Scaling Readiness in Action

Module 1:
Fundamentals

RESEARCH PROGRAM ON Roots, Tubers and Bananas

CGIAR

CIALCA — 10 years of science for improving livelihoods

IITA — Transforming African Agriculture 1967 - 2017

WAGENINGEN UNIVERSITY & RESEARCH

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R^G Enhancing Scaling Readiness of Livelihood Innovations

How Scaling Occurs in Livelihood Systems? Story of Penicillin

What were the innovations?

Which steps Penicillin followed until it was scaled?

What are innovations in Agricultural Systems?

(1) An Agronomy Practice

(2) A Machine

(5) Packing Material

(6) Policy

(3) Crop Varieties

(4) A Phone or Tablet

(7) A market

(8) A partnership

Source: CGIAR

How to scale innovations?

"A good gulp of hot whiskey at bedtime—it's not very scientific, but it helps."

Alexander Fleming
The inventor of Penicillin

"If Lincoln thinks that a barrel will scale the war success, maybe it can help with scaling agricultural innovations!"

Murat Sartas
Whisky Loving Scaling Scientist

"Tell me what brand of whiskey that (General Ulysses) Grant drinks. I would like to send a barrel of it to my other generals."
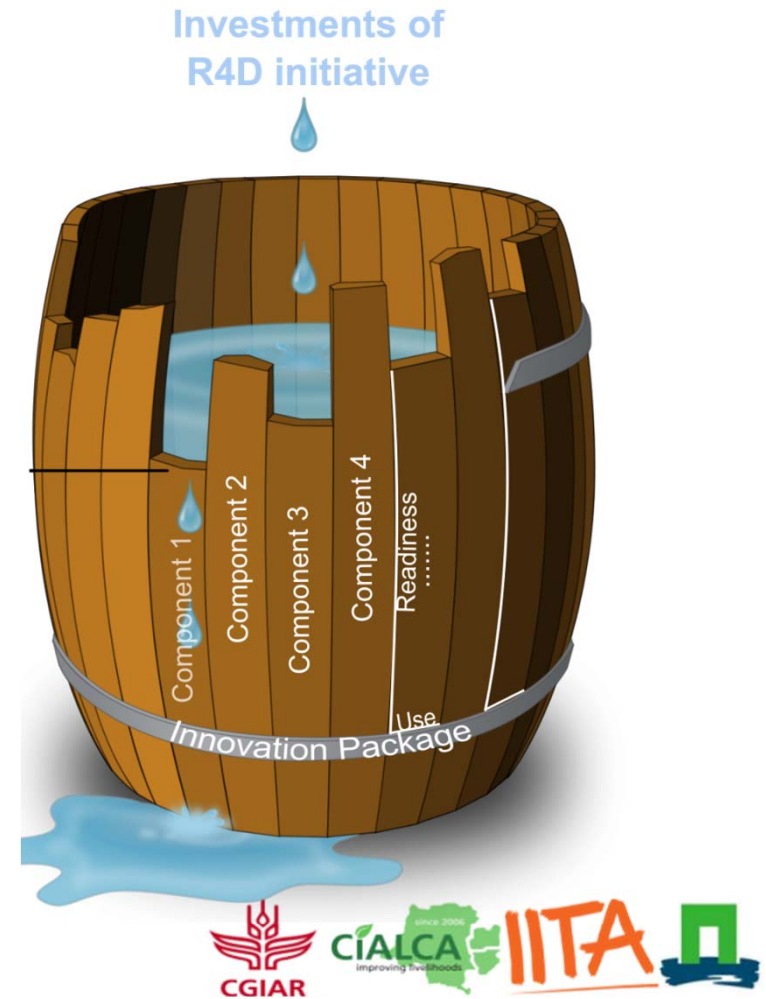
Abraham Lincoln
16th US President

What is Scaling Readiness?

