Investment model for agricultural development intervention in Eastern and Southern Africa: An application of Stochastic Impact Evaluation Technique on selected agricultural interventions

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03-03-2016
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Outline

- Introduction
- Problem statement
- Objective
- Justification
- Methodology

Preliminary and incomplete incremental investment needs for the SDGs in developing countries (in constant 2010 $ billion)[3]

Investment Area	Incremental annual investment needs in developing				Corresponding pooled finance mechanisms		
	Total needs	Private, commercial financing	Public, non-commercial financing	Of which ODA/public climate finance		Current annual disbursements	Projected annual need
Health	51-80	~0	51-80	TBD	GAVI, GFATM,GFF, UNFPA, UNICEF	[5,6]	*TBD*
Education	[22]	~0	[22]	13,6	Proposed Global Fund for Education	0,4	*TBD*
Food security	38	2	36	TBD	IFAD, GAFSP, proposed Smallholder Fund	[0,4]	*TBD*
Access to modern energy (SE4All)	34	10,5	23,5	12,8	GCF	N/A	[6]
Access to water and sanitation	27	3-5	22-24	TBD	Global Water and Sanitation Fund or regional facilities	TBD	*TBD*
Data for the SDGs	[7.5]	~0	[4.5]	[3]	Dedicated trust fund or other mechanism	0,3	[0,5]
Ecosystems including biodiversity	[18-48]*	[3-7]	[15-41]	TBD	GEF	1,1	*TBD*
Other agriculture	210	195	15	0	N/A		
Large infrastructure (power, transport, telco, watsan)	689-1279	291-595	398-684	TBD	N/A		
Climate change mitigation	[380-680]	[300-564]	[80-115]	TBD	GCF	N/A	100
Climate change adaptation	60-100	0	60-100	TBD	GCF	N/A	*TBD*
Total	**[1535 - 2529]**	**[805 - 1379]**	**[728 - 1151]**	**TBD**		TBD	TBD

Introduction

- Flood Based Farming system is a neglected sector
- Huge potential
- Needs an investment
  - Time
  - Financial (Schmidt-traub & Sachs, 2015)
  - Labour

- Require a wise decision

Problem Statement

- Planning and implementation project
  - Point estimation
  - Doesn’t capture uncertainty
  - Neglect environmental, social and political costs, benefits and the associated risks

Objectives

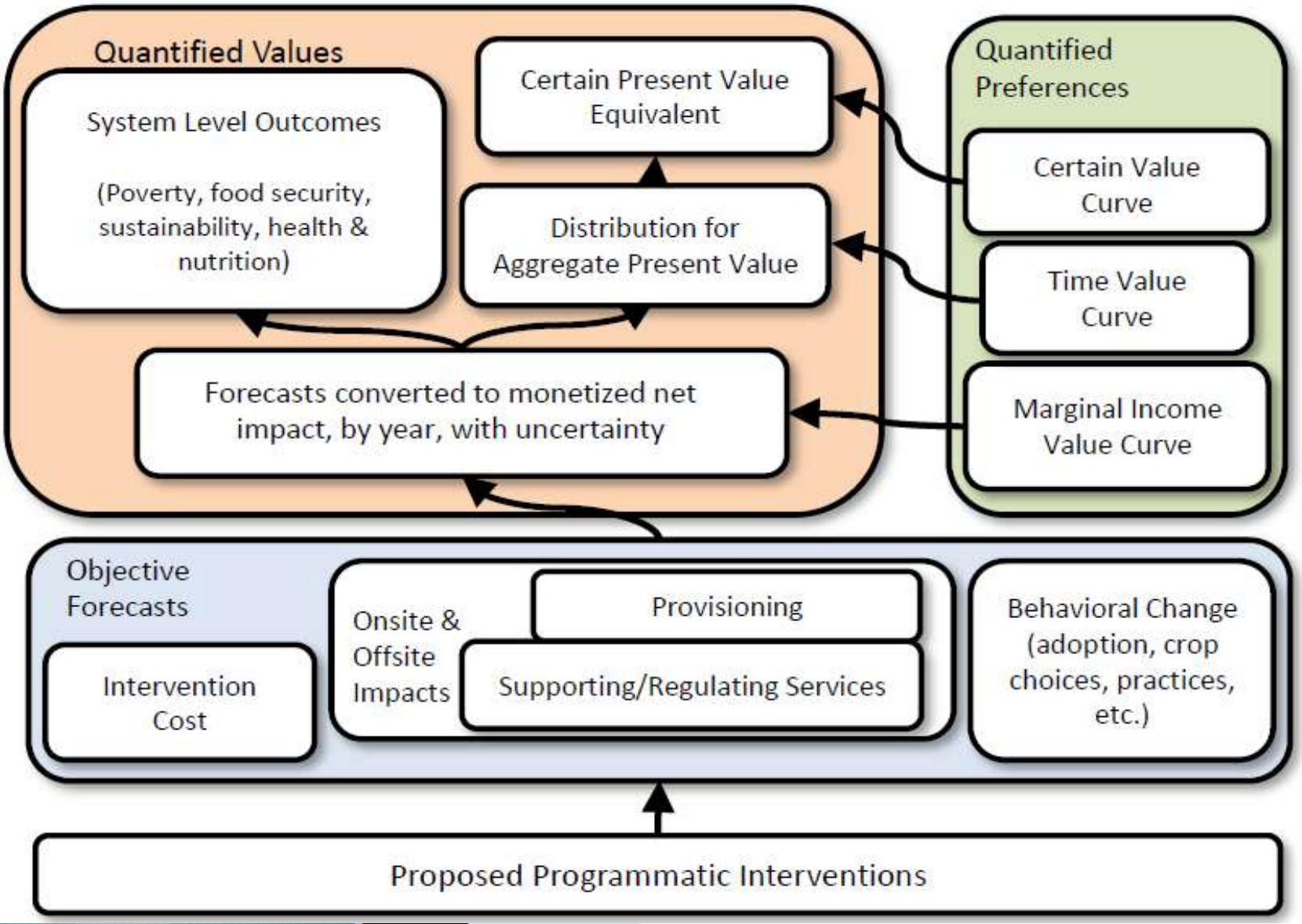
- Estimating the total investment
- Determine the feasibility and success rates
- Assess and compute the costs, benefits and associated risks
- Describing uncertainties quantitatively,
- identify highly uncertain variables
- Computing the net present value

