



RESEARCH
PROGRAM ON
Grain Legumes and
Dryland Cereals



GLDC Impact Evidencing Strategy

Karl Hughes

Head, Monitoring, Evaluation & Impact Assessment, ICRAF

GLDC's Stated Contribution to CGIAR System Level Targets



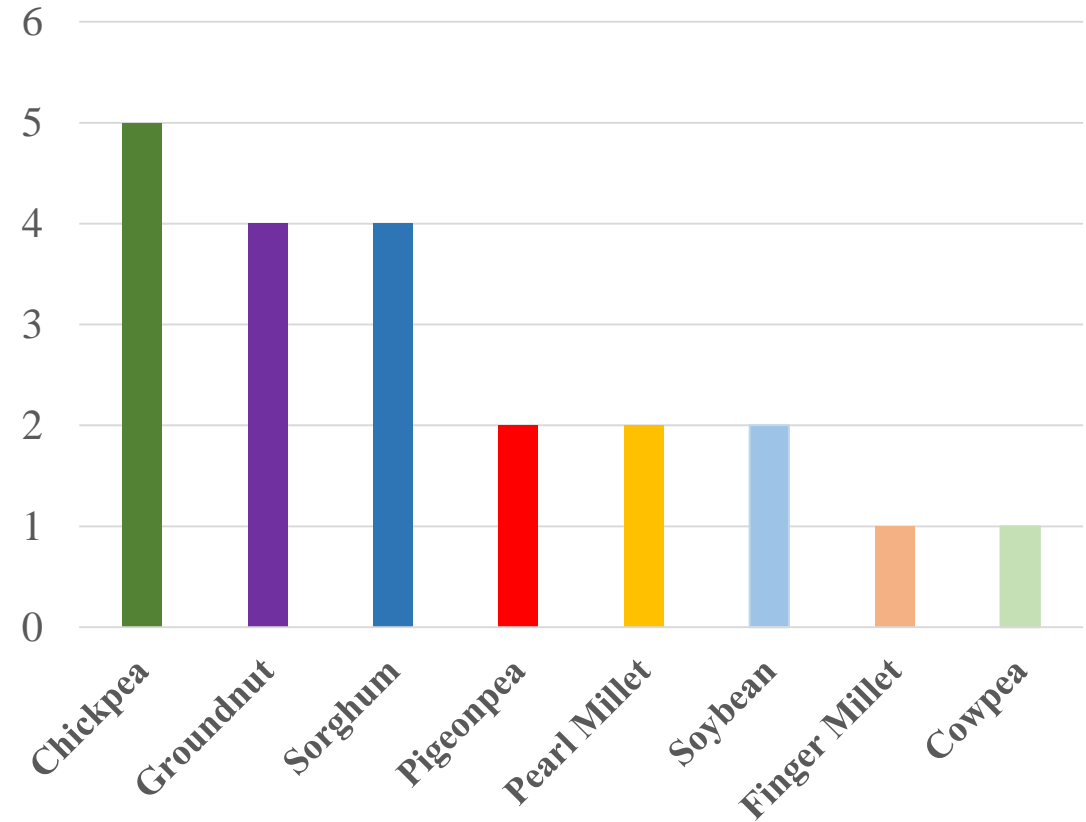
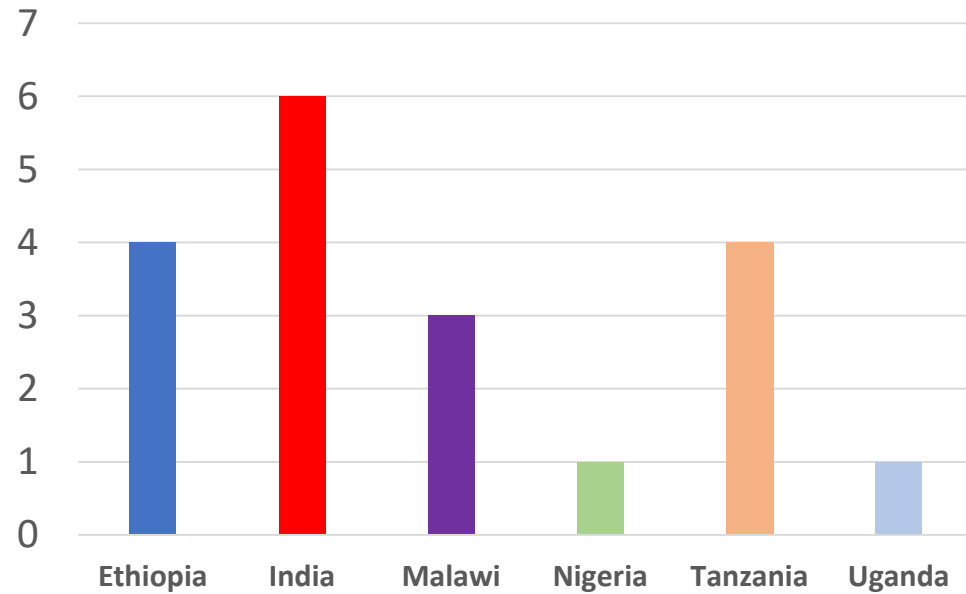
- 8.9M farm households have adopted improved GLDC varieties
- 4.4M people assisted to exit poverty (50% women)
- 1.2%/year rate of yield increase for GLDC crops
- 12.7M more people (50% women) assisted to meet minimum dietary energy requirements
- 28.9M (50 % women) assisted to meet daily protein dietary requirements
- 7.5M women of reproductive age assisted to meet daily protein dietary requirements
- 4.9M tons of cumulative carbon input to soils from increased GLDC productivity

