade Toolbox. We like to note here that we understand a toolbox as a compilation of instruments can go from guiding principles and approaches to targeted methods, tools and indicators.

The first stage of the methodology focuses on defining criteria to identify and select relevant frameworks, approaches, methodologies, methods, tools, and indicators; in the second stage, those criteria are applied when consulting various sources to identify and select relevant instruments; finally, in the third stage, the information gathered in the second stage is summarized and present in a fact sheet, designed around descriptors that facilitate future use of the toolbox.

Each of the three steps of the methodology are described below.

3.1. Define search strategies to select relevant tools

The main objective guiding the search was to identify potentially useful approaches, methodologies and tools. This was done applying three concurrent search strategies:

The search for useful instruments to analyse agri-food trade was made using **keywords** related to agriculture, food production, trade, assessment, sustainability, and analysis. We chose not to restrict the search to concepts related to agri-food trade, because the results obtained were very limited compared to the scope of MATS.

Due to the systemic nature of the analyses to be performed in MATS, the search for relevant instruments was guided by their usefulness for the analysis of **complex situations**. In this regard, the main criterion of selection was for the instrument to contribute to at least one of the following aspects: 1) Making sense of broader sustainability and human wellbeing issues related to agri-food trade; 2) Exploring the dynamic behaviour of food systems' dynamic; 3) Recognizing the role of agency in how problematic situations in food systems are framed and addressed.

Finally, the tools were filtered by their usefulness within the **scope of MATS**. In this regard, the instruments were selected considering their contributions

to identifying key leverage points that foster the positive and reduce the negative impacts of agri-food trade on sustainability and human wellbeing – main goal of MATS – through one or more of the following processes: 1) assessment of the links between agricultural trade, agricultural and rural investments, environmental sustainability and human wellbeing; 2) analysis of the role of institutional, regulatory, and legal frameworks in view of their impacts on SDGs and in respect of global agreements on environmental and climate change ; 3) Visioning and back casting processes to derive transition pathways for desirable changes in trade relations and formulate policy recommendations.

3.2. Identify and select relevant instruments for the Toolbox

In order to select relevant instruments for the toolbox – following the criteria mentioned in the previous section – several sources were consulted.

Considering the food systems perspective under which this deliverable is framed, more than twenty food systems frameworks published between 2009 and 2021 as academic and grey literature were selected and consulted in search for relevant instruments for this toolbox.

Afterwards, the search focus was broadened by reviewing scientific and grey literature in search engines and data bases using the keywords mentioned in the previous section.

Additionally, MATS Deliverable 2.2 "Synthesis of Model-Based Studies" was also consulted to include in the Toolbox references to the extensive list of models it provided.

As a result of applying the selection criteria to the searches in the three mentioned sources, a preliminary list of instruments was drawn up and shared with diverse members within the MATS consortium seeking for their expert inputs and feedback in strengthening the list of instruments composing the current version of the toolbox. In this regard, inputs were asked from partners involved in activities related to assessing linkages between agri-food trade, sustainability, and human wellbeing (WP3), analysing the role of institutional, regulatory and legal frameworks in the agri-food trade impacts on SDGs (WP4) and drawing transition pathways and policy recommendation towards sustainable agri-food trade (WP5).

Finally, all the information regarding instruments was systematized in a unique database.

3.3. Developing instrument factsheets to feed into the Toolbox

The selected instruments were characterized through descriptors designed to facilitate their search, consult, and understanding, so the navigation process through the toolbox is easier given the limitations of the format of this Deliverable. The selected descriptors are detailed below, under the toolbox section.

Finally, all the information included in the database comprising all the instruments in the toolbox was moved to factsheets – one for each instrument – to give the Toolbox a more user-friendly format. These factsheets are included below, under Toolbox.

It is important to note that the toolbox will be updated after the completion of all analyses in the MATS project. This will allow reflecting on the usefulness of each instrument and delving into their strengths and weaknesses. Once the updated version of the database is available, it is intended to generate an interactive search system enhancing the use of the toolbox that would be available on the MATS official website.

4. Toolbox

The toolbox comprises a set of factsheets with key information about each of the instruments selected. To facilitate navigation across the toolbox and consultation of instruments, each fact sheet contains a series of descriptors as listed below:

Name: It is a quick identifier of the tool as it is commonly known. However, the instrument name may vary depending on the field of application or country.

Type: Since the toolbox includes different types of instruments, this section indicates the type of instrument described in each factsheet: i) tool; ii) method; iii) model; iv) framework, or v) principles.

Topic: This section shows the topic(s) that could be addressed by the instrument in question. Each instrument is assigned to one or more topics, out of a total of six. The possible topics correspond to the six categories of elements/dimensions of agri-food systems proposed in D2.1, designed to systemically explore agri-food trade, highlighting its linkages with investment, sustainability and human wellbeing (See Figure 1).

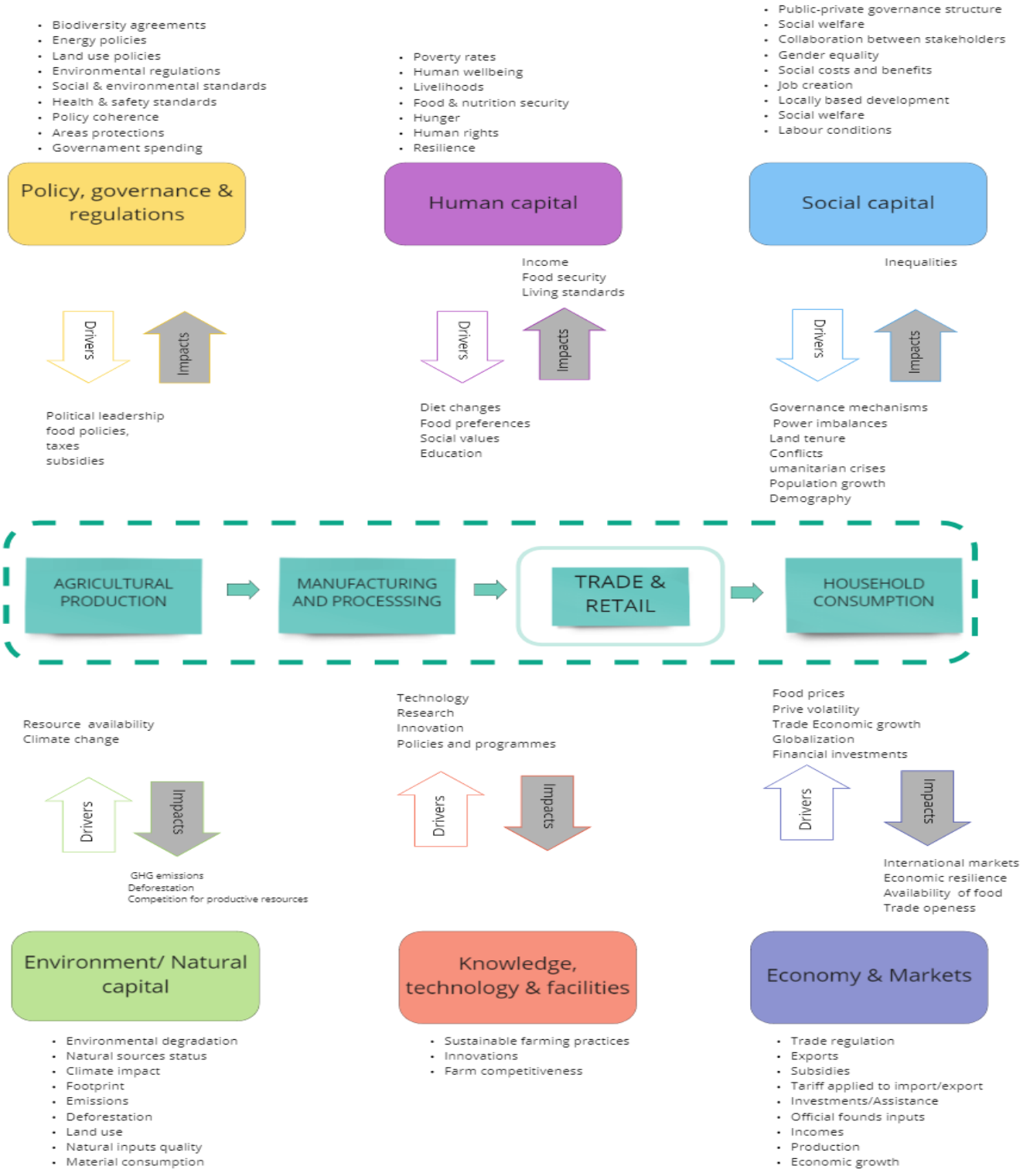

Figure 1. Categories of elements/ dimensions of agri-food systems

Keywords: The keywords are short descriptors used to facilitate the searching processes and the navigation within the toolbox. Generally speaking four types of descriptors are used as keywords: i) Descriptors that expand on key features of the instrument; ii) Descriptors that provide more information about the topic(s) already selected (e.g. for a tool addressing "human capital", a keyword could be “food security”); iii) Descriptors that reflect how each instrument contributes to a more systemic analysis of agri-food trade (e.g. “situation mapping”, “forecast”, “agency”, “perspectives”); iv) Descriptors reflecting the MATS activities and areas of interest (e.g. “food value chain”, “political relations”, “transition pathways”, etc.).

Description: It provides a high-level overview of what is the purpose of the instrument, and what it is useful for.

More info and source: This section includes the source of the instrument description, as well as references to additional documents that could be of interest.

Application: This section includes references or links to scientific articles or official reports that contain applications of each instrument concerning agri-food trade/ food systems and sustainability.

All the tools available are listed in the table of contents below.

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Nº 35: GIS (geographic Information System)

Nº 36: GLOBIOM (Global Biosphere Management Model)

Nº 37: GTAP (Global Trade Analysis Project)

Nº 38: GTAP model extensions

Nº 39: GTEM-C (The Global Trade and Environment Model)

Nº 40: Guide to Feminist Influencing

Nº 41: Guide to Gender Analysis

Nº 42: Guidelines for integrating gender in research planning

Nº 43: Handbook for monitoring and evaluation

of child labour in agriculture

Nº 44: Horizon Scanning

Nº 45: HRIA (Human Rights Impact Assessment)

Nº 46: Human Rights Indicators

Nº 47: Human Rights-based approach to data

Nº 48: IAMs (Integrated Assessment Models)

Nº 49: IBAT (Integrated Biodiversity Assessment Tool)

Nº 50: IDRISI Land Change Modeler

Nº 51: IMPACT (The International Model for Policy Analysis of Agricultural Commodities and Trade)

Nº 52: Influence Matrix

Nº 53: Integrating Gender Issues into Agricultural Chains (INGIA-VC framework)

Nº 54: InVEST (Integrated Valuation of Environmental Services and Trade Offs)

Nº 55: IPC Population Tracking Tool

Nº 56: iSDG (Integrated Sustainable Development Goal)

Nº 57: KSNL (Criteria for Sustainable Farming)

Nº 58: LandAssess Tool

Nº 59: LCA (Life Cycle Assessment)

Nº 60: LCC (Life Cycle Costing)

Nº 61: LCSFM (Latent Class Stochastic Frontier Model)

Nº 62: Linear Programming Models

Nº 63: Linear Programming Module of NutriSurvey

Nº 64: Logical Diagrams

Nº 65: MAGNET (Modular Applied GeNeral Equilibrium Tool)

Nº 66: Mapping approach

Nº 67: Materiality Assessment

Nº 68: MCA (Multi-Criteria Analysis)

Nº 69: Measuring Distance to the SDG Targets

Nº 70: MetODD-SDG

Nº 71: MIMES (Multi-scale Integrated Models of Ecosystem Services)

Nº 72: MIRAGE (Modelling International Relationships in Applied General Equilibrium)

Nº 73: MODAM (Multi-Objective Decision Support Model for Agri-Ecosystem Management Model)

Nº 74: MONICA (Model for Nitrogen and Carbon Dynamics in Agro-Ecosystems)

Nº 75: National Computable General Equilibrium model

Nº 76: Netmapping

Nº 77: Nodes of Power in the Food System

Nº 78: Nutrition-sensitive Value Chain Analysis

Nº 79: NWF (National Water-Food) modelling framework

Nº 80: OECD ENV-Linkages model

Nº 81: OECD-FAO Guidance for

Responsible Agricultural Supply Chains

Nº 82: Oxfam inequality guide

Nº 83: Problem tree

Nº 84: Qualitative scenarios

Nº 85: Quick Guide to Gender-Sensitive Indicators

Nº 86: Regression Models

Nº 87: Research guidelines for understanding estimates of economic inequality

Nº 88: Rich Picture

Nº 89: RISE (Response Inducing Sustainability Evaluation)

Nº 90: Roadmapping

Nº 91: SAFA (Sustainability Assessment of Food and Agricultural Systems)

Nº 92: SALCAsustain methodology

Nº 93: Scenario Planning

Nº 94: SDG Trade Monitor

Nº 95: Semi-structured interviews

Nº 96: SFPMs (Sustainable Food Profiling Models)

Nº 97: SNA (Social Network Analysis)

Nº 98: Soft Systems Methodology

Nº 99: Stochastic and Math Algorithm

Nº 100: SUSFANS

Nº 101: SWAT (The Soil and Water Assessment Tool)

Nº 102: Systems dynamics modelling approach

Nº 103: TCD (Trade Competitiveness Diagnostic Toolkit)

Nº 104: The Gravity Approach

Nº 105: Three-step methodology to assess food systems vulnerability

Nº 106: TOA (Tradeoff Analysis)

Nº 108: TRIMAG (Tariff Reduction Impact Model for Agriculture)

Nº 109: Typical Farm

Nº 110: UKAMM (UK Agricultural Market Model)

Nº 111: Value Chain Analysis

Nº 112: Visioning

Nº 113: VSS (Voluntary Sustainability Standards)

Nº 114: WGI (Worldwide Governance Indicators)

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Nº 1: Agent-based models

Type: Model **Topic:** All

Keywords:	**Agents, simulation models, linkages.**
Description:	Adaptive modelling tools that can accommodate and simulate potential interactions between individual agents operating within dynamic environments. It represents individual agents in the system, each with specified initial conditions and a set of adaptive rules that govern their interaction with each other and with their environment.
More info and source:	- Institute of Medicine, & National Research Council. (2015). A Framework for Assessing Effects of the Food System. Institute of Medicine and National Research Council of The National Academies. https://doi.org/https://doi.org/10.17226/18846
Applications in agri-food context:	- Abar, S., Theodoropoulos, G. K., Lemarinier, P., & O'Hare, G. M. P. (2017). Agent Based Modelling and Simulation tools: A review of the state-of-art software. Computer Science Review, 24, 13–33. https://doi.org/10.1016/j.cosrev.2017.03.001

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Nº 2: Aglink-Cosimo

Type: Model

Topic: Policy, governance & regulations
Economy & markets

Keywords:	**Partial equilibrium models, trade dynamics, market, prices.**
Description:	Aglink-Cosimo is a recursive-dynamic, partial equilibrium model that is used to mainly replicate developments of the balances of the annual market and prices for the main agricultural commodities consumed, produced, and traded at the global level. Aglink-Cosimo provides a comprehensive policy-specific and dynamic economic depiction of the standard temperate-zone commodities, as well as for cotton, vegetable oils, and rice.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Aglink-Cosimo-model-documentation-2015.pdf (agri-outlook.org)
Applications in agri-food context:	- OECD/FAO (2015). OECD-FAO Agricultural Outlook 2015. OECD Publishing, Paris.

