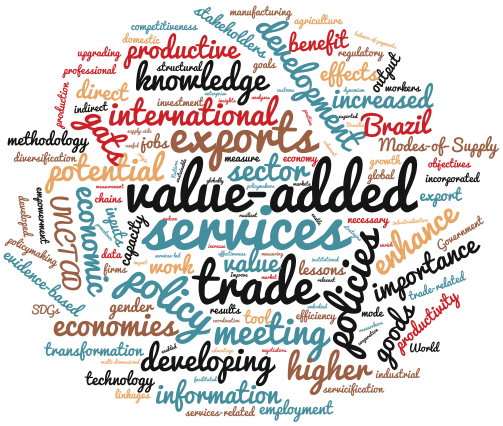

INTERNATIONAL MEETING ON SERVICES VALUE-ADDED IN EXPORTS

Services and trade policies for diversification and upgrading

Brasilia, Brazil, 22-23 October 2019

DIGITAL ECONOMY AND ECONOMIC TRANSFORMATION: AGRICULTURE IN EAST AFRICA

Presentation by

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Digital Economy and Economic Transformation: Agriculture in East Africa

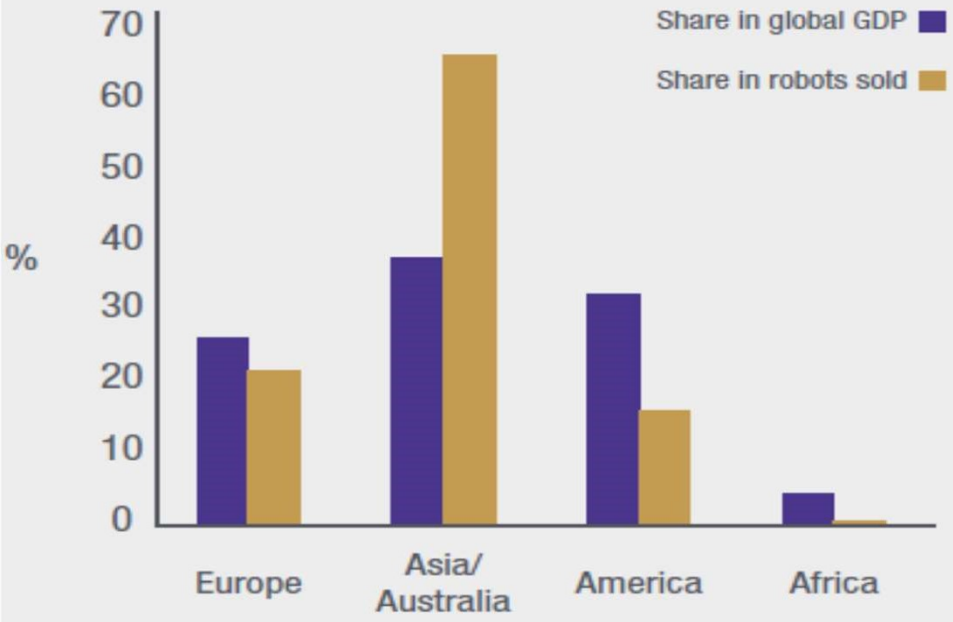
Dr Max Mendez-Parra

The digital economy in Africa

- Limits of traditional manufacturing/agriculture development challenge structural change (re-shoring, automation, etc.).
- Increasing servicification of manufacturing/agriculture.
- Anecdotal evidence suggests that services content in manufacturing and agriculture going up in most African countries (ODI, 2018)
- Knowledge-based services (e.g. Fintech) have been particularly dynamic.
- African companies have developed innovative technological solutions for the provision of services (e.g. M-Pesa)
- The digital economy is changing production, consumption and trade processes in all sectors, affecting value chains. This changes the way to approach the critical economic transformation of Africa.
- Current research on the use of mobile platforms in agriculture in East Africa is showing how is changing production