What do we really know about the impacts of improved grain legumes and dryland cereals?

A critical review of 18 impact studies

Erik Katovich, Andrew Feist, Karl Hughes, Kai Mausch

Working Paper



Study	Change	Effect
Bulte et al., 2014	Adoption of improved cowpea	0-9% increase in yield
Finkelstein et al., 2015	Consumption of iron-fortified pearl millet for four months	Statistically significant positive effects on three measures of iron-deficiency
Manda et al., 2019	Adoption of improved cowpea	26% increase in yields and 61% increase in net returns
Tufa et al., 2019	Adoption of improves soybean	61% increase in yield and 53% increase in income
Michler et al., 2018	Adoption of improved chickpea	23-28% increase in household profits
Verkaart et al., 2017	10% increase in area planted with improved chickpea	12.6% increase in household income; 3.9% reduction in probability of household poverty
Ndjeunga et al., 2013	Adoption of improved groundnut	155-202kg/ha increase in yields
Simtowe et al., 2012	Adoption of improved groundnut	2% increase in household consumption expenditure; 12-17% decrease in poverty headcount

Evidence of better-identified causal effects (Katovich et al. 2019)

GLDC IMPACT EVIDENCING WORKSHOP

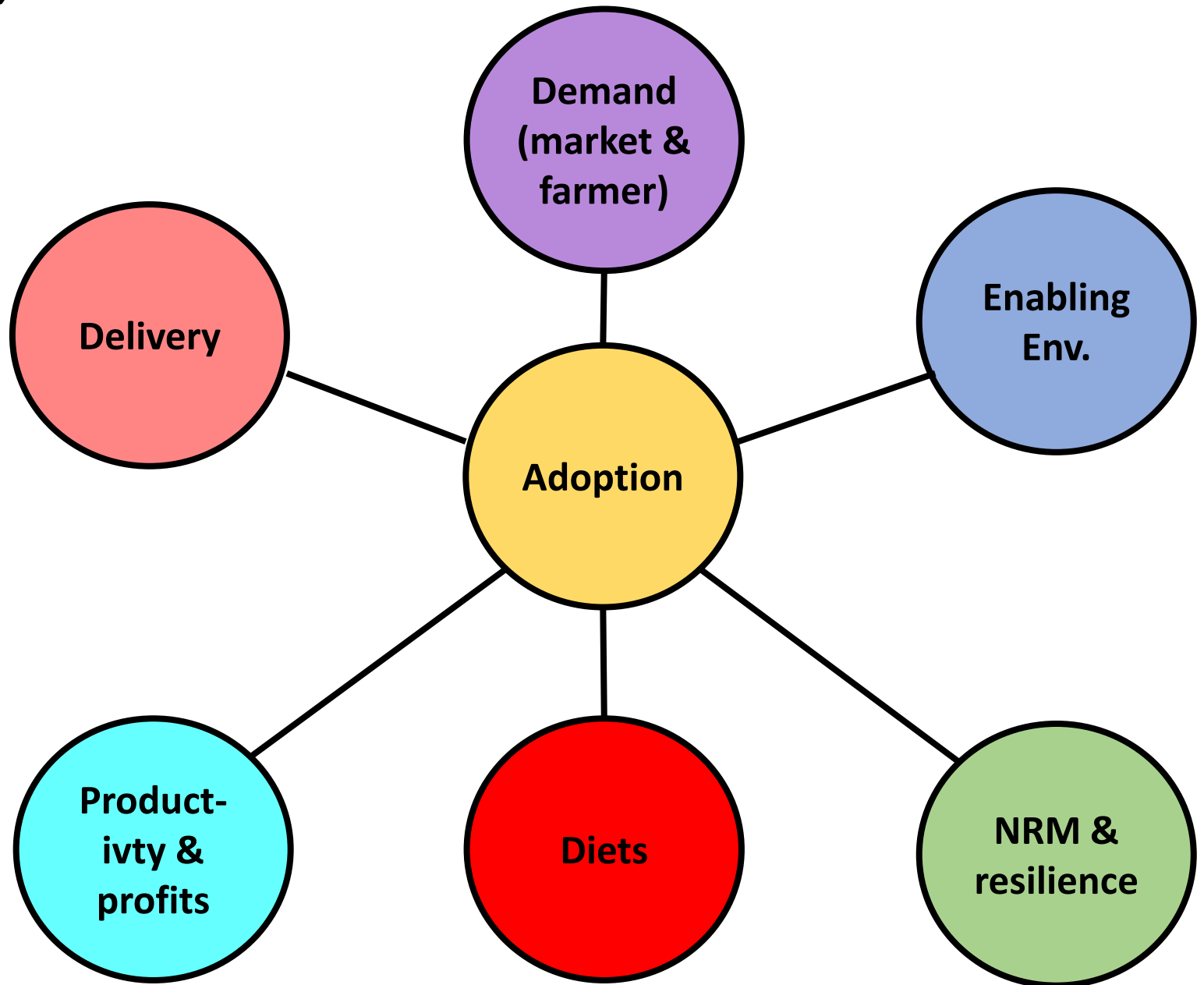
Aug. 28-30,
Nairobi, Kenya



GLDC Impact 'Nodes'

Strategy founded on 7 'impact' nodes that underlie GLDC's implicit Theory of Change:

- If GLDC 'technologies' are demand driven and well delivered, with key adoption constraints addressed → appropriate adoption at scale → large-scale improvements productivity, income, diets & NRM/resilience



Node	Descriptor	System Level Outcome (SLO) Target	Inter. Development Outcome (IDO)
1. Market & farmer demand	GLDC technologies are well matched with market demand (pre-existing or stimulated) and varying farmer preferences/needs (known or anticipated)	Precondition	
2. Delivery	National Seed Delivery Systems (NSDS) and National Agricultural Extension Systems (NAES) are delivering and promoting GLDC technologies at scale	Precondition	D1 National partners & beneficiaries enabled
