USING LOGIC MODELS FOR PROJECT AND PROPOSAL DEVELOPMENT

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Upcoming ORD Events

Thursday, February 18, 2021 2:00 PM-3:30 PM

Meet the R-Initiatives!

Tuesday, March 9, 2021 10:00 AM-11:30 AM

Proposal Budget Basics

Thursday, March 29, 2021 11:00 AM-12:30 PM

SciENcv

https://www.clemson.edu/research/development/events.html

Outline

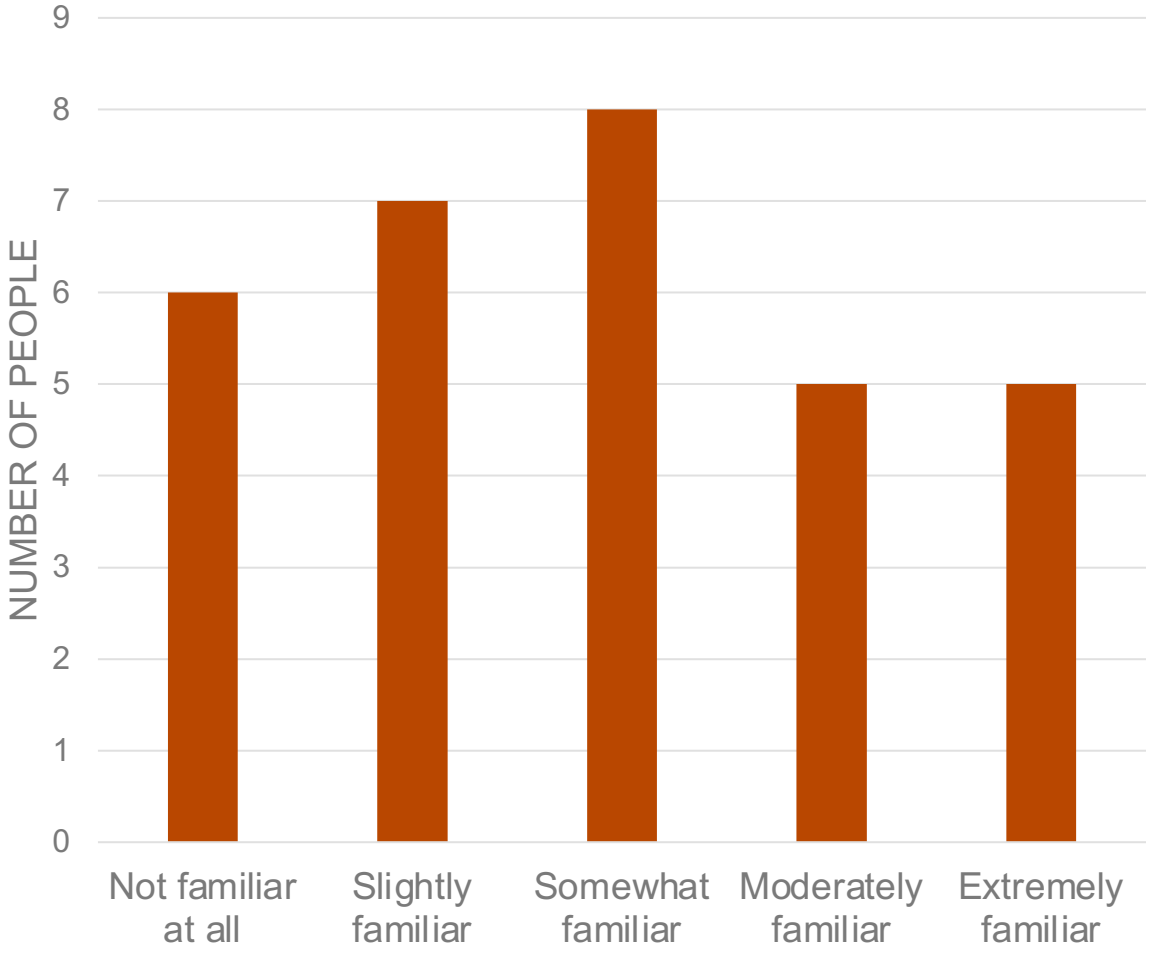
I. Introduction
II. Why Use Logic Models?
III. Components of Logic Models
IV. Using Logic Models to Develop a Project
V. Specific Components Discussion
VI. Connecting Logic Models to Project Descriptions/Narratives
VII. Potential Tools
VIII. Summary and Questions

