Logic Model for Agricultural Literacy Programming

Situation: Agriculture[1] provides the very sustenance of life and without it no society can survive. Agriculture impacts the food, health, economy, environment, technology, and well-being of all. By 2050 it is projected the world's population will reach 9 billion people requiring agriculture production to double—with less land and water—while sustaining our planet. More food will have to be produced in the next 50 years than the past 10,000 combined[2]. The U.S. agricultural industry annually produces about $159 billion in toward GDP2, netting a positive $37.4 billion trade balance.[3] Approximately 21 million U.S. workers (or about 15% of the total U.S. workforce), are in food and fiber industries. There are approximately 54,000 annual jobs in agriculture but only about 29,000 students—a 45% gap—are graduating in directly related degree programs. [4] A majority of consumers—youth and adults—do not have a fundamental understanding of agriculture or how agriculture impacts their lives.[5] In order to meet the challenges of the future, it is imperative that youth and adults are informed consumers, advocates, and policy makers.

Inputs

Financial Resources
- Public funding
- Private funding

Human Resources
- Time
- Expertise

Collaboration Partners
- Educators of PK–Adult
- Funders
- Other programs
- Agricultural industry
- Farm-based organizations
- Other agriculture-based youth organizations
- Public and private institutions/organizations
- Colleges and universities
- Federal and state agencies

Program Resources
- Agricultural literacy researchers
- Research-based materials/ curriculum
- Professional development for state contacts, volunteers, and other professionals

Outputs

Activities

K-20 Students/Youth
- Develop and present hands-on career awareness resources
- Develop research-based, standard-based, authentic, and relevant agricultural related materials

Educators of PK–Adult
- Develop research/standards-based, authentic and relevant related materials for use in the classroom
- Provide training opportunities
- Establish and conduct pre-service programs at post-secondary institutions
- Conduct in-service training
- Recruit and train volunteers
- Align work to education standards

Policymakers
- Provide science-based information to consumers and policy makers on multiple dimensions of complex issues

Consumers
- Develop agricultural awareness programs for general public

Participants

K-20 Students/Youth
- Formal Classrooms
- Informal Settings

Educators
- Teachers
- Counselors
- School administrators
- Volunteers
- Post-secondary Educators
- Program sponsors
- Agriculture community
- Federal and state agencies
- Consumers

Boundary Partners
- Program sponsors
- Agricultural community
- Federal and state agencies

Consumers
- Public

Outcomes: *Changes in…*

Knowledge/Attitudes/Skills

K-20 Youth
- Understand how Science, Technology, Engineering and Mathematics (STEM) is integrated into agriculture
- Identify and understand the connections between academic subjects and agricultural careers including, but not limited to, STEM
- Understand the relationships among agriculture, the environment, plants and animals for food, fiber, energy, health, society, and economics
- Understand the importance and value of agriculture in their daily lives

Educators of PK–Adult understand and integrate the above youth outcomes into academic subjects, and career and technical education

Education policymakers understand the significance of agricultural concepts and examples, and the importance of integrating them into teacher preparation training

Post-secondary faculty understand the importance of integrating agricultural concepts in all subjects

Guidance counselors understand the breadth of agricultural careers

State departments of education and local school districts understand the significance of integrating agricultural literacy concepts into all curricula

Policymakers understand that a strong agricultural economy is important to states, regions, and the U.S.; understand the impacts of their decisions

Behaviors/Practices

K-20 Youth
- Practice and apply STEM skills in the context of agriculture
- Explore and pursue courses and careers related to agriculture and STEM
- Demonstrate or explain relationships among agriculture, the environment, plants and animals for food, fiber, energy, health, society, and economics
- Explain the value of agriculture and how it is important in their daily lives

Educators of PK–Adult
- Effectively integrate agriculture into all curricula
- Emphasize agricultural careers in all academic courses, especially sciences