3. Enabling environment	Potential policy and institutional barriers affecting the successful scaling of GLDC technologies have been assessed and (as relevant) mitigated, e.g. via stakeholder engagement	Precondition	C1 Enabling environment improved
4. Adoption	Large numbers of smallholders are sustainably uptaking and making effective use of 'best fit' and impactful GLDC technologies	<ul style="list-style-type: none"> 8.9M farm households have adopted improved GLDC varieties 	
5. Diets	GLDC improved crop varieties are being widely consumed (by producers and/or other consumers), which, in turn, is leading to improved nutritional outcomes, especially women and children and women of reproductive age	<ul style="list-style-type: none"> 12.7M (50% women) assisted to meet minimum dietary energy 28.9M (50 % women) assisted to meet daily protein dietary 7.5M women of reproductive age assisted to meet daily protein dietary requirements 	2.1 Improved diets for poor and vulnerable people
6. Productivity & profits	The uptake of GLDC technologies is leading to enhanced farm productivity and/or efficiency, resulting in greater net returns for varying typologies of farming households	<ul style="list-style-type: none"> 1.2%/year rate of yield increase for GLDC crops 4.4M people assisted to exit poverty (50% women) 	1.3 Increased incomes and employment 1.4 Increased productivity
7. NRM & resilience	Uptake of GLDC improved technologies is improving the management of natural resources (e.g. by improving soil fertility, carbon sequestration, and water use efficiency) and farming system resilience (e.g. via integration of more drought tolerant crops)	<ul style="list-style-type: none"> 4.9M tons of cumulative carbon input to soils from increased GLDC productivity 	1.1 Increased resilience of the poor to climate change and other shocks 3.3 More sustainably managed agro-ecosystems

