



# **“I liked the new stove, but they made me build another one”: System factors for acceptability, adoption and sustainability**

**Funded by Global Alliance for Clean Cookstoves**

Presented at the Conference: “Beyond Distribution: Ensuring and Evaluating the Adoption of Clean Cooking and Its Benefits”, 4 – 5 May 2015

## Part 1. History Background

- Environmental home-based interventions research in Cajamarca, 2007- 2015 (D.Mäusezahl)

## Part 2. Adoption Project *“I liked the new stove, but they made me build another one”*: System factors for acceptability, adoption and sustainability in rural Peru

- Defining adoption and identifying enablers and barriers (S.Hartinger)
- System factors in the adoption process (D.Mäusezahl)
- Application: Improving ICS implementation (A.Powell)

## Part 3. Lessons learnt

(S.Hartinger)



## Part 1 History & Background

# Environmental home-based interventions research in Cajamarca, 2007- 2015

D.Mäusezahl, S.Hartinger, C.Lanata, J.Hattendorf, A.Gil,  
H.Verastegui & the IHIP-Peru Team



- **2007 – 2011 IHIP-1** : to address **key household burden of disease** by developing an **I**ntegrated **H**ome-based environmental **I**ntervention **P**ackage (**IHIP**).  
A community-randomised trial to improve indoor air pollution, drinking water quality and child nutrition in rural Peru.
- **2011 – 2013 IHIP-1** : to follow up the IHIP trial cohort on **early child development** outcomes
- **2013- 2014 GACC-Peru**: to analyse adoption outcomes in Cajamarca (IHIP), La Libertad and Cusco.
- **2014 – 2017 IHIP-2** : to combine home-environmental and ECD interventions in a randomised programme phasing-in of Cuna Mas (MIDIS), MoH (MINSA), MINEM and SENSICO programmes

## Integrating Home-based environmental Interventions (IHIP):

A community-randomised trial to improve indoor air pollution, drinking water quality and child nutrition in rural Peru (2007 – 2012)

Stella Hartinger, Claudio Lanata, Ana Gil, Jan Hattendorf, Daniel Mäusezahl





- To determine the reduction of ARI and diarrhoea and the increase in growth in children under 36 months.
- Determine the levels of reduction in environmental indicators at baseline, midterm and end of study.
- To measure indoor air pollution in the kitchen environment and in personal exposure.

## Underlying principles

- Work community /system-based: broad stakeholder inclusion
- Need-based intervention design : develop intervention package thru and by the communities
- Apply an engendered approach



- San Marcos Province, Cajamarca Region, northern Peru
- Altitude: 2400 – 3800m
- Cluster Randomised Trial: **51 communities**
- Cluster size: 5 – 30 children, Age: 6 – 36 months



# Participatory project design and intervention development



- To develop an effective low-cost environmental home intervention package based on **people's demand**.
- Identify the potential **exposure risks** at household level that are associated with cooking; contamination of food; drinking water; kitchens utensils and surfaces, and caregivers and children's hands.
- Identify responsive **environmental indicators** to objectively evaluate the intervention effects on indoor air pollution, home hygiene and water treatment and hand washing.
- Identifying a **control intervention** for the control arm.



# Participation throughout the IHIP trial



Set-up, community selection and selection of interventions

Enrollment, baseline and follow-up

Hand over workshops and auto-dissemination survey

Jul.07 - Oct07	Nov.07 - Jan.08	Feb.08-Apr.08	May. 08 - Jul.08	Aug.08 - Jan. 09	Feb.09	Jul.09	Feb.10	Mar.10 - Jun.10	10-Jul	Aug.10	Aug. 10 - Dic. 10
Preliminary Work				Baseline Information		Follow-up		Hand over workshop		Evaluation of hand-over activities - Multiplication survey	Final study report and scientific reporting / publication.
Project Set up	Community Selection	Preliminary Screening (census)	Test & Selection of Interventions Test forms Train field staff Local Authority & Community Consent	Enrollment Baseline Information - Environmental Sample - Anthropometrics - Socio/economic - Stool samples - Psychomotor stimulation evaluation	Installment of Interventions Start of followup period - Weekly Morbidity Surveillance - Anthropometrics (2 months) - Psychomotor stimulation evaluation (2 months) - Education component (monthly)	Mid Study Evaluation - Environmental samples - Control stool samples - Indoor air pollution assessment	End of followup period - Environmental Samples - Control Stool Samples	Hand over workshop	Data Cleaning	Evaluation of hand-over activities - Multiplication survey	Final study report and scientific reporting / publication.
Data entry, management and quality Control											

Community voice  
Stakeholder engagement  
System actors planning

Community, Researcher,  
Stakeholder engagement,  
Hlth & Edu System engaged

Community participation  
Stakeholder information  
Community driven roll-out

# Stove & Kitchen Environment





# IHIP-Trial: Selected Interventions



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Intervention arm: Kitchen environment

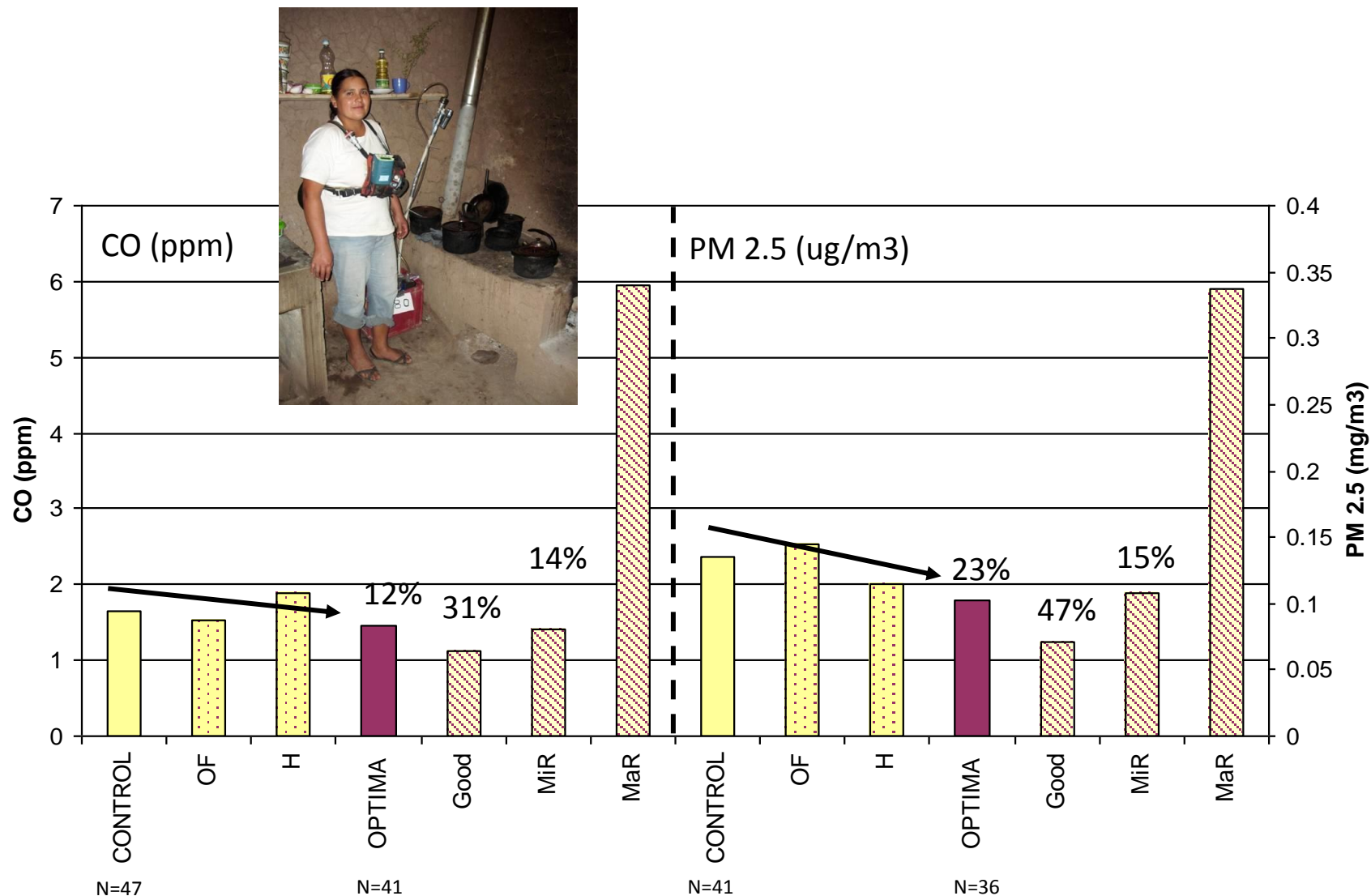
Control arm: Early Child development





FGD in 4 communities in 2007/8,  
built 3 stoves (before certification)