POLL QUESTIONS:

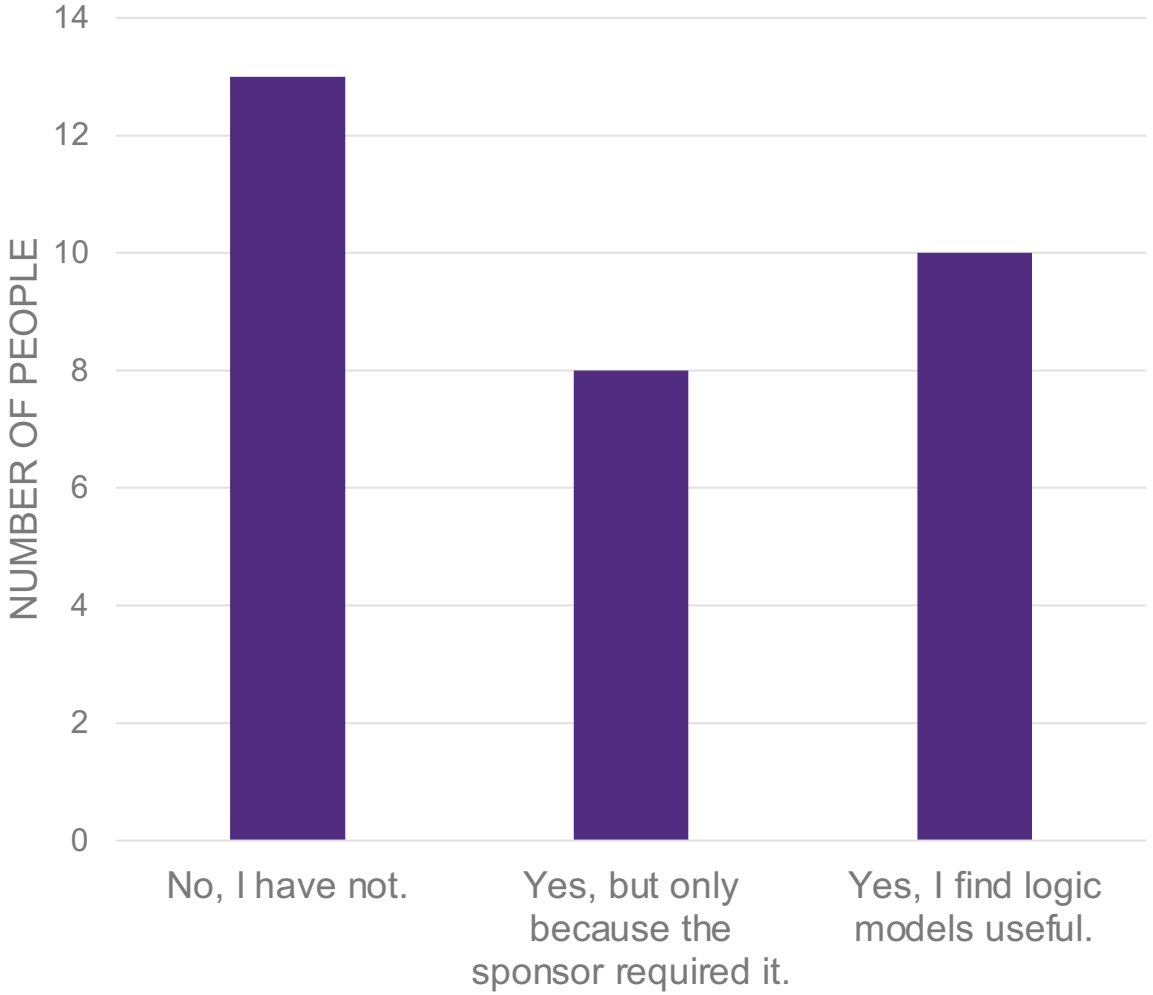
HOW FAMILIAR ARE YOU WITH LOGIC MODELS?