An Approach to

1. Enhance scaling performance of R4D initiatives

2. Optimize scaling investments

3. Provide Evidence for Science of Scaling

Scaling Readiness Concepts

Stave: Component

   Core

   Complementary

Hoop: Innovation Package

Investments of
R4D initiative

Scaling Readiness in Action

Module 2:
Building Innovation Package

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Enhancing Scaling Readiness
of Livelihood Innovations

How to Develop A Strategy (Theory) of Scaling?

What were the steps?

1. Preparing the wood

(Early development of the core component)

2.   Preparing the barrel pins

(Identifying complementary components)

3.   Combining the staves

(Building the innovation package)

Let's Construct the Barrel!

- Project based groups supported by Murat, Marc and Seerp, 1 hour

TASKS

1. Identifying complementary components
   a. What products, services, processes or organizational models necessary to scale the core component?

2. Building the innovation package
   a. List the innovation components using a spreadsheet

Scaling Readiness in Action

Module 3:
Readiness and Use of Components

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Enhancing Scaling Readiness of Livelihood Innovations

Scaling Readiness Concepts
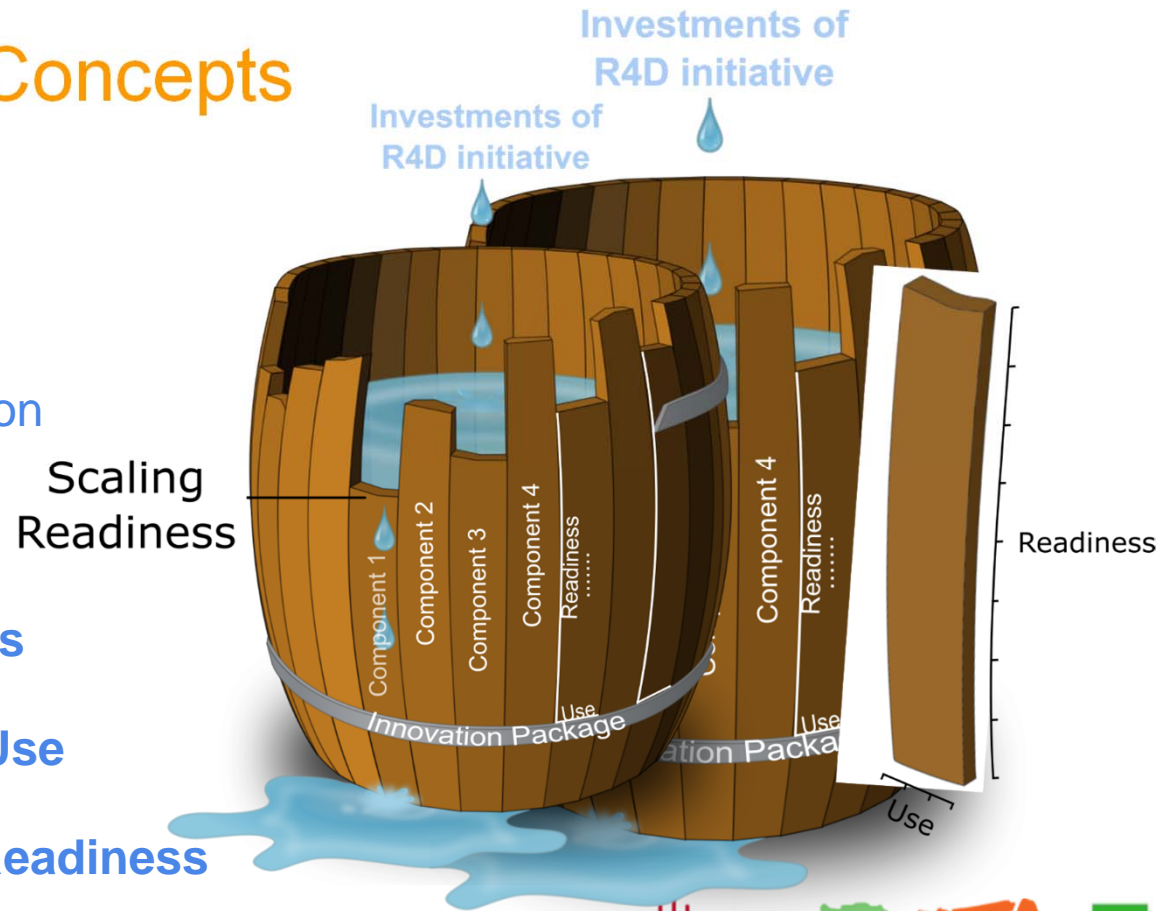
Bar (Stave): Component
        Core
        Complementary