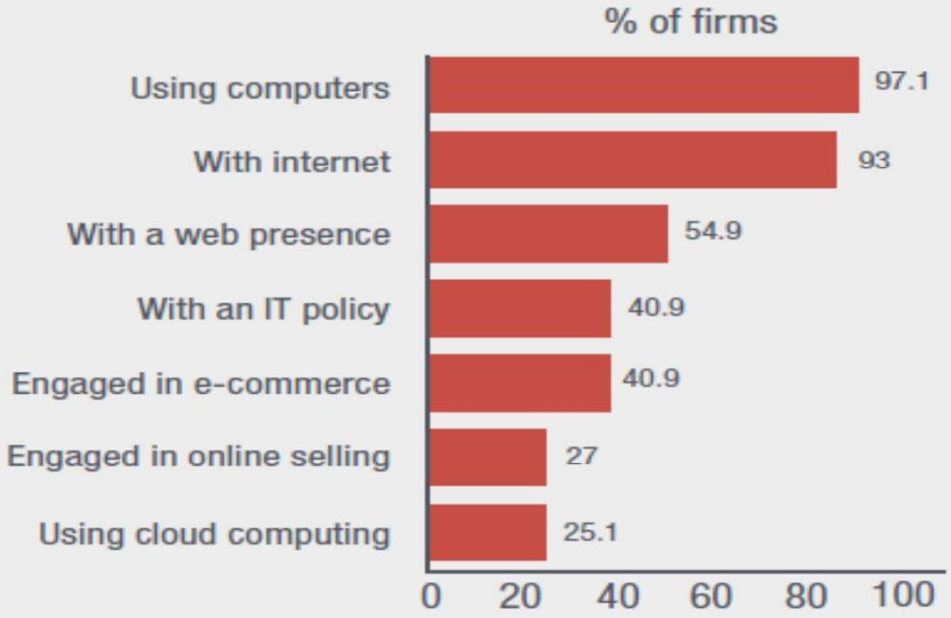
Persistent digital divide in access and use

Regional share of the number of industrial robots shipped globally in 2015 (%)



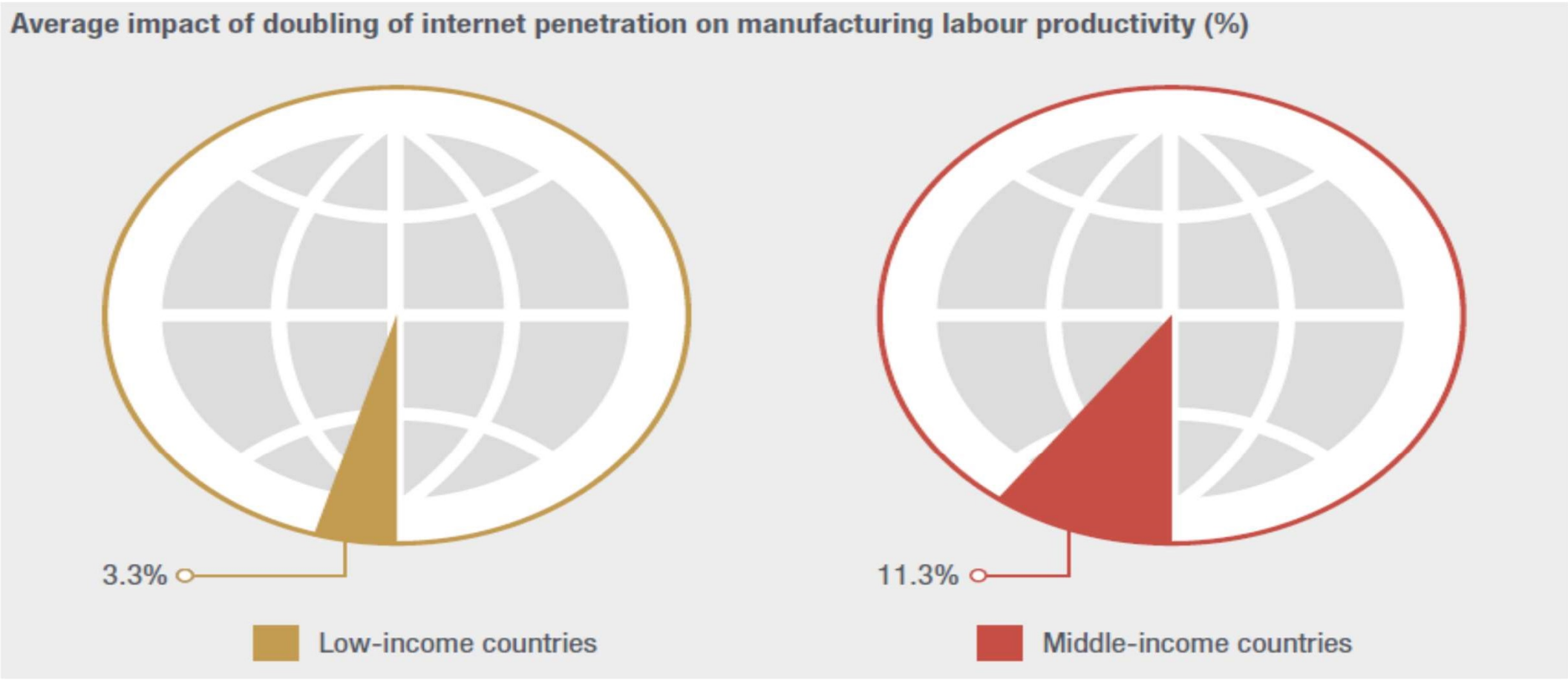
Source: Data from International Federation of Robotics (2016).