HAVE YOU USED LOGIC MODELS BEFORE?

How familiar are you with logic models?



Have you used logic models before?



Introduction

- Identified in 1950s, “Program” Logic Models in 1970s
- United Way “Measuring Program Outcomes” 1996
- W. K. Kellogg Foundation (early 2000s)
- “Theory of Change” vs. “Logic Models”

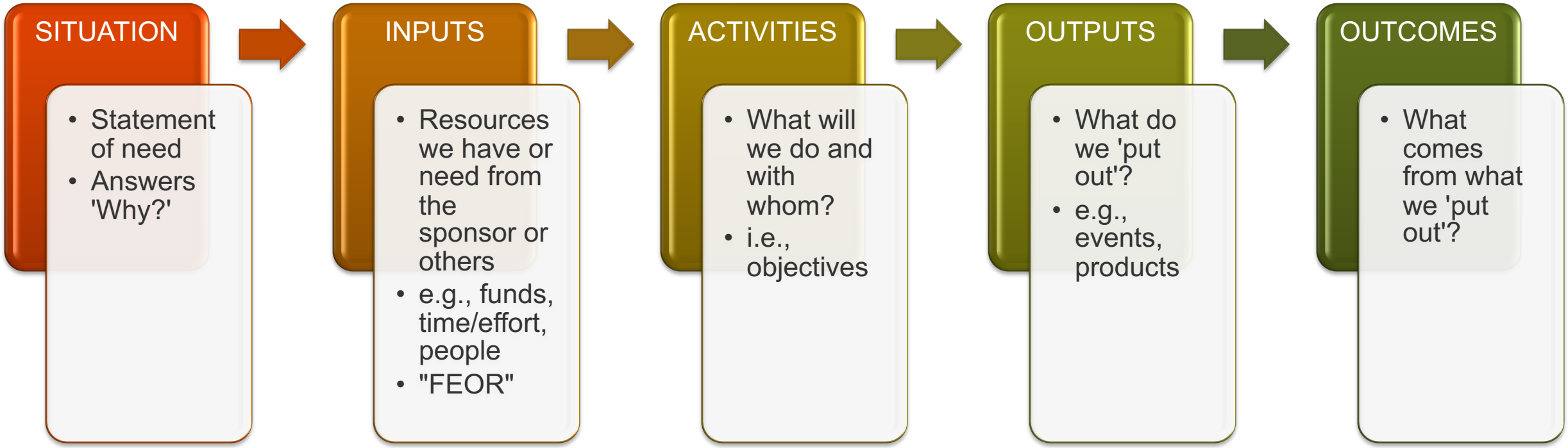
Trait	Theory of Δ	Logic Model
Time Frame	None	Time-bound
Detail Level	Low	High
Elements	Few	Several/Many
Display as	Graphic	Text + Graphics
Focus	General	Targeted Results
Function	Conceptual	Operational

Source: Knowlton, L. W. & Phillips, C. C. (2013). *The Logic Models Guidebook: Better Strategies for Great Results.* SAGE Pub.

Why Use Logic Models?

- For you and your team:
  - Planning tool (Did we miss anything? Why should this project work? Is it evaluate-able?)
  - Implementation roadmap
  - Reporting checklist
- For evaluators (internal or external):
  - What will be measured?
  - How will it be measured?
- For reviewers:
  - Visually depicts project
- For fundamental or foundational research:
  - May include training students, cross-training collaborators; LM can be used to demonstrate “Broader Impacts” for NSF submissions
- For applied research:
  - Helps ensure outcomes desired by stakeholders
- For education or extension:
  - By nature requires change in knowledge, possibly actions and conditions