Metal Piece (Hoop) : Innovation
Package

Bar Length   **: Readiness**

Bar Width   **: Use**

Barrel Capacity : Scaling Readiness
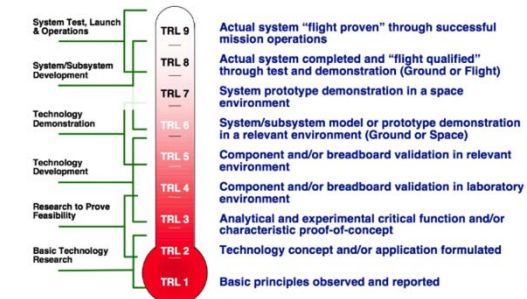
Component Readiness

- Does the component do what is supposed to do?
- Every innovation starts from an idea, being experimented and becomes ready
- Based on technological readiness concept developed by NASA

Readiness Score	Readiness Level
0	Idea
1	Hypothesis
2	Basic Research
3	Basic Model
4	Formulating Working Model
5	Working Model
6	Working Application
7	Proof of Application
8	Incubation
9	Ready

NASA/DOD Technology Readiness Level

System Test, Launch & Operations	TRL 9	Actual system "flight proven" through successful mission operations
System/Subsystem Development	TRL 8	Actual system completed and "flight qualified" through test and demonstration (Ground or Flight)
	TRL 7	System prototype demonstration in a space environment
Technology Demonstration	TRL 6	System/subsystem model or prototype demonstration in a relevant environment (Ground or Space)
Technology Development	TRL 5	Component and/or breadboard validation in relevant environment
	TRL 4	Component and/or breadboard validation in laboratory environment
Research to Prove Feasibility	TRL 3	Analytical and experimental critical function and/or characteristic proof-of-concept
Basic Technology Research	TRL 2	Technology concept and/or application formulated
	TRL 1	Basic principles observed and reported