Use of internet in Kenyan manufacturing



Source: Kenya ICT survey (2016).

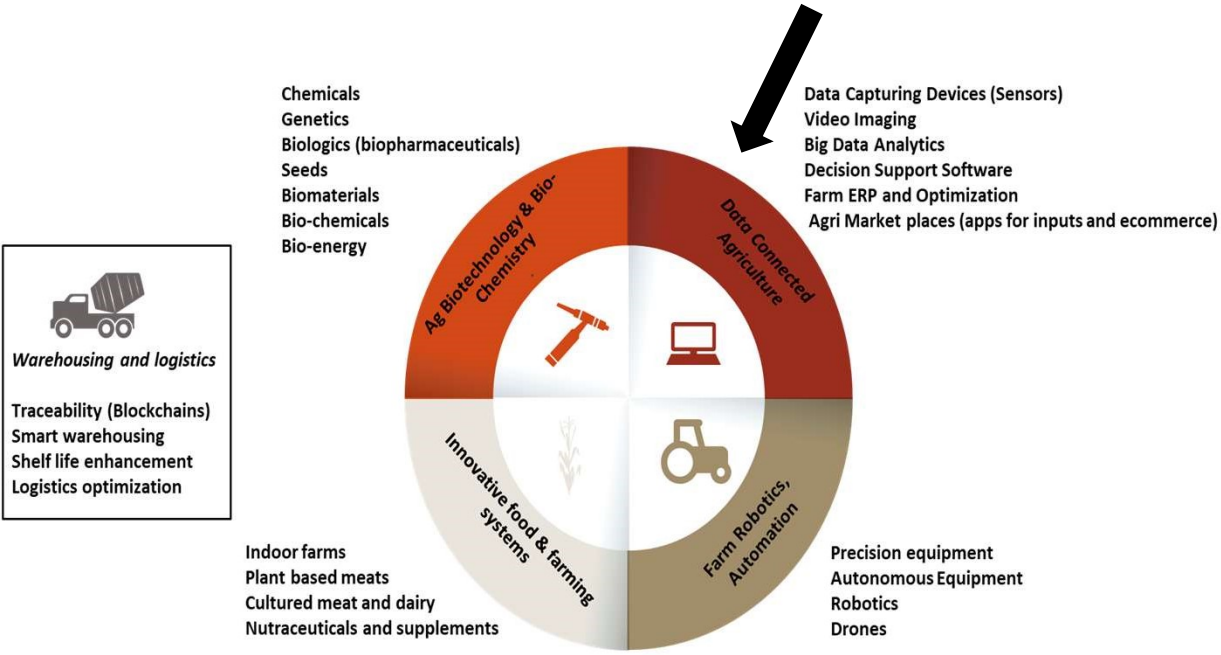
Impact of internet penetration

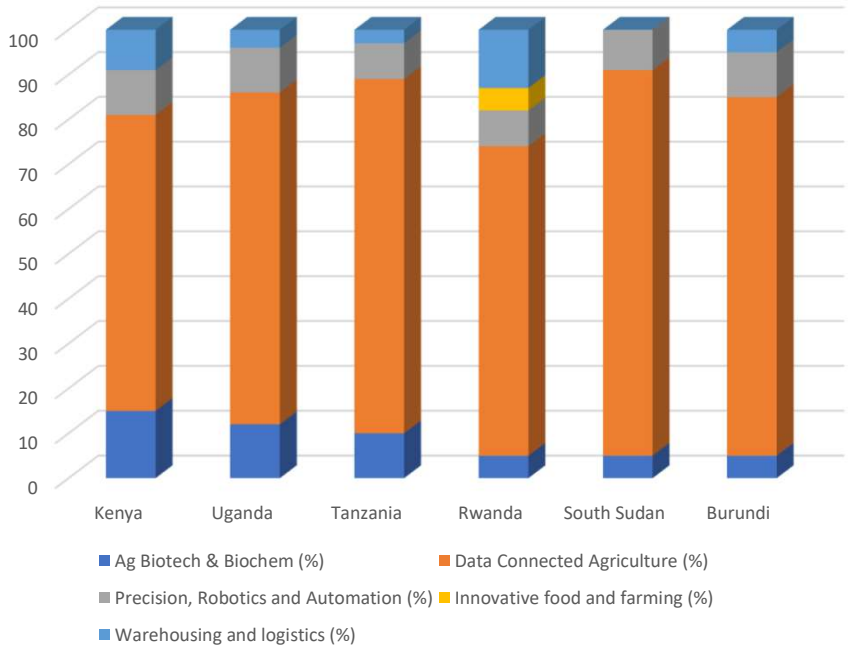


Momentum in the AgriTech space

- Global food demand is expected to increase by anywhere between 59% and 98% by 2050 as the world population reaches an estimated 9.7 billion.
- Changing modus operandi: Ag-servificiation a reality (increased content of services in Ag)
- How can this be disruptive?
- Disruption is not a linear process and can affect different actors in a value chain differently, from farmers and women to logistic providers to multinational organisations
- Important to understand what is disruptive, to who and how?