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Nº 3: AGMEMOD (Agricultural Member State Modelling)

Type: Model

Topic: Economy & markets
Policy, governance & regulations

Keywords:	**Agricultural production, partial equilibrium models, bottom up approach, policy.**
Description:	Agricultural Member State Modelling (AGMEMOD) is represented as a dynamic, econometric, multi-product partial equilibrium model in which a bottom-up approach is utilized. The respective approach captures the inherent heterogeneity of the agricultural systems existing across the EU, as well as ensures consistency across the country models through the adherence to agreed commodity model templates. AGMEMOD also promotes the significant comparison of the policy impact changes across the different Member States.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Riordan, B., Donnellan, T., Hanrahan, K. F., & McQuinn, K. (2002). Projection of policy impacts on the agri-food sector: overview and introduction to AG-MEMOD. Paper presented at the 10th Congress of the European Association of Agricultural Economists (EAAE), Zaragoza, 28–31 August, 2002 - Van Leeuwen, M., Bouma, F., Chantreuil, F., Dol, W., Erjavec, E., Hanrahan, K. F., ... & Salputra, G. (2012). AGMEMOD Model. In The Future of EU Agricultural Markets by AGMEMOD (pp. 45-74). Springer, Dordrecht.
Applications in agri-food context:	- Niemi, J., Jansik, C., Kettunen, L., & Lehtonen, H. (2005). A tool to analyse the impact of policy changes on the agri-food sector of Finland. In: Arfini, F. (ed.). Modelling agricultural policies: state of the art and new challenges. Parma: Monte Universitá Parma Editore, 609-629

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Nº 4: Agricultural Production Growth Models

Type: Model

Topic: Value chain
Policy, governance & regulations

Keywords:	**Agricultural production outputs, inputs, labour, land.**
Description:	Agricultural production models examine the relationship between agricultural production and important inputs of production such as physical capital stock, labour, and land.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Ngalawa, H., & Derera, E. (2020). Agricultural Production, Employment and Gender Vulnerability: Covid-19 Implications. African Journal of Governance & Development, 9(1.1), 200-225

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Nº 5: Agricultural sustainability assessment framework

Type: **Framework**
Indicators

Topic: **Policy, governance & regulations**
Environment/natural capital

Keywords:	**Sustainability assessment models, agricultural production outputs, indicator based analysis, sustainability, climate, policy, scenario.**
Description:	Streimikis and Balezentis (2020) developed new indicators for sustainability assessment in agriculture which allows for achieving harmonization of sustainable development, climate, and agricultural policies in the EU. The selected relevant indicators are combined in the framework which allows for achieving harmonization of climate change and agriculture policies by selecting relevant policy actions for targeted indicators.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. https://doi.org/10.5281/zenodo.6507170 - Streimikis, J., & Baležentis, T. (2020). Agricultural sustainability assessment framework integrating sustainable development goals and interlinked priorities of environmental, climate and agriculture policies. Sustainable Development, 28(6), 1702-1712
Applications in agri-food context:	To be updated

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Nº 6: APSIM (Agricultural Production Systems SIMulator)

Type: Model

Topic: Food value chain
Environment/Natural capital
Knowledge, technology & facilities

Keywords:	**Sustainability assessment models, agricultural production outputs, simulation, crop growth, ecosystem services.**
Description:	Agricultural Production Systems sIMulator (APSIM), is a dynamic, process based model with the goal of Simulation of plant growth in a variety of biophysical and economic conditions.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - McCown, R. L., Hammer, G. L., Hargreaves, J. N. G., Holzworth, D. P., & Freebairn, D. M. (1996). APSIM: a novel software system for model development, model testing and simulation in agricultural systems research. Agricultural Systems, 50(3), 255-271.
Applications in agri-food context:	- Keating, B. A., Carberry, P. S., Hammer, G. L., Probert, M. E., Robertson, M. J., Holzworth, D., Huth, N. I., Hargreaves, J. N. G., Meinke, H., Hochman, Z., McLean, G., Verburg, K., Snow, V., Dimes, J. P., Silburn, M., Wang, E., Brown, S., Bristow, K. L., Asseng, S., … Smith, C. J. (2003). An overview of APSIM, a model designed for farming systems simulation. European Journal of Agronomy, 18(3–4), 267–288. https://doi.org/10.1016/S1161-0301(02)00108-9 - Nelson, R. A., Dimes, J. P., Paningbatan, E. P., & Silburn, D. M. (1998). Erosion/productivity modelling of maize farming in the Philippine uplands part I: Parameterising the agricultural production systems simulator. Agricultural Systems, 58(2), 129–146. https://doi.org/10.1016/S0308-521X(98)00043-2

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Nº 7: ARIES (Artificial Intelligence for Ecosystem Services)

Type: **Model**

Topic: **Environment/natural capital**
Human capital

Keywords:	**Spatial model, environmental services, human well being, scenarios, natural inputs.**
Description:	Artificial Intelligence for Ecosystem Services (ARIES) is a web-based model that assists rapid ecosystem service assessment and valuation (ESAV). It helps users discover, understand, and quantify environmental assets and the factors influencing their values, for specific geographic areas and based on user needs and priorities. ARIES encodes relevant ecological and socioeconomic knowledge to map ecosystem service provision, use, and benefit flows.
More info and source:	- Integrated Modelling. (2021). Aries. An adaptive modelling technology. https://aries.integratedmodelling.org/
Applications in agri-food context:	- Villa, F., Ceroni, M., Bagstad, K., Johnson, G., & Krivov, S. (2009). ARIES (ARtificial Intelligence for Ecosystem Services): a new tool for ecosystem services assessment, planning , and valuation . Aries, July 2014, 1–10.

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Nº 8: ARIMA

Type: Model **Topic:** Economy & markets

Keywords:	**Agricultural production, regression models, forecasting, valuation.**
Description:	ARIMA model is one of the most useful techniques for future event forecasting. The mode estimates a value in a response time series as a linear combination of its past values.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Box, G. E., & Jenkins, G. M. (1976). Time series analysis: Forecasting and control San Francisco. Calif: Holden-Day
Applications in agri-food context:	- Kannan, S. and Karuppasamy, K.M. (2020). Forecasting for Agricultural Production Using Arima Model. PalArch's Journal of Archaeology Of Egypt/Egyptology, 17(9), 5939-5949. - Wang, K. C. (2021). Reimagining the global food regimes for relational spaces. Area, 53(4), 637-646

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Nº 9: Backcasting pathway builder tool

Type: Tool **Topic:** All

Keywords:	**Visioning process, transition pathways.**
Description:	"Backcasting" is one approach to working with a solution for a given setting to identify actionable steps towards having positive impact at some point in the future. The backcasting pathway builder tool meant to serve as a starting point to help develop concrete, actionable steps to achieve the vision of a solution for a specific context.
More info and source:	- IFSS Portal. (2021). Moving to action. Backcasting Tool. https://ifssportal.nutritionconnect.org/moving-to-action/backcasting-tool
Applications in agri-food context:	- Carlsson-Kanyama, A., Dreborg, K. H., Moll, H. C., & Padovan, D. (2008). Participative backcasting: A tool for involving stakeholders in local sustainability planning. Futures, 40(1), 34–46. https://doi.org/10.1016/j.futures.2007.06.001

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Sustainable Trade Toolbox

Nº 10: B-INTACT (The Biodiversity Integrated Assessment and Computation Tool)

Type: Tool **Topic:** Environment/natural capital

Keywords:	**Biodiversity, production externalities, land use, environmental impacts, project outputs.**
Description:	The Biodiversity Integrated Assessment and Computation Tool (B-INTACT) uniquely seeks to provide a thorough biodiversity assessment of project-level activities in the Agriculture, Forestry and Other Land Use (AFOLU) sector, taking on both a quantitative and a qualitative approach. The quantitative approach considers a set of relationships for anthropogenic impacts on biodiversity from land use changes, habitat fragmentation, infrastructure and human encroachment, expressed in the mean species abundance (MSA) metric. Non-quantifiable impacts to biodiversity from project activities are assessed with a qualitative appraisal. The tool aims to quantify the biodiversity impact of various investments at project and policy-level using globally recognized environmental assessment methodologies.
More info and source:	- FAO. (2022a). Economic and Policy Analysis of Climate Change. The Biodiversity Integrated Assessment and Computation Tool (B-INTACT). https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/b-intact/en/
Applications in agri-food context:	- FAO. (2021). Biodiversity Integrated Assessment and Computation Tool | B-INTACT – Guidelines. In Biodiversity Integrated Assessment and Computation Tool | B-INTACT – Guidelines. https://doi.org/10.4060/cb3393en

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Sustainable Trade Toolbox

Nº 11: Calibrated programming models

Type: Model

Topic: Environment/Natural capital
Knowledge, technology & facilities

Keywords:	**Agricultural production, water, policy, agricultural management.**
Description:	Calibration methods for models of agricultural production and water provide a tool for regional water management and policy as well as a framework for integrating many aspects of regional water and agricultural management.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Howitt, R. E. (1995). Positive mathematical programming. American Journal of Agricultural Economics, 77(2), 329-342.
Applications in agri-food context:	- Graveline, N. (2016). Economic calibrated models for water allocation in agricultural production: A review. Environmental Modelling and Software, 81, 12–25. https://doi.org/10.1016/j.envsoft.2016.03.004

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Sustainable Trade Toolbox

Nº 12: CAPRI (Common Agricultural Policy Regionalized Impact)

Type: Model

Topic: Value chain
Policy, governance & regulations

Keywords:	**Agricultural production, partial equilibrium models, processing sector, CAP, policy, impact assessment.**
Description:	Common Agricultural Policy Regionalized Impact analysis (CAPRI) modelling framework is considered to be a global static partial equilibrium model regarding the agricultural and primary processing sectors, used to assess the effects of CAP (Common Agricultural Policy) instruments at the EU or Member State level, as well as at sub-national level (Britz and Witzke, 2014). CAPRI model is mainly used for ex-ante impact assessment of environmental, agricultural, and trade policy options.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Britz, W., & Witzke, P. (2014). CAPRI Model Documentation 2014. Available at: https://www.capri-model.org/dokuwiki/doku.php
Applications in agri-food context:	- Barreiro Hurle, J., Bogonos, M., Himics, M., Hristov, J., Perez Dominguez, I.Sahoo, A. & Elleby, C. (2021). Modelling environmental and climate ambition in the agricultural sector with the CAPRI model (No. JRC121368). Joint Research Centre (Seville site)

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Sustainable Trade Toolbox

Nº 13: CARD Model

Type: Model

Topic: Economy & markets
Policy, governance & regulations
Food value chain

Keywords:	**Partial equilibrium models, trade dynamics, impacts, forecasting, policy, market, crops, biofuels, livestock.**
Description:	It is a system of econometric, partial equilibrium, non-spatial models for global agriculture, which covers all major temperate crops, sugar, biofuels, dairy, livestock, and meat products for all major producing and consuming regions and countries. The CARD model has been used in various studies to analyse the impact of policies and shocks on agricultural markets . The CARD modelling system is run to generate a baseline, which establishes 10-year projections by country and by crop for production, consumption, prices, and trade.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Searchinger, T., Heimlich, R., Houghton, R. A., Dong, F., Elobeid, A., Fabiosa, J., ... & Yu, T. H. (2008). Use of US croplands for biofuels increases greenhouse gases through emissions from land-use change. Science, 319(5867), 1238-1240. - Hayes, D., Babcock, B., Fabiosa, J., Tokgoz, S., Elobeid, A., Yu, T. H., ... & Dumortier, J. (2009). Biofuels: potential production capacity, effects on grain and livestock sectors, and implications for food prices and consumers. Journal of Agricultural and Applied Economics, 41(2), 465-491. - Dumortier, J., Hayes, D. J., Carriquiry, M., Dong, F., Du, X., Elobeid, A., ... & Tokgoz, S. (2011). Sensitivity of carbon emission estimates from indirect land-use change. Applied Economic Perspectives and Policy, 33(3), 428-448. - Carriquiry, M., Elobeid, A., Dumortier, J., & Goodrich, R. (2020). Incorporating sub-national Brazilian agricultural production and land-use into US biofuel policy evaluation. Applied Economic Perspectives and Policy, 42(3), 497-523.

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Sustainable Trade Toolbox

Nº 14: Causal Loop diagram

Type: Method **Topic:** All

Keywords:	**System relation map, Situation mapping, linkages.**
Description:	To reach a higher/ more systemic level of understanding by mapping the structure – variables and relationships - responsible for the systems' patterns of behaviour and dynamics over time.
More info and source:	- Williams, B., & Hummelbrunner, R. (2009). Systems concepts in action: a practitioner's toolkit. Stanford, California: Stanford University Press. pp. 31-44
Applications in agri-food context:	- Inam, A., Adamowski, J., Halbe, J., & Prasher, S. (2015). Using causal loop diagrams for the initialization of stakeholder engagement in soil salinity management in agricultural watersheds in developing countries: A case study in the Rechna Doab watershed, Pakistan. Journal of Environmental Management, 152, 251–267. https://doi.org/10.1016/j.jenvman.2015.01.052

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Sustainable Trade Toolbox

Nº 15: CBA (Cost Benefit Analysis)

Type: Method **Topic:** Economy & markets

Keywords:	**Cost, economic benefit, investment, input, output, impact assessment.**
Description:	Cost Benefit Analysis (CBA) is a systematic process for calculating and comparing benefits and costs of a given policy or project, based on assigning a monetary value to all the activities associated with the project (either as input or output). This approach generally compares the total investment and other costs required for the implementation of the project. CBA techniques are commonly used to evaluate the feasibility and profitability of business strategies and private and public projects, as well as public policy interventions. CBA helps make clear the total costs of an intervention, as well as the benefits generated.
More info and source:	- IFAD. (2015). Basic concepts and rationale. IFAD'S Internal Guideliness. Economic and Financial Analysis of rural investment projects. https://short.upm.es/lmk1x
Applications in agri-food context:	- Sharma, A. (2021). Cost-benefit analysis rules for the foodservice system. Journal of Hospitality Financial Management, 29(1), 14–21. https://doi.org/10.7275/s78n-vv08 - Miklyaev, M., Jenkins, G., & Shobowale, D. (2021). Sustainability of agricultural crop policies in rwanda: An integrated cost–benefit analysis. Sustainability (Switzerland), 13(1), 1–22. https://doi.org/10.3390/su13010048

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Sustainable Trade Toolbox

Nº 16: CEA (Cost-Effectiveness Analysis)

Type: Method **Topic:** All

Keywords:	**Externalities, cost, input, output, performance assessment.**
Description:	Cost-effectiveness analysis (CEA) compares the relative costs and outcomes (non-monetary effects) of two or more courses of action. It is narrower than a Cost Benefit Analysis (CBA) and excludes any valuation of benefits, focusing instead on the costs of attaining a given target.
More info and source:	- TEEB. (2018). Chapter 7. Teebagrifood Methodology: An overview of evaluation and valuation methods and tools. http://teebweb.org/wp-content/uploads/2018/11/Ch7.pdf
Applications in agri-food context:	- Verguet, S., Kim, J. J., & Jamison, D. T. (2016). Extended Cost-Effectiveness Analysis for Health Policy Assessment: A Tutorial. PharmacoEconomics, 34(9), 913–923. https://doi.org/10.1007/s40273-016-0414-z - Basu, S., Seligman, H., & Bhattacharya, J. (2013). Nutritional policy changes in the supplemental nutrition assistance program: A microsimulation and cost-effectiveness analysis. Medical Decision Making, 33(7), 937–948. https://doi.org/10.1177/0272989X13493971

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Sustainable Trade Toolbox

Nº 17: CGE Models (Computable General Equilibrium)

Type: Model

Topic: Economy & markets
Value chain

Keywords:	**Agricultural production outputs, linkages, income, optimization, scenario.**
Description:	Computable General Equilibrium (CGE) models models consider an economy of many goods which are produced by many sectors. CGE models describe all parts of an economy simultaneously and how these parts interact with each other. The models consider the maximizing behaviour of producers and the utility-maximizing behaviour of consumers as well as the macroeconomic behaviour of an economy, such as changes in the gross domestic product, aggregate saving and investment, government tax revenues and spending, and the balance of trade. Note that the CGE models require large databases.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Viana, J. H., de Moraes, M. M. A., & Araujo Jr, I. T. (2018). Impacts of a Reductionin Water Availability for Agriculture in Brazil. Available at SSRN 3195243 - Ikhide, E. E., Umaru, E. K., Oyebola, F., & Omoju, O. E. (2021). A CGE Analysisof the Gender Productivity Gap in Nigeria's Agriculture Sector. ICAE 2021 International Conference of Agricultural Economists, August 17-31, 2021-Online - Mbanda, V., & Ncube, S. (2021). CGE Analysis of Rural Economic Development through Agriculture Policy in South Africa: A Focus on Poverty, Inequality, and Gender. Working paper 2021-19. PEP Working Paper Series. ISSN 2709-7331

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Sustainable Trade Toolbox

Nº 18: CROPWAT (Water Supply and Water Requirements)

Type: Tool **Topic:** Environment/natural capital

Keywords:	**Water, irrigation, planification, scenarios, situation framing, decision making.**
Description:	Water Supply and Water Requirements (CROPWAT) is a decision support tool. It facilitates the calculation of crop water requirements and irrigation requirements based on soil, climate and crop data. It informs the development of irrigation schedules for different management conditions and the calculation of required water supply for varying crop patterns.
More info and source:	- TEEB. (2018). Chapter 7. Teebagrifood Methodology: An overview of evaluation and valuation methods and tools. http://teebweb.org/wp-content/uploads/2018/11/Ch7.pdf
Applications in agri-food context:	- Bouraima, A. K., Weihua, Z., & Chaofu, W. (2015). Irrigation water requirements of rice using Cropwat model in Northern Benin. International Journal of Agricultural and Biological Engineering, 8(2), 58–64. https://doi.org/10.3965/j.ijabe.20150802.1290 - Bhat, S. A., Pandit, B. A., Khan, J. N., Kumar, R., & Jan, R. (2017). Water Requirements and Irrigation Scheduling of Maize Crop using CROPWAT Model. International Journal of Current Microbiology and Applied Sciences, 6(11), 1662–1670. https://doi.org/10.20546/ijcmas.2017.611.199

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Sustainable Trade Toolbox

Nº 19: DCGE (Dynamic Computable General Equilibrium)

Type: Model **Topic:** Economy & markets

Keywords:	**Agricultural production, computable general equilibrium models, markets, import, price.**
Description:	Dynamic Computable General Equilibrium (DCGE) model explores the association between domestic and international markets by assuming imperfect price-sensitive substitution between domestic production and imports.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Sánchez Chóliz, J., & Sarasa, C. (2019). Uncertainty in irrigation technology: insights from a CGE approach. Water, 11(3), 617. - Solomon, R., Simane, B., & Zaitchik, B. F. (2021). The impact of climate change on agriculture production in Ethiopia: application of a dynamic computable general equilibrium model. American Journal of Climate Change, 10(1), 32-50