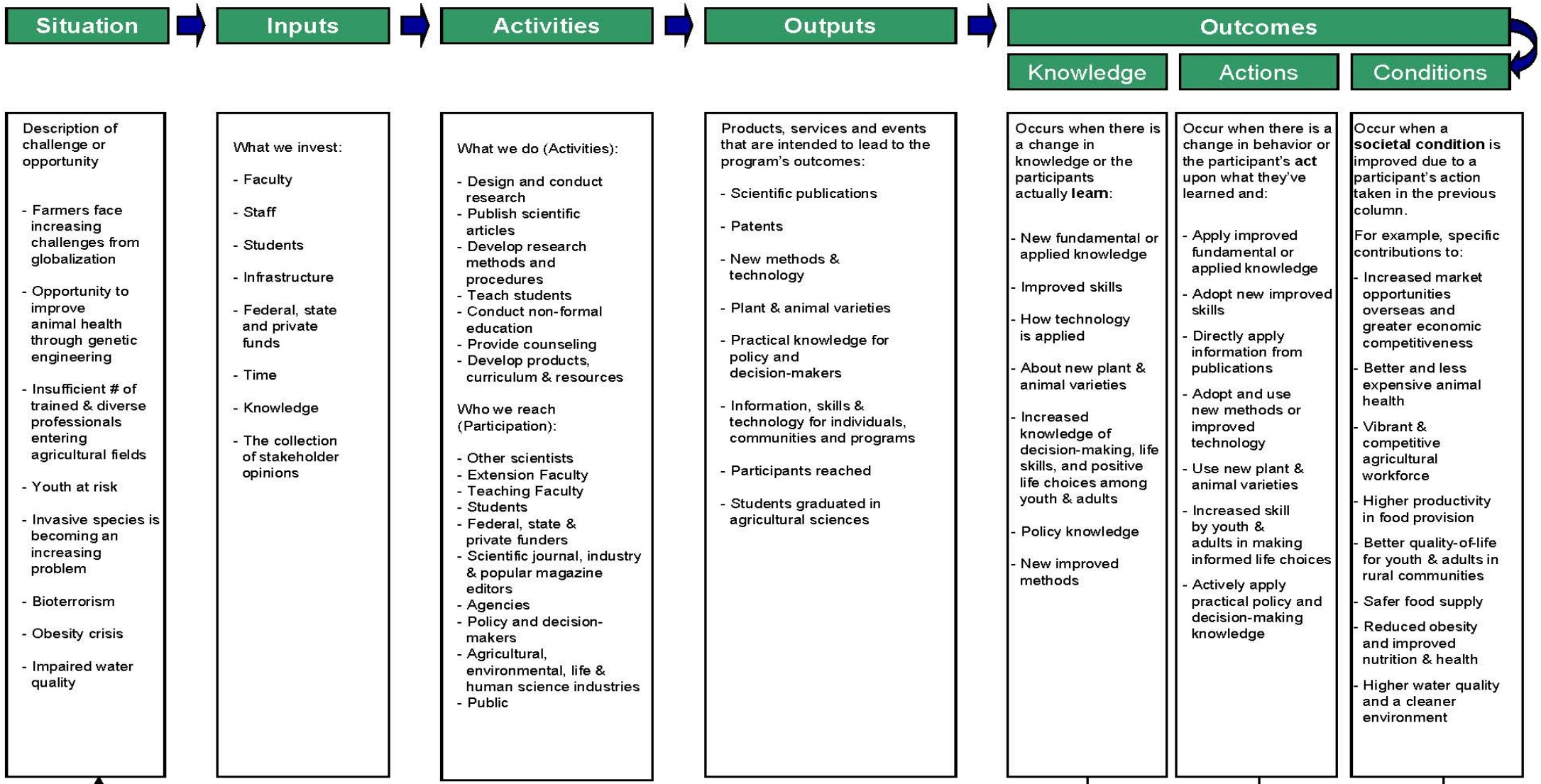
Components of Logic Models



Optional: Assumptions/Hypotheses, External Factors, Measurement/Evaluation

Generic Logic Model for NIFA Reporting

(This model is intended to be illustrative guide for reporting on NIFA-funded research, education and extension activities. It is not a comprehensive inventory of our programs.)