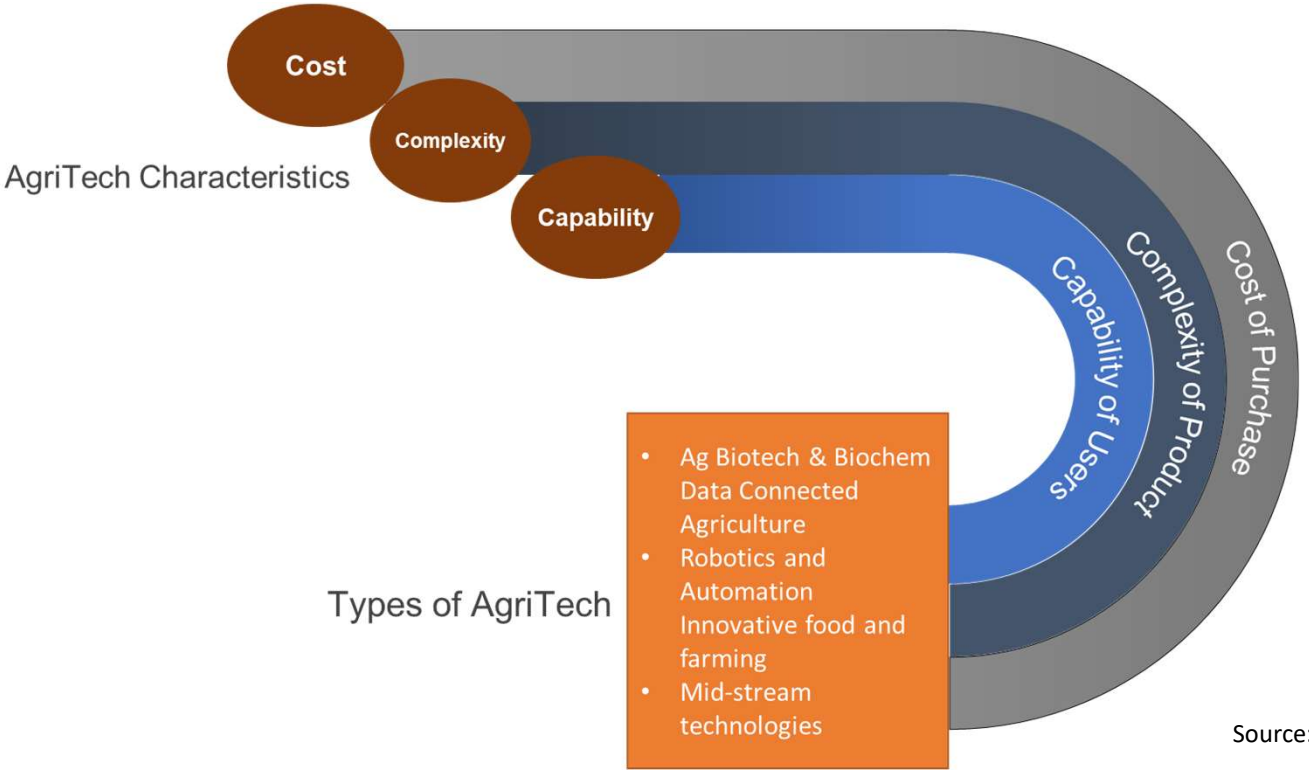
AgriTech Types