Crop/Country	Burkina Faso	Ethiopia	India	Malawi	Mali	Moz.	Myan-mar	Niger	Nigeria	Sudan	Tanzania	Uganda	Zambia	Bang.	Kenya	Morocco	Zim.	Multi-country
Chickpea	National Adoption; Ex-post income x2							Qualifying Demand										TPE Forsight
Common Bean											Non-rep. Adoption							
Cowpea								Trait Demand National Adoption Ex-post income		Ex-post: impact								Forsight
Finger millet	Bio-fort. Impact (with U of Camb.)											Bio-fort. Impact (with U of Camb.)						Forsight
Groundnut		Adoption: Odisha	Ex-post exp./pov.			Trait Demand		Trait demand National adoption Ex-post IA		National adoption			Demand: Peanut food sup.	AVCD Ex-post IA				TPE Forsight
Lentil												National Adoption						
Pearl millet	Bio-fort. Impact (with U of Camb.)	Ex-post: fortified millet, school child.											Bio-fort. Impact (with U of Camb.)					Forsight
Pigeonpea																		
Sorghum				Delivery				Demand Delivery		Dis-adoption				Brewery demand AVCD Ex-post IA				Forsight
Soybean			National Adoption Expot-impact					1999 ex-post nut.										Product Profile
Multi-crops			Demand nutr. Food Urgan											Demand nutr. Food Urgan		Demand nutr. Food Urgan		Demand: All crops; AVSI project profiles
Mgt. practices			Double up grain legumes											Legume-based rotation with faba				Sustain. intens. grain legumes
Enab. Env.																		

Legend	
Node 1: Demand	Priority Country
Node 2: Delivery	Completed study
Node 3: Enab. Env.	In-progress study
Node 4: Adoption	Planned study
Node 5: Diets	
Node 6: Productivity/Profits	
Node 7: NRM/Resilience	