- A device with 2 **furnaces** was rejected
- Mouth to fit local **wood** size
- Mouth to fit cultural bread (***cachanga***)
- Wood drying rack
- Local materials
- Need for **kitchen sink**









# Scaling of IHIP-intervention package

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Set-up, community selection and selection of interventions

Enrollment, Baseline and Follow-up

Hand over workshops and auto-dissemination survey

Jul.07 - Oct.07	Nov.07 - Jan.08	Feb.08-Apr.08	May. 08 - Jul.08	Aug.08 - Jan. 09	Feb.09	Jul.09	Feb.10	Mar.10 - Jun.10	10-Jul	Aug.10	Aug. 10 - Dic. 10
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Community voice  
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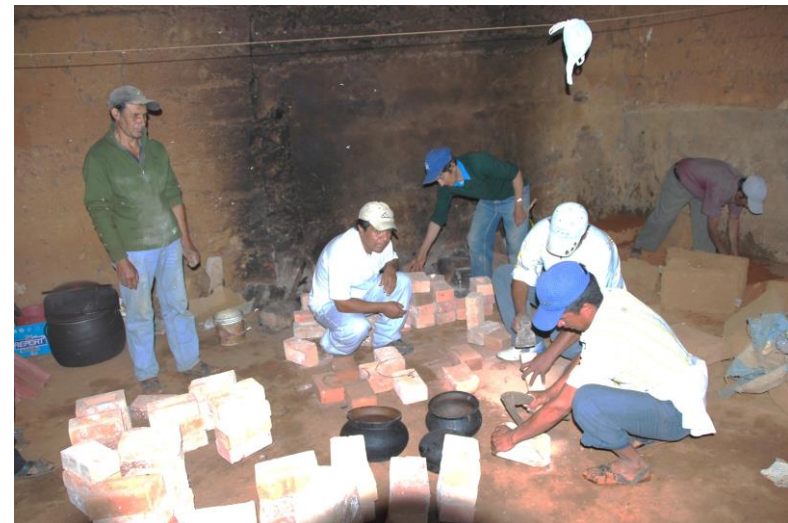
Community, Researcher,  
Stakeholder engagement,  
Hlth & Edu System engaged

Community participation  
Stakeholder information  
Community driven roll-out

- 24 community workshops organised in the community primary schools
- Increase community attendance and benefit the community by leaving the interventions implemented:

Interactive dialogue between participants, builders and local leaders / municipality and researcher

“How to use, maintain and build” the OPTIMA-improved stove.



**Evaluation at 12 mths :** 230/864 (27%) households had an ICS newly built  
75/864 (9%) built a correct Optima ICS replica

# Sustainability after 12, 24, 72 months, but...



Interventions	12 mts End of study N=216	24 months N=177	6 yrs N=155
<b>OPTIMA-improved stove</b>			
Do you have the OPTIMA -where you live?	200 (92%)	161 (90%)	124 (80%)
Do you use the stove?	194 (90%)	152 (85%)	124 (80%)
Do you use it everyday?	185 (86%)	143 (80%)	123 (79.5%)
<b>Kitchen Sink</b>			
Do you have a kitchen sink were you live?	177 (82%)	155 (88%)	
Do you use the sink?	177 (82%)	135 (76%)	
Sink in good conditions	160 (73%)	101 (57%)	
<b>SODIS -HWT</b>			
Do you use SODIS	147 (71%)	11 (6%)	

# ...is this really “Adoption” ?



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Reference	Definition of adoption	
Rehfuess E. A. et al (2014) & Puzzolo E. et al (2013)	Acquisition: stoves are purchased or installed without any reference to their later use. Initial	essed
Silk B. J. et al (2014), Klasen E. et al (2013), Lewis J. J. et al (2012)	Rehfuess, <i>et al</i> (2014), Puzzolo, <i>et al</i> (2013)	<p><b>Acquisition:</b> stove installed – no reference to use.</p> <p><b>Initial adoption:</b> use within 12 mts after acquisition</p> <p><b>Sustained use:</b> medium-term (1–2 years after acquisition) and longer-term sustained use</p>
Person B. et al (2012)	No definition given. Generally they speak of adoption as "general use" of a cookstove.	
Jeuland M. A. et al (2012), Ruiz-Mercado I. et al (2011), Shankar A. et al (2011)	Ruiz-Mercado, <i>et al</i> (2011)	<p><b>Adoption :</b> "long-term sustained use" (no further specification). Considers various information around the adoption process at individual and population level</p>
Barstow C. K. et al (2014)	Reported use	
Troncoso K. et al (2007 & 2011)	"Only when the user becomes independent in the management and maintenance of a new	il
Stanistreet D. et al (2014)	Stanistreet, <i>et al</i> (2014)	<p><b>Adoption :</b> initial uptake and sustained use</p> <p>Sustained use = use <math>\geq</math> 12 mts</p>
Bwenge N. S. (2011)	No definition of adoption given	
Troncoso K. et al (2014)	Troncoso, <i>et al</i> (2014)	<p><b>Adoption Index:</b> Frequency of stove use, condition of ICS, level of satisfaction and interest in replacing with new ICS</p>
Siddig El Tayeb et al (2009)	No definition given	

# Was there adoption in IHIP-Phase-1?

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## Main Objectives IHIP-Peru Trial

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- To determine the reduction of ARI, diarrhoea and growth in children under 36 months.
- Determine the levels of reduction of environmental indicators at baseline, midterm and end of study.
- To measure indoor air pollution on kitchen environment and personal exposure.

### Underlying principles

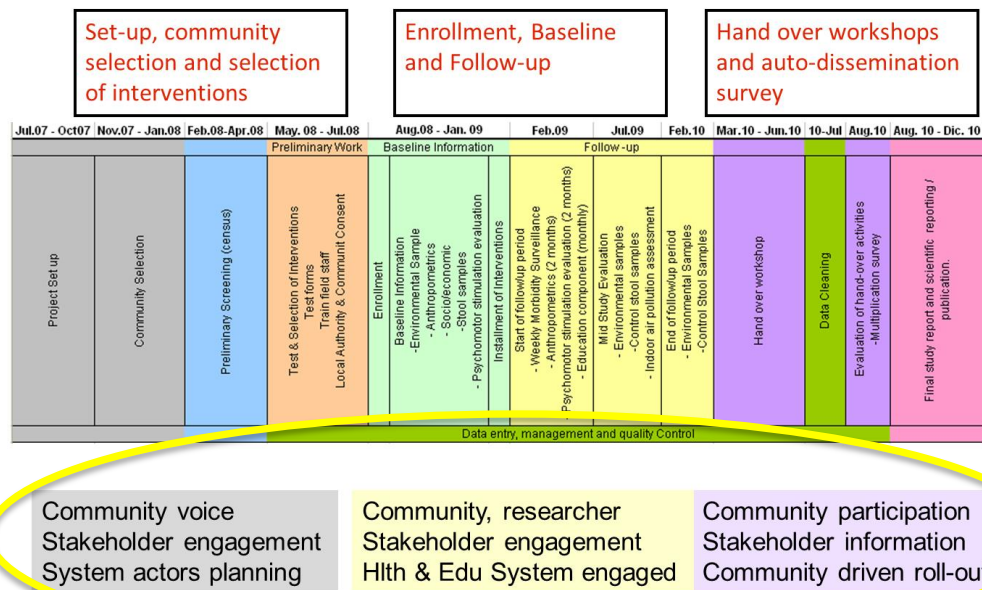
- Work community /system-based: broad stakeholder inclusion
- Need-based intervention design : develop intervention package thru and by communities
- Apply an engendered approach

A priori planning

Ownership → empowerment

## Timetable: IHIP work in Peru

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Continued engagement across the stakeholders of the socio-ecological system.



## **Part 2: “I liked the new stove, but they made me build another one”: System factors for acceptability, adoption and sustainability**

# **Defining Adoption and Identifying Enablers and Barriers**

S. Hartinger, D. Mäusezahl, J. Wolf, V. Paz-Soldán,  
A. Powell, H. Verastegui, J. Muela



**Overall Objective:** Identify key attributes that influence acceptability and adoption of clean and safe cooking devices, using a socio-ecological framework, in rural Andean populations of Peru.

