Adoption of Rubber Harvesting Technologies (HTs) in the Smallholder Rubber Sector: A Case Study in Ratnapura District of Sri Lanka

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INTRODUCTION

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POSITIVE FACTS.....

Rubber *(Hevea brasiliensis)* sector in Sri Lanka (2018)

GDP	- 0.3 %
Export earnings	- US $ 875 Mn
Employment generation	- > 500,000
Grown in	- 16 Districts

Smallholder Rubber Sector

< 20.2 ha (50 Ac) in extent

Rubber Smallholders	- ≈ 125,000
Total production under the smallholder sector	- 69 %

(MPI,2018, CBSL, 2018)

RUBBER HARVESTING *(TAPPING)*

- Rubber - Perennial plantation crop
- Mature period
- Harvestable girth

What is Rubber Harvesting/ Tapping ?

The rubber tree is exploited by periodic excision of a thin shaving of the bark along a sloping groove placed spirally on the bark of the tree trunk to extract latex from latex vessels by a "tapping knife" and the procedure is known as harvesting (tapping).

(Nugawela, 2001)

ISSUES AND RESEARCH QUESTIONS

Expectations

- High potential yield (≈2500 kg/ha/year)
- Economic life of the tree (> 20 years)
- High adoption rate of HTs

Field situation

- Low productivity (<1000 kg/ha/year)
- Low economic lifespan of rubber (< 20 years)
- Damaged trees

Early uprooting

RRISL/Extension organizations

Extension Approaches

Adoption rate and reasons for poor-adoption

Polices/Strategies

(Dissanayake, *at el.*, 2005, Wijesuriya, *at el.*, 2007, Dissanayake, 2009)

SIGNIFICANCE OF THE STUDY

- No planned studies undertaken so far, to assess the adoption level of HTs
- Policy makers/Researches

OBJECTIVES

- Assess the adoption level of HTs
- Explore the reasons for poor adoption
- Suggest possible means of improving adoption of HTs

METHODOLOGY

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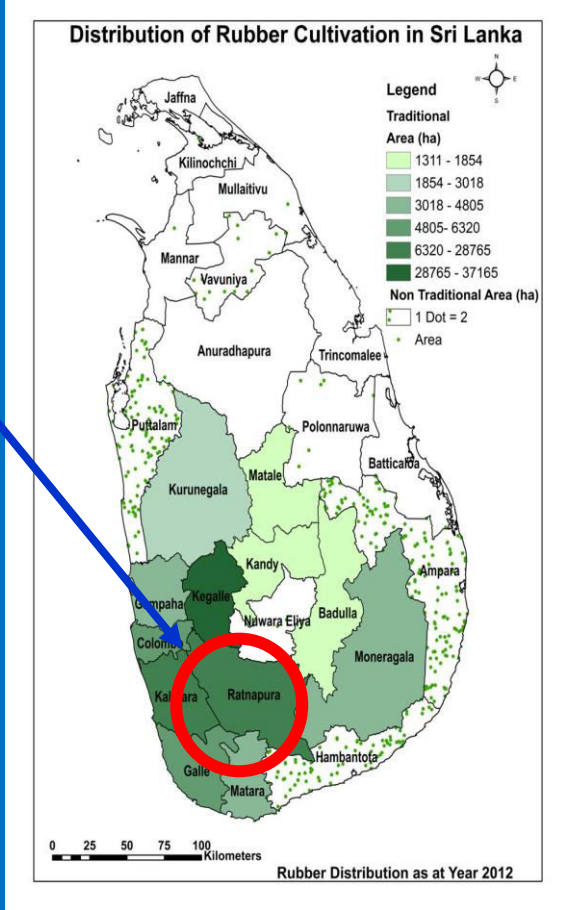
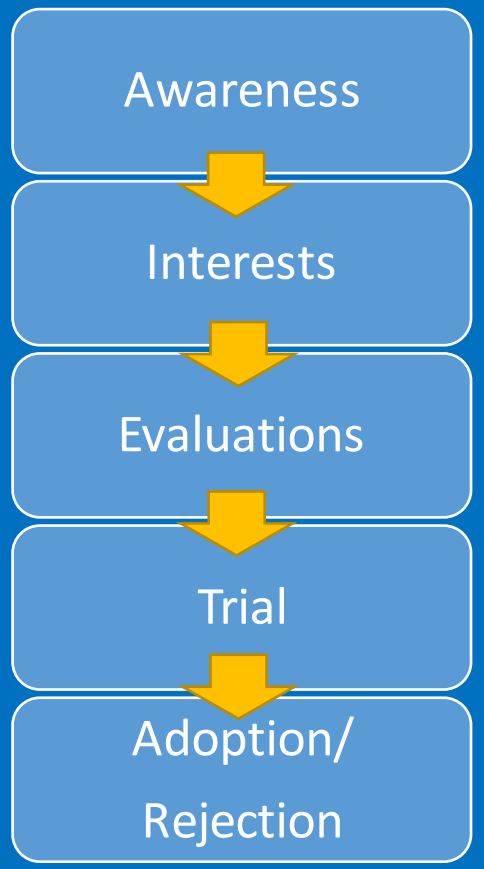
STUDY SITE AND SAMPLING