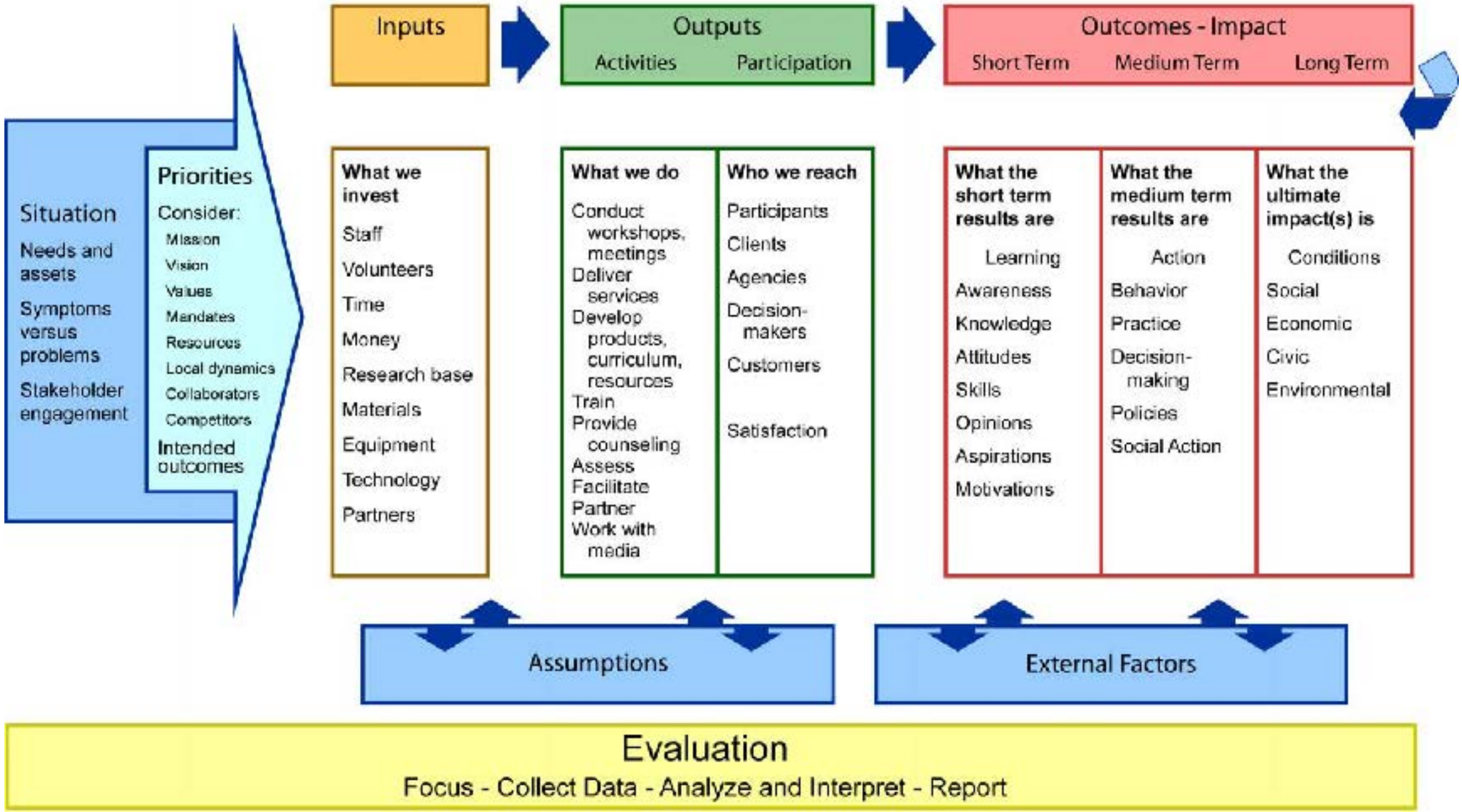


ASSUMPTIONS - These are the premises based on theory, research, evaluation knowledge etc. that support the relationships of the elements shown above, and upon which the success of the portfolio, program, or project rests. For example, finding animal gene markers for particular diseases will lead to better animal therapies.

EXTERNAL FACTORS - A brief discussion of what variables have an effect on the portfolio, program or project, but which cannot be changed by managers of the portfolio, program, or project. For example, a plant breeding program's success may depend on the variability of the weather...etc.