1. Describe current level of ICS use and/or traditional cooking devices, focusing on specific attributes and performance that contribute to its acceptance and adoption.
2. Examine social and cultural factors associated with adoption processes (acceptance, use, adoption and sustained adoption).
3. Examine and map the existing ICS interventions/programmes and national/regional policies associated with ICS promotion.



Grupo Temático  
Energía para Cocinar

Mejorando la calidad de vida

Cocinas Mejoradas implementadas en el Perú

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Cocinas en Hogares por Departamento ☒

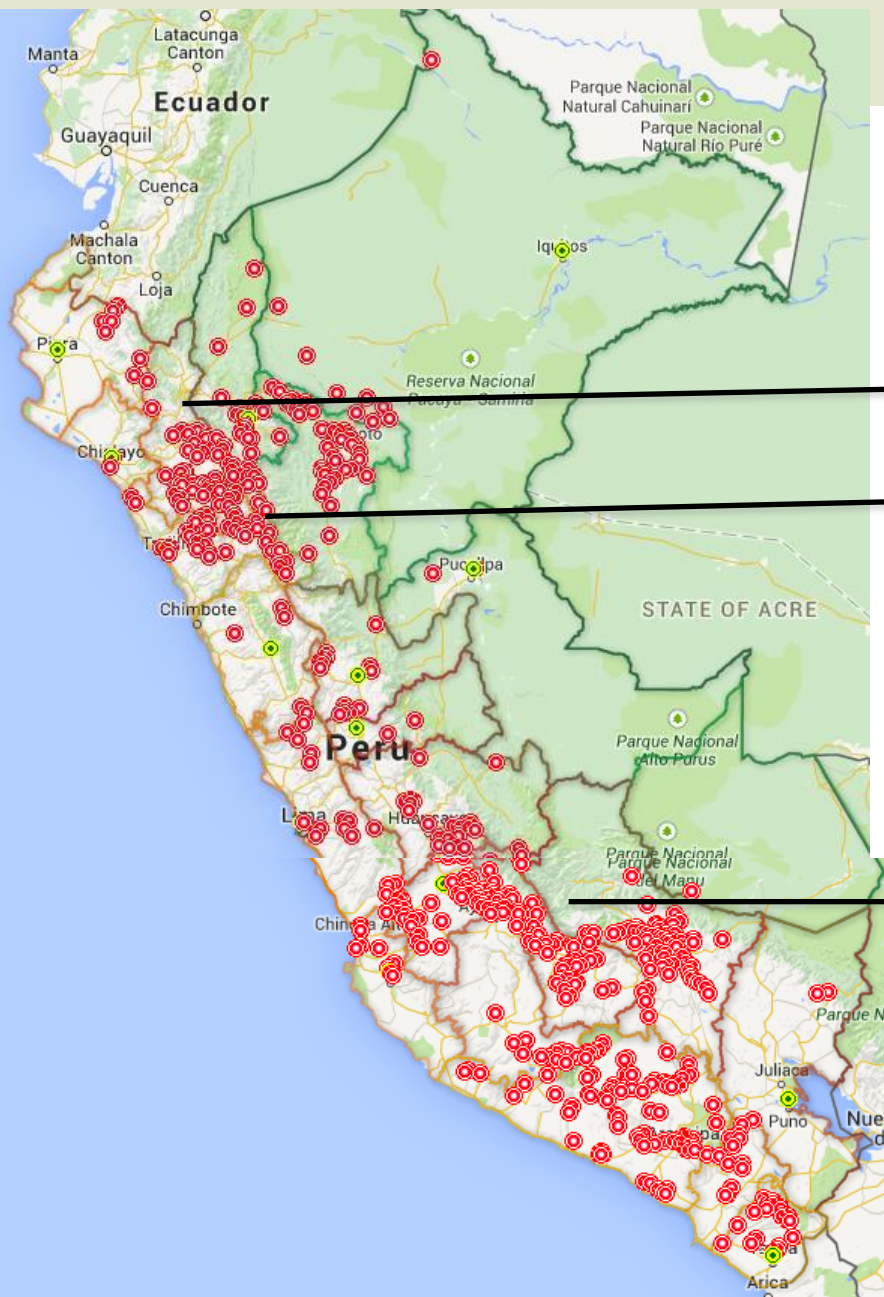
Cocinas en Hogares por Distrito ☒

Cocinas en Hogares por Centro Poblado ☐

Ver Mapa de Pobreza por Distrito ☐

Busque Poblado, Distrito, Provincia, ...

Buscar



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AMAZONAS	5,182
ANCASH	1,687
APURIMAC	18,179
AREQUIPA	14,404

**Cajamarca 45'673 ICS**

HUANUCO	6,086
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**La Libertad 58'732 ICS**

ICA	624
JUNIN	2,168
LAMBAYEQUE	1,949
LIMA	3,183
LORETO	3,509
MOQUEGUA	4,073
PASCO	4,983
PIURA	20,652

**Cusco 41'904 ICS**

SAN MARTIN	4,159
TACNA	9,802
UCAYALI	520

**TOTAL : 301'088**

# Stove Programmes found in each Region

Cajamarca	Cuzco	La Libertad
<b>Municipality ICS</b> (Provincia Cajabamba, Contumaza, Hualgayoc, Jaen, San Marcos, San Miguel and San Pablo )	<b>MINEM/EnDev GIZ</b> (NINA Program)	<b>Regional Government</b> (Provinces of Bolivar, Gran Chimú, Pataz, Sánchez Carroón)
<b>ITyF (Sembrando)</b>	<b>Municipality ICS</b> (Provincia Acomayo, Anta, Calca, Canchis, Chumbivilcas, Cusco, Paruro, Paucartambo and Paucartambo)	<b>ITyF (Sembrando)</b>
<b>ADIAR</b>	<b>Chacra Productiva</b>	<b>Proyecto Especial Copasa/EnDev GIZ</b>
<b>PREDECI</b>	<b>Proyecto Especial Copasa/EnDev GIZ</b>	<b>Nueva Esperanza/EnDev GIZ</b>
<b>GIZ</b>	<b>San Bartolome de las Casas</b>	<b>EnDev GIZ</b>
<b>OPTIMA ICS</b>		<b>Barrick Mining Company/Reg. Gov/Local Govern./Juntos /EnDev</b>
<b>Haren Alde</b>		
<b>Asociación de los Andes de Cajamarca-ALAC</b>		





## Inclusion Criteria

- Participation in an ICS program (NGO's, governmental or research institution) during the past 7 years
- Have used biomass (wood, carbon, dung ) for cooking (alone or in combination with a CC-T)
- Head of household >18yrs
- Signed the informed consent form

## Sampling Scheme

- Cultural and regional representation
- Large number of ICS programmes and beneficiaries
- Large communities (population) and easily accessed



## Livelihood-SES Questionnaires

- 1'200 Households in 3 regions (N=400 each)
- Seven domains: Systematic literature review
- Livelihood characteristics (financial, social, human, physical and personal)



## Focus Group

- ICS beneficiaries
- Cajamarca N=16, La Libertad N=6, Cusco N=10



## In-depth Interviews

- Main stakeholders (Central)
- Cajamarca N=14, La Libertad N=6, Cusco N=8



## Household Observation and HAP monitoring

- Observation of stove conditions
- CO monitoring (N=120)





# Methods – Variables in the seven domains



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D1: Fuel and technology characteristics	<ul style="list-style-type: none"><li>- Type of stove programme</li><li>- Presence of three potholes in ICS</li><li>- Durability/Problems with ICS</li><li>- Need to buy firewood</li></ul>
D2: Household and setting characteristics	<ul style="list-style-type: none"><li>- Age and education of reporting mother/female</li><li>- Household wealth index / Household income</li><li>- Household size / Land ownership</li><li>- Stove stacking (presence of a secondary cookstove)</li><li>- ICS used to heat the household / ICS lit all day</li><li>- Renovations in the house since ICS was installed</li></ul>
D3: Knowledge and perceptions	<ul style="list-style-type: none"><li>- Perception of a well-ventilated kitchen</li><li>- Local associations/authorities/leaders</li><li>- Social Network</li><li>- Know somebody who can build an ICS</li><li>- Would recommend the ICS to neighbour or relative</li></ul>
D4: Financial, tax & subsidy aspects	<ul style="list-style-type: none"><li>- Bank account</li></ul>
D5: Market development	<ul style="list-style-type: none"><li>- Possibility to access stove parts in the community</li></ul>
D6: Regulation, legislation and standards	<ul style="list-style-type: none"><li>- Certification</li></ul>
D7: Programmatic and policy mechanisms	<ul style="list-style-type: none"><li>- Participation in programmes (JUNTOS or Gas)</li></ul>