- Ratnapura District (6.5741° N, 80.5438° E) in Sri Lanka in 2018
- The Stratified Sampling Technique
- 200 smallholders (Without Rain guarding) who harvest their own rubber holdings in 7 rubber growing REO ranges
- Pre-tested questionnaire and field observations



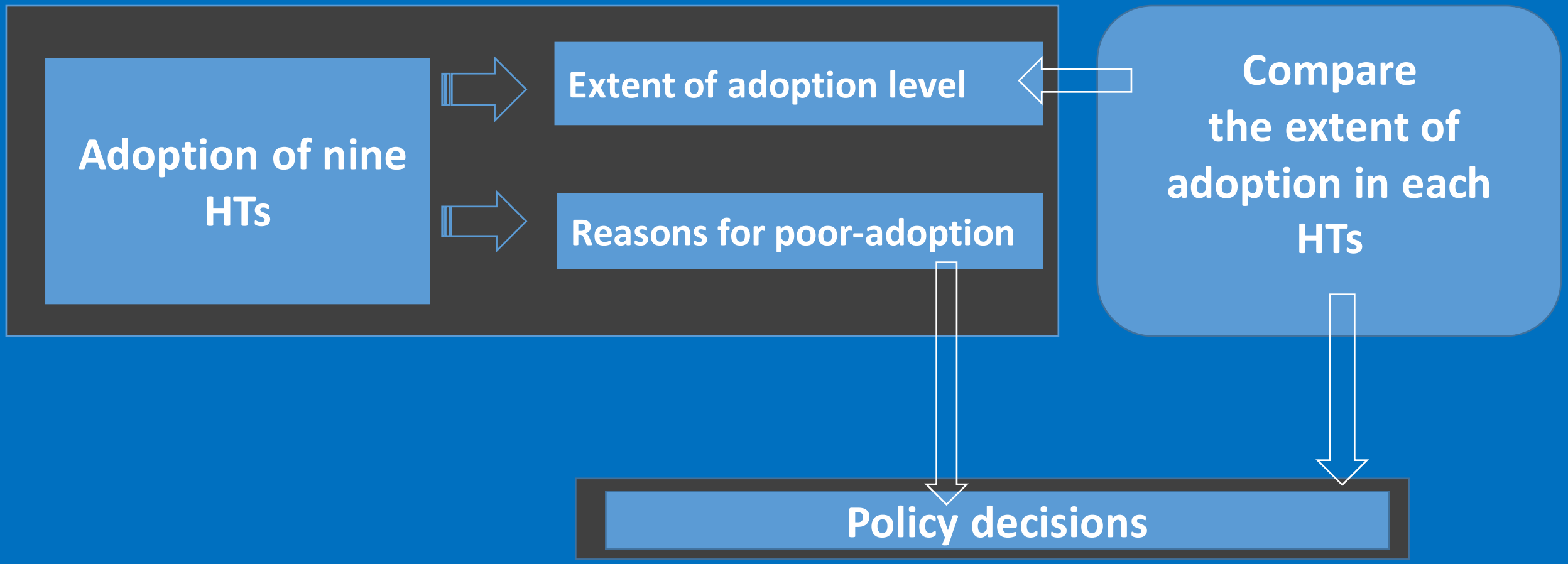
THEORIES OF ADOPTION

- *Adoption as a decision to make full use of a new idea as the best source of action available*



(Rogers and Shoemaker,1971)

RESEARCH DESIGN



MEASUREMENT OF VARIABLES AND DATA ANALYSIS

- Basic harvesting statistics

  - Size of the holding
  - Current harvesting panel
  - Harvesting stand
  - Type of clones
  - Harvesting days
  - Average yield

- Testing for adoption of HTs

- Finding the reasons for poor-adoption of HTs

  - Listed out by discussing with smallholders prior to the survey
  - Then list was administrated for response at the time of survey