Evidence Gap Map of Initial GLDC Impact Evidence



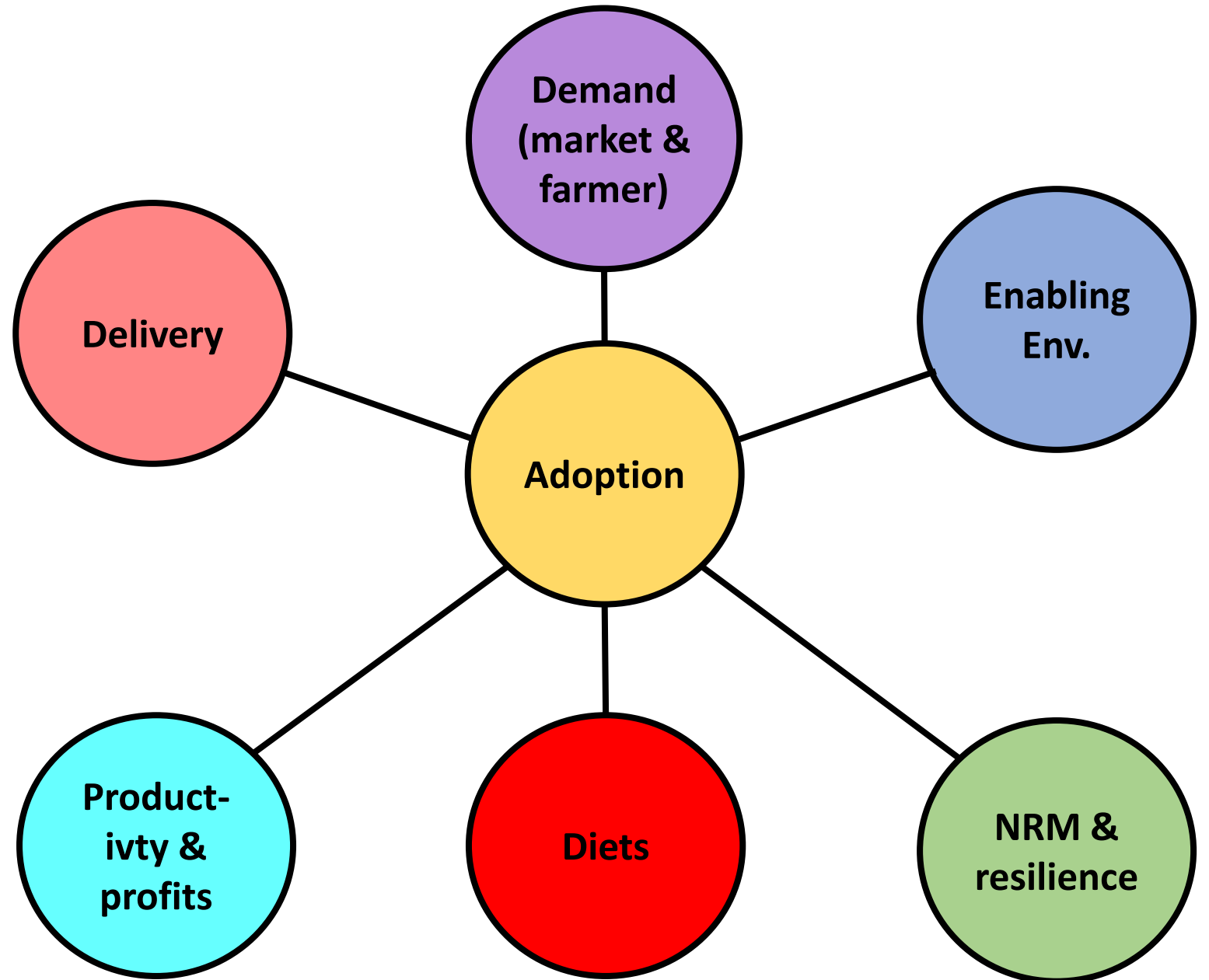
Prioritized evidence gaps by node from workshop:

No	Node	Evidence Gap	Gap in:
1	Farmer and market demand	<u>Demand for specific crops</u> by market segmentation	Theory of Change
2	Delivery	Effectiveness of <u>GLDC seed business models</u>	Theory of Change
3	Enabling Environment	Effectiveness of efforts to <u>improve enabling environment</u>	Theory of Change
4	Adoption	<u>Adoption of GLDC 'signature' management practices</u>	SLO 1 Reduced Poverty
5	Diets	Extent to which promotion and, in turn, <u>consumption of GLDC crops improves diets</u>	SLO 2 Improved Food & Nutrition Security for Health
6	Productivity and profits	<u>Benefits from productivity and profitability of GLDC technologies on varying typologies of farmers</u>	SLO 1 Reduced Poverty
7	NRM and resilience	Evidence on the <u>landscape-level effects</u> of the scaling of GLDC technologies	SLO 3 Improved Natural Resources Systems and Ecosystem services