Technology Readiness Levels

TRL 0: Idea. Unproven concept, no testing has been performed.
TRL 1: Basic research. Principles postulated and observed but no experimental proof available.
TRL 2: Technology formulation. Concept and application have been formulated.
TRL 3: Applied research. First laboratory tests completed; proof of concept.
TRL 4: Small scale prototype built in a laboratory environment ("ugly" prototype).
TRL 5: Large scale prototype tested in intended environment.
TRL 6: Prototype system tested in intended environment close to expected performance.
TRL 7: Demonstration system operating in operational environment at pre-commercial scale.
TRL 8: First of a kind commercial system. Manufacturing issues solved.
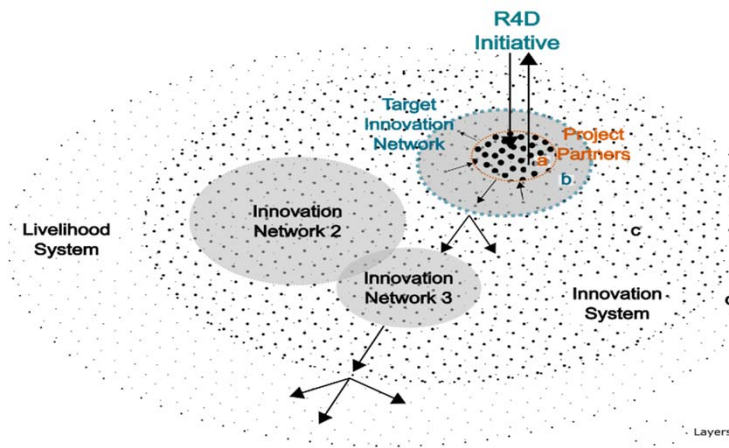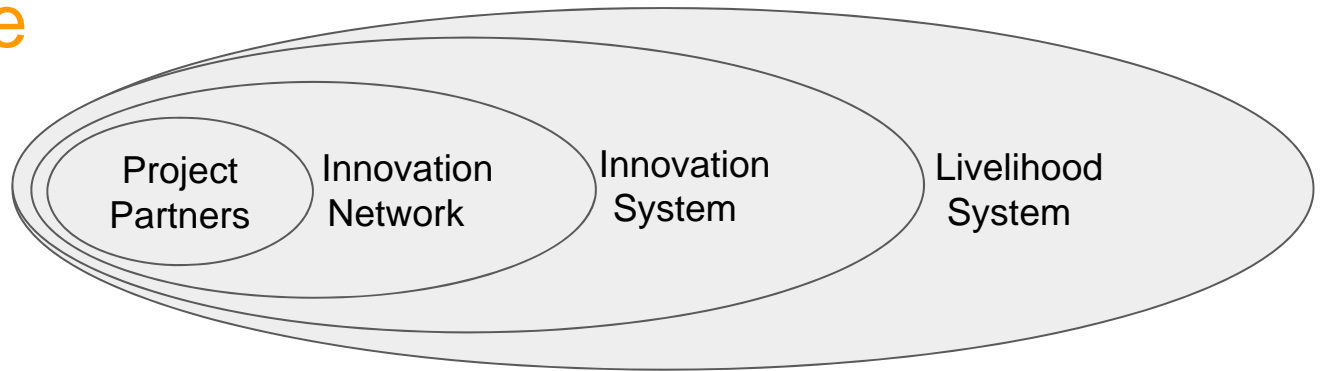**TRL 9:** Full commercial application, technology available for consumers.

Component Use

1. Does high adoption during the intervention imply higher scalability?

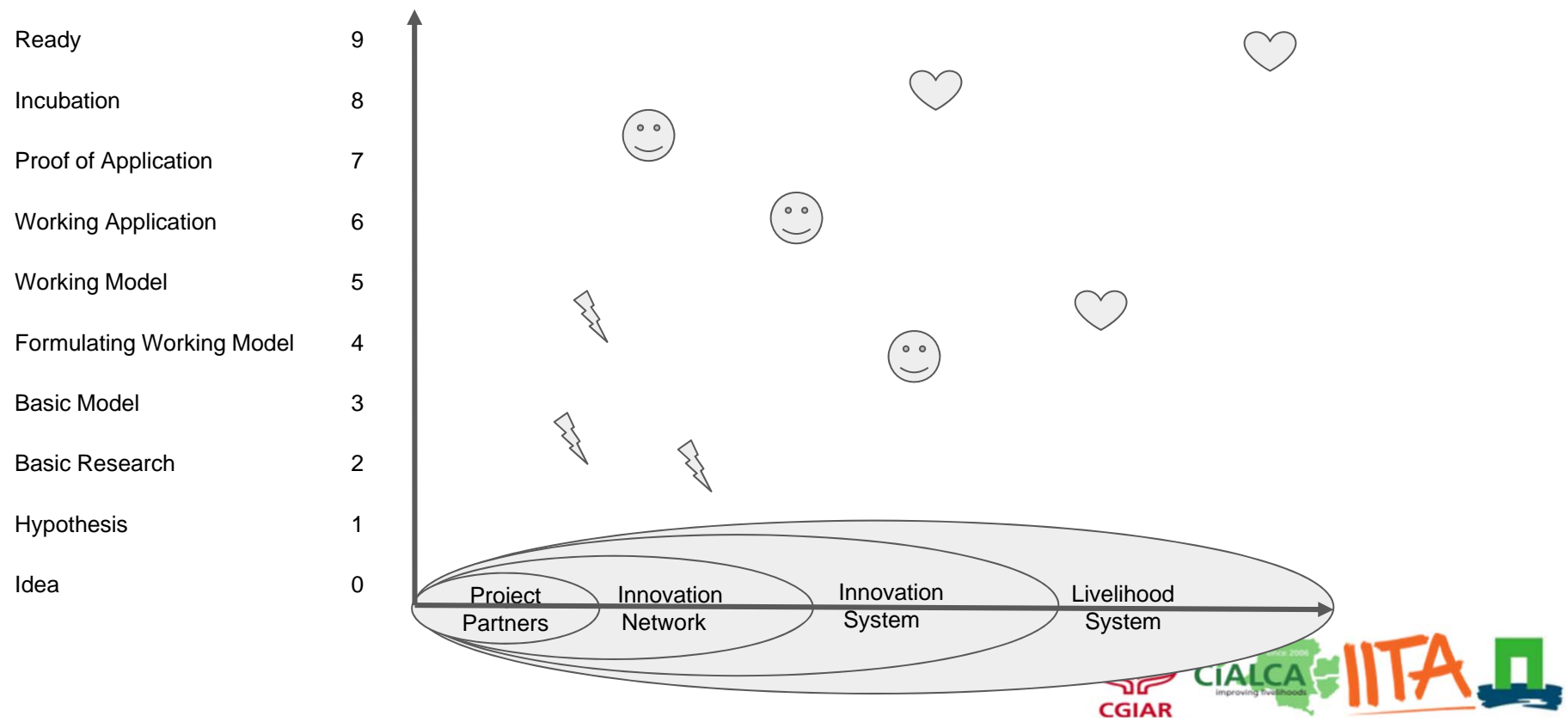2. Does high adoption during the intervention imply that intervention worked?