- Descriptive analysis

RESULTS AND DISCUSSION

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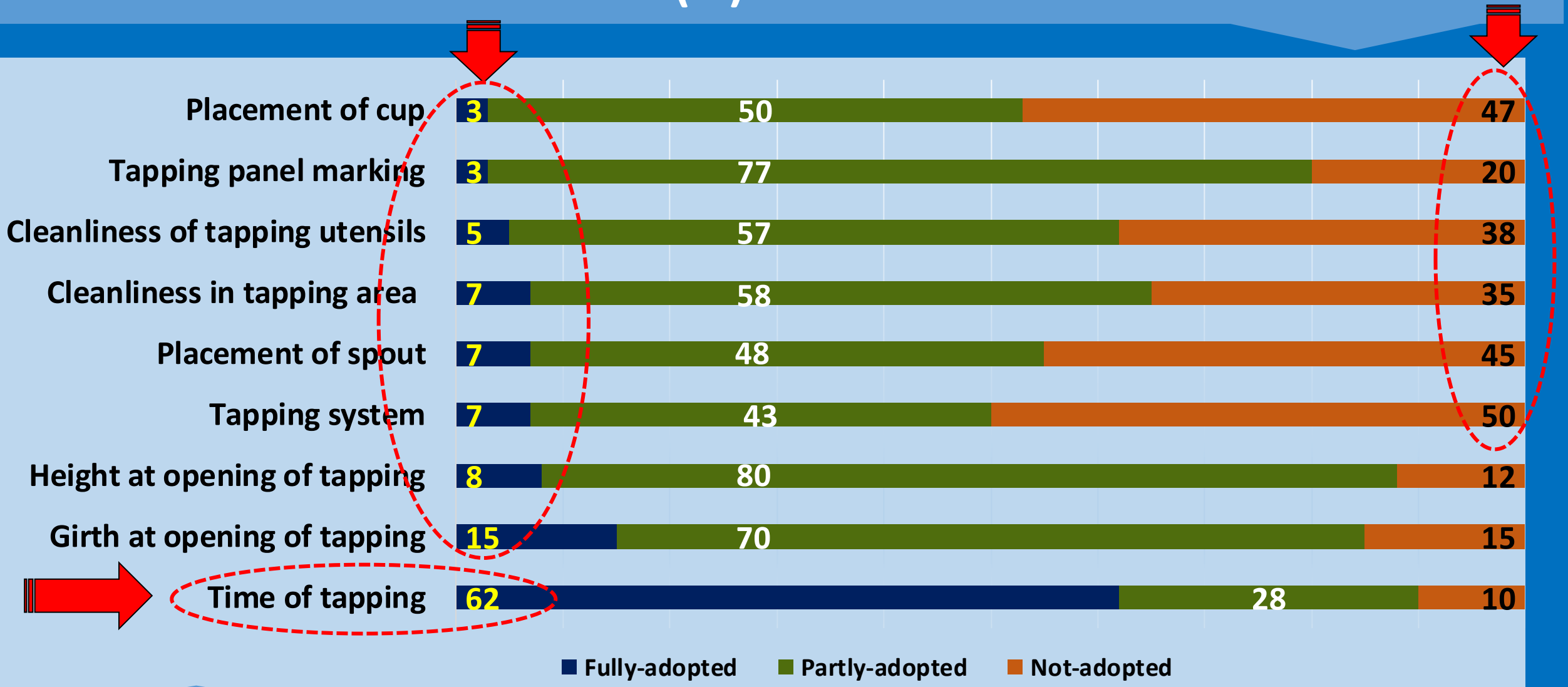
KEY INFORMATION OF SMALLHOLDINGS

• Average size of the holding	- 1.55 ac.
• Type of clones	- RRIC 121 (82%)
• Average harvesting stand per ac.	- 170 trees
• Current harvesting panel	- B0-1 (47%)
	- B0-2 (41%)
• Average harvesting days (S_2D_2)	- 104/year (Without Rain guarding)
• Average yield (dry basis)	- 1050 kg/ha/year
• Female	- 79 %

EXTENT OF ADOPTION OF HTs (%)