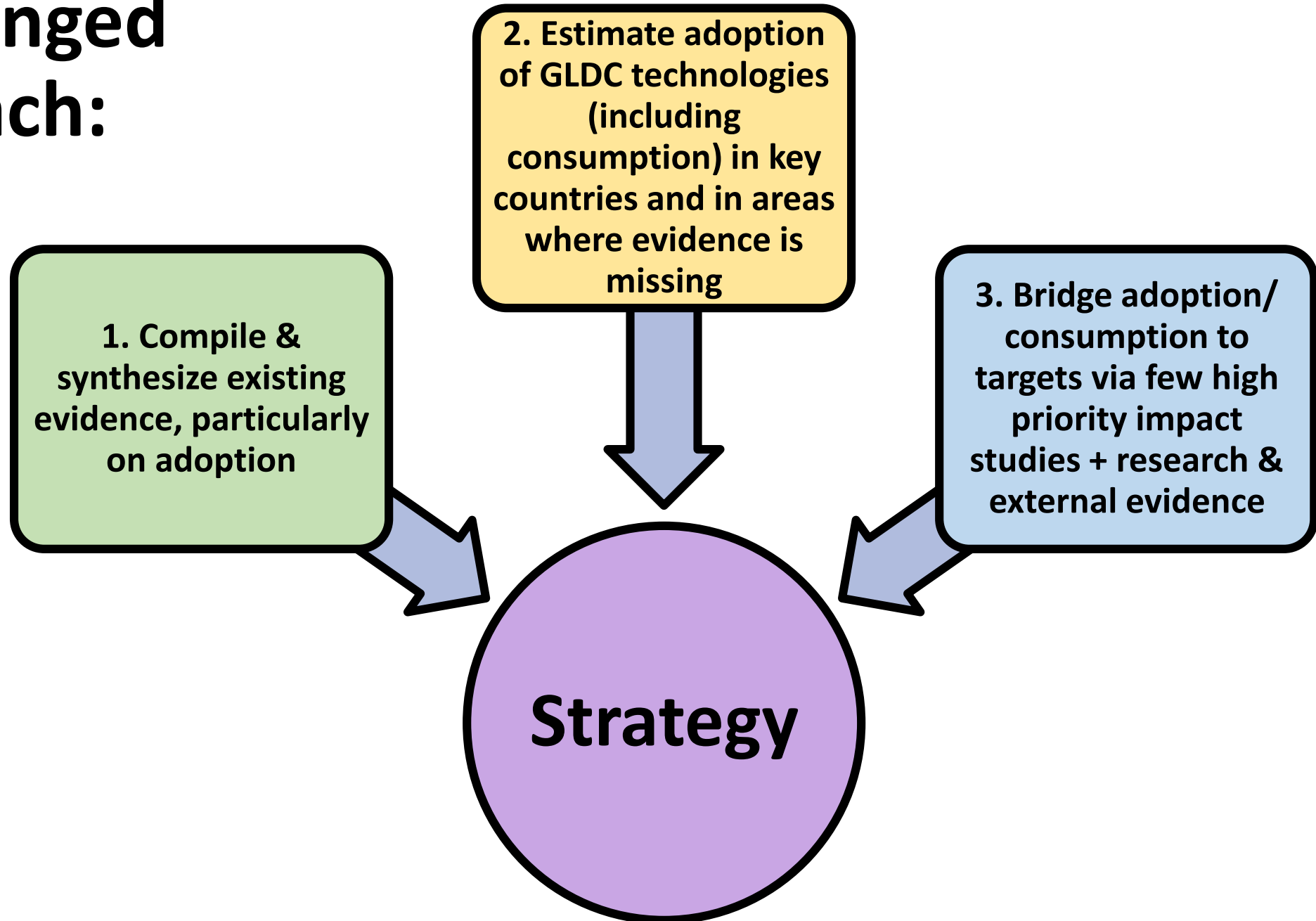
We will need to combine different types of evidence vis-à-vis the nodes

e.g. trial evidence on dietary improvement combined with adoption, delivery & demand data to estimate achievement of the nutrition targets

Extrapolation & impact modelling work critical



A 3 Pronged Approach:



Next Steps:

- ① Compile and synthesize current evidence on the extent of GLDC technology adoption, e.g. by Masters/post-doctoral student(s)
- ② Identify countries where particular GLDC technologies have been scaled significantly but for which there is limited adoption & consumption evidence and devise and execute strategies to estimate the extent accordingly
- ③ Use existing impact and scientific evidence to establish a plausible link from such adoption to the targets. Invest in several additional impact studies but only to address strategic gaps in the evidence, e.g. impacts of the promotion of GLDC crops on nutrition.