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Sustainable Trade Toolbox

Nº 20: Delphi-method / Delphi Toolkit

Type: Method **Topic:** All

Keywords:	**Participatory approach, situation map, perspective analysis.**
Description:	It is an iterative process that involves sending various rounds of questions to a selected group of experts on a particular subject. Responses to one round are summarised and used to inform the next round of questions, seeking to identify agreement and disagreements among participants and generating insights about the topic.
More info and source:	- Global Alliance for improved Nutrition, G. A. for improved. (2021). DELPHI TOOLKIT A tool to surface and assess innovative solutions (Issue May). https://ifssportal.nutritionconnect.org/sites/default/files/2021-05/Delphi%20Toolkit_IFSS%20portal_0.pdf
Applications in agri-food context:	- Mullender, S. M., Sandor, M., Pisanelli, A., Kozyra, J., Borek, R., Ghaley, B. B., Gliga, A., von Oppenkowski, M., Roesler, T., Salkanovic, E., Smith, J., & Smith, L. G. (2020). A delphi-style approach for developing an integrated food/non-food system sustainability assessment tool. Environmental Impact Assessment Review, 84. https://doi.org/10.1016/j.eiar.2020.106415

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Sustainable Trade Toolbox

Nº 21: DLG (Sustainability Standard of the German Agricultural Society)

Type: Model

Topic: Knowledge, technology & facilities
Food value chain

Keywords:	**Sustainability assessment models, agricultural production outputs, farm, standards, Germany, sustainability.**
Description:	Sustainability Standard of the German Agricultural Society (DLG) focuses on analysis and certification for German farms and agricultural products, food, energy crop, and livestock with a goal of documentation and communication to support an agricultural sustainable economy (Doluschitz et al., 2009).
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Doluschitz, R., Zapf, R., & Schultheiss, U. (2009). Nachhaltigkeit landwirtschaftlicher Betriebe—Einordnung und Stärken-Schwächenanalyse von Bewertungssystemen. Berichte uber Landwirtschaft, 87(3), 380.
Applications in agri-food context:	- Burkart, S. (2016). Social sustainability in agriculture : Insights into the Sustainability Standard of the German Agricultural Society (DLG) Stefan Burkart , Raphael Schäfer. July 2013. https://doi.org/10.13140/RG.2.2.26506.47042

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Sustainable Trade Toolbox

Nº 22: Dynamic CGE-Water

Type: Model

Topic: Economy & markets
Environment/natural capital

Keywords:	**Computable General Equilibrium models, agricultural production outputs, water.**
Description:	Dynamic CGE-Water modelling framework is a multi-sector, multi-region, recursively dynamic modelling approach, extending the standard GTAP model.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Hertel, T. W. (1997). Global Trade Analysis: Modeling and Applications. Cambridge and New York: Cambridge University Press. 1997
Applications in agri-food context:	- Zeshan, M., & Shakeel, M. (2021). Water Crisis in Pakistan: A Dynamic CGE-Water Model

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Sustainable Trade Toolbox

Nº 23: EX-Ante Carbon-balance Tool (EX-ACT)

Type: Tool **Topic:** Environment/natural capital

Keywords:	**Emissions, externalities, performance analysis, agricultural outputs, environmental impacts.**
Description:	EX-Ante Carbon-balance Tool (EX-ACT) is based on the Intergovernmental Panel on Climate Change (IPCC) methodology for greenhouse gas (GHG) emissions inventories. EX-ACT provides its users a consistent way of estimating and tracking the outcomes of agricultural interventions on GHG emissions. EX-ACT is the only GHG accounting tool to cover the entire agricultural sector including Agriculture, Forestry and Other Land Use (AFOLU,) inland and coastal wetlands, fisheries and aquaculture, agricultural inputs and infrastructure.
More info and source:	- FAO. (2022b). Economic and Policy Analysis of Climate Change. The EX-Ante Carbon-balance Tool (EX-ACT). https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/ex-act/en/
Applications in agri-food context:	- FAO. (2019). EX-Ante Carbon-balance Tool | EX-ACT: Mainstreaming greenhouse gas accounting into agricultural investments and policies.

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Sustainable Trade Toolbox

Nº 24: EX-Ante Carbon-balance Tool for value chains (EX-ACT VC)

Type: Tool

Topic: Environment/natural capital
Food value chain

Keywords:	**Emissions, externalities, performance analysis, environmental impacts.**
Description:	EX-Ante Carbon-balance Tool for value chains (EX-ACT VC) is a quantitative multi-appraisal tool that aims to support policymakers in identifying greenhouse gas (GHG) emissions along an agri-food value chain. It analyses GHG fluxes from farm-gate-to-shelf, as well as potential entry points for socio-economic improvements at each stage of the value chain, allowing the projects and policies for low carbon value chains.
More info and source:	- FAO. (2022c). Economic and Policy Analysis of Climate Change. The EX-Ante Carbon-balance Tool for value chains (EX-ACT VC). https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/ex-act-vc/en/
Applications in agri-food context:	- FAO. (2020). EX-Ante Carbon-balance Tool for value chains: Assessing environmental and socio-economic potential of agri-food value chains.

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Sustainable Trade Toolbox

Nº 25: FAO framework on ending child labour in agriculture

Type: Framework **Topic:** Human capital, Economy & markets

Keywords:	**Child labour, SDGs, FAO.**
Description:	The purpose of the FAO's framework is to guide the Organization in the integration of measures addressing child labour within programmes and initiatives at global, regional and country levels. The framework is aimed to be used by FAO, but others outside the organization are ivited to use it. The frameowrk provides definitions and vissions on child labour, along with guiding principles, key areas of work, and strategies to work on ending child labour.
More info and source:	- FAO. 2020. FAO framework on ending child labour in agriculture. Rome. https://doi.org/10.4060/ca9502en
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 26: FAPDA (Food And Agriculture Policy Decision Analysis)

Type: Decision-support database **Topic:** Policy, governance & regulations

Keywords:	**Food policy, decision making, situation framing.**
Description:	Food And Agriculture Policy Decision Analysis (FAPDA) is a web-based platform gathering information on food and agriculture policy decisions since 2007 from more than 80 countries (5000+ policies registered). The tool allows users to directly access and retrieve information by country or region, date or type of policy.
More info and source:	- FAO. (2022d). Fapda - Food And Agriculture Policy Decision Analysis Tool. http://fapda.apps.fao.org/fapda/#main.html
Applications in agri-food context:	- Maetz, M., Aguirre, M., Kim, S., Matinroshan, Y., Pangrazio, G., & Pernechele, V. (2011). Food and agricultural policy trends after the 2008 food security crisis. 44.

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Sustainable Trade Toolbox

Nº 27: Feminist Principles to Program, Monitoring, Evaluation, Accountability and Learning

Type: **Principles** **Topic:** **Human capital**

Keywords:	**Gender analysis, guidelines, human rights, monitoring.**
Description:	Examples and lessons learned to illustrate how the Oxfam International Feminist Monitoring, Evaluation, Accountability and Leaning (MEAL) Principles has been used in the design and practices of MEAL systems.
More info and source:	- Wakefield, S., & Koerppen, D. (2017). Applying Feminist Principles to program monitoring, evaluation, accountability and learning. Oxfam Discussion Paper. www.oxfam.org
Applications in agri-food context:	- Wakefield, S., & Koerppen, D. (2017). Applying Feminist Principles to program monitoring, evaluation, accountability and learning. Oxfam Discussion Paper, July. www.oxfam.org

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Sustainable Trade Toolbox

Nº 28: Food Policy Analysis Tools

Type: Decision-support database **Topic:** Policy, governance & regulations

Keywords:	**Toolbox, database, food policy, situation framing, decision making**
Description:	Information-and decision-support tools to strengthen the ability of policymakers, food policy experts, and researchers to respond quickly to dynamic developments in the world food system.
More info and source:	- Food Security Portal. (2022). Food Policy Analysis Tools. https://www.foodsecurityportal.org/tools
Applications in agri-food context:	- Louhichi, K., & Gomez y Paloma, S. (2014). A farm household model for agri-food policy analysis in developing countries: Application to smallholder farmers in Sierra Leone. Food Policy, 45, 1–13. https://doi.org/10.1016/j.foodpol.2013.10.012

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Sustainable Trade Toolbox

Nº 29: Force Field Analysis

Type: Tool **Topic:** All

Keywords:	**Agency, situation map, linkages, power relations, governance.**
Description:	Force Field Analysis, is a widely used tool to inform decision making, particularly with regards to managing change. The method can be used to gain a comprehensive overview and assess the sources and strengths of all different forces acting on a potential organizational issue or intervention.
More info and source:	- MSP Guide. (2022a). Force Field Analysis. Tool 16. https://mspguide.org/2022/03/18/force-field-analysis/
Applications in agri-food context:	- Schwering, R. E. (2003). Focusing leadership through force field analysis: new variations on a venerable planning tool. Leadership & Organization Development Journal, 24(7), 361–370. https://doi.org/10.1108/01437730310498587

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Sustainable Trade Toolbox

Nº 30: Forms and Power

Type: Tool **Topic:** Social capital

Keywords:	**Agency, situation map, linkages, power relations, governance, participatory approach.**
Description:	This tool aims to help reflecting on different expressions and faces of power, in a multistakeholder partnership to explore power dynamics.
More info and source:	- MSP Guide. (2022). Forms of Power. Tool 27. https://mspguide.org/2022/03/18/forms-of-power/
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 31: FPA (Flower Pollinated Algorithm)

Type: Model

Topic: Environment/natural capital
Food value chain

Keywords:	**Agricultural Production, optimal crop allocation models, pollination.**
Description:	Flower Pollinated Algorithm (FPA) is utilized to solve diverse types of optimization matters, with its algorithm being based on the pollination principle.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Yang, X. S. (2012, September). Flower pollination algorithm for global optimization. In International Conference on Unconventional Computing and Natural Computation (pp. 240-249). Springer, Berlin, Heidelberg.
Applications in agri-food context:	- Ejieji, C. N., & Akinsunmade, A. E. (2020). Agricultural Model for Allocation of Crops Using Pollination Intelligence Method. Applied Computational Intelligence and Soft Computing, 2020.

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Sustainable Trade Toolbox

Nº 32: Fuzzy Cognitive Maps

Type: Model **Topic:** All

Keywords:	**Complex systems, linkages, perspective analysis, system dynamic assessment, agency, participatory approach.**
Description:	Semiquantitative models that represent the behaviour of complex systems based on people's perceptions. It aggregates stakeholders/ expert knowledge into a standardized format, thus allowing a broad range of knowledge types to be in-regrated and communicated.
More info and source:	- Gray, S. A., S. Gray, J. L. De Kok, A. E. R. Helfgott, B. O'Dwyer, R. Jordan, and A. Nyaki. 2015. Using fuzzy cognitive mapping as a participatory approach to analyze change, preferred states, and perceived resilience of social-ecological systems. Ecology and Society. http://dx.doi.org/10.5751/ES-07396-200211 - Halbe, J., & Adamowski, J. (2019). Modeling sustainability visions: A case study of multi-scale food systems in Southwestern Ontario. Journal of Environmental Management, 231, 1028–1047. https://doi.org/10.1016/j.jenvman.2018.09.099
Applications in agri-food context:	- Christen, B., Kjeldsen, C., Dalgaard, T., & Martin-Ortega, J. (2015). Can fuzzy cognitive mapping help in agricultural policy design and communication? Land Use Policy, 45, 64–75. https://doi.org/10.1016/j.landusepol.2015.01.001 - Papageorgiou, E. I., Markinos, A. T., & Gemtos, T. A. (2011). Fuzzy cognitive map based approach for predicting yield in cotton crop production as a basis for decision support system in precision agriculture application. Applied Soft Computing Journal, 11(4), 3643–3657. https://doi.org/10.1016/j.asoc.2011.01.036

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Nº 33: GEM (Green Economy Model)

Type: Model

Topic: Policy, governance & regulations
Environment/natural capital

Keywords:	**Agricultural production, system dynamics, policy, land use, forecasting, agency sustainability.**
Description:	Green Economy Model (GEM) is an integrated assessment model used to analyse the impacts of sustainable development-oriented policies across sectors and actors over time, and if integrated with spatial modelling, space. At the core of the module are land use for crop production and land productivity as well as the total livestock herd. GEM forecasts agriculture land use and livestock herd based on total population, productivity, and climate-related variables. Forecasts are usually aligned with relevant development plans and/or validated by relevant project stakeholders.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - UNEP (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. Nairobi, United Nations Environment Programme
Applications in agri-food context:	- GoE (2021). Updated Nationally Determined Contribution - Federal Democratic Republic of Ethiopia. Government of Ethiopia.

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Nº 34: GEM-E3 (General Equilibrium Model for Economy, Energy, and Environment)

Type: Model

Topic: Policy, governance & regultaions
Enviroment/natural capital
Economy & markets

Keywords:	**Computable general equilibrium model, system dynamics, impact assessment, policy, energy, externalities.**
Description:	General Equilibrium Model for Economy, Energy, and Environment (GEM-E3) is a recursive dynamic CGE model, multi-regional and multi-sectoral that is mainly used for policy analyses and impact evaluations on the three E's. The creators (Capros et al., 2013) aimed to cover the topic of sustainable economic growth and to support the study of associated policy matters.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Capros, P., Van Regemorter, D., Paroussos, L., Karkatsoulis, P., Fragkiadakis, C., Tsani, S., ... & Abrell, J. (2013). GEM-E3 model documentation. JRC Scientific and Policy Reports, 26034.
Applications in agri-food context:	- Paroussos, L., Fragkiadakis, K., & Fragkos, P. (2020). Macro-economic analysis of green growth policies: the role of finance and technical progress in Italian green growth. Climatic Change, 160(4), 591-608.

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Nº 35: GIS (geographic Information System)

Type: Tool **Topic:** All

Keywords:	**Decision Making, situation mapping.**
Description:	Geographic Information System (GIS) is a technological tool which captures, manages, and helps to analyse all forms of geographic reference data and facilitate informed decision making. It's an information system which helps integrate and present geographical data as per specific project requirements. Use of the GIS tool is increasing in building (schedule management, supply footprint, logistics, etc.), O&M (energy, space management, waste management etc.), and recycling portions of the life cycle.
More info and source:	- Khandelwal, A. (2012). Using GIS to advance sustainability. Sustainability Outlook. http://www.sustainabilityoutlook.in/content/using-gis-advance-sustainability
Applications in agri-food context:	- Gimpel, A., Stelzenmüller, V., Töpsch, S., Galparsoro, I., Gubbins, M., Miller, D., Murillas, A., Murray, A. G., Pınarbaşı, K., Roca, G., & Watret, R. (2018). A GIS-based tool for an integrated assessment of spatial planning trade-offs with aquaculture. Science of the Total Environment, 627, 1644–1655. https://doi.org/10.1016/j.scitotenv.2018.01.133

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Nº 36: GLOBIOM (Global Biosphere Management Model)

Type: Model **Topic:** Environment/natural capital

Keywords:	**Partial equilibrium model, trade dynamics, land use, ecosystem services, bioenergy, forest, livestock, agriculture, water, land use.**
Description:	Global Biosphere Management Model (GLOBIOM) is a global, recursively dynamic, partial equilibrium model used to investigate the various trade-offs and synergies around land use and ecosystem services. It uses extensive socioeconomic and geospatial data to capture the numerous interrelationships between diverse systems engaged in the provision of agriculture and forestry products. It includes the 18 most important crops in the world, as well as a variety of livestock production operations, forestry commodities, first and second-generation bioenergy, and water. Land, management, and weather characteristics are all taken into account in the production process. (Takayama and Judge, 1971; McCarl and Spreen, 1980; CSIRO, 2021).
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Takayama, T., & Judge, G. G. (1964). An interregional activity analysis model for the agricultural sector. American Journal of Agricultural Economics, 46(2), 349- 365. - McCarl, B. A., & Spreen, T. H. (1980). Price endogenous mathematical programming as a tool for sector analysis. American Journal of Agricultural Economics, 62(1), 87-102. https://doi.org/10.2307/1239475
Applications in agri-food context:	- Baker, J. S., Havlík, P., Beach, R., Leclère, D., Schmid, E., Valin, H., ... & McFarland, J. (2018). Evaluating the effects of climate change on US agricultural systems: sensitivity to regional impact and trade expansion scenarios. Environmental Research Letters, 13(6), 064019.

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Sustainable Trade Toolbox

Nº 37: GTAP (Global Trade Analysis Project)

Type: Model **Topic:** All

Keywords:	**Computable general equilibrium model, trade dynamics, input, output.**
Description:	Global Trade Analysis Project (GTAP) model is a global, general equilibrium, comparative static model, based on an input output accounting framework that is complete, in the sense that all sources and uses of each economic good are accounted for, as are all inputs into production.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Hertel, T. W., & Tsigas M. E. (1997). Structure of GTAP. In Global Trade Analysis: Modeling and Applications, edited by T. W. Hertel, 9–71. Cambridge: Cambridge University Press. - Corong, E. L., Hertel, T. W., McDougall, R., Tsigas, M. E., & van der Mensbrugghe, D. (2017). The standard GTAP model, version 7. Journal of Global Economic Analysis, 2(1), 1-119.
Applications in agri-food context:	- Ouraich, I., Dudu, H., Tyner, W. E., & Cakmak, E. H. (2019). Agriculture, trade, and climate change adaptation: a global CGE analysis for Morocco and Turkey. The Journal of North African Studies, 24(6), 961-991.

