Introducing the Jamaica Agri-tourism Innovation System (JATIS) - A model to enable the effective use of Information and Communication Technologies (ICT) in Jamaican Agri-tourism

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Setting the context…

- For SIDS, both tourism and agriculture have a comparatively larger economic impact

- Tourism is the main industry, and the engine of growth, for several SIDS within the Caribbean

Setting the context…

- Percentage of Jamaican workforce employed in agriculture
  (World Bank (IBRD-IDA), 2015)
  - **19%**
    - 2009 – 20.2; 2010 – 20%; 2011 – 18%; 2012 – 18%; 2013 – 18.2%

- Percentage of Jamaican population employed in tourism
  (JTB, 2015)
  - **25%**

Setting the context…

- Approximately one-third of all tourism expenditure is directed towards food (Torres, 2003).

- Jamaica is estimated to lose up to 50% of its tourism revenue due to leakage and it imports majority of the food consumed by tourists (Daye et al., 2006).

Setting the context…

- In Jamaica, there is an **almost annual** phenomenon, as reported through the media, of farmers complaining that they have to dump agricultural produce due to insufficient, or the inability to access, markets to which these produce can be sold.

- At the same time, restaurants and hoteliers complain of insufficient, or inconsistent, supply of agricultural produce, causing them to import to supply their needs.

Main Research Question

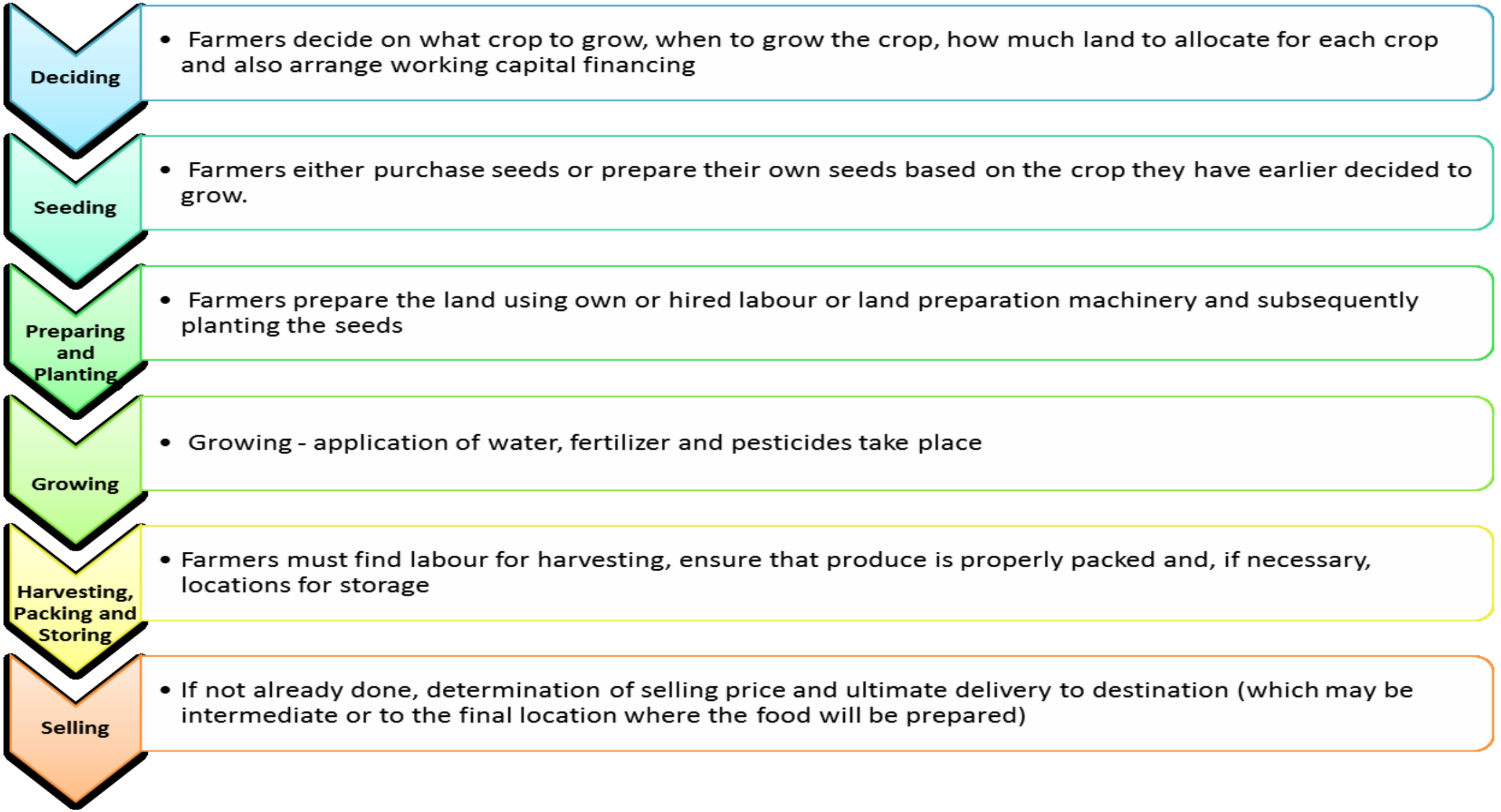
- In what specific ways can information and communication technologies be applied to the Jamaican Agritourism sub-sector in order to match farm output to market demand within the tourism sector?