Version 1.3

Program Action - Logic Model



Logic Model Template

Measuring Program Outcomes: A Practical Approach

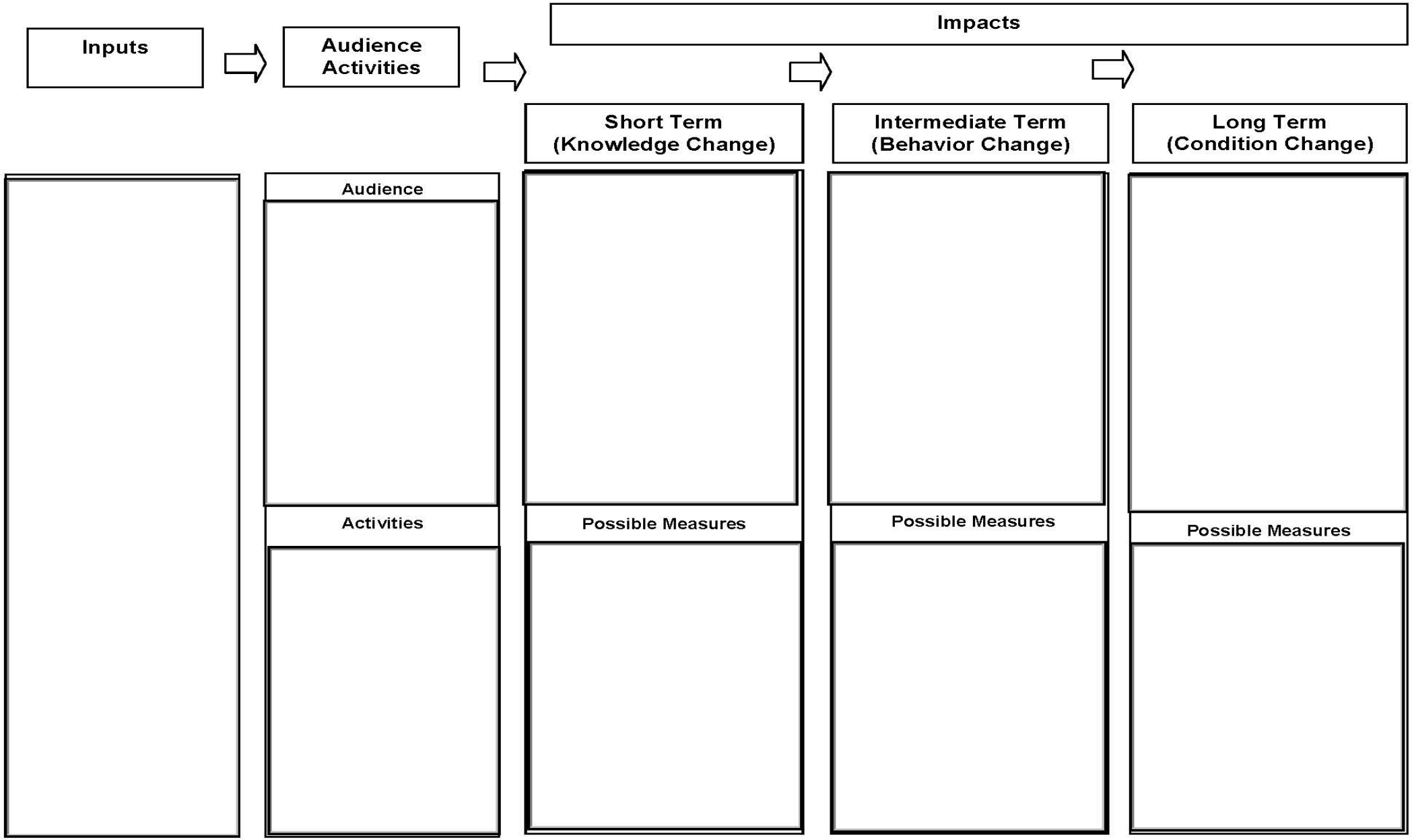
Additional USDA Logic Model Components: *Situation, Assumptions/Hypotheses, External Factors*