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Sustainable Trade Toolbox

Nº 38: GTAP model extensions

Type: Model **Topic:** Policy, governance & regultaions

Keywords:	**Computable general equilibrium models, trade dynamics, policy.**
Description:	Standard model has been frequently modified to become more suitable for policy analysis. In particular, the following six modifications of the standard GTAP model are considered for policy analysis: GTAP-AGR examine agricultural policy reforms GTAP-POV to evaluate the consequences of agricultural policy reforms on poverty in the world's poorest countries. - The MyGTAP evaluate the distributional impacts of policy applications Grant et al. (2009) nested within the GTAP model, a detailed, partial equilibrium model of the dairy sector, which allows for sophisticated analysis of tariff-line expansion. - The GTAP-E (Burniaux and Truong, 2002) accurately represents energy demands across the economy and binds these to greenhouse gas (GHG) emissions. The GTAP-E focuses on the potential for substituting fossil fuels (the primary source of CO2 emissions) and between those fuels and other sources of energy and capital/labour. - GTAP-IRTS (Francois, 1998) is an extension that has a variety of market structures, such as monopolistic competition or Cournot oligopoly with GDyn introduces time as a continuous variable in the GTAP model, which, when shocked, moves the economy forward in time" - The GTAP-AEZ allows for heterogeneous land endowments in each region, and it was at least initially aimed to analyse land-based climate mitigation and, more recently, is used to investigate induced land-use change from biofuels. - The GTAP-BIO extension contributed to analysing the global land use impacts of biofuels by disaggregating biofuel production GTAP-BIO-W extension incorporated water as an additional component of the biofuel products GTAP-POWER differentiates electric power generation by major types (e.g., coal, nuclear, hydroelectric, etc.), and differentiates base vs. peak load capacities. This model extension obtains a high data quality.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170

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Applications in agri-food context:	- Keeney, R., & Hertel, T. (2005). GTAP-AGR: A framework for assessing the implications of multilateral changes in agricultural policies. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Technical Paper No. 24." - Beckman, J., Estrades, C., & Aguiar, A. (2019). Export taxes, food prices and poverty: a global CGE evaluation. Food Security, 11(1), 233-247. Hertel, T., Verma, M., Ivanic, M., Magalhaes, E., Ludena, C., & Rios, A. (2015). GTAP-POV: A framework for assessing the national poverty impacts of global economic and environmental policies. GTAP Technical Paper No. 31, Purdue University. - Walmsley, T., & Minor, P. (2013). MyGTAP model: a model for employing data from the MyGTAP data application—multiple households, Split Factors, Remittances, Foreign Aid and Transfers. - Narayana, B. G., Hertel, T. W., & Horridge, J. M. (2010). Linking partial and general equilibrium models: a GTAP application Using TASTE. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Technical Paper No. 29. - Burniaux, J. M., & Truong, T. P. (2002). GTAP-E: an energy-environmental version of the GTAP model. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Technical Paper No. 16. - Francois, J. F. (1998). Scale Economies and Imperfect Competition in the GTAP Model. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Technical Paper No. 14. - Ianchovichina, E., & McDougall, R. (2000). Theoretical Structure of Dynamic GTAP. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Technical Paper No. 17. - Darwin, R., Tsigas, M., Lewandrowski, J., & Raneses, A. (1995). World Agriculture and Climate Change: Economic Adaptations. Natural Resources and Environment Division, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 703. - Birur, D., Hertel, T., & Tyner, W. (2007). Impact of biofuel production on world agricultural markets: a computable general equilibrium analysis. Global Trade Analysis Project (GTAP), Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Working Paper No. 53. - Taheripour, F., Hertel, T. W., & Liu, J. (2013a). Introducing water by river basin into the GTAP-BIO model: GTAP-BIO-W. Global Trade Analysis Project (GTAP), 84 www.sustainable-agri-trade.eu Department of Agricultural Economics, Purdue University, West Lafayette, IN, GTAP Working Paper No. 77. - Antimiani A., Costantini V., Markandya A., Paglialunga E., & Sforna G. (2017). The Green Climate Fund as an effective compensatory mechanism in global climate negotiations. Environmental Science & Policy, 77, 49-68.

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Nº 39: GTEM-C (The Global Trade and Environment Model)

Type: Model

Topic: Environment/natural capital
Social capital

Keywords:	**Computable general equilibrium model, trade dynamics, natural resources, land, labour.**
Description:	Global Trade and Environment Model (GTEM-C) is a dynamic general equilibrium and economy-wide model, capable of projecting trajectories for globally-traded commodities (including agricultural products) and builds upon the global trade and economic core of the Global Trade Analysis Project (GTAP) database. Natural resources, land, and labour are endogenous variables in GTEMC.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Cai, Y., Newth, D., Finnigan, J., & Gunasekera, D. (2015). A hybrid energyeconomy model for global integrated assessment of climate change, carbon mitigation and energy transformation. Applied Energy, 148, 381-395.
Applications in agri-food context:	- Porfirio, L. L., Newth, D., Finnigan, J. J., & Cai, Y. (2018). Economic shifts in agricultural production and trade due to climate change. Palgrave Communications, 4(1), 1-9.

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Nº 40: Guide to Feminist Influencing

Type: Framework **Topic:** Human capital

Keywords:	**Gender analysis, strategy, human rights, guidelines.**
Description:	It presents ideas, strategies and tools to integrate gender, or create gender-focused works, across themes and issues. It includes methodological guidance to: (I) conduct a gender analysis of context & situation; (ii) conduct a gender power analysis; (iii) design a theory of change; (iv) formulate objectives with a gender lens; (v) design the strategy & tactis; (vi) actualize your influencing.
More info and source:	- Blackwell, R., & America, O. (n.d.). Oxfam ' s Guide to Feminist Influencing. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620723/gd-oxfam-guide-feminist-influencing-070319-en.pdf?sequence=5
Applications in agri-food context:	- Savani, M. M., & Stewart, A. (2019). Making market systems work for women dairy farmers in Bangladesh: A final evaluation of Oxfam's Gendered Enterprise and Markets programme in Bangladesh. December, 1–35. https://doi.org/10.21201/2019.5365

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Nº 41: Guide to Gender Analysis

Type: Framework **Topic:** Human capital

Keywords:	**Gender analysis, livelihood, human rights, strategy.**
Description:	Gender analysis is part and parcel of social analysis and the study of social diversity. It provides a focused examination of the differences in the asset bases, livelihood strategies and vulnerabilities between women and men, as well as the reasons for and implications of these differences.
More info and source:	- Food and Agriculture Organization of the United Nations. (2022). Investment Learning Platform (ILP). https://www.fao.org/investment-learning-platform/themes-and-tasks/gender-analysis/en/
Applications in agri-food context:	- Abelson, P. H. (1992). Agriculture and climate change. Science, 257(5066), 9. https://doi.org/10.1126/science.257.5066.9 - International Fund for Agricultural Development. (2017). Community-led value chain development for gender justice and pro-poor wealth creation. 1–4. - Papers, G. D. (2016). Identifying gender inequalities and possibilities for change in shrimp value chains in indonesia and vietnam. Oxfam. - Savani, M. M., & Stewart, A. (2019). Making market systems work for women dairy farmers in Bangladesh: A final evaluation of Oxfam's Gendered Enterprise and Markets programme in Bangladesh. September 2017, 1–35. https://doi.org/10.21201/2019.5365 - Tallontire, A., Dolan, C., Smith, S., & Barrientos, S. (2005). Reaching the marginalised? Gender value chains and ethical trade in African horticulture. Development in Practice, 15(3–4), 559–571. https://doi.org/10.1080/09614520500075771 - Barrientos, S. (2019). Gender dynamics in global value chains. Handbook on Global Value Chains, 324–338. https://doi.org/10.4337/9781788113779.00028 - Ayinde, O., Abduolaye, T., Olaaoye, G., & Akangbe, J. A. (2020). Gender and Innovation in Agriculture : A Case Study of Farmers ' Varietal Preference of Drought Tolerant Maize in Southern Guinea Savannah Region of Nigeria.

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Nº 42: Guidelines for integrating gender in research planning

Type: Principles **Topic:** Human capital

Keywords:	**Gender analysis, guidelines, human rights, monitoring.**
Description:	Guidelines document to integrate a clear and strong gender analysis when planning research. It includes a rubric to identify how integrated gender is in your research.
More info and source:	- Parvez Butt, A., Jayasinghe, N., & Zaaroura, M. (2019). Integrating Gender in Research Planning. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620621/gd-integrating-gender-research-planning-210219-en.pdf?sequence=1
Applications in agri-food context:	- Njuki, J., Waithanji, E., Bagalwa, N., & Kariuki, J. (2013). Guidelines on integrating gender in livestock projects and programs. ILRI Project Report.

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Nº 43: Handbook for monitoring and evaluation of child labour in agriculture

Type: Framework
Tool

Topic: Human capital, Economy & markets

Keywords:	**Child labour, family based agriculture, SDGs, FAO, evaluation, toolkit**
Description:	The Handbook offers guidance and tools for assessing the impacts of agricultural and food security programmes and projects on child labour in family-based agriculture. The handbook is structured around 3 parts: an analysis of child labour in agriculture, monitoing and evaluation guidance on ending child labour, and a toolkit along with templates for working on ending child labour
More info and source:	- FAO (2015). Handbook for monitoring and evaluation of child labour in agriculture. Measuring the impacts of agricultural and food security programmes on child labour in family-based agriculture. Rome, Food and Agriculture Organization of the United Nations. https://www.fao.org/3/i4630e/i4630e.pdf
Applications in agri-food context:	To be updated

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Nº 44: Horizon Scanning

Type: Method **Topic:** All

Keywords:	**Forecast, scenarios, decision making, desirable changes.**
Description:	Horizon scanning is a method of identifying emerging changes at an early stage and assessing how relevant they are for current issues, goals or strategic decisions. Horizon scanning involves the search, evaluation and preparation of signals for current and future developments. Signals are data or indications that may be weak or strong, hidden or already known. If signals for developments stabilize over time, they can establish a medium- to long-term trend or megatrend. Several such trends are bundled in the so-called "sense-making" phase of horizon scanning to form future themes with possible effects, opportunities and risks.
More info and source:	- Geurts, A., Gutknecht, R., Warnke, P., Goetheer, A., Schirrmeister, E., Bakker, B., & Meissner, S. (2022). New perspectives for data-supported foresight: The hybrid AI-expert approach. Futures & foresight science, 4(1). https://doi.org/10.1002/ffo2.99
Applications in agri-food context:	- Glaros, A., Marquis, S., Major, C., Quarshie, P., Ashton, L., Green, A. G., Kc, K. B., Newman, L., Newell, R., Yada, R. Y., & Fraser, E. D. G. (2022). Horizon scanning and review of the impact of five food and food production models for the global food system in 2050. Trends in Food Science and Technology, 119(November 2021), 550–564. https://doi.org/10.1016/j.tifs.2021.11.013

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Nº 45: HRIA (Human Rights Impact Assessment)

Type: Framework

Topic: Policy, governance & regulations
Human capital

Keywords:	**Human rights, policy, impacts, prevention.**
Description:	Human Rights Impact Assessment (HRIA) is an instrument for examining policies, legislation, programs and projects to identify and measure their effects on human rights. HRIA's essential purpose is to help prevent harmful effects of the action, while maximizing positive effects. HRIA can be useful, in cases where the human rights implications of a proposed policy or project are not clear at the beginning and enhance accountability for impacts on human rights.
More info and source:	- Alternative, G. (2020). Human rights impact assessment toolkit. https://greenalt.org/app/uploads/2018/10/HRIA_Guide_toolkit.pdf
Applications in agri-food context:	- FIDH, CEHPRODEC, & FUPNAPIB. (2017). Endangered Protected Areas and Water Resources in Honduras. The case of the Cuyamel II Hydroelectric Dam Project in San Francisco, Atlántida. https://www.fidh.org/IMG/pdf/22052017_anexo_metodolo_gico_vfinal.pdf - FDIH, PASO, & CCAJAR. (2016). The Human Cost of Oil: A Human Rights Impact Assessment on the Activities of Pacific Exploration & Production Corp. in Puerto Gaitan. https://www.fidh.org/IMG/pdf/colombia_executive_summary.pdf

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Nº 46: Human Rights Indicators

Type: **Framework** **Topic:** **Human capital**

Keywords:	**Human rights, policy, impacts, indicator based, capacity building.**
Description:	Guide covering the conceptual, methodological, and empirical aspects of the approach underlying the identification of context-sensitive indicators to promote and monitor the implementation of human rights. It outlines a framework for building the capacity of human rights monitoring systems and facilitating the use of appropriate tools in policy-making, its implementation and monitoring.
More info and source:	- United Nations Human Rights. (2012). Human right indicators: A Guide to Measurement. https://www.ohchr.org/sites/default/files/Documents/Publications/Human_rights_indicators_en.pdf
Applications in agri-food context:	- Tomaševski, K. (1984). "Human Rights Indicators: The Right to Food as a Test Case". In The Right to Food. Leiden, The Netherlands: Brill | Nijhoff. doi: https://doi.org/10.1163/9789004482302_010

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Nº 47: Human Rights-based approach to data

Type: Principles **Topic:** Human capital

Keywords:	**Human rights, recommendations, good practices, data, sustainability.**
Description:	Set of principles, recommendations and good practices for a data "revolution" for sustainable development, upholding human rights.
More info and source:	- United Nations Human Rights. (2022). A Human Rights-Based Approach To Data Leaving No One Behind in the 2030. https://short.upm.es/ui9wr
Applications in agri-food context:	To be updated

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Nº 48: IAMs (Integrated Assessment Models)

Type: Model **Topic:** Environment/natural capital

Keywords:	**Trade dynamics, water, ecosystems, climate, biodiversity.**
Description:	Integrated Assessment Models (IAMs) designed to examine issues related to the future development of environmental and sustainability topics. Such models have examined the interactions between human activities (such as energy use and agriculture) and environmental factors such as and cover and climate systems.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Hasegawa, T., Fujimori, S., Havlík, P., Valin, H., Bodirsky, B. L., Doelman, J. C., ... & Witzke, P. (2018). Risk of increased food insecurity under stringent global climate change mitigation policy. Nature Climate Change, 8(8), 699-703. - IPCC (2019). Summary for Policymakers. In J. M. P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, (Ed.), Climate change and land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. - Searchinger, T., Edwards, R., Mulligan, D., Heimlich, R., & Plevin, R. (2015). Do biofuel policies seek to cut emissions by cutting food?. Science, 347(6229), 1420-1422. - Meller, L., van Vuuren, D. P., & Cabeza, M. (2015). Quantifying biodiversity impacts of climate change and bioenergy: the role of integrated global scenarios. Regional Environmental Change, 15(6), 961-971. - Rogelj, J., Shindell, D., Jiang, K., Fifita, S., Forster, P., Ginzburg, V., ... & Zickfeld, K. (2018). Mitigation pathways compatible with 1.5 C in the context of sustainable development. In Global warming of 1.5 C (pp. 93-174). Intergovernmental Panel on Climate Change. - Rose, S. K., Kriegler, E., Bibas, R., Calvin, K., Popp, A., van Vuuren, D. P., & Weyant, J. (2014). Bioenergy in energy transformation and climate management. Climatic Change, 123(3), 477-493. - Creutzig, F., Ravindranath, N. H., Berndes, G., Bolwig, S., Bright, R., Cherubini, F., ... & Masera, O. (2015). Bioenergy and climate change mitigation: an assessment. GCB Bioenergy, 7(5), 916-944. - Hasegawa, T., Fujimori, S., Havlík, P., Valin, H., Bodirsky, B. L., Doelman, J. C.,... & Witzke, P. (2018). Risk of increased food insecurity under stringent global climate change mitigation policy. Nature Climate Change, 8(8), 699-703. - Köberle, A. C., Daioglou, V., Rochedo, P., Lucena, A. F., Szklo, A., Fujimori, S., ...& Schaeffer, R. (2022). Can global models provide insights into regional mitigation strategies? A diagnostic model comparison study of bioenergy in Brazil. Climatic Change, 170(1), 1-31.