# How do we define adoption?



Rehfuess E. A. et al (2014) & Puzzolo E. et al (2013)	<p><b>Acquisition:</b> stoves are purchased or installed without any reference to their later use.</p> <p><b>Initial adoption:</b> use is assessed &lt; 1 year from acquisition.</p> <p><b>Sustained use:</b> both medium-term (assessed 1–2 years after acquisition) and long-term sustained use (longer time periods).</p>
Lewis J. J. et al (2012)	Adoption represents some use of an ICS.
Person B. et al (2012)	No definition given. Generally they speak of adoption as "general use" of a cookstove.
Ruiz-Mercado I. et al (2011)	<b>Adoption:</b> long-term sustained use ( no further specification).
Shankar A. et al (2014)	Adoption is defined as the acquisition and substantive use of a technology by the user.
Barstow C. K. et al (2014)	Reported use
Stanistreet D. et al (2014)	<p><b>Adoption:</b> Initial uptake and sustain use</p> <p><b>Sustained use</b> = Use <math>\geq</math> 12 months</p>
Stanistreet D. et al (2014)	adoption = initial uptake and sustained use = use over 12 months or longer
Troncoso K. et al (2014)	<b>Adoption Index:</b> Frequency of stove use, condition of ICS, level of satisfaction with the ICS and interest in replacing with a new ICS
Siddig El Tayeb M. et al (2003)	None given

# How do we define adoption?



## Adoption

- **Frequency of use**

- ICS is stated as primary cookstove *OR* ICS and gas stove are stated as primary and secondary cookstove
- Use ICS  $\geq 50\%$  of all cooking activities *OR* ICS and gas stove  $\geq 50\%$  of all cooking activities

- **Condition of ICS**

- Has a chimney and a closed combustion chamber
- No leaks in the chimney

- **Willingness to Invest**

- New stove or new parts

## Sustained Adoption

- Criteria for “**Adoption**” + **investment** / ICS replacement made

# How do we define adoption?



## Adoption

- Frequency of use

- ICS is stated as primary cookstove OR ICS and gas stove are stated as primary and secondary cookstove

- ICS is stated as primary cookstove OR ICS and gas stove are stated as primary and secondary cookstove

- Correlation

*The outcome for the subsequent analysis is the binary variable adopter/non-adopter of clean cooking technologies.*

- Willingness to pay

- New stove or new parts

## Sustained Adoption

- Criteria for “**Adoption**” + **investment** / ICS replacement made

# Results - Questionnaires per Region



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<b>Cajamarca</b> (48 communities)	<b>n (%)</b>	<b>Cusco</b> (23 communities)	<b>n (%)</b>	<b>La Libertad</b> (12 communities)	<b>n (%)</b>
OPTIMA ICS	155 (42.8)	NINA	260 (70.8)	Juntos	185 (49.5)
Municipality	88 (24.3)	Municipality	38 (10.4)	ITyF (Sembrando)	156 (47.7)
ITyF (Sembrando)	41 (11.3)	Chacra Productiva	23 (6.3)	Barrick	28 (7.5)
ADIAR	35 (9.7)	Other	46 (12.5)	Other	5 (1.34)
PREDECI	21 (5.8)				
GIZ/ENDEV	18 (5.0)				
Other	4 (1.1)				

# Results - Baseline Characteristics



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	Cajamarca (n=400)	Cusco (n=400)	La Libertad (n=402)
household size, mean (sd)	4.3 (1.5)	4.4 (1.9)	4.3 (1.9)
Language (mother)			
Spanish	397 (99.8)	4 (1.0)	379 (97.7)
Quechua	1 (0.3)	262 (66.7)	9 (2.3)
Spanish & Quechua	-	127 (32.3)	-
age (years), mean (sd)			
reporting mother/female	40.3 (12.7)	46.5 (12.8)	48.1 (14.4)
husband	43.8 (12.7)	47.7 (11.8)	50.2 (14.8)
years of schooling, mother, n (%)			
0	30 (7.6)	73 (18.6)	52 (13.4)
1-6 years	310 (78.1)	237 (60.5)	261 (67.4)
7-11 years	54 (13.6)	75 (19.1)	58 (15)
>11 years	3 (0.76)	7 (1.8)	16 (4.1)
years of schooling, father			
0	6 (1.7)	18 (5.4)	18 (5.5)
<b>Household income</b>	<b>475</b>	<b>800</b>	<b>250</b>
	(300-695)	(500-1200)	(150-350)
household income, median (IQR)	475 (300-695)	800 (500-1200)	250 (150-350)
<b>Programme participation started</b>	<b>2009</b>	<b>2011</b>	<b>2010</b>
years since programme participation, mean (SD)	2009 (2.3)	2011 (1.2)	2010 (0.9)



## Results – Main & secondary stove (stove stacking)



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Main stove	Secondary stove	Overall (n=1'099)	Cajamarca (n=361)	Cusco (n=365)	La Libertad (n=373)
ICS	Gas stove	45.1%	34.6%	55.6%	45%
ICS	Traditional	15.2%	21.3%	10.1%	14.2%
ICS	none	28.2%	28.3%	27.1%	29.2%
Gas stove	ICS	4.1%	2.8%	3.3%	6.2%
Gas stove	Traditional	0.3%	0.8%	0	0
Gas stove	None	0	0	0	0
Traditional	ICS	4.2%	3.9%	3.8%	4.8%
Traditional	Gas stove	0.8%	2.2%	0	0.3%
Traditional	None	2%	6.1%	0	0

## Results – Level of use of the different ICS



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% use of all cooking activities	Overall (n=1,058)	Cajamarca (n=349)	Cuzco (n=339)	La Libertad (n=370)	x2-test
ICS					
≤5%	6.1%	9.5%	2.7%	6.2%	p<0.001
>5-50%	7.4%	5.4%	8.3%	8.4%	
>50-95%	43.3%	33%	52.5%	44.6%	
>95%	43.3%	52.2%	36.6%	40.8%	
Gas stove					
≤5%	54.7%	65.9%	47.5%	50.8%	p<0.001
>5-50%	38.9%	28.1%	47.5%	41.1%	
>50-95%	5.5%	5.4%	4.7%	6.2%	
>95%	1.0%	0.6%	0.3%	1.9%	
Traditional					
≤5%	84.7%	82.5%	85.6%	86%	p=0.2
>5-50%	9.1%	9.2%	9.7%	8.4%	
>50-95%	2.7%	2.6%	3%	2.4%	
>95%	3.6%	5.7%	1.8%	3.2%	



ICS condition (Fieldworker observations)	Overall n=971	Cajamarca n=304	Cusco n=328	La Libertad n=339	x2-test
Presence of a chimney which is not broken	93.5%	89.8%	94.8%	95.6%	p<0.01
Presence of a closed combustion chamber	86.7%	82.2%	91.2%	86.4%	p<0.01
Improved solid fuel stove in “good condition (not cracked or with leaks)”	81.2%	74%	86.3%	82.6%	p<0.001



Willingness to pay for a ...	Overall (n=1,033)	Cajamarca (n=344)	Cusco (n=331)	La Libertad (n=358)	x2-test
new stove or different replacement parts	79.1%	58.1%	92.5%	86.9%	p<0.001



% adoption of clean cooking technologies	Overall n= 1'033	Cajamarca n= 344	Cusco n= 331	La Libertad n= 358	x2-test
<b>Incl.</b> willingness to pay	59.2%	39.2%	74.6%	64%	p<0.001
<b>Excl.</b> willingness to pay	72.2%	64.2%	79.8%	72.9%	p<0.001