Inputs	Activities	Outputs	Outcomes	Indicators	Data Sources
What do you need to run your programs?	*What do you do?*	*How much do you do?*	*How do participants change because of your services?*	*What concrete and measurable information will track that change?*	*What data collection instruments will you use to collect information on each indicator*
	Job train by developing workshops for job readiness	Deliver 5 workshops to 20 people per workshop	Short-Term: X out of 20 participants demonstrate new knowledge/skill, etc.	Short-Term: specific questions participants will respond to	Short-Term: pre- and post-workshop survey
			Mid-Term:	Mid-Term:	Mid-Term:
			Long-Term:	Long-Term:	Long-Term:

Focus Area:

Impact Area:

Roadmap Goal:



Using Logic Models to Develop a Project

- Start with the ***situation***
- Move to ***outcome(s)*** in mind
  - What is the overall goal of the project (e.g., long-term change in situation(s) that can't be accomplished in project time period)
  - What are the short-, medium-, and long-term outcomes?
- Next look at ***activities***
  - Note: are the outcomes related to specific objectives?
  - Example: an objective could be to demonstrate the effectiveness of X activity/process.
  - What do you need to do to achieve the objectives?

Using Logic Models to Develop a Project

- Consider ***outputs*** next
  - What outputs will the activities produce?
  - What outputs will demonstrate the project's progress (e.g., milestones)?
- Consider ***inputs,*** then activities
  - What facilities, equipment, resources, and effort do you have to put toward your activities? (Note: these could go into facilities and equipment documents)
  - What might you need from a collaborator or consultant?
    - Expertise, Equipment, Data, Samples, etc.
  - What do you need the sponsor to fund?

Using Logic Models to Develop a Project

- Address ***assumptions/hypotheses***
  - Why should your project work?
  - Why would your outputs impact outcomes? Why would activities help complete an objective?
- Address ***external factors***

Specific Components: Situation

Why is this project necessary? (funding opportunity/3S)

- Science/Engineering/Education
  - Unanswered question(s) (e.g., test a hypothesis)
  - New technique(s) needed or desired
  - Develop and/or test novel technology
- Stakeholder(s) (define)
  - Specific request/need for research
  - General concerns/issues facing group
  - Students
- Society
  - Improve policies
  - Encourage better practices
  - For NSF, “Broader Impacts” (guidance, not prescriptive)

PRACTICE: Make your own “Situation”

NSF Advancing Informal STEM Education:

AISL seeks to (a) advance new approaches to and evidence-based understanding of the design and development of STEM learning in informal environments; (b) provide multiple pathways for broadening access to and engagement in STEM learning experiences; (c) advance innovative research on and assessment of STEM learning in informal environments; and (d) engage the public of all ages in learning STEM in informal environments.

USDA NIFA Foundational and Applied Science:

Investigate how changes to cropping systems, including diversification or intensification, affect crop performance, soil health, and other outcomes beneficial to system resilience;

Examples of “Situation”

Students "overpersisting" in a particular major and not ultimately graduating in that degree program

There is a lack of a near-universal affinity membrane chromatography product for the rapid and selective capture-step purification of therapeutic proteins (e.g., non-antibodies) that cannot be purified by Protein A affinity chromatography.

Access to data about a youth's diabetes management leads to poorer diabetes management in adolescents and excessive parental monitoring of diabetes data

The majority of youth in the U.S. lack foundational skills and knowledge of STEM with low-income and minority youth at a further disadvantage. Career readiness among ACT-tested high school graduates in SC has been dropping since 2013. In SC, only 11% of females are ready for college STEM, and the statistics are worse for African American (2%), American Indian (4%), Pacific Islander (3%), and Hispanic (8%) youth.

Fewer women faculty hold leadership positions within universities

Mental health and developmental needs are often not identified until adolescence

Specific Components: Outcomes

What results are desired, based on the situation?