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Nº 49: IBAT (Integrated Biodiversity Assessment Tool)

Type: Decision-support database **Topic:** Environment/natural capital

Keywords:	**Biodiversity, risk analysis, situation framing, decision making.**
Description:	Integrated Biodiversity Assessment Tool (IBAT) provides a basic risk screening on biodiversity. It draws together information on globally recognised biodiversity information drawn from a number of IUCN's Knowledge Products: IUCN Red List of Threatened Species, Key Biodiversity Areas (priority sites for conservation) and Protected Planet/The World Database on Protected Areas (covering nationally and internationally recognised sites, including IUCN management categories I–VI, Ramsar Wetlands of International Importance and World Heritage sites). Through an interactive mapping tool, decision-makers are able to easily access and use this up-to-date information to identify biodiversity risks and opportunities within or close to a project boundary.
More info and source:	- IBAT. (2022). Sample Downloads. Reports. https://www.ibat-alliance.org/sample-downloads?tab=reports&anchor_id=resource-header
Applications in agri-food context:	- Nygård, H., Murray, C., Andersen, J. H., Martin, G., Torn, K., & Korpinen, S. (2018). BEAT 3.0 – a Tool for Integrated Biodiversity Assessments. Journal of Open Research Software, 6, 1–5. https://doi.org/10.5334/jors.226

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Nº 50: IDRISI Land Change Modeler

Type: Model **Topic:** Environment/natural capital

Keywords:	**Land use, model, planification, scenarios.**
Description:	Land Change Modeler (IDRISI) is land use model to plot out optimal physical placement of economic activities, human settlements and other land uses. Practically, through the identification of trends (e.g. for population) and/or the use of assumptions for future land use change (e.g. land use per person). This model generate future land cover maps that optimize placement in space.
More info and source:	- TEEB. (2018). Chapter 7. Teebagrifood Methodology: An overview of evaluation and valuation methods and tools. http://teebweb.org/wp-content/uploads/2018/11/Ch7.pdf
Applications in agri-food context:	- Mishra, V., Rai, P., & Mohan, K. (2014). Prediction of land use changes based on land change modeler (LCM) using remote sensing: A case study of Muzaffarpur (Bihar), India. Journal of the Geographical Institute Jovan Cvijic, SASA, 64(1), 111–127. https://doi.org/10.2298/ijgi1401111m

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Nº 51: IMPACT (The International Model for Policy Analysis of Agricultural Commodities and Trade)

Type: Model

Topic: Human capital
Environment/natural capital

Keywords:	**Partial equilibrium models, trade dynamics, agricultural production, forecasting, food security, climate, water.**
Description:	International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) is a model that tests the connection of essential food commodities and food demand with security on a national level under the circumstances of future alterations of related factors. It is an integrated modelling system linked mainly to core partial equilibrium, multimarket model and is focused on the agriculture sector considering trade, global production, demand, and prices for agricultural commodities. This model provides policymakers and researchers with the flexibility to examine and compare the effects of changes in socioeconomic trends, biophysical systems, policies, and technologies.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Robinson, S., Mason-D'Croz, D., Sulser, T., Islam, S., Robertson, R., Zhu, T., ... & Rosegrant, M. W. (2015). The international model for policy analysis of agricultural commodities and trade (IMPACT): model description for version 3. Environment and Production Technology Division of IFPRI.
Applications in agri-food context:	Trade dynamics: - Rosegrant, M. W., Agcaoili-Sombilla, M. C., & Perez, N. D. (1995). Global food projections to 2020: Implications for investment. Washington, D.C. Waithaka, M., Nelson, G. C., Thomas, T. S., & Kyotalimye, M. (Eds.). (2013). East African agriculture and climate change: A comprehensive analysis. Washington, DC: International Food Policy Research Institute. - Hachigonta, S., Nelson, G. C., Thomas, T. S., & Sibanda, L. M. (Eds.). (2013). Southern African agriculture and climate change: a comprehensive analysis. Washington, DC: International Food Policy Research Institute. - Sulser, T. B., Nestorova, B., Rosegrant, M. W., & van Rheenen, T. (2011). The future role of agriculture in the Arab region's food security. Food Security, 3(1),23-48. - Nelson, G. C., Rosegrant, M. W., Palazzo, A., Gray, I., Ingersoll, C., Robertson, R., ... & You, L. (2010). Food security, farming, and climate change to 2050: scenarios, results, policy options. Washington, DC: International Food Policy Research Institute. - Rosegrant, M. W., Koo, J., Cenacchi, N., Ringler, C., Robertson, R. D., Fisher, M., ... & Sabbagh, P. (2014). Food security in a world of natural resource scarcity: The role of agricultural technologies. Washington, DC: International Food Policy Research Institute. - Ignaciuk, A., & Mason-D'Croz, D. (2014). Modelling adaptation to climate change in agriculture. OECD Food, Agriculture and Fisheries Papers No. 70. Paris: OECD. - Palazzo, A., Vervoort, J., Havlik, P., Mason-D'Croz, D., & Islam, S. (2014). Simulating stakeholder-driven food and climate scenarios for policy development in Africa, Asia and Latin America A multi-regional synthesis. CCAFS Working Paper No. 109. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security. Agricultural production: - Wiebe, K., Sulser, T. B., Dunston, S., Rosegrant, M. W., Fuglie, K., Willenbockel,D., & Nelson, G. C. (2021). Modeling impacts of faster productivity growth to inform the CGIAR initiative on Crops to End Hunger. PloS one, 16(4), e0249994

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Sustainable Trade Toolbox

Nº 52: Influence Matrix

Type: Tool

Topic: Policy, governance & regulations
Social capital

Keywords:	**Agency, situation map, linkages, power relations, governance, transition pathways.**
Description:	Making an Importance versus Influence Matrix helps to map out stakeholders and their relation to the issue. It generates insights on the importance and influence of each stakeholder. With this information, it becomes possible to develop a specific approach and strategy for the identified stakeholders.
More info and source:	- MSP Guide. (2022e). Stakeholder Analysis. Tool 12. https://mspguide.org/2022/03/18/stakeholder-analysis/
Applications in agri-food context:	- Xu, W., Zhou, C., Cao, A., & Luo, M. (2016). Understanding the mechanism of food waste management by using stakeholder analysis and social network model: An industrial ecology perspective. Ecological Modelling, 337, 63–72. https://doi.org/10.1016/j.ecolmodel.2016.06.006

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Sustainable Trade Toolbox

Nº 53: Integrating Gender Issues into Agricultural Chains (INGIA-VC framework)

Type: Framework **Topic:** Human capital

Keywords:	**Gender analysis, strategy, assessment, human rights, guidelines.**
Description:	Five-step process for identifying and evaluating gender-based constraints within agricultural value chains with tools and worksheets for implementing the process.
More info and source:	- Gender Platform. (2022). Gender Platform. https://gender.cgiar.org/tools-methods-manuals/integrating-gender-issues-agricultural-value-chains-ingia-vc-understanding
Applications in agri-food context:	- Rubin, Deborah (Cultural Practice LLC), Cristina Manfre (dTS) Barrett, and Kara (dTS) Nichols. 2009. Promoting Gender Equitable Opportunities in Agricultural Value Chains; Promoting Gender Equitable Opportunities in Agricultural Value Chains: A Handbook. Washington, DC: USAID

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Sustainable Trade Toolbox

Nº 54: InVEST (Integrated Valuation of Environmental Services and Trade Offs)

Type: Model **Topic:** Environment/natural capital

Keywords:	**Agricultural production, Spatial model, environmental services, human well being, scenarios, natural inputs.**
Description:	Integrated Valuation of Environmental Services and Trade Offs (InVEST) quantifies and maps environmental services and supports (if required) their economic valuation, allowing defining how changes in the structure and the functioning of ecosystems can affect the flows and values of ecosystem services across a landscape.
More info and source:	- Stanford University. (2022). Natural Capital Project. InVest. https://naturalcapitalproject.stanford.edu/software/invest
Applications in agri-food context:	- Nelson, E., Mendoza, G., Regetz, J., Polasky, S., Tallis, H., Cameron, D. R., Chan, K. M. A., Daily, G. C., Goldstein, J., Kareiva, P. M., Lonsdorf, E., Naidoo, R., Ricketts, T. H., & Shaw, M. R. (2009). Modeling multiple ecosystem services, biodiversity conservation, commodity production, and tradeoffs at landscape scales. Frontiers in Ecology and the Environment, 7(1), 4–11. https://doi.org/10.1890/080023 - Hamel, P., Guerry, A. D., Polasky, S., Han, B., Douglass, J. A., Hamann, M., Janke, B., Kuiper, J. J., Levrel, H., Liu, H., Lonsdorf, E., McDonald, R. I., Nootenboom, C., Ouyang, Z., Remme, R. P., Sharp, R. P., Tardieu, L., Viguié, V., Xu, D., … Daily, G. C. (2021). Mapping the benefits of nature in cities with the InVEST software. Npj Urban Sustainability, 1(1). https://doi.org/10.1038/s42949-021-00027-9

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Sustainable Trade Toolbox

Nº 55: IPC Population Tracking Tool

Type: Decision-support database **Topic:** Human capital

Keywords:	**Food security, human well-being, decision making.**
Description:	Integrated Food Security Phase Classification (IPC) Population Tracking Tool is an online platform that gives the public access to population data from more than 30 different countries. It allows users to download resource data for offline IPC analyses since 2017. All national population figures are based on official country population estimates. IPC estimates are those published in country IPC reports.
More info and source:	- IPC Global Platform. (2022). The IPC Population Tracking Tool.
Applications in agri-food context:	- Fredriksen, A. (2016). Crisis in 'a normal bad year': Spaces of humanitarian emergency, the Integrated Food Security Phase Classification scale and the Somali famine of 2011. Environment and Planning A, 48(1), 40–57. https://doi.org/10.1177/0308518X15597446

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Sustainable Trade Toolbox

Nº 56: iSDG (Integrated Sustainable Development Goal)

Type: Model **Topic:** All

Keywords:	**Agricultural production outputs, system dynamics, transition pathways, SDGs.**
Description:	Integrated Sustainable Development Goal (iSDG) is a Systems Dynamics model intended to assist policymakers and policy planners to determine efficient pathways toward the SDGs. The iSDG model simulates the fundamental trends for SDGs until 2030 under a business-as-usual scenario, and supports the analysis of relevant alternative scenarios. The model also traces the trends beyond the SDGs' time span all the way up to 2050.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - https://www.millenniuminstitute.org - Arquitt, S. (2020). Industry note: Seeing through the SDG maze–the iSDG model, a simulation-based tool to aid SDG planners. International Journal of Agriculture Innovation, Technology and Globalisation, 1(4), 315-322
Applications in agri-food context:	- Pedercini, M., Zuellich, G., Dianati, K., & Arquitt, S. (2018). Toward achieving sustainable development goals in Ivory Coast: Simulating pathways to sustainable development. Sustainable Development, 26(6), 588-595.

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Sustainable Trade Toolbox

Nº 57: KSNL (Criteria for Sustainable Farming)

Type: Model

Topic: Knowledge, technology & facilities
Food value chain

Keywords:	**Sustainability assessment models, agricultural production outputs, farm, standards.**
Description:	Criteria for Sustainable Farming (KSNL) focuses on analysis and certification for the sustainable farm-level crop, livestock, and bioenergy production to identify deficiencies of different sustainable agriculture criteria and advise farmers.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Breitschuh, G., Eckert, H., Matthes, I., Strümpfel, J., Bachmann, G., Herold, M., Breitschuh, T., & Gernand, U. (2008). Kriteriensystem nachhaltige Landwirtschaft (KSNL). KTBL-Schrift 466, Kuratorium für Technik und Bauwesenin der Landwirtschaft e.V. (KTBL), Darmstadt, Germany.
Applications in agri-food context:	- Zapt, R., & Doluschitz, R. (2008). Assessment of sustainability - common requirements and comparative evaluation of the systems RISE, KSNL and the "DLG certification system for sustainable agriculture." 86(3), 357–540.

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Sustainable Trade Toolbox

Nº 58: LandAssess Tool

Type: Tool **Topic:** Human capital, Economy & markets

Keywords:	**Land rights, business, companies, checklist, smallholder farmers**
Description:	The LandAssess Tool is a risk assessment and management framework. It provides a clear and simple set of checklists that generate a report to help agricultural companies assess and manage how they respect land rights.
More info and source:	-Landesa (2022). LANDASSESS TOOL. http://www.landesa.org/what-we-do/landassess-tool
Applications in agri-food context:	- To be updated

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Sustainable Trade Toolbox

Nº 59: LCA (Life Cycle Assessment)

Type: Method

Topic: Environment/natural capital
Food value chain

Keywords:	**Energy, materials, inputs, resources, environmental externalities.**
Description:	Life Cycle Assessment (LCA) is defined as: "a systematic set of procedures for compiling and examining the inputs and outputs of materials and energy and the associated environmental impacts directly attributable to the functioning of a product or service system throughout its life cycle" (IOS 2016). LCA examines physical impacts across the value chain; it can also be viewed as "a tool for the assessment of environmental loadings of entire life cycle processes related to a production system, covering all the processes, activities and resources used" (Mogensen et al. 2012).
More info and source:	- TEEB. (2018). Chapter 7. Teebagrifood Methodology: An overview of evaluation and valuation methods and tools. http://teebweb.org/wp-content/uploads/2018/11/Ch7.pdf
Applications in agri-food context:	- Notarnicola, B., Sala, S., Anton, A., McLaren, S. J., Saouter, E., & Sonesson, U. (2017). The role of life cycle assessment in supporting sustainable agri-food systems: A review of the challenges. Journal of Cleaner Production, 140, 399–409. https://doi.org/10.1016/j.jclepro.2016.06.071 - Curran, M. A. (2016). Life cycle assessment in the agri-food sector: case studies, methodological issues, and best practices. In The International Journal of Life Cycle Assessment (Vol. 21, Issue 5). https://doi.org/10.1007/s11367-015-0977-5

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Sustainable Trade Toolbox

Nº 60: LCC (Life Cycle Costing)

Type: Method **Topic:** Economy & Markets

Keywords:	**Cost, value, materials.**
Description:	Life-Cycle Costing (LCC) means considering all the costs that will be incurred during the lifetime of the product, work, or service. Such as: a) purchase price and all associated costs, b) operating costs, including energy, fuel and water use, spares, and maintenance, c) end-of-life costs or residual value. LCC may also include the cost of externalities under specific conditions laid out in the directives.
More info and source:	- Europe Union. (2022). Life-cycle costing. https://ec.europa.eu/environment/gpp/lcc.htm
Applications in agri-food context:	- Gavaldà, O., González, A., Raya, M., Owen, M., Kemausuor, F., & Arranz-Piera, P. (2022). Life Cycle Cost analysis for industrial bioenergy projects: Development of a simulation tool and application to three demand sectors in Africa. Energy Reports, 8, 2908–2923. https://doi.org/10.1016/j.egyr.2022.02.016

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Sustainable Trade Toolbox

Nº 61: LCSFM (Latent Class Stochastic Frontier Model)

Type: Model **Topic:** Knowledge, technology & facilities

Keywords:	**Partial equilibrium models, trade dynamics, firms, technologies.**
Description:	Latent Class Stochastic Frontier Model (LCSFM) is an error model, which is appropriate for use by researchers who do not have a clear idea of which firms fit with particular production technology or the number of various technologies in the sample (Mekonnen et al., 2015; Martinez Cillero et al., 2016).
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Mekonnen, D. K., Spielman, D. J., Fonsah, E. G., & Dorfman, J. H. (2015). Innovation systems and technical efficiency in developing-country agriculture. Agricultural Economics, 46(5), 689-702.
Applications in agri-food context:	- Dakpo, K. H., Latruffe, L., Desjeux, Y., & Jeanneaux, P. (2021). Latent class modelling for a robust assessment of productivity: Application to French grazing livestock farms. Journal of Agricultural Economics, 72(3), 760-781. - Martinez Cillero, M., Breen, J., Thorne, F., Wallace, M., & Hennessy, T. (2016). Technical efficiency and technology heterogeneity of beef farms: a latent class stochastic frontier approach (No. 358-2016-18333). In Contributed Paperprepared for presentation at the 90th Annual Conference of Agricultural Economics Society. University of Warwick, England, April 2006.

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Sustainable Trade Toolbox

Nº 62: Linear Programming Models

Type: Model

Topic: Value chain
Environment/natural capital
Knowledge, technology & facilities

Keywords:	**Agricultural Production, optimal crop allocation models, soil management, agricultural approaches.**
Description:	Linear programming models have been frequently employed to develop Agricultural production planning models. These models often integrate the production of various goods with various soil management and agricultural approaches, allowing for effective resource allocation and cost minimization.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Heady, E. O. (1954). Simplified presentation and logical aspects of linear programming technique. Journal of Farm Economics, 36(5), 1035-1048. - McCorkle, C. O. (1955). Linear programming as a tool in farm management analysis. Journal of Farm Economics, 37(5), 1222-1235
Applications in agri-food context:	- Osaki, M., & Batalha, M. O. (2014). Optimization model of agricultural production system in grain farms under risk, in Sorriso, Brazil. Agricultural Systems, 127, 178-188.

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Sustainable Trade Toolbox

Nº 63: Linear Programming Module of NutriSurvey

Type: Tool **Topic:** Human capital

Keywords:	**Software, diet optimization, nutrition security, human wellbeing, decision making, situation framing.**
Description:	Linear programming is a mathematical tool which can give clear answers to very practical questions faced in the field by nutritionists working in developing countries. Linear programming is based on the examination of multiple inequalities a the same time.
More info and source:	- Nutrisurvey. (2022). Linear Programming Module of NutriSurvey
Applications in agri-food context:	- Briend, A., Darmon, N., Ferguson, E., & Erhardt, J. G. (2003). Linear programming: A mathematical tool for analyzing and optimizing children's diets during the complementary feeding period. Journal of Pediatric Gastroenterology and Nutrition, 36(1), 12–22. https://doi.org/10.1097/00005176-200301000-00006 - Ferguson, E., Darmon, N., Fahmida, U., Ferguson, E., Darmon, N., & Fahmida, U. (2020). programming Recommendations using Linear Programming.