# Results – Multi-regression analysis

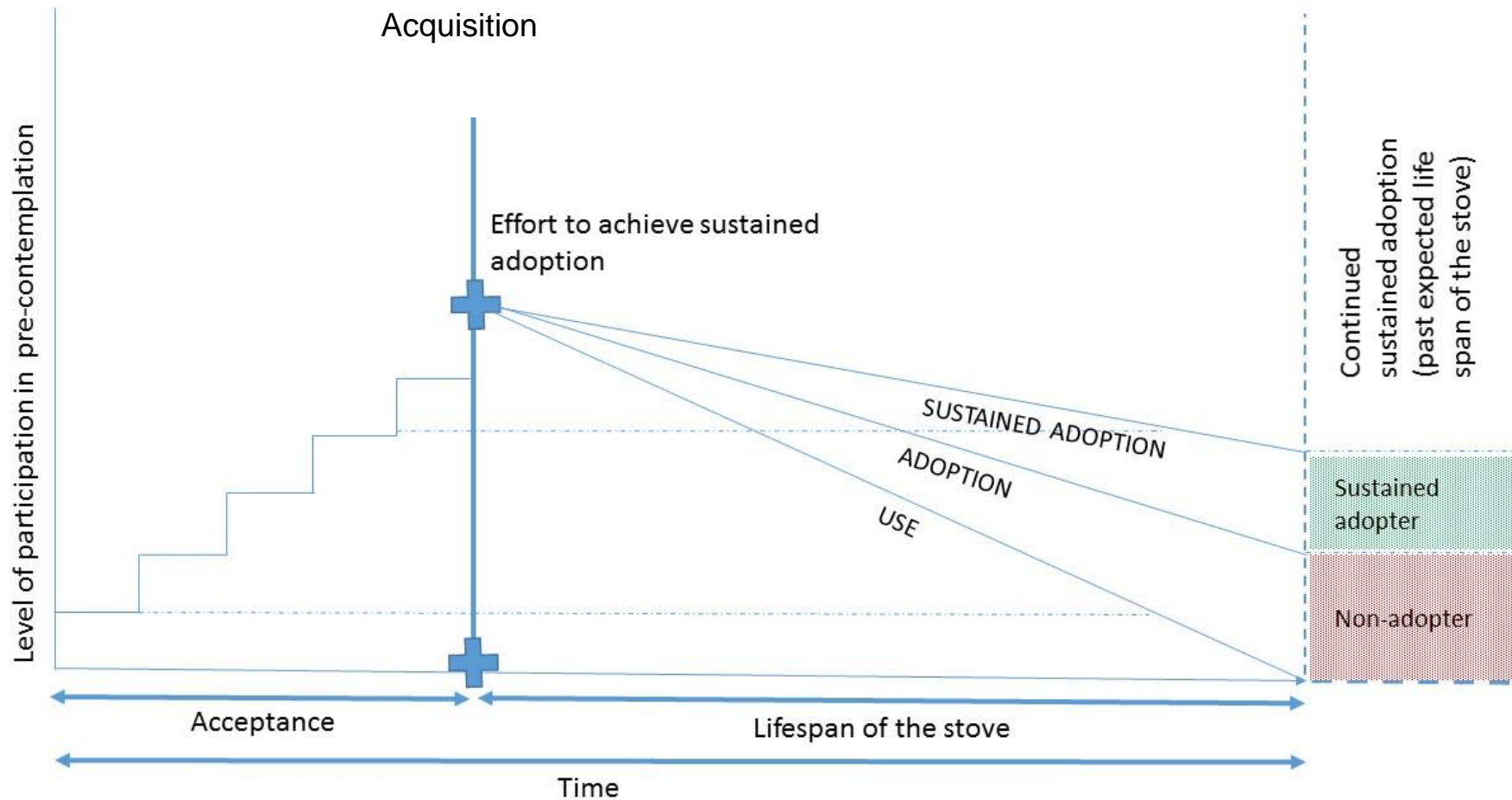


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Independent variable	OR (95% CI)	p-value
<b>Region</b>		
Cajamarca		
Cuzco	3.5 ( 1.5 -8.1)	0.004
La Libertad	2.2 (1.0 -4.7)	0.05
Presence of bank account	1.34 (0.79-2.28)	0.3
Access to help/presence of social network	1.17 (0.74-1.86)	0.5
HH has internet access	1.03 (0.73-1.45)	0.9
HH needs to buy wood	0.91 (0.66-1.26)	0.6
HH participates in gas programme	1.28 (0.85-2.04)	0.00
<b>HH experience problems with ICS</b>	<b>0.6 (0.5 - 0.8)</b>	<b>0.002</b>
<b>HH would recommend ICS to relative/neighbour</b>	<b>2.0 (1.2 - 3.4)</b>	<b>0.005</b>
<b>Support of local associations, leader/authorities</b>	<b>1.4 (1.0 - 2.0)</b>	<b>0.05</b>
House renovations since ICS installation	1.07 (0.70-1.45)	0.7
<b>HH participates in JUNTOS programme</b>	<b>0.6 (0.5 - 0.9)</b>	<b>0.02</b>
<b>HH participate in a gas programme*</b>	<b>1.4 (1.0 - 2.0)</b>	<b>0.09</b>
HH participates in Juntos programme	0.65 (0.45-0.94)	0.02
<b>Wealth quintile*</b>	<b>1.1 (1.0 - 1.3)</b>	<b>0.07</b>
<b>HH income level*</b>	<b>1.3 (1.0 - 1.6)</b>	<b>0.08</b>
<b>Maternal age (25 – 50yrs)*</b>	<b>1.3 (0.6 - 2.6)</b>	<b>0.09</b>
7-11 years	1.46 (0.80-2.64)	
>11 years	1.31 (0.41-4.15)	
Mother's age		0.09
<25 years	1	
25-<50 years	1.28 (0.64-2.58)	38
50-<75 years	1.20 (0.57-2.50)	





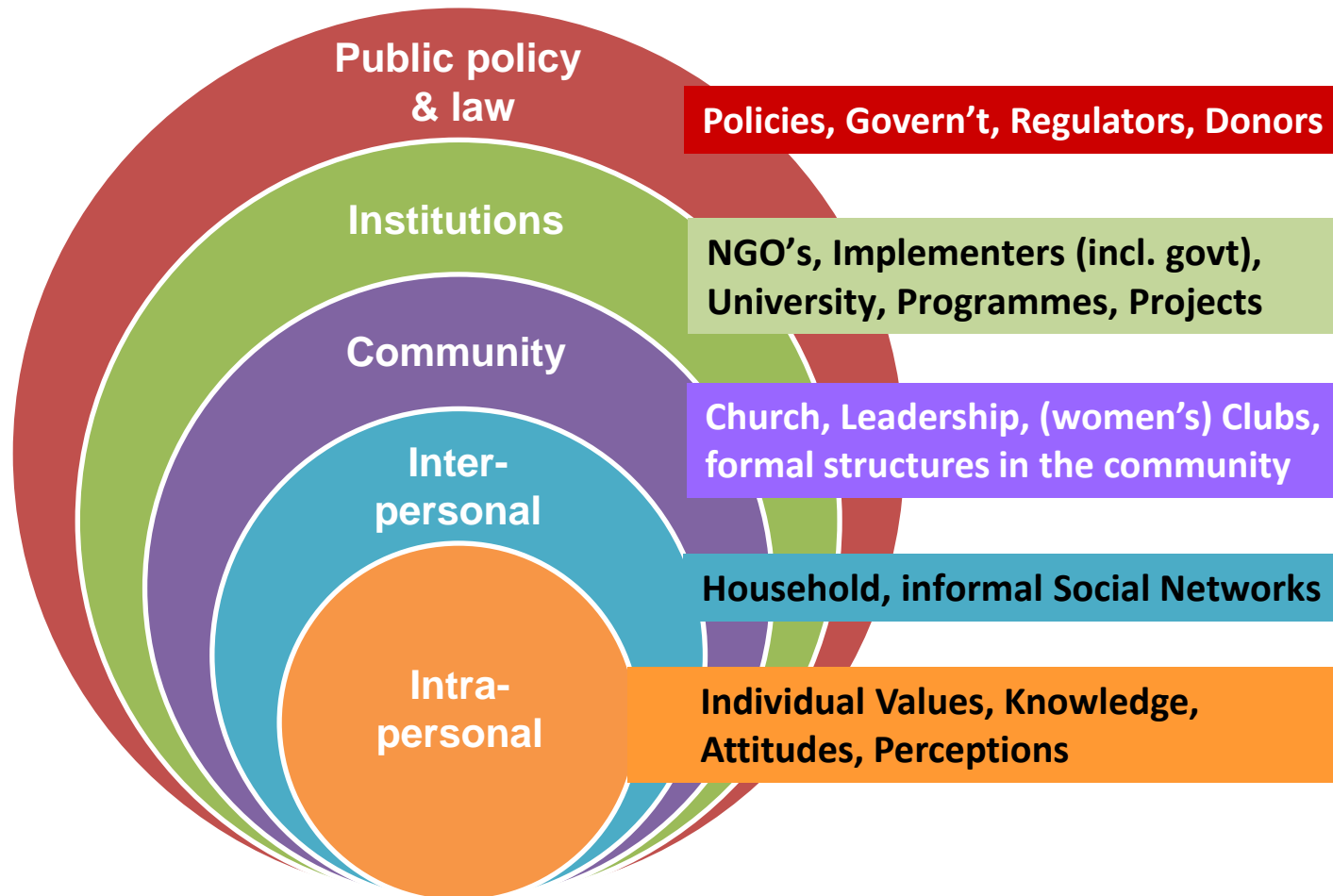
- We propose an **Adoption** definition that is easily defined, specific, responsive, objective and robust against external factors.
- **Sustained Adoption** should only consider households that have achieved adoption and have made an functional investment during the lifespan of the ICS and/or replaced it.
- The **Adoption process** is a continuum that starts with a pre-contemplation phase (acceptance incl. acquisition) → use, adoption and sustained adoption.
- **Enablers and barriers** are context specific and dynamic.
- We propose to use the **Socio-ecological Model**, to identify enablers and barriers and stratify them according to their level of influence.