Education policymakers
- Advocate for inclusion of agricultural concepts in educational standards and their integration into teacher and counselor preparation training
- Increase the number of graduates in post-secondary education agricultural programs

Post-secondary faculty integrate agriculture across degree programs and utilize agricultural materials in pre-service classes

Guidance counselors encourage youth to pursue agricultural careers

State departments of education and local school districts integrate and contextualize agriculture literacy concepts into all curricula and standards

Policymakers establish policies that positively support agricultural research, education, production, and land use

Conditions

- Agricultural policies positively impact global health, food, technology, the environment, and the economy
- The needs of agricultural employers are met with a well-prepared, skilled, and flexible workforce
- A diverse U.S. agricultural industry is an economic engine that is valued by all
- Farmers provide—and consumers have access to—healthy and nutritious food choices
- Youth and adult consumers are agriculturally literate, make informed decisions, and advocate for agriculture
- The world has a secure, safe, and adequate food supply
- The U.S. remains a sovereign nation

Assumptions

1. A majority of the U.S. population is not agriculturally literate6.
2. Opinions—not facts or evidence—sometimes drive decisions.
3. There is a decrease in graduates entering agricultural careers.
4. Paid staff are able to effectively train educators and implement the logic model.
5. Curriculum and resources are high-quality, rigorous, and linked to education standards.
6. All materials and activities are science-based and experiential.
7. Consumers have an increased interest in their food choices and availability.

External Factors

1. Teachers lack time to add to their prescribed curricula.
2. Information available to the public is not always scientifically based.
3. Human and financial resources differ across states and programs.
4. Public and private funds may or may not be adequate.
5. The general public is not informed and/or concerned about the looming food crisis.

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[1]Agriculture is broadly defined to include agriculture, food, and natural resources. This would include all of the industries, processes, and resources involved in the production and delivery of food, fiber and fuel that humans need to survive and thrive.

[2]Borlaug, N. (2000). Taking the GM food aid debate to Africa: Are we going mad? Retrieved from http://artsci.wustl.edu/~anthro/bnc/readings/Borlaug%202000%20Going%20Mad.htm

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[4]Goecker, A. D., Smith, P. G., Smith, E., & Goetz, R. (2010). Employment opportunities for college graduates in food, renewable energy, and the environment: United States, 2010-2015. Retrieved from http://www3.ag.purdue.edu/USDA/employment/Pages/default.aspx

[5]Doerfert, D. L. (2011). National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.

[6]Agricultural Literacy is defined as having the ability to understand and communicate the source and value of agriculture as it affects our quality of life.

LOGIC MODEL for AGRICULTURAL LITERACY PROGRAMS

National Research Agenda for Agricultural Education - Priority 1 (Doerfert, 2011)
- Increases understanding
- Demonstrates impacts
- Determines the potential of emerging technologies for communication

Situation: By 2050 the world's population is projected to reach nine billion people requiring agricultural production to double—with less land and water—while sustaining our planet. This increase in population will require more food to be produced in the next 50 years than the past 10,000 years combined (Borlaug, 2000).

National Agricultural Literacy Outcomes (Spielmaker, 2014)
- K-20 Assessment
- Program Evaluation

Long-term Result

An agriculturally literate society that understands and can communicate the source and value of agriculture as it affects our quality of life.

Specifically, a society that:
- values agriculture
- makes informed decisions and advocates for agriculture
- supports rational and practical agricultural policies resulting in a food-secure nation
- encourages the preparation of an agricultural workforce
- works to ensure that farmers can provide a healthy, safe, and adequate food supply

From the Ground Up

Outcomes: Changes in...

Knowledge | Attitudes | Skills | Behaviors | Practices

Outputs

Educators of PK-Adult Training | K-20 Students/Youth Activities | Policymaker Information | Consumer-based Information

Inputs

Program Resources | Human Resources
Financial Resources | Collaboration Partners

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Spielmaker, D. M. (2013). National agricultural literacy outcomes. Retrieved from http://agclassroom.org/teacher/matrix