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Sustainable Trade Toolbox

Nº 64: Logical Diagrams

Type: **Tool** **Topic:** **All**

Keywords:	**Scenarios, linkages, situation mapping, visioning process.**
Description:	Logic Diagrams are used in a variety of inquiries and are frequently created iteratively. They can be used to show plausible causes, conditions, and occurrences to aid in selecting the cause scenario. They can also direct investigators to what more information or evidence should be collected to corroborate or deny a supposed cause scenario. They are very useful way to convey a control sequence in a generic format.
More info and source:	- ScienceDirect. (2022). Logic Diagram. ScienceDirect. https://www.sciencedirect.com/topics/engineering/logic-diagram
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 65: MAGNET (Modular Applied GeNeral Equilibrium Tool)

Type: Model

Topic: Economy & markets
Environment/natural capital
Human capital

Keywords:	**Agricultural production, computable general equilibrium models, land use, agricultural prices, nutrition, household food security.**
Description:	Modular Applied GeNeral Equilibrium Tool (MAGNET) is a standard, dynamic, global general equilibrium model, whose modular structure can be modified according to specific questions research is inquiring about MAGNET was developed based on the standard GTAP, which means it offers a general equilibrium modelling framework on a global scale. Moreover, MAGNET is also based on the LEITAP model used in policy analyses but is more flexible in aggregation and changes in structure. Researchers chose MAGNET to replicate the impacts of agricultural, trade, land, and bioenergy policies on the worldwide economy highlighting the impacts of land use, agricultural prices, nutrition, and household food security.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Woltjer, G. B., Kuiper, M., Kavallari, A., van Meijl, H., Powell, J. P., Rutten, M. M., ... & Tabeau, A. A. (2014). The MAGNET model: Module description (No. 14-57). LEI Wageningen UR.
Applications in agri-food context:	- van Meijl, H., Havlik, P., Lotze-Campen, H., Stehfest, E., Witzke, P., Domínguez, I. P., ... & van Zeist, W. J. (2018). Comparing impacts of climate change and mitigation on global agriculture by 2050. Environmental Research Letters, 13(6), 064021

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Sustainable Trade Toolbox

Nº 66: Mapping approach

Type: Method **Topic:** All

Keywords:	**Participative approach, agency.**
Description:	Powerful mixed method approach that provides an efficient way to generate an interpretable conceptual framework that is developed in the language of participating stakeholders.
More info and source:	To be updated
Applications in agri-food context:	1. Barrientos, S. (2019). Gender dynamics in global value chains. Handbook on Global Value Chains, 324–338. https://doi.org/10.4337/9781788113779.00028

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Sustainable Trade Toolbox

Nº 67: Materiality Assessment

Type: Tool **Topic:** All

Keywords:	**Impact, transition pathways, decision making.**
Description:	Used to determine which impacts and dependencies are the most important and significant in relation to the issue of interest and what you will go on to measure and value. It provides a transparent way to communicate how and why you have limited the scope of the assessment by providing the rationale behind your choices. It informs the boundary decisions on the impact pathways and de-pendency pathways, ensuring a systemic view of the situation to be addressed.
More info and source:	- IDDEA GROUP, & GLOBAL ALLIANCE FOR THE FUTURE OF FOOD. (2020). Applying the TEEBAgrifood Evaluation Framework. Overarching Implementation Guidance. https://futureoffood.org/wp-content/uploads/2021/01/GA_TEEBAgriFood_Guidance.pdf
Applications in agri-food context:	- Torelli, R., Balluchi, F., & Furlotti, K. (2020). The materiality assessment and stakeholder engagement: A content analysis of sustainability reports. Corporate Social Responsibility and Environmental Management, 27(2), 470–484. https://doi.org/10.1002/csr.1813

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Sustainable Trade Toolbox

Nº 68: MCA (Multi-Criteria Analysis)

Type: Method **Topic:** All

Keywords:	**Externalities, multiple criteria, performance analysis.**
Description:	Multi-Criteria Analysis (MCA) expands the boundaries of the analysis beyond cost benefit or cost effectiveness results and allows the assessment of projects against a variety of criteria, including quantitative and qualitative indicators. MCAs can be conducted in cases where multiple objectives and decision criteria exist.
More info and source:	- TEEB. (2018). Chapter 7. Teebagrifood Methodology: An overview of evaluation and valuation methods and tools. http://teebweb.org/wp-content/uploads/2018/11/Ch7.pdf
Applications in agri-food context:	- Gésan-Guiziou, G., Alaphilippe, A., Aubin, J., Bockstaller, C., Boutrou, R., Buche, P., Collet, C., Girard, A., Martinet, V., Membré, J. M., Sabbadin, R., Thiollet-Scholtus, M., & van der Werf, H. M. G. (2020). Diversity and potentiality of multi-criteria decision analysis methods for agri-food research. Agronomy for Sustainable Development, 40(6). https://doi.org/10.1007/s13593-020-00650-3 - Aidonis, D., Folinas, D., Achillas, C., Triantafyllou, D., & Malindretos, G. (2015). Multi-criteria evaluation of sustainable supply chains in the agrifood sector. International Journal of Sustainable Agricultural Management and Informatics, 1(2), 106. https://doi.org/10.1504/IJSAMI.2015.070747

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Sustainable Trade Toolbox

Nº 69: Measuring Distance to the SDG Targets

Type: Decision-support database **Topic:** All

Keywords:	**SDGs, data, trends, countries, OECD, progress, evaluation**
Description:	This report aims to help OECD Member countries evaluate where they currently stand with regard to the SDGs, to assess the direction and pace of their recent trajectory, and to identify areas where additional effort is needed. It also sets out the statistical agenda ahead – showing how much we do not yet know and how this might affect both the achievement of the SDGs and decisions about what to prioritise across this vast agenda.
More info and source:	- OCDE (2022). The Short and Winding Road to 2030. Measuring Distance to the SDG Targets. OECD Publishing, Paris. https://doi.org/10.1787/af4b630d-en
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 70: MetODD-SDG

Type: Tool **Topic:** Economy & markets

Keywords:	**Business assessment, SDGs, mission-driven, impact.**
Description:	MetODD-SDG is an assessment tool that lets mission-driven businesses measure their contribution to the Sustainable Development Goals. MetODD-SDG is a list of micro-level indicators for SDG Targets. MetODD-SDG draws on recent impact measurement initiatives from the private sector including UN Global Compact SDG Compass, UNPRI, GIIN, IMP, SPTF, HIPSO and CSAF. The assessment tool works iteratively with a list of indicators covering 73 Targets for 16 of the 17 SDGs by now. MetODD-SDG was created with the support of the French Ministry of Europe and Foreign Affairs.
More info and source:	-CERISE (2022). MetODD-SDG. https://cerise-spm.org/en/metodd-sdg/
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 71: MIMES (Multi-scale Integrated Models of Ecosystem Services)

Type: Model **Topic:** Environment/natural capital

Keywords:	**Spatial model, environmental services, human well being, scenarios, natural inputs, land use.**
Description:	Multi-scale Integrated Models of Ecosystem Services (MIMES) uses a systems approach (in that it considers entire ecological systems, but not social and economic dynamics) to model changes in ecosystem services across a spatially explicit environment. The model quantifies the effects of land and sea use change on ecosystem services and can be run at global, regional, and local levels.
More info and source:	- AFORDable Futures LLC. (2022). Dynamic Spatial Modeling - MIMES. http://www.afordablefutures.com/orientation-to-what-we-do/services/mimes
Applications in agri-food context:	- Othoniel, B., Rugani, B., Heijungs, R., Withagen, C., & Benetto, E. (2015). The use of ecosystem services integrated modelling in LCA. World Conference on Natural Resource Modeling. 29th June - 1st July.

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Sustainable Trade Toolbox

Nº 72: MIRAGE (Modelling International Relationships in Applied General Equilibrium)

Type: Model **Topic:** Policy, governance & regultaions

Keywords:	**Computable general equilibrium model, trade dynamics, policy, forecasting.**
Description:	Modelling International Relationships in Applied General Equilibrium (MIRAGE) model is a multi-region, multi-sector computable general equilibrium model used to analyse trade policy (Bchir et al., 2002); it is a recursive dynamic model to deal with world structural change from medium to the very long-run horizon. It describes imperfect competition and horizontal product differentiation in a rather standard way, but with a new procedure, allowing the available information to be used more efficiently.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Bchir, M. H., Decreux, Y., Guérin, J. L., & Jean, S. (2003). MIRAGE, a computable general equilibrium model for trade policy analysis. CEPII Working Paper.
Applications in agri-food context:	- Bellora, C., & Foure, J. (2018). Value-added in a Computable General Equilibrium model with oligopolistic competition: drivers and implications of sourcing by agent in the MIRAGE-e model.

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Sustainable Trade Toolbox

Nº 73: MODAM (Multi-Objective Decision Support Model for Agri-Ecosystem Management Model)

Type: Model

Topic: Knowledge, technology & facilities
Food value chain

Keywords:	**Sustainability assessment models, agricultural production outputs, decision making, sustainability, crops, livestock, farm.**
Description:	Multi-Objective Decision Support Model for Agri-Ecosystem Management Model (MODAM), a static, process-based model with multi-objective linear programming. Its' goal is to assess the economic and environmental sustainability of crop and livestock production at the farm level.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Zander, P. M. (2003). Agricultural land use and conservation options: a modelling approach. PhD. Thesis, Wageningen University and Research, The Netherlands
Applications in agri-food context:	- Prato, T., Fulcher, C., Wu, S., & Ma, J. (1996). Multiple-Objective Decision Making for Agroecosystem Management. Agricultural and Resource Economics Review, 25(2), 200–212. https://doi.org/10.1017/s1068280500007863

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Sustainable Trade Toolbox

Nº 74: MONICA (Model for Nitrogen and Carbon Dynamics in Agro-Ecosystems)

Type: Model

Topic: Food value chain
Environment/natural capital
Knowledge, technology & facilities

Keywords:	**Sustainability assessment models, agricultural production outputs, crop growth, ecosystem services, simulation.**
Description:	Model for Nitrogen and Carbon Dynamics in Agro-Ecosystems (MONICA), a dynamic, process-based model with a goal of simulation of crop growth and analysis of its relationship with soil characteristics in changing climate conditions and cropping practices.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Nendel, C., Berg, M., Kersebaum, K. C., Mirschel, W., Specka, X., Wegehenkel, M., ... & Wieland, R. (2011). The MONICA model: Testing predictability for crop growth, soil moisture and nitrogen dynamics. Ecological Modelling, 222(9), 1614-1625.
Applications in agri-food context:	- Chu, M., Guzman, J., & Villamil, M. (2018). A Modeling Framework to Evaluate the Impacts of Future Climate on Soil Organic Carbon Dynamics. Journal of Environmental Quality, 47(4), 596–606. https://doi.org/10.2134/jeq2017.07.0295

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Sustainable Trade Toolbox

Nº 75: National Computable General Equilibrium model

Type: Model **Topic:** Economy & markets

Keywords:	**Agricultural production, computable general equilibrium models, market, land.**
Description:	National Computable General Equilibrium model is an amplified national CGE model that combines economic factors with biophysical models which take into account land heterogeneity and market mechanisms. It is a static model and it eliminates the impact of economical dynamic factors which may be unconnected with the bioethanol extension, the only variable factor that alters at the base year level of the model.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Weng, Y., Chang, S., Cai, W., & Wang, C. (2019). Exploring the impacts of biofuel expansion on land use change and food security based on a land explicit CGE model: A case study of China. Applied Energy, 236, 514-525

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Sustainable Trade Toolbox

Nº 76: Netmapping

Type: Tool **Topic:** Social capital

Keywords:	**Agency, situation map, linkages, perspective analysis, power relations, governance, participatory approach, transition pathways.**
Description:	Net-Map is an interview-based mapping tool that helps people understand, visualize, discuss, and improve situations in which many different actors influence outcomes. By creating Influence Network Maps, individuals and groups can clarify their own view of a situation, foster discussion, and develop a strategic approach to their networking activities.
More info and source:	- IFPRI. (2007). International Food Policy Research Institute. Tool Net-Map. https://www.ifpri.org/publication/net-map
Applications in agri-food context:	- Yaméogo, T. B., Fonta, W. M., & Wünscher, T. (2018). Can social capital influence smallholder farmers' climate-change adaptation decisions? Evidence from three semi-arid communities in Burkina Faso, West Africa. Social Sciences, 7(3), 1–20. https://doi.org/10.3390/socsci7030033

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Sustainable Trade Toolbox

Nº 77: Nodes of Power in the Food System

Type: Framework

Topic: Social capital
Policy, governance & regulations

Keywords:	**Power relations, power inequalities, agency, situation framing.**
Description:	Identification of sources of power concentrated at eight strategic nodes. In each nodes, is examined where the power is accumulated, the critical issues that surround that node, now the power may be leveraged, and potential methodological strategies for documenting it.
More info and source:	- Hendrickson, M., Wilkinson, J., Heffernan, W. D., & Gronski, R. (2011). The Global Food System and Nodes of Power. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.1337273
Applications in agri-food context:	- Hendrickson, M., Wilkinson, J., Heffernan, W. D., & Gronski, R. (2011). The Global Food System and Nodes of Power. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.1337273

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Sustainable Trade Toolbox

Nº 78: Nutrition-sensitive Value Chain Analysis

Type: Method **Topic:** Human Capital

Keywords:	**Situation map, production, inputs, outputs, nutrition security, human well-being.**
Description:	Identify the constraints in supply and demand of commodities as they relate to the nutrition problem. This analysis differs from a standard VC analysis in that it specifically analyses dimensions that are relevant to nutrition, such as food safety, food loss, nutrition value or barriers to consumption from smallholders.
More info and source:	- De La Peña, I., & Garrett, J. (2018). Nutrition-sensitive value chains. A guide for project design, Volume I. https://www.ifad.org/documents/38714170/40804965/GFPD+Nutrition-sensitive+value+chains+VOL.1.pdf/5177a3c0-a148-4b1f-8fff-967a42f51ce8?t=1584027322000
Applications in agri-food context:	- De la Pena, I., Garrett, J., & Gelli, A. (2018). Nutrition-sensitive value chains from a smallholder perspective: A framework for project design . In Go.Gale.Com (Issue January). https://hdl.handle.net/10568/99241 - Allen, S., & de Brauw, A. (2018). Nutrition sensitive value chains: Theory, progress, and open questions. Global Food Security, 16(July 2017), 22–28. https://doi.org/10.1016/j.gfs.2017.07.002

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Sustainable Trade Toolbox

Nº 79: NWF (National Water-Food) modelling framework

Type: Model

Topic: Human capital
Environment/natural capital
Social capital

Keywords:	**System dynamic, trade dynamics, water, population, food security.**
Description:	National Water-Food (NWF) modelling framework examines the broad links between the water use in different sectors, the population dynamics, and their compounding effects on a country's food gap and water self-sufficiency.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Alexandratos, N., & Bruinsma, J. (2012). World agriculture towards 2030/2050: the 2012 revision. '- Abdelkader, A., Elshorbagy, A., Tuninetti, M., Laio, F., Ridolfi, L. F. G. G. M., Fahmy, H., & Hoekstra, A. Y. (2018). National water, food, and trade modeling framework: The case of Egypt. Science of the Total Environment, 639, 485-496.

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Sustainable Trade Toolbox

Nº 80: OECD ENV-Linkages model

Type: Model

Topic: Policy, governance & regultaions
Enviroment/natural capital
Economy & markets

Keywords:	**Computable general equilibrium model, trade dynamics, forecasting, emission.**
Description:	Standard OECD ENV-Linkages model is a global, general equilibrium, recursive dynamic model. The model can explore and quantify policy responses to a series of government environmental initiatives, through future projections of the link between economic activities and emissions.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Burniaux, J. M., & Château, J. (2008). An overview of the OECD Env-linkages model.OECD Economics Department Working Papers, No. 653, OECD Publishing, Paris.
Applications in agri-food context:	- Chateau, J., Rebolledo, C., & Dellink, R. (2011). An Economic Projection to 2050: The OECD" ENV-Linkages" Model Baseline.