## **Part 2: “I liked the new stove, but they made me build another one”: System factors for acceptability, adoption and sustainability**

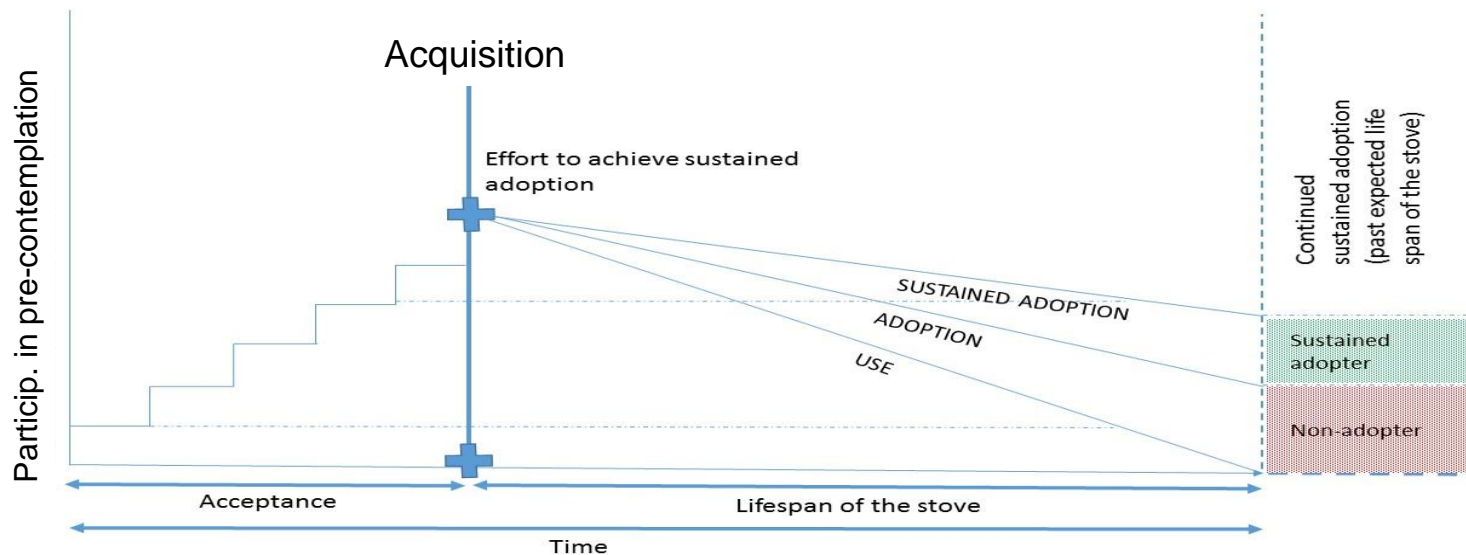
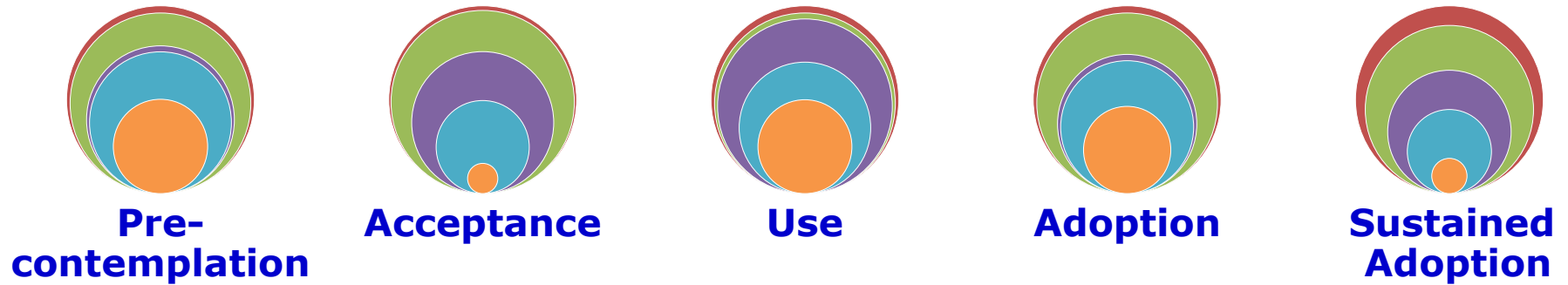
# **System factors in the adoption process**

D. Mäusezahl, S. Hartinger, J. Wolf, V. Paz-Soldán,  
A. Powell, H. Verastegui, J. Muela

ICS implementation happens in a system context that is often neglected



# The SEM for ICS Adoption - Cajamarca, La Libertad, Cusco



**Process of adoption**

## Enablers/Barriers

### D1 Fuel & Technology

#### Accommodation of needs

- ✓ Number of burners/furnaces
- ✓ Cooking ring (*hornilla*)
- ✓ indoor smoke reduction
- ✓ Durability: Broken parts, low quality of replacement parts
- ✓ Safety - chimney soot fire (straw roofs!)
- ✓ Saving time / firewood
- ✓ Heat rooms
- ✓ Good design (*bonita*)

### D2 Household setting

- ✓ Cleanliness (no soot)
- ✓ Good taste of food
- ✓ Poor ability to pay

### D3 Knowledge & Perceptions

#### Perceived benefits

- ✓ Local culture-specific (cooking needs)
- ✓ Health benefits

#### Perceived quality

- ✓ Branding & **perception of institution!**
- ✓ Building materials, resistant
- ✓ Good performance
- ✓ It is **provider responsibility** to repair ICS → Can change of ideology (*"Obligation to repair – programme can harm"*)

## Summary

Fuel & technology characteristics

Durability and design requirements

Time (cooking, wood collection)

Perception & knowledge

Safety

Household improvements

Branding

Presented by domains (D) as in  
Rehfuess, Puzzolo, Stanistreet, Pope, Bruce.  
Environmental Health Perspectives  
2014;122(2):120—30.



## Enablers / Barriers

### D3 Knowledge & Perception

#### Positive /Negative reinforcement

- ✓ When “**relevant others**” (female **family** – and female **neighbours**) positively influence adoption
- ✓ **Rumours**, “Gringos” kidnaping children
- ✓ **Reputation** associated with project (e.g. promoted by a mining company)

### D2 Household & Setting

#### Social agency and self-organisation

- ✓ When women have a voice and are organised they can claim ICS
- ✓ When **husbands** accept ICS and its benefits (e.g. less firewood)
- ✓ Social **networks for repairing**

## Summary

### Social influence

- Approval
- Social networks

### Reputation, Preconception

## Enablers / Barriers

### D7 Programmatic & policy mechanisms

#### Reinforcement by community leaders (*autoridades*)

- ✓ If they are actively involved in promoting ICS
- ✓ If they manifestly use ICS (exemplary role)

#### Reinforcement by community programme promoters (*lideresas*)

- ✓ If they are trusted and have good reputation in the community

#### Positive reinforcement by health providers (*nurses*)

- ✓ If they are actively involved in promoting the health benefits of using ICS
- ✓ If they manifestly use ICS (exemplary role)

#### People trained by the programme (*capacitados*)

- ✓ If they are available for repairing or building a new stove

### D5 Market development

- ✓ For sustained use: Pieces for repair are available in the community (market structure)

## Summary

Creation of competences (ToT)

Competences and champions needed a local community level

Availability of parts at community level

## Enablers / Barriers

### D1 Fuel & technology

- ✓ Women can **see** and **test** and **chose** between different models, before the implementation

### D7 Programmatic & Policy mechanisms

- ✓ Good **social reputation** of the programme / institution
- ✓ The project provides **good and understandable** information
- ✓ The project uses **participatory** approaches
- ✓ Project integrates users in the building process
- ✓ Different projects with **different approaches** can be confusing
- ✓ Programme technicians (*ingenieros*) and promoters interact with community in a socially appreciative way (trust)
- ✓ The programme **involves local authorities**
- ✓ Stoves are provided **free of charge (-)**