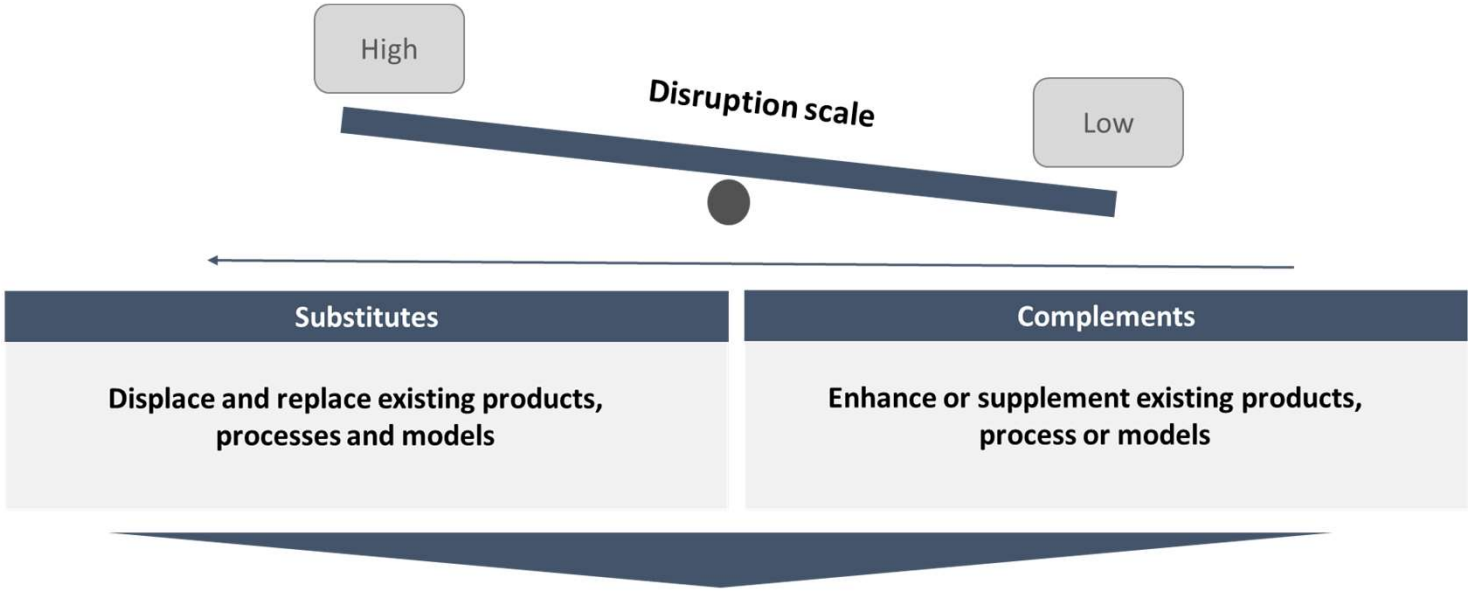
Source: Krishnan, Banga and Mendez-Parra (2019)

