

Proposal for
AGRICULTURE AND FOOD (A&F) SPECIAL INTEREST GROUP
of the System Dynamics Society

1. Nature of the SIG

1.1 Scope

Food systems comprise agricultural input supply, crop and livestock production, and post-farm processing, distribution and retailing. The dynamics of food systems often have important impacts on the well-being of agricultural producers and consumers, the environment and nutritional outcomes. Given their importance, food systems have been the focus of many policy initiatives, including farm-level support policies, environmental regulations, food safety requirements and price-related interventions. Given this importance and a growing number of researchers applying System Dynamics (SD) to provide insights into the dynamics of food systems, a SIG would serve as a focal point for food systems researchers active in the SD community. The proposed SIG will focus on food systems as integrated dynamic systems in which economic, social and biophysical are important elements to enhance our understanding and management. This group welcomes a multidisciplinary perspective to deal with topics such as:

- Input supply sector dynamics (e.g., seeds and fertilizer)
- Farm management
- Innovation dynamics (adoption of new technologies or techniques in agricultural production, processing and distribution)
- Environmental impacts, including land use change, nutrient dynamics and climate change
- The role of food systems in economic growth and rural development;
- Market dynamics and supply chain issues
- Social dynamics and human cultural aspects linked to food systems
- Human health and nutritional aspects
- Livestock and crop health
- Food safety (sanitary and phytosanitary) practices, policies and outcomes
- The dynamics of food value chains
- Food processing and distribution (including, but not limited to, logistics)

We envision that a broad range of disciplines would be interested in participating into this SIG, including but not limited to agricultural sciences (crop and livestock sciences), food science, agricultural and development economics, rural sociology, veterinary science, plant pathology, human nutrition, business, supply chain management, environmental engineering, public policy, biology, ecology, urban planning and public health.

The mission of the A&F SIG is to:

- Enhance interactions and collaborations in the network of SD modelers around food-system-related topics;
- Increase awareness of and interest in the SD perspective and approach among a broader audience of food system stakeholders;
- Facilitate the development of expertise in the SD community to assess current and proposed agricultural and food policies;
- Stimulate model development on food system issues, especially oriented to inform improved management of food dynamics at both urban and rural levels;
- To reach out to those researchers who are using SD but are not yet integrated with the System Dynamics Society (SDS)
- Encourage a multidisciplinary approach to the analysis of food supply and distribution issues;
- Support international organizations in the use of the SD approach to develop and implement managerial strategies to improve food production and distribution in developing, transition and developed countries.

1.2 Agriculture and Food SIG Background

Several papers have been published in the proceedings of the System Dynamics Conferences and in SD books to show complex aspects of food and agriculture policies. A list of SD models and papers related to food systems has been published by Giraldo et al., (2001) and further updated by Armendariz et al., (2015;Appendix 1). In addition, an increasing interest of researchers and modelers to solve problems related to food production and distribution systems, and their relationships with social, economical and environmental aspects has been observed. Just by considering ISDC 2014 (Delft, Netherlands), the program included quite a number of sessions on this topic:

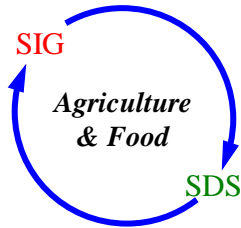
- a Plenary session on Agricultural Sustainability and Governance,
- 3 Parallel session on food related aspects, and
- the keywords "Agriculture" and "food" were included in the title of 13 oral presentations.

2. SIG Society interactions

During the ISDC 2014, around 30 people from 18 different countries expressed their interest in the creation of an "Agriculture and Food SIG". Furthermore, several SDS members recently participated in special event of the System Dynamics Italian Chapter, in collaboration with the FAO project "Meeting Urban Food Needs (MUFN)" was held in Italy: "First Mediterranean Conference on Food Supply and Distribution Systems in Urban Environments" (SAPIENZA University, Rome, 6-7 July 2015) (<http://systemdynamics.it/workshop2015/>)

From all this, we have clear evidence that the creation of a SIG in Agriculture and Food will be of interest and a beneficial activity for the SDS and regional Chapters.

The SIG is proposed with the following Logo and Acronym as a draft provisional shape.



Proposed LOGO:

Proposed acronym: A&F SIG

The System Dynamics Society will publicize the A&F SIG through the SDS website, newsletter and other publications. The A&F SIG will communicate with the SDS Policy Council through written reports submitted to the Vice President for Members and Chapters.

3. Recognition

Initial list of active members (petition signed by at least six Society members)

1. Alberto Stanislao Atzori
2. Stefano Armenia
3. Vanessa Armendariz
4. Charles Nicholson
5. Brigit Kopainsky
6. Paulo Goncalves

List of leaders/ representatives to the Society

Alberto Stanislao Atzori

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Viale Italia 39, 07100 Sassari,
Sardinia – Italy

Email: asatzori@uniss.it

Vice president secretary of the System Dynamics Italian Chapter

Stefano Armenia

Research Centre for Cyber Intelligence and Information Security (CIS) from Sapienza University of Rome "Sapienza"

Via Ariosto 25 I-00185 Roma, Italy

Email: armenia@dis.uniroma1.it

President of the System Dynamics Italian Chapter

4. Membership

Any Society member in good standing of the Society and any other interested individual sharing the objectives outlined above may join the Agriculture and Food SIG. Although SIG membership is not restricted to members of the System Dynamics Society, Inc., Membership of the System Dynamics Society, Inc. is encouraged.