## Summary

Interpersonal skills of prog. staff

Clear messages and understandable information

Participatory approaches → flexibility for deliverables

Availability of parts at commun. level

“Exclusion criteria” gives a sense of favouritism and unfairness

Dependency issues

- (for-free delivery creates expectations for free services)

Different institutions, devices, approaches → confusion, distrust

## Enablers / Barriers

### D3 Knowledge & Perception

- ✓ Good social reputation and acceptance of national programmes (i.e. JUNTOS)
- ✓ Install ICS in “areas of extreme poverty”

### D6 Regulation, legislation, standards

- ✓ ICS evaluation & certification policy (2009)
- ✓ National energy policy (2010)
- ✓ Social energy inclusion fund (FISE)

### D7 Programmatic & Policy mechanisms

- ✓ Implementing ministries
- ✓ Lack of monitoring and quality control

### D5 Market development

- ✓ Lack of policies to support supply chain creation

### D4 Financial Tax & Subsidy aspects

- ✓ Change in cash transfer programme policy

## Summary

Ministries implement policies

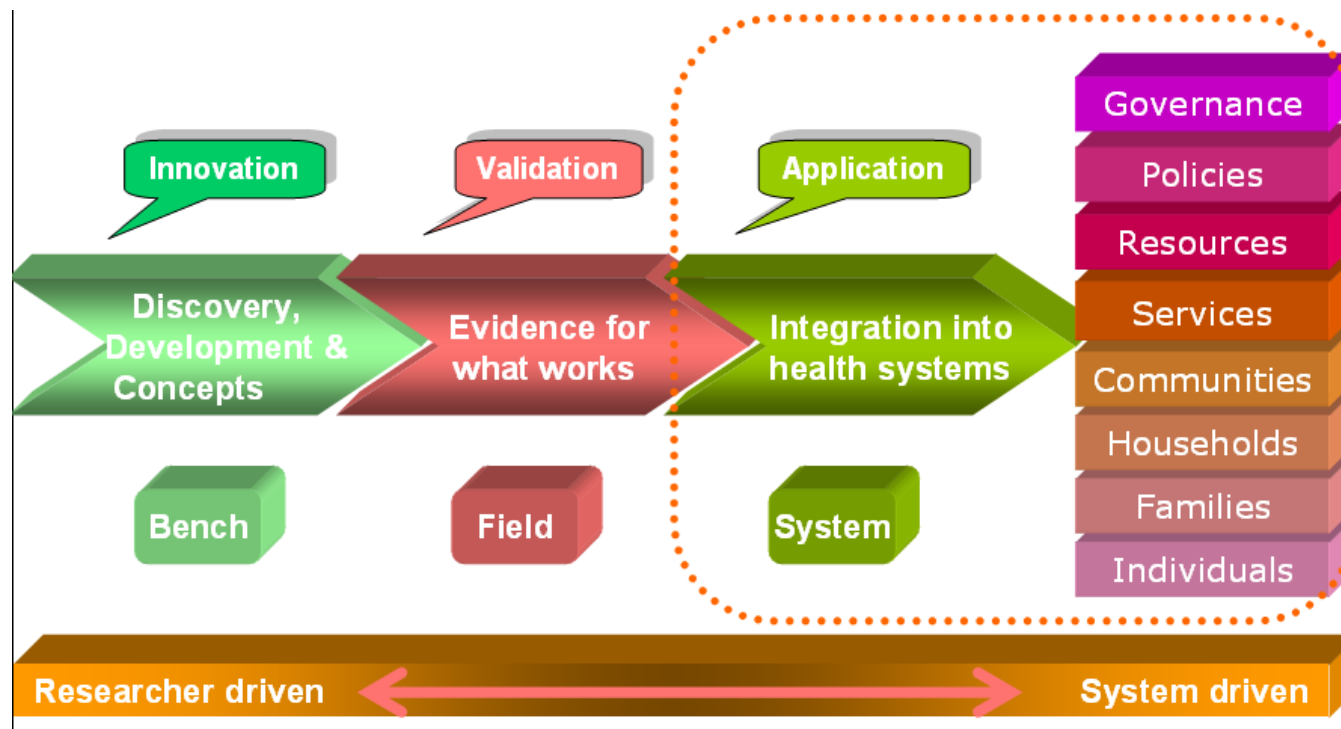
Insufficient on-site quality control

Post-policy implementation unclear

- Enablers and barriers for adoption are **dynamic**
- Determinants are context-specific and differently powerful **at different system levels** and **at different stages within the adoption process**
- Easy way to assess (for evaluators) and identify solutions in a non-blaming way
- Identifying solutions for a problem at one level of the ecological framework merits considering the other level
- Harmonisation for implementations – policy change to have supply chain building a part of the registration of ICS NGOs'

# “We know what works”. Do we? Review our perspective

The development and delivery of new tools, strategies and interventions and the implementation of large initiatives must do better in addressing all system blocks and levels



**IHIP-1, 2007-12**

**GACC, 2013-14**

**IHIP-2, 2014 - 17**





## Part 2: “I liked the new stove, but they made me build another one”: System factors for acceptability, adoption and sustainability

# The **Behavioural Economic Model**: Practical field applications to improve adoption of clean cooking technology

A. Powell, S. Hartinger-Peña, J. Wolf, J. Muela, H. Verastegui,  
D. Mäusezahl, V. Paz Soldán

**To promote practical application of an analytic approach, to improve “adoption” of clean cooking technology**

1. Why?
2. The Behavioural Economic Model
3. Examples
4. Lessons learned



**“Many interventions found to be effective in health services research studies fail to translate into meaningful outcomes”**

*– Damschroder et al (2009)*

- **Avoids bias**
- Change is **validated and evidence-based**
- **Implementation and monitoring and evaluation tool**





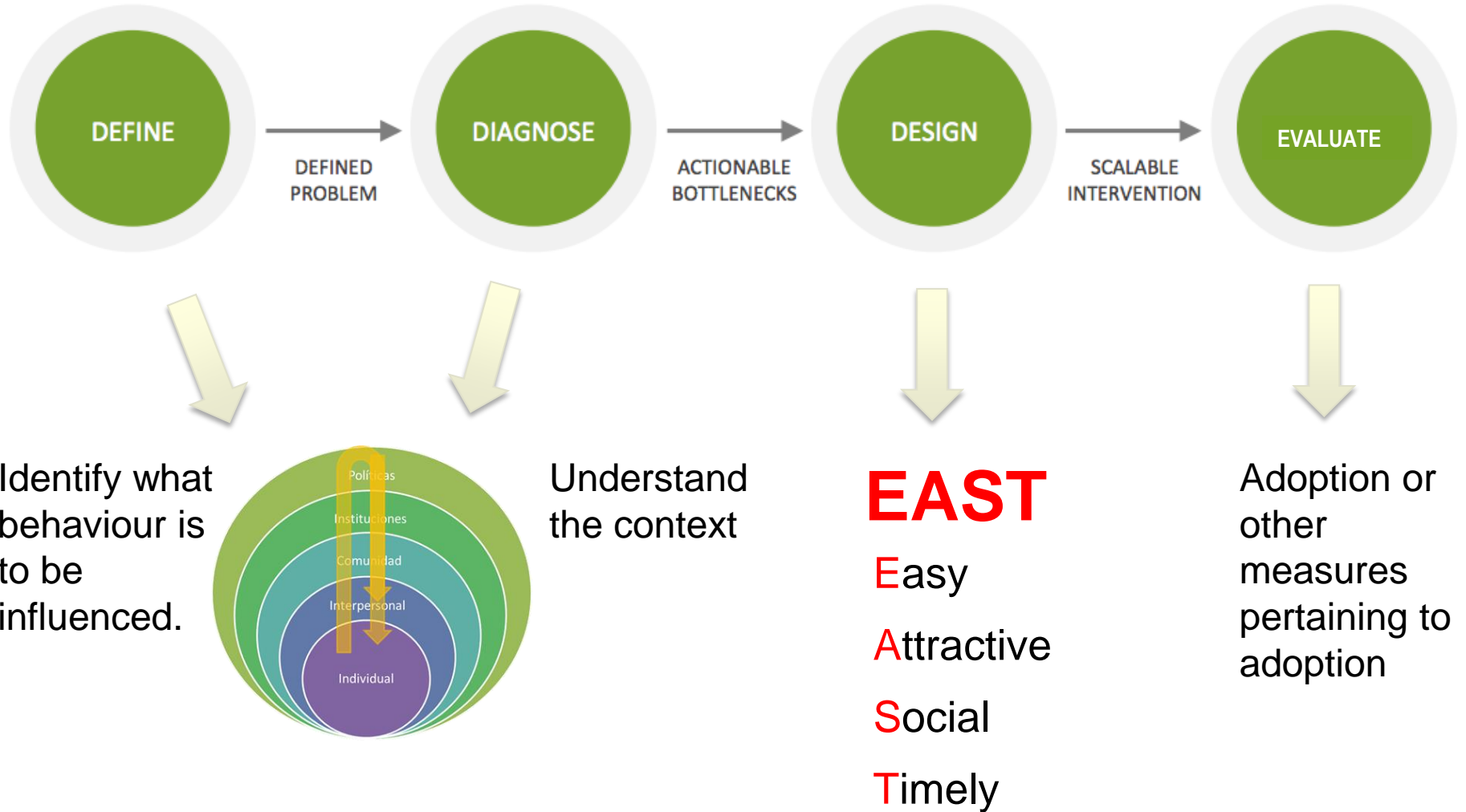
## A stylized illustration of a human head profile, facing right, with a large eye. The head is filled with a dense collection of financial and business icons, including a calculator, a globe, a pie chart, a bar chart, a handshake, a magnifying glass, a bank building, a judge's gavel, a stack of money, and various currency symbols (Euro, Dollar, Pound, Yen). The background is a light blue and white pattern of dots and lines, suggesting a complex network or system.