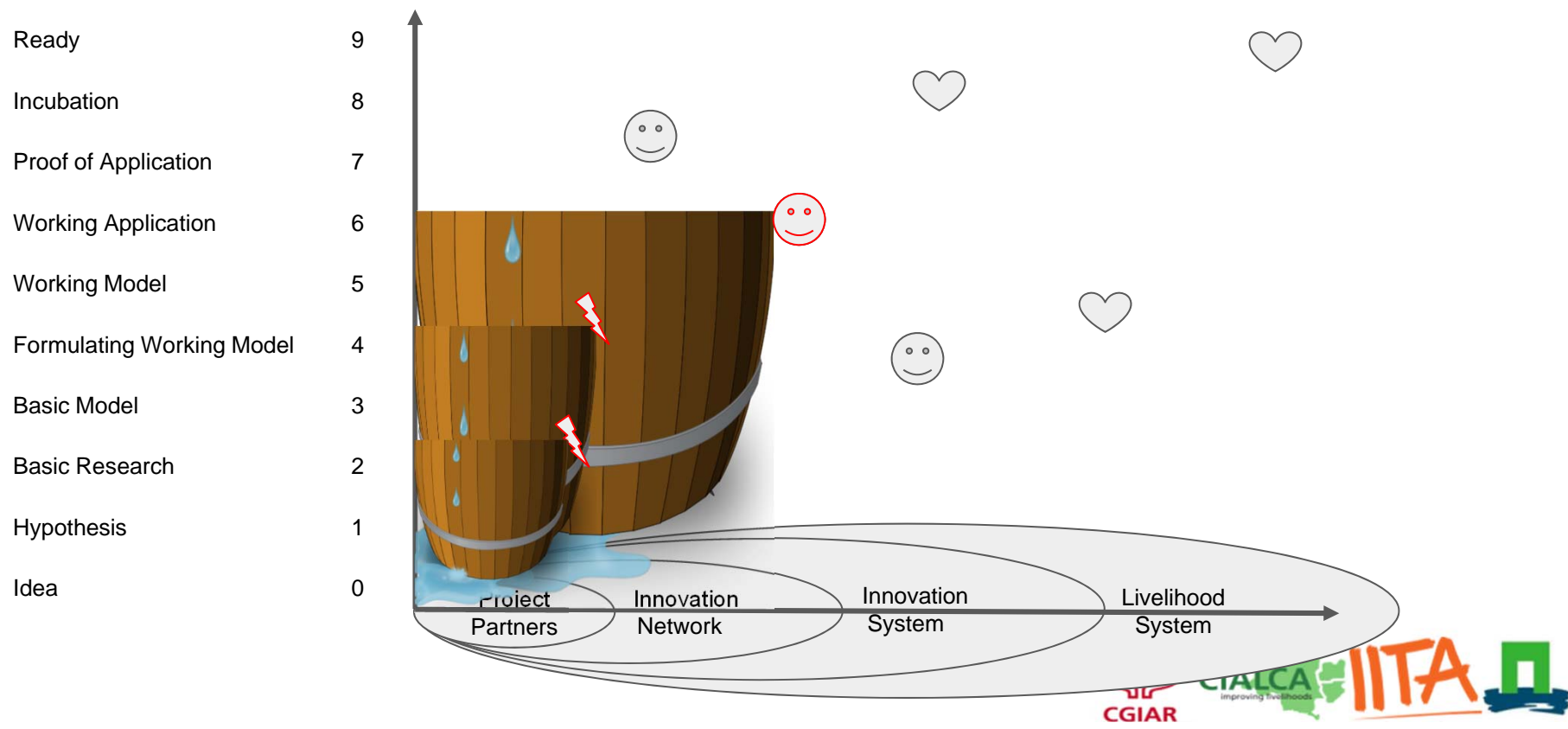How to ensure scalability and attribution to intervention?