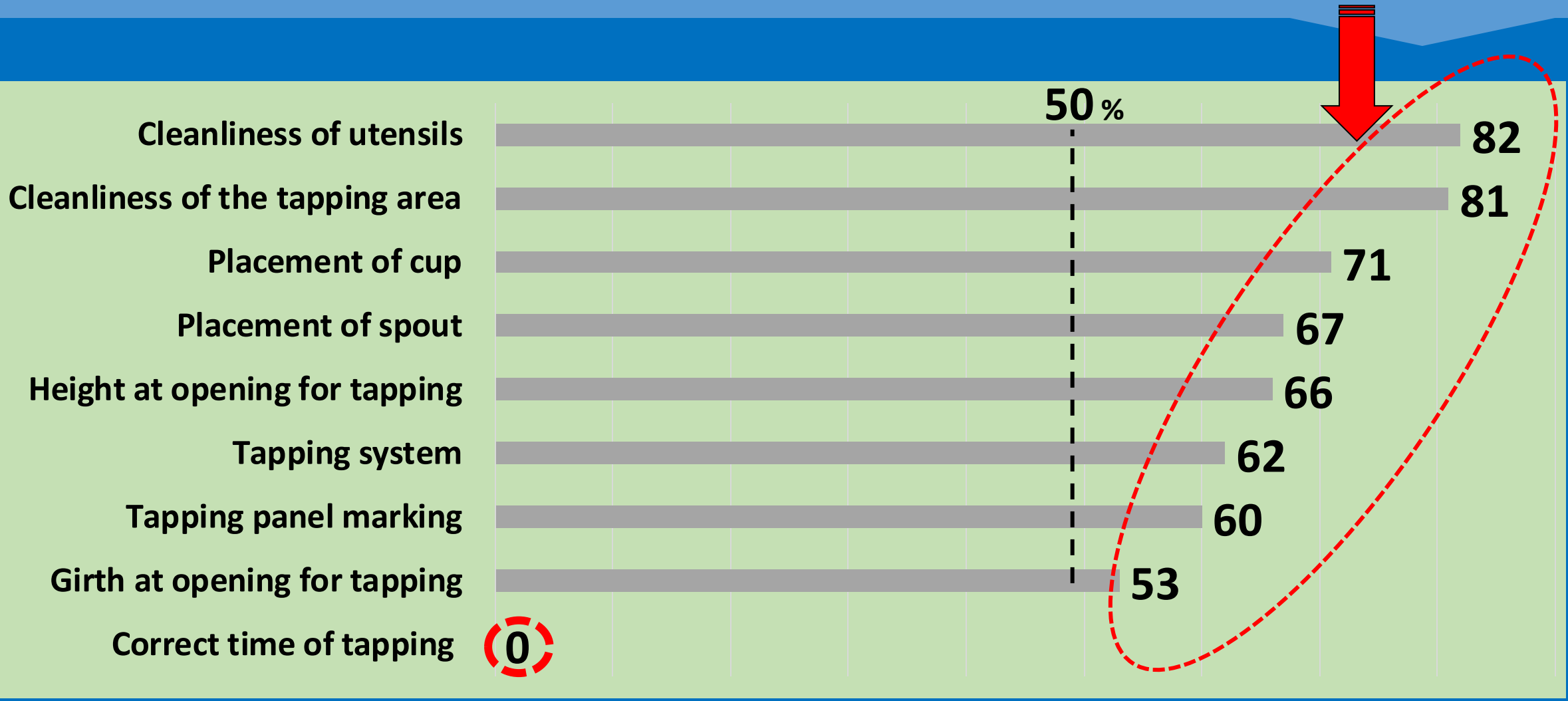
REASONS FOR POOR ADOPTION OF HTs

- Due to…

  - Lack of awareness

  - Other reasons (already aware of HTs)

LACK OF AWARENESS %



REASONS FOR POOR ADOPTION OF HTs

HTs	Reason/s for poor adoption
Tapping system (S_2D_2) →	**High rainfall on tapping days (88 %)** Not given the due recognition (12 %)
Tapping panel marking →	**Non-availability of marking stencils (98 %)** Reluctance to allocate extra time for marking (2 %)
Correct time of tapping practice →	**Bad weather condition in early morning (53%)** Threat of bites by snakes/animals (47%)
Girth at opening for tapping →	**Desire was to harvest the full tapping task (100%)**

REASONS FOR POOR ADOPTION OF HTs

HTs	Reason/s for poor adoption
Height at opening for tapping ➡	**Difficulty in practicing due to stature of the harvester (81 %)** Not given the due recognition (19 %)
Cleanliness of the tapping area ➡	**Reluctance to allocate extra time for cleaning the tapping area (96 %)** Not given the due recognition (04 %)
Cleanliness of the tapping utensils ➡	**Reluctance to allocate extra time for cleaning the tapping utensils (97 %)** Not given the due recognition (03 %)
Placement of spout ➡	**Not given the due recognition (93 %)** Reluctance to allocate extra time for proper placement of the spout (07 %)
Placement of collecting cup ➡	**Not given the due recognition (84 %)** Reluctance to allocate extra time for proper placement of the cup (16 %)

CONCLUSION AND RECOMMENDATIONS

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CONCLUSION AND RECOMMENDATIONS