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Sustainable Trade Toolbox

Nº 81: OECD-FAO Guidance for Responsible Agricultural Supply Chains

Type: Framework
Indicators

Topic: Economy & markets

Keywords:	**Business assessment, SDGs, due dilligence.**
Description:	Frameowrk with SGDs indicators developed by a working group during the OECD-FAO Agricultural pilot project that illustrates how a company can use its due diligence process to contribute to the SDGs. It can support assessments of companies engaged accross the whole value chain.
More info and source:	- OECD/FAO (2021), OECD-FAO Guidance for Responsible Agricultural Supply Chains - Helping achieve the SDGs, OECD Publishing, Paris. http://mneguidelines.oecd.org/How-the-OECD-FAO-Guidance-can-help-achieve-the-Sustainable-Development-Goals.pdf
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 82: Oxfam inequality guide

Type: Framework **Topic:** Human capital

Keywords:	**Guidelines, participatory approach, human rights, inequalities.**
Description:	Guide to tackling inequalities. It explains why certain issues could be relevant to your work, it provides questions to explore with your team and partners, and it gives options for actions for: (I) tackling power and political inequalities; (ii) strengthening transparency, accountability, citizen participation and space for civil society; (iii) raising public resources: aid, debt, and fair taxation; (iv) raising public resources: revenues form extractive industries; (v) spending public resources on progressive public services; (vi) jobs and wages; (vii) access to productive resources: land and capital; (viii) tackling gender inequalities.
More info and source:	- Oxfam. (2017). Oxfam Inequality Guide. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620253/gt-oxfam-inequality-guide-120417-en.pdf?sequence=1
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 83: Problem tree

Type: Tool **Topic:** All

Keywords:	**Participatory approach, situation map, linkages, desirable change.**
Description:	Problem tree analysis (also called Situational analysis or just Problem analysis) helps to find solutions by mapping out the anatomy of cause and effect around an issue.
More info and source:	- MSP Guide. (2022b). Problem Tree. Tool 14. https://mspguide.org/2022/03/18/problem-tree/
Applications in agri-food context:	- Ammani, A., Auta, S., & Aliyu, J. (2011). Challenges to Sustainability: Applying the Problem Tree Analysis Methodology to the ADP System in Nigeria. Journal of Agricultural Extension, 14(2), 35–45. https://doi.org/10.4314/jae.v14i2.64122

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Sustainable Trade Toolbox

Nº 84: Qualitative scenarios

Type: Method **Topic:** All

Keywords:	**Forecast, scenarios, decision making, desirable changes.**
Description:	Long recognized as a cornerstone of foresight processes, scenarios, and the processes through which they are developed, are rich with opportunities to build anticipatory capacities and make an organization more prepared and resilient in the face of uncertainty and crises. Thus, developing scenarios through systems-level research coupled with rigorous imagination enables teams to develop 'futures literacy' and to inform and improve decisions and robust strategies in the present.
More info and source:	- Fraunhofer. (2022). Communication and Participation for the Societal Transformation towards the Bioeconomy (BioKompass). https://www.isi.fraunhofer.de/en/competence-center/foresight/projekte/biokompass.html
Applications in agri-food context:	- Fraunhofer ISI. (2022a). Digital Agricultural Knowledge and Information System (DAKIS). Innovative integration for landscape smart agriculture. https://www.isi.fraunhofer.de/en/competence-center/foresight/projekte/dakis.html#4 - Rikkonen, P., & Tapio, P. (2009). Future prospects of alternative agro-based bioenergy use in Finland-Constructing scenarios with quantitative and qualitative Delphi data. Technological Forecasting and Social Change, 76(7), 978–990. https://doi.org/10.1016/j.techfore.2008.12.001

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Sustainable Trade Toolbox

Nº 85: Quick Guide to Gender-Sensitive Indicators

Type: Principles **Topic:** Human capital

Keywords:	**Gender analysis, human rights, indicator based, guidelines**
Description:	Guidance to developing gender-sensitive indicators.
More info and source:	- Parvez Butt, A., Jayasinghe, N., & Zaaroura, M. (2019). Integrating Gender in Research Planning. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/312420/ml-quick-guide-to-gender-indicators-300114-en.pdf?sequence=1 - OXFAM. (2014). Quick Guide to Gender-Sensitive Indicators. In Oxfam Gb. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/312420/ml-quick-guide-to-gender-indicators-300114-en.pdf?sequence=1
Applications in agri-food context:	- Quisumbing, Agnes, Jessica Heckert, Simone Faas, Gayathri Ramani, Kalyani Raghunathan, Hazel Malapit, Hazel Malapit, et al. 2021. "Women's Empowerment and Gender Equality in Agricultural Value Chains: Evidence from Four Countries in Asia and Africa." Food Security 13 (5): 1101–24. https://doi.org/10.1007/s12571-021-01193-5.

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Sustainable Trade Toolbox

Nº 86: Regression Models

Type: Model **Topic:** All

Keywords:	**Trade dynamics, agricultural production, production outputs,, impact, forecasting, policy.**
Description:	The models are used to perform impact evaluation, causal analysis, and forecasting. The primary goal of regression analysis is to estimate the causal effects of a policy on an outcome of interest to enhance the credibility of the estimated results.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Koondhar, M. A., Aziz, N., Tan, Z., Yang, S., Abbasi, K. R., & Kong, R. (2021). Green growth of cereal food production under the constraints of agricultural carbon emissions: A new insight from ARDL and VECM models. Sustainable Energy Technologies and Assessments, 47, 101452. - Iorga, E., Oancea C., & Stanca R. (2009). The analysis of variance transmission of the industrial production price on the consumer price variation. Occasional Papers no. 26, National Bank of Romania. - Mehraban, N., Kubitza, C., Alamsyah, Z., & Qaim, M. (2021). Oil palm cultivation, household welfare, and exposure to economic risk in the Indonesian small farm sector. Journal of Agricultural Economics, 72(3), 901-915. AGRICULTURAL PRODUCTION: Ngalawa, H., & Derera, E. (2020). Agricultural Production, Employment and Gender Vulnerability: Covid-19 Implications. African Journal of Governance & Development, 9(1.1), 200-225

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Sustainable Trade Toolbox

Nº 87: Research guidelines for understanding estimates of economic inequality

Type: Principles **Topic:** Human capital

Keywords:	**Economic inequalities, guidelines, data, assessment.**
Description:	Guidelines document that introduces the fundamentals of how economic inequality is estimated, thus shedding light on the diversity of measures and data used for capturing inequality.
More info and source:	- Mager, F. (2019). Understanding Estimates of Economic Inequality. 7. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620172/rg-understanding-estimates-of-economic-inequality-240116-en.pdf?sequence=7
Applications in agri-food context:	To be updated

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Sustainable Trade Toolbox

Nº 88: Rich Picture

Type: Tool **Topic:** All

Keywords:	**Situation mapping, linkages, mapping, participatory approach.**
Description:	Rich picture is a drawing of a situation that illustrates the main elements and relationships that need to be considered in trying to intervene in order to create some improvement. It consists of pictures, text, symbols and icons, which are all used to illustrate graphically the situation. It is called a rich picture because it illustrates the richness and complexity of a situation.
More info and source:	- MSP Guide. (2022b). Rich Picture . https://mspguide.org/2022/03/18/rich-picture/
Applications in agri-food context:	- Monk, A., & Howard, S. (1998). Methods & tools: the rich picture: a tool for reasoning about work context. Interactions, 5(2), 21–30. https://doi.org/10.1145/274430.274434 - Grant, M., Gilgen, A. K., & Buchmann, N. (2019). The rich picture method: A simple tool for reflective teaching and learning about sustainable food systems. Sustainability (Switzerland), 11(18). https://doi.org/10.3390/su11184815

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Sustainable Trade Toolbox

Nº 89: RISE (Response Inducing Sustainability Evaluation)

Type: Model **Topic:** All

Keywords:	**Sustainability assessment models, agricultural production outputs, farm, indicator based tool.**
Description:	Response Inducing Sustainability Evaluation (RISE) that focuses on production at the farm level; a holistic, indicator-based sustainability tool to support farmers in distinguishing precise on-farm deficiencies in sustainability performance (e.g. environmental issues such as biodiversity, water usage, and soil quality; social and economic issues such as working conditions and economic viability) (Grenz et al., 2016).
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Grenz, J., Mainiero, R., Schoch, M., Sereke, F., Stalder, S., Thalmann, C., & Wyss, R. (2016). RISE (Responce-InducingSustainability Evaluation), version 3.0. Bern University of Applied Sciences School of Agricultural, Forest and Food Sciences: Zollikofen, Switzerland.
Applications in agri-food context:	- Pineau -Ilw, M. (2008). Bachelor Thesis-2008 RISE model for Livestock Water Productivity Improvement. www.waterandfood.org

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Sustainable Trade Toolbox

Nº 90: Roadmapping

Type: Tool **Topic:** All

Keywords:	**Forecast, participatory process, scenarios, decision making, desirable changes.**
Description:	Road mapping is a versatile tool to support strategic planning. Roadmaps depict future developments, events or measures over time, whether for technologies, products, sectors, R&D or other areas relevant to planning. It was first developed and used by large companies in technology-intensive industries. Common to all roadmaps is a reference to the future, the temporal linkage of the depicted aspects and the orientation towards a vision or a goal. Road mapping creates an orientation framework by identifying knowledge gaps and inconsistencies at an early stage and identifying appropriate measures in good time. The road mapping process is as important as the result. By uncovering the implicit expertise of experts and converting it into roadmap elements, interactive workshops are a central element of road mapping.
More info and source:	-Specialisation, S., & Ris, S. (2021). INNOVATION UND FOR- SCHUNG SÜDTIROL 2030. https://www.provinz.bz.it/innovation-forschung/innovation-forschung-universitaet/downloads/Innovation_und_Forschung_Suedtirol_2030_RIS3.pdf - Fraunhofer. (2022). Regionale Entwicklungsstrategie TechnologieRegion Karlsruhe 2030. https://www.isi.fraunhofer.de/de/competence-center/foresight/projekte/entwicklungsstrategie-TechnologieRegion-Karlsruhe-2030.html#4report
Applications in agri-food context:	- Berner, S., Derler, H., Rehorska, R., Pabst, S., & Seebacher, U. (2019). Roadmapping to enhance local food supply: Case study of a city-region in Austria. Sustainability (Switzerland), 11(14), 1–16. https://doi.org/10.3390/su11143876

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Sustainable Trade Toolbox

Nº 91: SAFA (Sustainability Assessment of Food and Agricultural Systems)

Type: Model

Topic: Economy & markets
Environment/natural capital
Policy, governance & regulations

Keywords:	**Sustainability assessment models, agricultural production outputs, firms, sustainability, standards.**
Description:	Sustainability Assessment of Food and Agricultural Systems (SAFA) focuses on observation and self-assessment of enterprises in the food and agricultural sector with a goal of worldwide recognized standard for agriculture sustainability assessment.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - FAO (2013). SAFA Sustainability Assessment of Food and Agriculture Systems Indicators. Food and Agriculture Organization of the United Nations (FAO): Rome, Italy
Applications in agri-food context:	- Soldi, A., Meza, M. J. A., Guareschi, M., Donati, M., & Ortiz, A. I. (2019). Sustainability assessment of agricultural systems in Paraguay: A comparative study using FAO's SAFA framework. Sustainability (Switzerland), 11(13). https://doi.org/10.3390/su11133745

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Sustainable Trade Toolbox

Nº 92: SALCAsustain methodology

Type: Method

Topic: Knowledge
Enviroment/natural capital

Keywords:	**Sustainability assessment models, agricultural production outputs, indicator based.**
Description:	SALCAsustain is an indicator-based sustainability method that evaluates dimensions and subjects. It is a more complex model compared to others that can give researchers answers to their queries and analyses of various farm management strategies.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Roesch, A., Nyfeler-Brunner, A., & Gaillard, G. (2021). Sustainability assessment of farms using SALCAsustain methodology. Sustainable Production and Consumption, 27, 1392-1405

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Sustainable Trade Toolbox

Nº 93: Scenario Planning

Type: Method **Topic:** All

Keywords:	**Scenarios, visioning process, agency, linkages, power relations, governance, participatory approach, transition pathways.**
Description:	Scenario Planning uses stories of what could happen in the future with diverse stakeholders in order to decide jointly how they want to influence the future. Scenarios consist of a range of multiple stories or hypotheses to capture a range of future possibilities, both good and bad. They include diverse external issues, which might evolve. Scenario planning consists of the process through which scenarios are developed and how they are used to inform strategic planning.
More info and source:	- MSP Guide. (2022c). Scenario Planning. Tool 36. https://mspguide.org/2022/03/18/scenario-planning/
Applications in agri-food context:	- Chermack, T. J., & Lynham, S. A. (2002). Definitions and Outcome Variables of Scenario Planning. Human Resource Development Review, 1(3), 366–383. https://doi.org/10.1177/1534484302013006

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Sustainable Trade Toolbox

Nº 94: SDG Trade Monitor

Type: Decision-support database **Topic:** Economy & markets

Keywords:	**Indicator based tool, trade, SDG.**
Description:	It is a free analytical portal to track down the progress made in the area of international trade toward the achievement of the Sustainable Development Goals. SDG Trade Monitor allows to conduct customized analysis using official trade-related SDG indicators and other complementary indicators to provide you with a more extensive understanding of the relation between trade and development in the SDG agenda.
More info and source:	- ITC, UNCTAD, & WTO. (2022). Analyse the contribution of international trade to economic development with the SDG Trade Monitor. https://sdgtrade.org/en
Applications in agri-food context:	- Siegel, K. M., & Bastos Lima, M. G. (2020). When international sustainability frameworks encounter domestic politics: The sustainable development goals and agri-food governance in South America. World Development, 135, 105053. https://doi.org/10.1016/j.worlddev.2020.105053 - Tanumihardjo, S. A., McCulley, L., Roh, R., Lopez-Ridaura, S., Palacios-Rojas, N., & Gunaratna, N. S. (2020). Maize agro-food systems to ensure food and nutrition security in reference to the Sustainable Development Goals. Global Food Security, 25(August 2019), 100327. https://doi.org/10.1016/j.gfs.2019.100327

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Sustainable Trade Toolbox

Nº 95: Semi-structured interviews

Type: Tool **Topic:** All

Keywords:	**Participatory approach, situation map, perspective analysis.**
Description:	A semi-structured interview is one of the most effective tools for systematically gathering qualitative and quantitative data. This is a method which allows you to ask predetermined questions, determined, perhaps, by the theoretical framework or theory of change underpinning the project, or by your research hypothesis. It is also one which keeps questions open-ended, to gain a comprehensive view of surrounding information.
More info and source:	- Biden, A. (2022). How to Conduct and Analyze Semi-Structured Interviews. Evalcareers. https://evalcareers.com/magazine/how-to-conduct-and-analyze-semi-structured-interviews
Applications in agri-food context:	- Bloemhof, J. M., van der Vorst, J. G. A. J., Bastl, M., & Allaoui, H. (2015). Sustainability assessment of food chain logistics. International Journal of Logistics Research and Applications, 18(2), 101–117. https://doi.org/10.1080/13675567.2015.1015508

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Sustainable Trade Toolbox

Nº 96: SFPMs (Sustainable Food Profiling Models)

Type: Model

Topic: Economy & markets
Human capital
Environment/natural capital

Keywords:	**Sustainability assessment models, agricultural production outputs, impact, nutrition security, food.**
Description:	Sustainable Food Profiling Models (SFPMs) are the models used which give information about food products since they are the base of the labelling of goods. The products are categorized based on their environmental and nutritional impact and hence enhance the consumer's knowledge.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170
Applications in agri-food context:	- Bunge, A. C., Wickramasinghe, K., Renzella, J., Clark, M., Rayner, M., Rippin, H, & Breda, J. (2021). Sustainable food profiling models to inform the development of food labels that account for nutrition and the environment: a systematic review. The Lancet Planetary Health, 5(11), e818-e826

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Sustainable Trade Toolbox

Nº 97: SNA (Social Network Analysis)

Type: Method **Topic:** Social capital

Keywords:	**Agency, situation map, linkages, power relations, governance.**
Description:	Social Network Analysis (SNA) is a set of techniques for analysing social systems. It can be used to understand networks and their participants, that is, to grasp and describe the organization of the networks as a whole as well as the position of individual actors. It offers a variety of techniques for measuring, visualizing, and simulating relationships and allows analysing these relationships in visual as well as mathematical terms. SNA essentially provides a set of representational techniques for the analysis of social ties. It assumes that social ties matter because they influence behaviour or transmit information and goods.
More info and source:	- Williams, B., & Hummelbrunner, R. (2009). Systems concepts in action: a practitioner's toolkit. Stanford, California: Stanford University Press. pp. 60-74
Applications in agri-food context:	- Clark, L. (2010). Seeing the social capital in agricultural innovation systems: using SNA to visualise bonding and bridging ties in rural communities. Knowledge Management for Development Journal, 6(3), 206–218. https://doi.org/10.1080/19474199.2011.554324 - Suárez, D., Díaz-Puente, J. M., & Bettoni, M. (2021). Risks identification and management related to rural innovation projects through social networks analysis: A case study in Spain. Land, 10(6). https://doi.org/10.3390/land10060613

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Sustainable Trade Toolbox

Nº 98: Soft Systems Methodology

Type: Method **Topic:** Policy, governance & regulations

Keywords:	**Agency, participatory approach, perspective analysis, transition pathways, negotiation, situation framing.**
Description:	Explore a situation from different perspectives, mobilizing stakeholders to negotiate their goals, expectations, and interests. Oriented towards learning and insights.
More info and source:	- Williams, B., & Hummelbrunner, R. (2009). Systems concepts in action: a practitioner's toolkit. Stanford, California: Stanford University Press. pp. 241-261
Applications in agri-food context:	- Tavella, E., & Hjortsø, C. N. (2012). Enhancing the design and management of a local organic food supply chain with soft Systems Methodology. International Food and Agribusiness Management Review, 15(2), 47–68. - Tanaya, I. G. L. P., McGregor, M., & Rola-Rubzen, M. F. (2010). An Application of Soft Systems Methodology to Improve Agri-Food Supply Chain: The Case of Dryland Farming of Lombok Island Indonesia. 1–19.