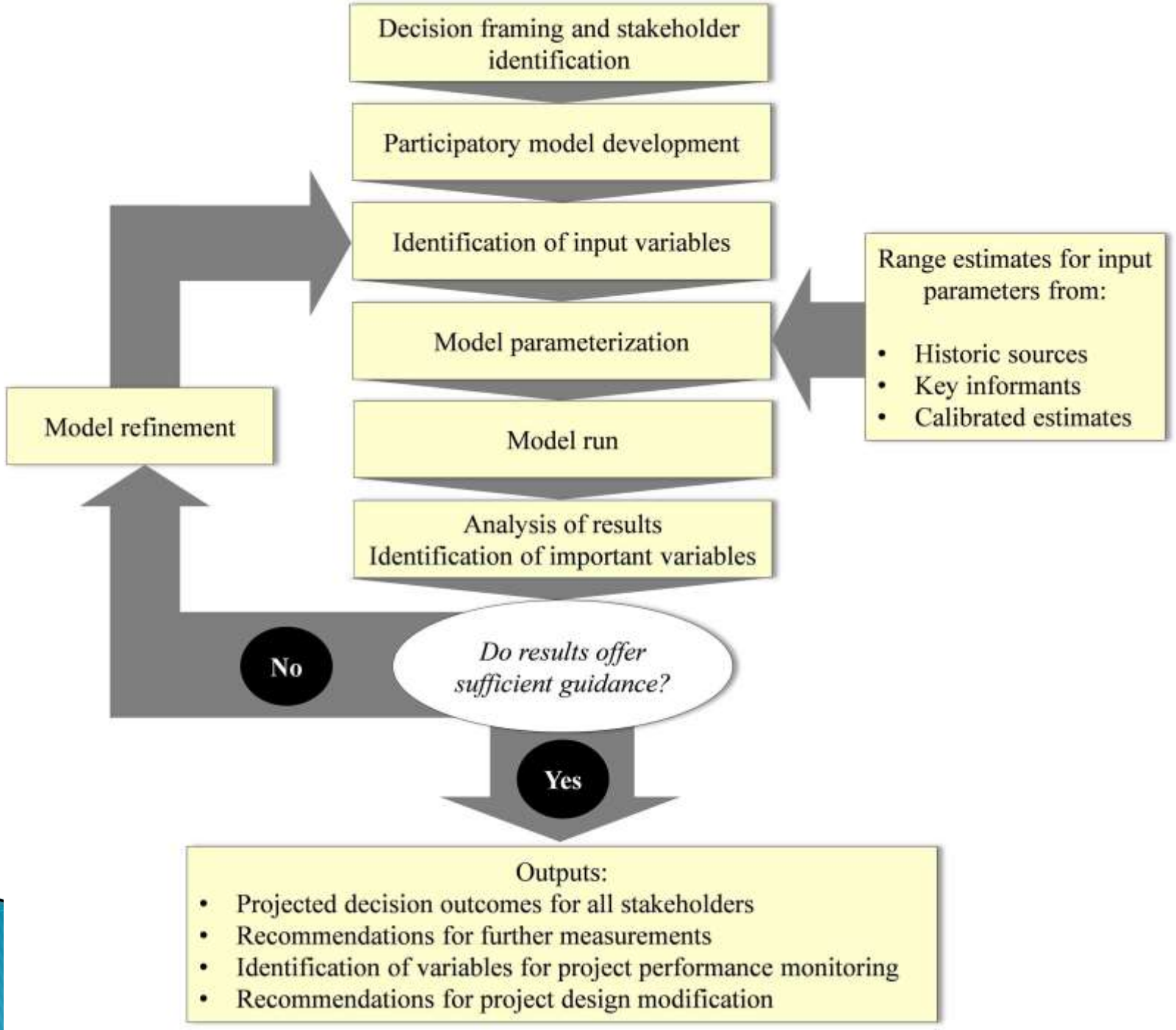
Justification

- Range of values
- All costs, benefits and risks
  - Environmental
  - Social
  - Political
- Capture uncertainty
- Reduce costs related to measurement
- Provide an investment estimate

- Methodology

Figure 1: Initial Outline of the Global Intervention Decision Model




Decision framing and stakeholder identification
Participatory model development
Identification of input variables
Model parameterization
Model run
Analysis of results
Identification of important variables
Do results offer sufficient guidance?
No
Yes
Model refinement
Range estimates for input parameters from:
• Historic sources
• Key informants
• Calibrated estimates
Outputs:
• Projected decision outcomes for all stakeholders
• Recommendations for further measurements
• Identification of variables for project performance monitoring
• Recommendations for project design modification

Cont'ed

- Cost-Benefit analysis
  - Stochastic Impact Evaluation (SIE)
    - Monte Carlo simulation
    - Partial least square regression model
    - Value of information Analysis
  - Bayesian analysis

- Decision support tool
  - R- package
    - Eike Leudeling (ICRAF-Bonn)
    - Lutz Göhring (consultant)
- Bayesian analysis
  - AgenaRisk
  - Bayesialab

Thank you