5. Meetings and selection of representatives

The SIG will meet at least once every year at, but not interfering with, the annual meeting of the System Dynamics Society. Business and election of leaders will be dealt with in this meeting. Additional annual meetings may be organized at or outside of the annual System Dynamics Conference.'

The Agriculture and Food SIG will hold a minimum of one meeting per year. This meeting may be held during, with, but not interfering with, the International Conference of the System Dynamics Society. Business and election of leaders will be dealt within this meeting.

The leaders will be elected by a majority vote of the Agriculture and Food SIG membership. The elections will be held annually at a SIG meeting open to all members. All members in good standing and present at the meeting are allowed to vote.

6. Dues

The Agriculture and Food SIG will not charge any dues. Volunteers will do the work of the Agriculture and Food SIG.

7. Sponsorship of activities

The Agriculture and Food SIG may request System Dynamics Society recognition of and/or co-sponsorship of specially organized major programs. The review of the request and response to the Agriculture and Food SD SIG will be the responsibility of the System Dynamics Society Executive Director and Executive Committee, who may choose to bring the request before the System Dynamics Society Policy Council.

8. Policies and activities

2015 -2016 Activities

Create a database of SD scientist working on topics within the SIG scope and strengthen the community cohesion via online web-meetings.

Develop a listing of organizations and/or projects where model-based policy initiatives would be of potential interest and make key representatives aware of the SDS and the A&F SIG.

Define short, medium and long-term activities for 2016-2017 with the complete Agriculture and Food SIG.

Alberto Stanislao Atzori

Department of Agriculture, University of Sassari – Italy
Vice President Secretary of
the System Dynamics Italian Chapter

References:

- Armendariz, Vanessa., Armenia, Stefano., Atzori, Alberto & Romano, Angelo. (2015). Analyzing Food Supply and Distribution Systems using complex systems methodologies. Proceedings 9th Iglis-Forum on System Dynamics and Innovation in Food Networks; Innsbruck, Austria
- Giraldo, D. P., Betancour, M., Arango, S., (2008). Food Security in Developing countries, a systemic perspective, The 2008 International conference of system dynamics, Greece

APPENDIX 1. Examples (non-exhaustive) of SD applications to food system from the literature: an integration of the original list reported by Giraldo et al., (2011) p. 9 with additional applications related to FSDS published by Armendariz et al., 2015.

Authors	Model	Emphasis
Bach et al. (1992)*	Food self-sufficiency in Vietnam: a search for a viable solution.	Studies various possible solutions to self-sufficiency on food (supply) in Vietnam.
Bala (1999)*	Computer Modeling of Energy, Food and Environment: The case of Bangladesh.	An integrative Vision of energy, food and environment applied to Bangladesh.
Briano et al. (2010)	Scenario development of an Italian food-company on short life cycle products.	Demand forecast and production times as key issues to maximize efficiency. Inclusion of different policies test related to safety stocks and demand planning
Gohara (2001)*	A System Dynamics Model for Estimation of Future World Food Production Capacity.	Analysis on supply and demand of food worldwide
Meadows (1976)*	Food and Population: Policies for the United States.	Analysis on supply and demand of food as well as demographic changes.
Meadows, (1977)*	The World Food Problem: Growth Models and Non-growth Solution.	Analysis of the global food problem as seen from both, growth models as well as non-growth models approach
Quinn (2002)*	Nation State Food Security: A Simulation of Food Production, Population Consumption, and Sustainable Development.	Model simulation that links food production, the requirements of the population consumption and sustainable development
Saeed, et al. (1983)*	Rice Crop Production Policies and Food Supply in Bangladesh.	Policy analysis applied to rice and food supply
Georgiadis et al. (2004)*	A system dynamics modeling framework for the strategic supply chain management of food chains.	Analysis on the food supply chain management.. Scenarios of long run operation food systems.
Minegishi and Thiel (2000)	Model on poultry production and processing. Application to the analysis of the dioxin infection effect on poultry supply chain	Improve expertise in complex logistic behaviour in food systems
Saeed (2000)*	Defining Developmental Problems for System Dynamics Modeling: An Experiential Learning Approach	Application of a model to constructing a reference mode addressing the food security problem in Asia
Ozbayrack et al. (2007)	Modelling framework to simulate supply network in order to manage complexity	Complex factors present in supply chains. Variables considered: inventory, WIP levels, backlogged orders and customer satisfaction
Vo & Thiel (2008)	Model on the chicken meat supply chain face with the bird flu crisis in France	Account the uncertain environment supply chain. shed light on both the shortages in up-stream supply capacity and also in downstream unforeseen consumer behaviour affected by the crisis.

(*). Examples reported by Giraldo et al. (2011)