The selected definition used for Agritourism

- Agritourism is the segment of economic and social activity where agriculture and tourism intersect and can be described as the use of agricultural products, spaces (farms, etc.) and processes, to meet the accommodation, sustenance or entertainment needs of the tourism sector

(Koc, 2008; Kuo and Chiu, 2006; Iakovidou, 1995; Phillip et al., 2010; Pulina et al., 2006; Sharpley, 2002)

The WFIC Agri-tourism Agricultural Production Value Chain (adapted from Harsha de Silva and Dimuthu Ratnadiwakara (2009))



Farm size	Number of Farms		Area in Farms	
	Total	% of total	Total	% of total
Under 1 ha	151,929	75.73	47,712	14.64
1 to under 5 ha	43,731	21.80	86,011	26.40
5 to under 50 ha	4,543	2.27	50,783	15.59
50 to under 200 ha	270	0.13	25,449	7.81
200+ ha	140	0.07	115,854	35.56
All Farms	**200,613**	**100.00**	**325,810**	**100.00**

Source: Statistical Institute of Jamaica. *Census of Agriculture, 2007.*

Early Observations

1. The Jamaican agritourism sub-sector is not well defined
2. Components currently using ICT effectively are the medium-sized and large purveyors. These do not promote the inclusion of other players
3. ICT cannot be effectively applied to the current disorganized sub-sector. Preliminary work must be conducted to organize the sub-sector

The theories…

THEORIES ON TECHNOLOGY ACCEPTANCE

Technology Acceptance – Individuals	The Technology Acceptance Model (Davis, 1986; Davis, 1989; Davis et al., 1989 Updated Technology Acceptance Model (Venkatesh and Davis, 2000)
	The Theory of Planned Behaviour (Ajzen, 1985, 1991)
	The Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)
Technology Acceptance – Firms	Diffusion of Innovations Theory (OECD, 2005; Rogers, 1962)
	Technology-Organization-Environment Framework (Kuan and Chau, 2001; Iacovou et al., 1995)
	Institutional Theory (Scott, 2004; Li, 2008)

Challenges to ICT use in Agritourism (agriculture)

(Gelb and Porter, 2006; Iddings and Apps, 1990)

- Degree of external support
- Network (support system among peers)
- Age (of farmer)
- Time available (to learn to use ICT)
- Past Experience
- Availability of information
- Personality and Approach to Learning

More literature

- Assimilation of information theory (Keim et al. 2005)
- In certain circumstances, ICT use in small-scale agribusiness might be regarded as **innovative** (Tan et al.,2009)
- **Innovative** use of ICT in agribusiness is especially evident in developing countries… (Frambach and Schillewaert, 2002 and Rao, 2007)

Defining Innovation

- “the process by which individuals and organizations generate new ideas and put them into practice” White House (2011).
- “a process by which value is created for customers through public and private organizations that transform new knowledge and technologies into profitable products and services for national and global markets”
- “creating or improving goods, services, or methods of production” (Van Schewick, 2009)

- “the introduction of new goods, new methods of production, the opening of new markets, the conquest of new sources of supply and the carrying out of a new organization of any industry” (Schumpeter, 1934)
- Industrial economists tend to define innovation in terms of productive and dynamic efficiency, i.e., the ability of a society to push the efficiency frontier outwards by finding new ways to use existing resources, or creating new resources that can be added to the production mix.

Innovation…

- Granieri and Renda (2012)
  - Innovation is at once pervasive and elusive

Innovation…

- Granieri and Renda (2012)

  …

  - It is pervasive since it entails both government and private investment; it permeates all areas of public policy, from tax to labour, from telecoms to energy, from competition to industrial policy, from education to intellectual property, from immigration to health and agriculture, from supply-side to demand-side policies; and also, because it requires actions at global, national, regional and local levels.