3Cs: Adoption of AgriTech



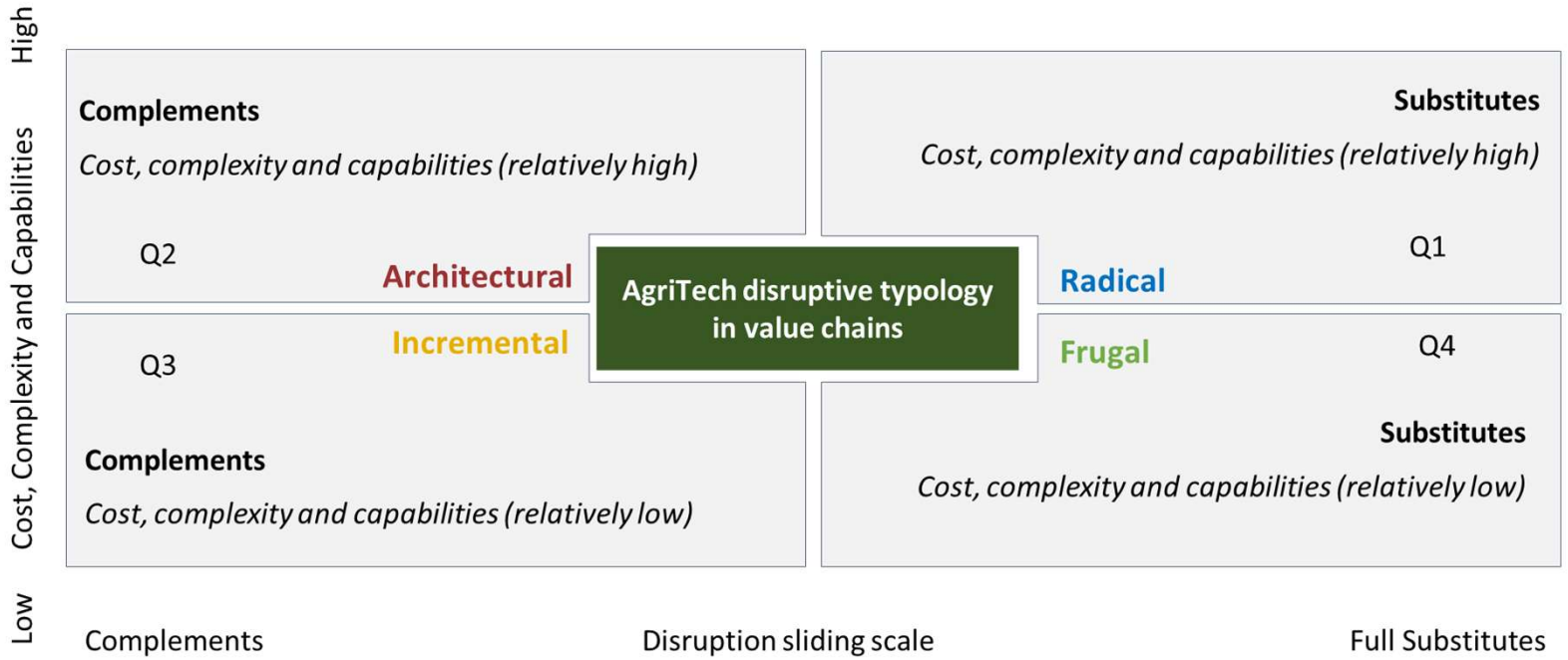
Source: Krishnan, Banga and Mendez-Parra (2019)

Sliding scale of disruption



Source: Krishnan, Banga and Mendez-Parra (2019)

Four ideal types of disruption



Source: Krishnan, Banga and Mendez-Parra (2019)

Disruption type	AgriTech categorisation	East African user experience
Radical	Farm robotics through driverless farm tractors (e.g. Hello Tractor IBM/John Deere); Blockchains (e.g. Twiga Foods)	About 85% of users reported difficulty in uptake but were optimistic about the possible increase in productivity
Architectural	STARS in Kenya; and Makerere's AI lab-driven automated visual diagnostics	70% of users interviewed claimed an improvement in productivity from real-time information
Incremental	VODP (Vegetable Oil Development Project) with SAP Uganda, E-Granary full value chain	Vertically Integrated chains, with higher trust
Frugal	SMS and USSD-based apps, such as N-Frnds Rwanda, PAD Kenya Subsidy schemes: E-Voucher Uganda	Approximately 75% users claimed improved knowledge accumulation, better yields

Source: Krishnan, Banga and Parra (2019)

Sampling

- Sampling so far: 825 producers (437 PP; 388 NP)
- Crops: Maize, Coffee, Soybean
- Regions: Kyotera, Masaka, Mubende, Kalangana, Lira
- Data collection: Mixed method (Phase 1: 65 interviews, Phase 2: survey, Phase 3: Follow-up)
-