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Sustainable Trade Toolbox

Nº 99: Stochastic and Math Algorithm

Type: Model

Topic: Food value chain
Environment/Natural capital

Keywords:	**Agricultural Production, optimal crop allocation models, scenarios, prevention.**
Description:	Stochastic models were used to prevent severe phenomena that could affect production. Ivanyo et al. (2020) constructed an algorithm to improve and maximize agricultural production taking into account the agro-metrological phenomena which may disrupt it.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Ivanyo, Y., Fedurina, N., & Varanitsa-Gorodovskaya, Z. (2020). Mathematical models of agricultural production management in high risk environments. In E3S Web of Conferences (Vol. 222, p. 01018). EDP Sciences.
Applications in agri-food context:	- Paris, Q., & Easter, C. D. (1985). A Programming Model with Stochastic Technology and Prices: The Case of Australian Agriculture. American Journal of Agricultural Economics, 67(1), 120–129. https://doi.org/10.2307/1240831

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Nº 100: SUSFANS

Type: Tool

Topic: Human capital
Environment/natural capital
Social Capital

Keywords:	**Scenarios, nutrition security, indicator-based tool, sustainability.**
Description:	This Visualizer gives insight into the sustainability performance of European diets and food systems for the years 2010 to 2050. It is based on the metrics, models and foresight developed in the SUSFANS project.
More info and source:	- SUSFANS. (2015). Metrics, Models and Foresight for European SUStainable Food And Nutrition Security. Exploring The European Food System. Https://Susfans.Eu/.
Applications in agri-food context:	- Rutten, M., Achterbosch, T. J., de Boer, I. J. M., Cuaresma, J. C., Geleijnse, J. M., Havlík, P., Heckelei, T., Ingram, J., Leip, A., Marette, S., van Meijl, H., Soler, L. G., Swinnen, J., van't Veer, P., Vervoort, J., Zimmermann, A., Zimmermann, K. L., & Zurek, M. (2018). Metrics, models and foresight for European sustainable food and nutrition security: The vision of the SUSFANS project. Agricultural Systems, 163(2018), 45–57. https://doi.org/10.1016/j.agsy.2016.10.014 - Zurek, M., Ingram, J., Zimmermann, A., Garrone, M., Rutten, M., Tetens, I., Leip, A., Veer, P. van 't, Verain, M., Bouwman, E., Marette, S., Chang, C., Latka, C., Hornborg, S., Ziegler, F., Vervoort, J., Achterbosch, T., Terluin, I., Havlik, P., & Deppermann, A. (2016). A Framework for Assessing and Devising Policy for Sustainable Food and Nutrition Security in EU: The SUSFANS conceptual framework. 633692, 1–102. http://edepot.wur.nl/441080

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Nº 101: SWAT (The Soil and Water Assessment Tool)

Type: Model **Topic:** Environment/natural capital

Keywords:	**Simulation model, impact, water, land use, climate change, production externalities.**
Description:	Soil & Water Assessment Tool (SWAT) is a small watershed to river basin-scale model used to simulate the quality and quantity of surface and ground water and predict the environmental impact of land use, land management practices, and climate change. SWAT is widely used in assessing soil erosion prevention and control, non-point source pollution control and regional management in watersheds.
More info and source:	- SWAT. (2022). Soil & Water Assessment Tool. https://swat.tamu.edu/
Applications in agri-food context:	- Douglas-Mankin, K. R., Srinivasan, R., & Arnold, J. G. (2010). Soil and water assessment tool (SWAT) model: Current developments and applications. Transactions of the ASABE, 53(5), 1423–1431. https://doi.org/10.13031/2013.34915 - Bressiani, D. de A., Gassman, P. W., Fernandes, J. G., Garbossa, L. H. P., Srinivasan, R., Bonumá, N. B., & Mendiondo, E. M. (2015). A review of soil and water assessment tool (SWAT) applications in Brazil: Challenges and prospects. International Journal of Agricultural and Biological Engineering, 8(3), 1–27. https://doi.org/10.3965/j.ijabe.20150803.1765

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Nº 102: Systems dynamics modelling approach

Type: Model **Topic:** All

Keywords:	**Complex systems, linkages, system dynamic assessment.**
Description:	Facilitate better understanding of the dynamic behaviour of complex systems, by clarifying the underlying mental models and generating scenarios of systems behaviour over time. It has been widely used in research related to agricultural land, soil, and water resources management, as well as in the examination of the resilience in food systems to address complex and non-linear feedback systems.
More info and source:	- Sterman, J. (2000). Business Dynamics, 1st ed.; McGraw-Hill, Inc.: New York, NY,USA.
Applications in agri-food context:	- Williams, B., & Hummelbrunner, R. (2009). Systems concepts in action: a practitioner's toolkit. Stanford, California: Stanford University Press. pp. 45-59 - Abdelkader, A., Elshorbagy, A., Tuninetti, M., Laio, F., Ridolfi, L. F. G. G. M., Fahmy, H., & Hoekstra, A. Y. (2018). National water, food, and trade modeling framework: The case of Egypt. Science of the Total Environment, 639, 485-496 - Hamza, K., Rich, K. M., & Wheat, I. D. (2014). A system dynamics approach to sea lice control in Norway. Aquaculture Economics & Management, 18(4), 344-368 - Aboah, J., Enahoro, D. K., Dizyee, K., Ajeigbe, H., Shalander, K., & Rich, K. M. (2021). System dynamics modelling of the cattle value chain in Nigeria. ILRI Discussion Paper

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Nº 103: TCD (Trade Competitiveness Diagnostic Toolkit)

Type: Framework

Topic: Economy & markets
Knowledge, technology & facilities

Keywords:	**Agricultural trade, competitiveness, toolbox, exports.**
Description:	Trade Competitiveness Diagnostic (TCD) toolkit provides a framework, guidelines, and practical tools needed to conduct an analysis of trade competitiveness. The toolkit can be used to assess the competitiveness of a country's overall basket of exports, as well as specific traded sectors. It includes guidance on a range of tools and indicators that can be used to analyse trade performance in terms of growth, orientation, diversification, quality, and survival, as well as quantitative and qualitative approaches to analyse the market and supply-side factors that determine competitiveness.
More info and source:	- Reis, J. G., & Farole, T. (2012). Trade Competitiveness Diagnostic Toolkit. In Trade Competitiveness Diagnostic Toolkit. https://doi.org/10.1596/978-0-8213-8937-9
Applications in agri-food context:	To be updated

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Nº 104: The Gravity Approach

Type: Model

Topic: Economy & markets
Food value chain

Keywords:	**Trade dynamics, income, costs, policy, culture, transportation.**
Description:	The Gravity Approach explains international or regional trade. The model uses a function to relate the trade flows between countries to the distance between the origin and destination countries and the various explanatory variables related to the characteristics of both origin and destination countries.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Sen, A., and Smith, T. E. (1995) Gravity models of spatial interaction behavior, Berlin: Springer-Verlag.
Applications in agri-food context:	- Anderson, J. E. (1979). A theoretical foundation for the gravity equation. The American Economic Review, 69(1), 106-116. - Anderson, J. E., & Van Wincoop, E. (2004). Trade costs. Journal of Economic Literature, 42(3), 691-751. - Angulo, A. M., Mtimet, N., Dhehibi, B., Atwi, M., Youssef, O. B., Gil, J. M., & Sai, M. B. (2011). A revisited gravity equation in trade flow analysis: an application to the case of Tunisian olive oil exports. Investigaciones Regionales-Journal of Regional Research, (21), 225-239.

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Nº 105: Three-step methodology to assess food systems vulnerability

Type: Method **Topic:** Policy, governance & regulations

Keywords:	**Scenario, Agency, power relations, vulnerability framework, perspective analysis, participatory approach, transition pathways.**
Description:	Adapt a vulnerability framework in combination with participatory scenario analysis. It allows including the agency of agri-food system actors and normative issues in the research. 1. Vulnerability of what and to what? – Selection of drivers of change. 2. Vulnerability for whom? At which scale? – Exploring different narratives of historical and current per-captions of change, exposure, and impacts of local agri-food system. 3. Envisioning future trajectories of transformation through participant-tory scenario analysis.
More info and source:	- Vallejo-Rojas, V., Ravera, F., & Rivera-Ferre, M. G. (2016). Developing an integrated framework to assess agri-food systems and its application in the Ecuadorian Andes. Regional Environmental Change, 16(8), 2171–2185. https://doi.org/10.1007/s10113-015-0887-x
Applications in agri-food context:	- Molderink, A., Bakker, V., Bosman, M. G. C., Hurink, J. L., & Smit, G. J. M. (2010). A three-step methodology to improve domestic energy efficiency. Innovative Smart Grid Technologies Conference, ISGT 2010, 1–8. https://doi.org/10.1109/ISGT.2010.5434731 - Folinas, D., Aidonis, D., Voulgarakis, N., & Triantafylou, D. (2013). Applying Lean Thinking Techniques in the Agrifood Supply Chain. 1st Logistics International Conference, November, 234–239. https://logic.sf.bg.ac.rs/wp-content/uploads/LOGIC_2013_ID_42.pdf

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Nº 106: TOA (Tradeoff Analysis)

Type: Method **Topic:** Economy & markets

Keywords:	**Participatory process, simulation tools, forecast, decision making.**
Description:	Trade-off Analysis (TOA) is an approach to positive analysis that combines foresight analysis and simulation modelling tools from the relevant disciplines, including economics, in a participatory process designed to formulate and evaluate forward-looking, strategic decisions under high levels of uncertainty in complex systems.
More info and source:	- Antle, J. M., & Valdivia, R. O. (2021). Trade-off analysis of agri-food systems for sustainable research and development. Q Open, 1(1), 1–34. https://doi.org/10.1093/qopen/qoaa005
Applications in agri-food context:	- Antle, J. M., & Valdivia, R. O. (2021). Trade-off analysis of agri-food systems for sustainable research and development. Q Open, 1(1). https://doi.org/10.1093/qopen/qoaa005

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Nº 108: TRIMAG (Tariff Reduction Impact Model for Agriculture)

Type: Model **Topic:** Economy & markets

Keywords:	**Partial equilibrium models, trade dynamics, scenario, tariff, imports, added value.**
Description:	Tariff Reduction Impact Model for Agriculture (TRIMAG) was developed to optimize the domestic agricultural added value after applying the tiered formula considering a maximum number of sensitive tariff lines . The model evaluates the impacts of domestic prices from the standard and sensitive tariff cut, based on an 8-digit level database on domestic (Swiss) tariffs, prices and import flows from the EU and the Rest of the World, with the prices and consumption as calculated in the context of WTO negotiations. TRIMAG is capable to estimate for 90 agricultural commodities a list of all the potential impacts on domestic prices from tariff reductions. Furthermore, it can be used as a tool for other partial or general equilibrium models.
More info and source:	To be updated
Applications in agri-food context:	- Listorti, G., Kempen, M., Girardin, J., & Kranzlein, T. (2011). Do price uncertainties affect the use of policy flexibilities? The selection of sensitive products in WTO agricultural negotiations (No. 726-2016-49878). - Listorti, G., Tonini, A., Kempen, M., & Adenauer, M. (2013). How to implement WTO scenarios in simulation models: linking the TRIMAG tariff aggregation tool to CAPRI (No. 710-2016-48483).

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Nº 109: Typical Farm

Type: Tool

Topic: Economy and markets
Knowledge, technology & facilities

Keywords:	**Farm economics, competitiveness.**
Description:	Typical farm is a model farm representing the most common farm type for a specific product in a specific country or region. The necessary technical and economic data to define the typical farm were established by farmers and local experts. The typical farms are fully comparable worldwide due to standard rules. Still, even with a high number of typical farms it is not possible to draw statistically significant conclusions. Since a worldwide farm accountancy system does not exist, the typical farm approach is a good tool to compare the total cost of production per unit and other indicators of farm performances across different countries.
More info and source:	- European Commission. (2014). Assessing farmers' cost of compliance with EU legislation in the fields of environment, animal welfare and food safety. 277. http://ec.europa.eu/agriculture/external-studies/2014/farmer-costs/fulltext_en.pdf
Applications in agri-food context:	- Menghi, A., de Roest, K., Porcelluzzi, A., Deblitz, C., von Davier, Z., Wildegger, B., de Witte, T., Strohm, K., Garming, H., Dirksmeyer, W., & Zimmer, Y. (2014). Assessing farmers' cost of compliance with EU legislation in the fields of environment, animal welfare and food safety. FINAL REPORT. European Commission Directorate-General for Agriculture and Rural Development. https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/ext-study-farmer-costs-fulltext_2014_en.pdf

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Nº 110: UKAMM (UK Agricultural Market Model)

Type: Model

Topic: Food value chain
Economy & markets

Keywords:	**Agricultural production, partial equilibrium models, UK, consumption, international trade.**
Description:	UK Agricultural Market Model (UKAMM) is a system of consumption patterns, production processes, and international trade flows, mainly used to describe economic relationships regarding the sectors of dairy, crops, oilseed processing, livestock, and sugar.
More info and source:	- Rezitis, Anthony, Karytsas, Spyridon, Siettou, Anna Stefani, & Xylangouras, Efthymios. (2022). D2.2 Synthesis of model-based studies. Zenodo. https://doi.org/10.5281/zenodo.6507170 - Department for Environment, Food & Rural Affairs UK (2021). Modelling agriculture in the UK.
Applications in agri-food context:	To be updated

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Nº 111: Value Chain Analysis

Type: Method **Topic:** Food value chain

Keywords:	**Situation map, production, inputs, outputs.**
Description:	Study of the "full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use" (Kaplinsky and Morris, 2001, pg. 4).
More info and source:	- Kaplinsky, R., & Morris, M. (2001). A Handbook for Value Chain Research. ResearchGate. https://www.researchgate.net/publication/42791981_A_Handbook_for_Value_Chain_Research
Applications in agri-food context:	- Taylor, D. H. (2005). Value chain analysis: An approach to supply chain improvement in agri-food chains. International Journal of Physical Distribution and Logistics Management, 35(10), 744–761. https://doi.org/10.1108/09600030510634599 - Howieson, J., Lawley, M., & Hastings, K. (2016). Value chain analysis: an iterative and relational approach for agri-food chains. Supply Chain Management, 21(3), 352–362. https://doi.org/10.1108/SCM-06-2015-0220

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Nº 112: Visioning

Type: Method **Topic:** All

Keywords:	**Visioning process, transition pathways, participatory approach.**
Description:	In visioning (or mission statement) processes we deal with desirable futures. A vision should provide a team with orientation and motivation in its daily work and strengthen cohesion. It clearly and inspiringly describes a desirable future for all group members. Depending on the orientation, this includes internal aspects, e.g. "how we work together" or "what makes us tick", as well as external goals such as "what we want to achieve". Accordingly, the target groups range from the narrower circle of team members to actors in the outside world, e.g. cooperation partners, target groups or customers. In terms of methodology, the most important thing in visioning processes is to create a space in which an open exchange about values and one's own situation is possible and encouraged, because this kind of discourse is often not very present in everyday work. Therefore, in visioning, we also speak of the future of the heart, while scenarios that arise through analytical work and often describe the external environment are considered "futures of the head".
More info and source:	- Cimulatac. (2017). CIMULACT -Building visions for Europe. https://www.youtube.com/watch?v=wFyQHfj7xSM - Warnke, P., & Röß, A. (2017). A clear and inspiring description of a group's preferred future. Fraunhofer.
Applications in agri-food context:	- Halbe, J. & Adamowski, J. (2019). Modeling Sustainability visions: A Case study of multi-scale food systems in Southwestern Ontario. Jornal of Environmental Management. 231. pp. 1028-1047 https://doi.org/10.1016/j.jenvman.2018.09.099 - Hubeau, M., Marchand, F., Coteur, I., et al. (2017). Ecological Economics. 131. pp. 52-63. http://dx.doi.org/10.1016/j.ecolecon.2016.08.019

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Nº 113: VSS (Voluntary Sustainability Standards)

Type: Framework **Topic:** Policy, governance & regulations

Keywords:	**Agricultural trade, standards, sustainability, toolbox, situation mapping, policy, agency, participatory approach.**
Description:	Voluntary Sustainability Standards (VSS) Assessment Toolkit guide the identification of the challenges and perceptions behind the adoption of a VSS scheme, from mapping the value chain of interest and its stakeholders to exploring policy options to address them. The assessment consists of five steps: 1) Value Chain Mapping, 2) Interviews, 3) Survey, 4) Analysis, and 5) Policy Options.
More info and source:	- United Nations. (2022). The UNCTAD Approach to Voluntary Sustainability Standards. https://vssapproach.unctad.org/
Applications in agri-food context:	- UNCTAD. (2020a). Assessment of organic certification in the coconut oil value chain in the Philippines. Fostering the development of green exports through voluntary sustainability standards. https://unctad.org/system/files/official-document/ditctabinf2020d1_en.pdf - UNCTAD. (2020b). LAO People's Democratic Republic: Sustainable Commercialisation in the coffee value chain. Fostering the development of green exports through voluntary sustainability standards. https://unctad.org/system/files/official-document/ditctabinf2020d2_en.pdf

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Nº 114: WGI (Worldwide Governance Indicators)

Type: Decision-support database

Topic: Policy, governance & regulations
Social capital

Keywords:	**Governance, indicators, decision making, situation framing.**
Description:	Worldwide Governance Indicators (WGI) project reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2020, for six dimensions. These aggregate indicators combine the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. They are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms.
More info and source:	- Worldbank. (2021). Worldwide Governance Indicators. Interactive Data Access . http://info.worldbank.org/governance/wgi/Home/Reports
Applications in agri-food context:	- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010a). Response to "what do the worldwide governance indicators measure?" European Journal of Development Research, 22(1), 55–58. https://doi.org/10.1057/ejdr.2009.49 - Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010b). The Worldwide Governance Indicators: A Summary of Methodology, Data and Analytical Issues. The World Bank, 5430(September), 1–29.

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