- Science
  - Short-term: peers and students have changes in knowledge, skills/abilities, attitudes/perceptions
  - Medium-term: peers and students may use new techniques or technology, or conduct additional research based on project findings (change in action or behavior)
  - Long-term: (new paradigm, convergence of disciplines, long-term collaborations)
- Stakeholder(s)
  - Short-term: same
  - Medium-term: adopt new skills, techniques, technologies, policies
  - Long-term: changed (improved) situation
- Society
  - Similar to stakeholders

Specific Components: Activities

Project Design

- Lay out research/education objectives – “tasks” after?
  - Data collection
  - Experiments
  - Development of pedagogical model
- Stakeholder(s)
  - Depends on level of involvement in the project
  - Data collection from stakeholders
  - Dissemination plan to stakeholders
  - Participation in evaluation of the project
- Society

Specific Components: Inputs

What do we have, what do we need? How to organize?

- By objective?
- By 3 Ss?
- Science/Engineering/Education
  - People (faculty, staff, students) – time, knowledge
  - Infrastructure (facilities, equipment, administrative assistance, etc.)
  - Other funding (e.g., match)
- Stakeholder(s)
  - Their level of involvement (e.g., advisory council?)
- Society
  - Rare input

Specific Components: Outputs

What will we put out into the world? To what audience?

- Science/Engineering
  - Peer-reviewed publications/presentations about, e.g.,
    - New technique(s)
    - Novel or improved technology
    - Proof of hypotheses
  - IP (e.g., invention disclosure, licenses, patents)
  - Graduate and undergraduate students trained
- Stakeholder(s)
  - Publications (e.g., fact sheets, “how to” manuals)
  - Events (e.g., workshops, conferences)
- Society
  - Dissemination of results to decision-makers, interested groups

Connecting Logic Models to Project Descriptions/Narratives

- NSF PAPPG
  - "Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful."
  - **Logic models are blueprints for success based on a theory of change (if . . . then).**
  - **Strategic planning:** Logic models help identify key program components (workforce development, research, education, culture of inclusion, innovation ecosystem, convergence, etc.) and objectives/tasks.
  - **Building the argument**: Sell the readers on the idea that a situation needs to be addressed in order to get desperately desired outcomes (NSF merit criteria). Tell them NSF resources (inputs) are critical to realizing your vision. Why is your team best positioned to produce promised outputs and anticipated outcomes?
  - **Evaluation planning:** What evidence do we need to manage and improve the project? How will we gather and use evidence?

Connecting Logic Models to Project Descriptions/Narratives

- USDA Project Narrative must include:
  - Introduction
    - "long-term goal(s) & supporting objectives" - look to outcomes, activities
    - "role of stakeholders in problem identification, planning, implementation, and evaluation, as appropriate" - look to situation, input, activities, outcomes
    - "reasons for performing work at proposed institution" - look to inputs, activities
  - Rationale and Significance
    - Rationale – look to assumptions/hypotheses
    - Relation of objectives to program area priority – look to activities, outcomes
    - Long-range improvement in sustainability – look to long-term outcome and/or goal(s)
  - Approach
    - All components of logic model (e.g., "pitfalls that might be encountered, limitations to proposed procedures" - look to external factors)

Potential Tools

- Microsoft
  - Word, Excel, Visio
- www.lucid.app
  - Free = two “charts”
  - Flowcharts can be used for creating a logic model
  - Does not include “situation”
  - Can add hypotheses/assumptions and external factors
- www.dylomo.com
  - Does not have situation, hypotheses/assumptions, or external factors
- www.cyfar.org
  - Based on USDA/NIFA requirements, U of MN site
  - “Build a Logic Model” – answer questions, site builds it for you

Summary and Questions

1. Useful tool for project planning, implementation, and reporting
   - Science/Engineering (helps remind of “Broader Impacts”)
   - Education/Extension Programs – Evaluation (goal is change)
2. No “right” logic model
3. No “right” methodology
4. If required (e.g., USDA “integrated” projects) –
   - Think of “Objectives” as defining “Activities”
   - “Activities” require “Inputs”
   - Think of “Activities” as leading to “Outputs”
   - Think of “Outputs” as leading to “Outcomes”
5. Questions?

THANK YOU FOR YOUR PARTICIPATION

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