Source: Modified from Sartas et all (2017). Effects of Multi-stakeholder Platforms on Multi-stakeholder Innovation Networks: Implications for Research for Development Interventions Targeting Agricultural Innovations at Scale, PLoS One (In press)

Scaling readiness

Ready	9
Incubation	8
Proof of Application	7
Working Application	6
Working Model	5
Formulating Working Model	4
Basic Model	3
Basic Research	2
Hypothesis	1
Idea	0

Project Partners — Innovation Network — Innovation System — Livelihood System

Scaling readiness

Ready	9
Incubation	8
Proof of Application	7
Working Application	6
Working Model	5
Formulating Working Model	4
Basic Model	3
Basic Research	2
Hypothesis	1
Idea	0

Project Partners   Innovation Network   Innovation System   Livelihood System

Scaling Readiness of Your Project

- Project based groups supported by Murat, Marc and Seerp, 1 hour

TASKS

1. Identifying complementary components
   a. Free Brainstorming (What products, services, processes or organizational models necessary to scale the core component?)
2. Building the innovation package
   a. List the innovation components using a spreadsheet
3. Identifying the scaling readiness level
   a. Add four columns to the spreadsheet: component readiness, component use, critical component and scaling readiness
   b. Discuss and determine readiness and use for each component using the scales
   c. Identify the (critical) components with minimum readiness and use
   d. Calculate the scaling readiness level

Readiness Scale

Ready	9	Validation of the capacity of the component to meet specific objectives in natural /real /uncontrolled conditions without support from an R4D initiative
Incubation	8	Testing the capacity of the component to meet specific objectives in natural/real/uncontrolled conditions with support from an R4D initiative
Proof of Application	7	Validation of the capacity of the component to meet specific objectives in controlled environments
Working Application	6	Testing of the capacity of the component to meet specific objectives in controlled environments
Working Model	5	Validation of the capacity of the component to meet specific objectives using existing applied-sciences-evidence
Formulating Working Model	4	Researching the capacity of the component to meet specific objectives using existing applied-sciences-evidence
Basic Model	3	Validation of principles that component can meet specific objectives using existing basic-sciences-evidence
Basic Research	2	Validation of principles that component can meet specific objectives using existing basic-sciences-evidence
Hypothesis	1	Validation of the idea that component can meet specific objectives. Development of the key hypothesis about the elements of the initial concept (e.g. objectives, functions, intended users)
Idea	0	Genesis of the idea. Formulating an idea that a component can meet specific objective.