- All level of adoption of HTs - Not satisfactory
- Reasons for poor-adoption of following HTs
  - Tapping system
  - Tapping panel marking
  - Girth and height at opening for tapping
  - Placement of spout/cup
  - Cleanliness in tapping area/ utensils

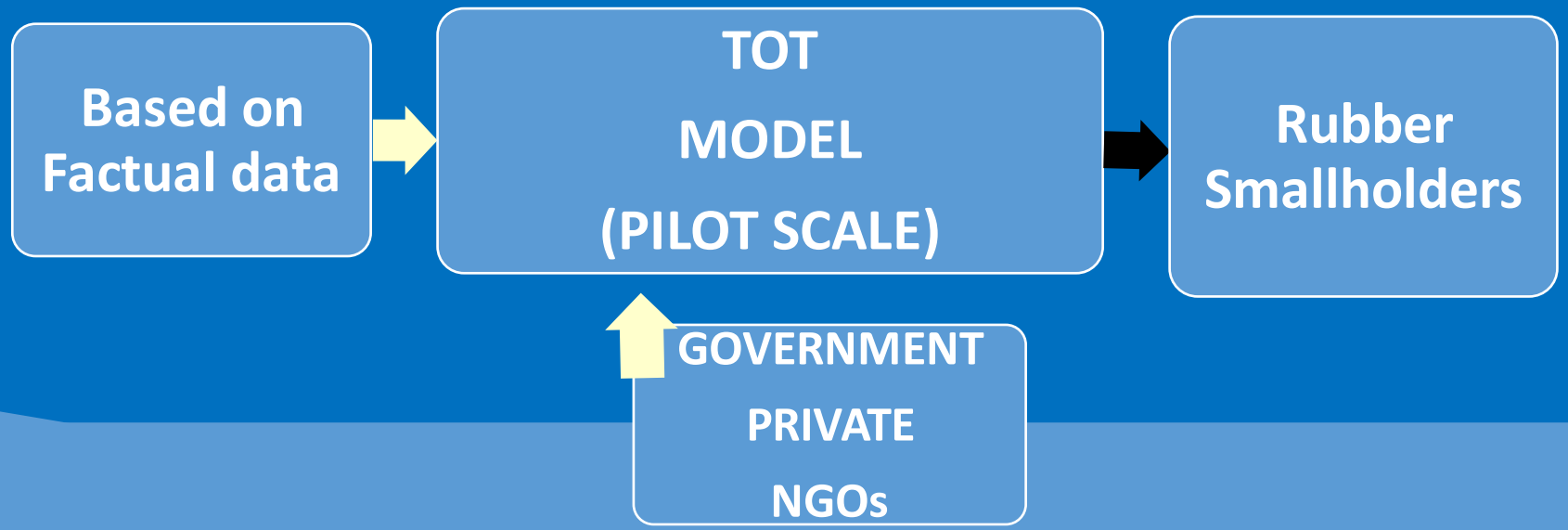
Suggest

Improving the Knowledge Attitude Awareness

Through proper Extension and Advisory system

CONCLUSION AND RECOMMENDATIONS

- Consider necessary changes to present HTs - Girth and height at opening for tapping
- The policy changes regarding material distribution (stencils) - In more efficient way
- Introduce - “Multi Stakeholder Collaborative Transfer of Technology” Model



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Acknowledgement

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Thank you.....

Testing for adoption of HTs – (10 % of trees in each block)

Type of harvesting practices	Level of adoption	Scale of adoption*
Tapping system	S_2D_2	FA
	Some days with S_2D_2	PA
	Daily tapping	NA
Tapping panel marking	Annually	FA
	At the commencement of tapping	PA
	Not attended	NA
Time of tapping	Early morning (5.00am-6.00am)	FA
	Morning (6.00am-7.00am)	PA
	Late (after 7.00am)	NA
Girth at opening for tapping	>20'' or 20" 18"- 20" < 18"	FA PA NA
Height at opening for tapping	> 4'or 4' 4'-3'	FA PA
	<3'	NA

Type of harvesting practices	Level of adoption	Scale of adoption*
Placement of spout	1"-2" away from latest line marked	FA
	3"-5" away from latest line marked	PA
	>5" away from latest line marked	NA
Placement of cup	2"-3" away from last marked line	FA
	3"-5" away from last marked line	PA
	>5" away from last marked line	NA
Cleanliness of tapping area	Fully cleaned Partially cleaned Not cleaned	FA PA NA
Cleanliness of tapping utensils	Fully cleaned Partially cleaned	FA PA
	Not cleaned	NA

* FA – Fully adopted, PA – Partially adopted and NA – Not adopted