Source: https://www.nationsonline.org/oneworld/map/uganda-administrative-map.htm

Who adopt it?: Capabilities and Knowledge

Variables	*NP*	*PP*
Implicit capabilities index (average)	0.411 (0.014)	0.336*** (0.023)
ICT index (average)	0.324	0.419***
Explicit learning(%)	38.03 (1.031)	73.61*** (1.273)

**Mean value is significantly different from NP at 10% level*

*** Mean value is significantly different from NP at 5% level*

**** Mean value are significantly different from NP at 1% level*

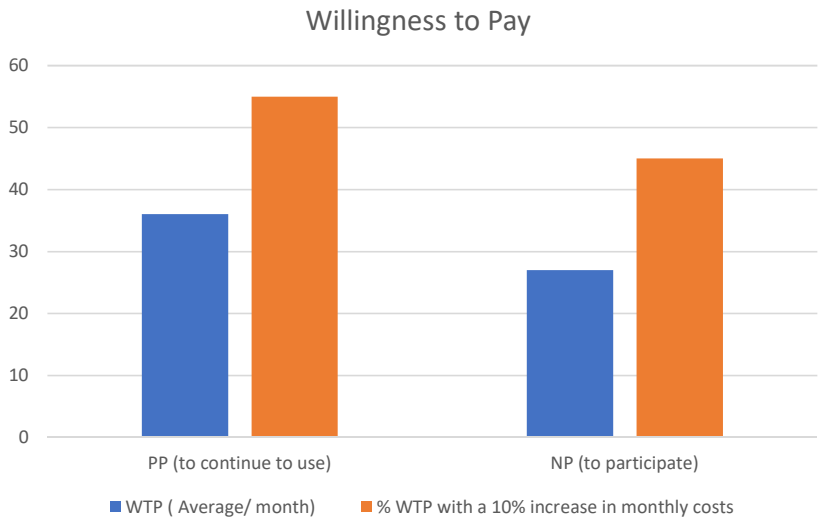
Implicit or ex-ante capabilities (Lall 1993): assets or stocks of capital are implicit capabilities required by resource poor actors to participate in markets (Booysen et al., 2008). Scoones (1998)- Physical capital and productive capital

ICT capabilities index: based on access, use and skills (ITU indicators)

Explicit: Imitation, direct transfer, spillover

Source: Krishnan, Banga and Parra (forthcoming)

Willingness to pay



Ranking of services	PP (% access and preference)	NP (% access and preference)
working capital loans	92	73
Price	86	65
Weather	76	23
pest and diseases information	81	65
training in GAPs	76	70
training in chemical and fertilizer use	69	65
satellite imagery	48	18
sprayer services	41	44
transportation services	41	23
health and safety	39	12
soil testing	37	35
crop insurance	36	8
tractor services	18	20
water testing	8	3
Laws (regional)	7	1

Source: Krishnan, Banga and Parra (forthcoming)

6 pathways to transformation

Pathway	PP	NP	Disruption type
Productivity (average O/I)	1.3**	1.01	Incremental
Value addition (%)	25***	6	Architectural
Diversification (%)	54	51	None
Formalisation of jobs (%)[a]	95***	49	Architectural
Gender participation (%)	43	41	None
Value distribution (YOY%)	12***	-2	

Mean value is significantly different from NP at 10% level

** Mean value is significantly different from NP at 5% level*

*** Mean value are significantly different from NP at 1% level*

[a]:does not account for enforcement of commercial contracts or access to government subsidies

Disruption type: equal weighted

- Quartiles of cost, complexity and capabilities
- Substituting more processes versus complementing

Source: Krishnan, Banga and Parra (forthcoming)

Challenges

- Low social capital or e-trust
  - Corruption
  - Information asymmetry
  - Re-intermediation with power asymmetries
- New forms of knowledge
  - ICT – tough to grasp
  - Transference of skills/ job neutral skills supporting diversification
- Value proposition
  - Information: prices and news on surroundings (but with infrastructural gaps!)
  - Community support
- Governance
  - Vertical integration or dis/re intermediation
  - Regional trade?

Source: Krishnan, Banga and Parra (forthcoming)