Use Scale

Livelihood System (Common)	9	Component has been commonly used by the stakeholders who are not involved in developing the component
Livelihood System (Some)	8	Component has been used by some of the stakeholders who are not involved in developing the component
Livelihood System (Rare)	7	Component started to be used by few stakeholders who are not involved in developing the component
Innovation System (Common)	6	Component has been commonly used by the stakeholders who work in developing the innovation but not directly connected to the intervention partners
Innovation System (Some)	5	Component has been used by some of the stakeholders who work in developing the innovation but not directly connected to the intervention partners
Innovation System (Rare)	4	Component started to be used by the stakeholders who work in developing the innovation but not directly connected to the intervention partner
Innovation Network (Common)	3	Component has been commonly used by the stakeholders who are not involved in the project but are connected to project partners
Innovation Network (Some)	2	Component has been used by some of the stakeholders who are not involved in the project but are connected to project partners
Innovation Network (Rare)	1	Component started to be used by the stakeholders who are not involved in the project but are connected to project partners
Project Partners	0	Component is only used by project partners

Scaling Readiness in Action

Module 3:
Developing Scaling Strategies
(Theory of Scaling)

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1967 - 2017

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Scaling Readiness Concepts

Scaling strategy:

Objective : Achieve maximum scaling readiness given resources

Targets : Define readiness and use level targets for each critical component

Components : Innovation Development (How to reach to targets?)

Stakeholder Engagement (Whom can contribute to reach the targets?)

Innovation Development Strategy

Strategic component development options

- Is **substitution** with higher readiness and use component possible?
- If not can it be **outsourced** to other better positioned projects?
- If not, can the intervention **improve** the readiness and use of the component?
- If not, where is the best place to **relocate**?
- If relocation is not possible, can the innovation package serve **another goal?**

Scaling Readiness Target

- An intervention has limited resource and can't achieve all
- Then what is realistic readiness and use targets

Develop your innovation development strategy

- Project based groups supported by Murat, Marc and Seerp, 40 Min

3. Identifying the scaling readiness level
   a. Add three columns to the spreadsheet: component readiness, component use and scaling readiness
   b. Discuss and determine readiness and use for each component using the scales
   c. Identify the (critical) components with minimum readiness and use
   d. Calculate the scaling readiness level

4. Develop component development strategy
   a. Add 8 columns: substitution, outsourcing, development, best option, target readiness, target use relocate, new goal and target
   b. Discuss and determine substitution,outsourcing and development possibilities for each option for each critical component
   c. Identify the best option for each component.
   d. Discuss readiness and use targets
   e. If there is no best option, it relocation feasible?
   f. If relocation not feasible, refine goals and start the process again

Stakeholder Engagement Strategy

Which stakeholders to Engage? The more specific the better

How to engage with them? What is the best engagement option?

Develop your innovation development strategy

- Project based groups supported by Murat, Marc and Seerp, 20 Min

4.   Develop component development strategy
5.   Develop stakeholder engagement strategy
   a. Add one column to the spreadsheet and specify which stakeholders can contribute to pursuing the best option
   b. List each stakeholder
   c. For each stakeholder add a pair of columns. Add the name of the stakeholder and the best engagement means (Workshop, publication, periodic visits etc)

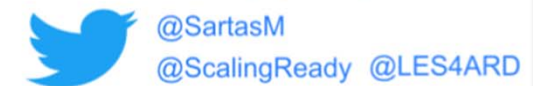NOW YOU CAN READY TO WRITE DRAFT SCALING ACTION PLAN USING THE

SPREADSHEET

EVIDENCE BASED SCALING

Draft scaling action plan is ready but

- Has key stakeholders been represented?
    - Is it certain that innovation package is complete?
    - Are the readiness and use assessment unbiased?
    - Are innovation development options realistic?
    - Are stakeholder lists complete and engagement means realistic?
- Is it enough to plan only once?

IF NOT ALL ANSWERS YES, THEN A MORE STRUCTURE APPROACH IS BETTER!

SCALING READINESS USING LES4RD!