- Approach to ***defining, diagnosing and designing*** solutions to problems
- Behavioural economics helps us understand...
  - why people behave in certain ways
  - why they make the decisions they do
- People do not behave in the way we expect them to behave
  - Self control
  - Limitless mental capacity
  - Procrastination
  - “Better me in the future”

# Stages of the BEM process



Swiss TPH






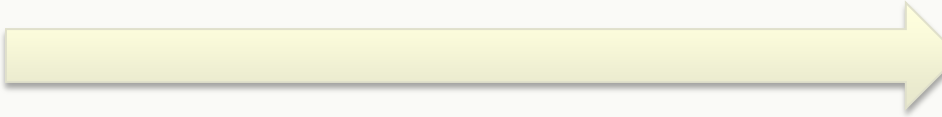


# Fuel and technology characteristics



Swiss TPH



	Individual	Interpersonal	Community	Institutional	Policy
					
<b>BEM</b>					
<b>Define</b>	<ul style="list-style-type: none"> <li>Cracks easily</li> </ul>	<ul style="list-style-type: none"> <li>Rumors</li> </ul>	<ul style="list-style-type: none"> <li>Do not cook for large group of people</li> </ul>	<ul style="list-style-type: none"> <li>Cracks and breaks very fast</li> <li>Furnace size is too specific</li> </ul>	<ul style="list-style-type: none"> <li>Families not asked for stove preference</li> </ul>
<b>Diagnose</b>	<ul style="list-style-type: none"> <li>Stove design</li> <li>Durability</li> </ul>				
<b>Design</b>					
<b>Test</b>	<ul style="list-style-type: none"> <li>Test whether families participated in ICS design and installation</li> <li>Test durability (using previous longevity as a baseline) and/or a measure of adoption</li> </ul>				

<b>Easy</b>	<ul style="list-style-type: none"> <li>Simple stove options</li> <li>Clear messages</li> </ul>
<b>Attractive</b>	<ul style="list-style-type: none"> <li>Choices</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>Savings/maintenance scheme</li> <li>Create networks</li> </ul>
<b>Timely</b>	<ul style="list-style-type: none"> <li>Plan programs using adoption process</li> </ul>

# Acceptance



BEM					
Define	<ul style="list-style-type: none"> <li>Women do not perceive ICS benefits</li> <li>Not adapted to women’s cooking needs</li> <li>Perceived low quality</li> <li>Women do not like the design</li> <li>Perceived risks and high costs</li> </ul>	<ul style="list-style-type: none"> <li>Negative reinforcement</li> <li>Rumours</li> </ul>	<ul style="list-style-type: none"> <li>Passivity or lack of interest of community leaders and health providers</li> <li>Social conflicts involving community program promoters</li> </ul>	<ul style="list-style-type: none"> <li>Bad reputation of the institution</li> <li>Bad communication</li> <li>Lack of a participatory approach</li> <li>Promoters lack interpersonal skills</li> <li>“Exclusion criteria”</li> <li>Confusion</li> </ul>	<ul style="list-style-type: none"> <li>Policy is not aligned with implementation institutions</li> <li>Confusing changes in policy and national programs</li> </ul>
Diagnose	<ul style="list-style-type: none"> <li>Poor communication (verbal and policy) between implementers and communities</li> <li>Misunderstanding about the benefits that are important in the community</li> <li>Not feeling ownership of the ICS and the project</li> </ul>				
Design					
Evaluate	<ul style="list-style-type: none"> <li>Understanding of ICS implementation process</li> <li>Satisfaction with implementation process</li> <li>ICS knowledge</li> </ul>				

Easy	<ul style="list-style-type: none"> <li>Simple stove options</li> <li>Clear, relevant messages</li> <li>Open forums with consistent, elected leaders</li> <li>Transparency</li> </ul>
Attractive	<ul style="list-style-type: none"> <li>Choices</li> </ul>
Social	<ul style="list-style-type: none"> <li>Create associations/networks</li> </ul>
Timely	<ul style="list-style-type: none"> <li>Plan programs using adoption process</li> <li>Honor timelines</li> </ul>



# Lessons learned...



- A **Proposal** of one way we can improve adoption in the field
- The two approaches are **complementary**
- **Practical** utilization of the data
- **Context specific**
- It is **practical** and **easy** to apply for a range of actors and stakeholders
- Avoids **assumptions**
- Identifies variables which are **effective for change**



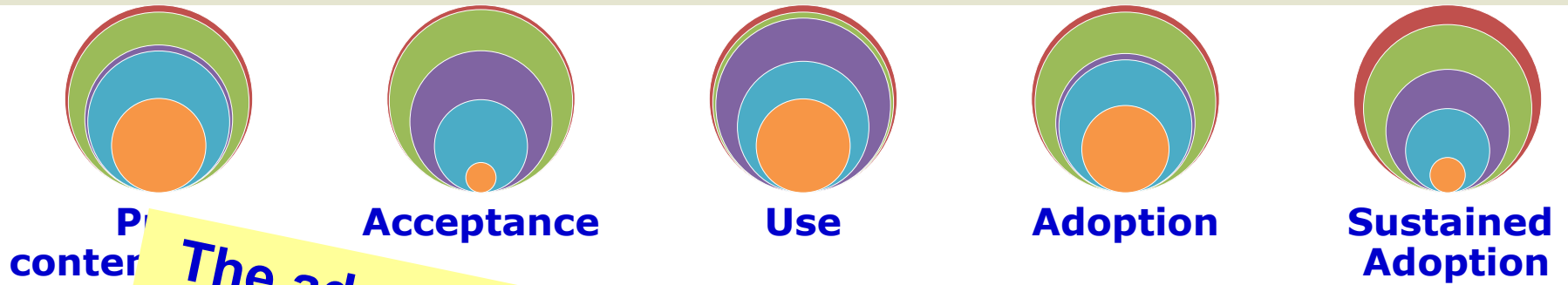
## **Part 3: “I liked the new stove, but they made me build another one”: System factors for acceptability, adoption and sustainability**

# **Lessons learnt / Conclusions**

S. Hartinger

- We identified different **enablers & barriers** that are context specific. Specific for each level of the local **social-ecological framework** and specific for the **adoption continuum**.
- We define **Adoption** as i.) Use, ii.) Condition of the ICS (chamber and chimney) and iii.) Willingness to invest in repairs.
- **Sustained Adoption** should only consider households that achieved adoption and invested and/or replaced during the lifespan of the ICS.
- The **Adoption process** is a continuum starting with a pre-contemplation phase (acceptance incl. acquisition) → use, → adoption → sustained adoption.
- There is a need for actors to adopt a **systemic view** when implementing ICS/CC-T programmes to achieve / improve levels of adoption.
- Finally ...

... the SEM can provide a needed systemic view to address adoption at all level of the adoption continuum.



*The adoption process is intrinsically linked to supply chain and market development*

**Process of adoption**





Swiss TPH



# ¡Muchas gracias!



Fresco outside San Marcos district hospital



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**iin** Instituto de  
Investigación  
Nutricional

UBS Optimus Foundation



**PERÚ**

Ministerio  
de Salud