Innovation…

- Granieri and Renda (2012)

  …

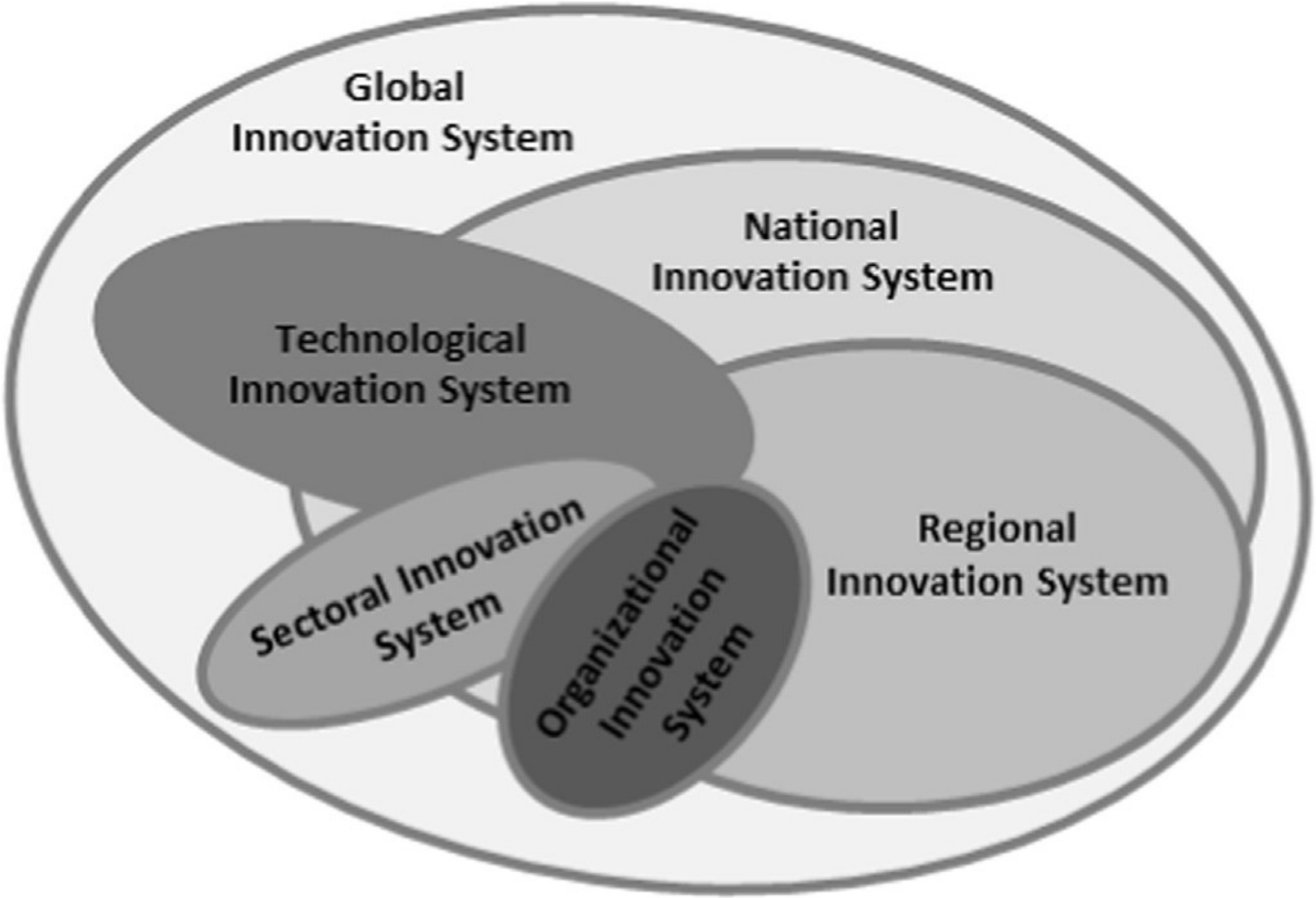
  - It is elusive because it is hard to define and also because there is no easy mix, no one-size-fits-all solution, no recipe to unleash the potential of innovation in a given country

- Innovation is widely considered to be a key factor behind economic development and competitiveness for firms, regions, and nations (Frambach and Schilewaert,2002; Reindersetal., 2010; Tödtling and Trippl,2005)

- Sceptics and agnostics even push themselves to observing that innovation has become impossible to define: you just know it when you see it

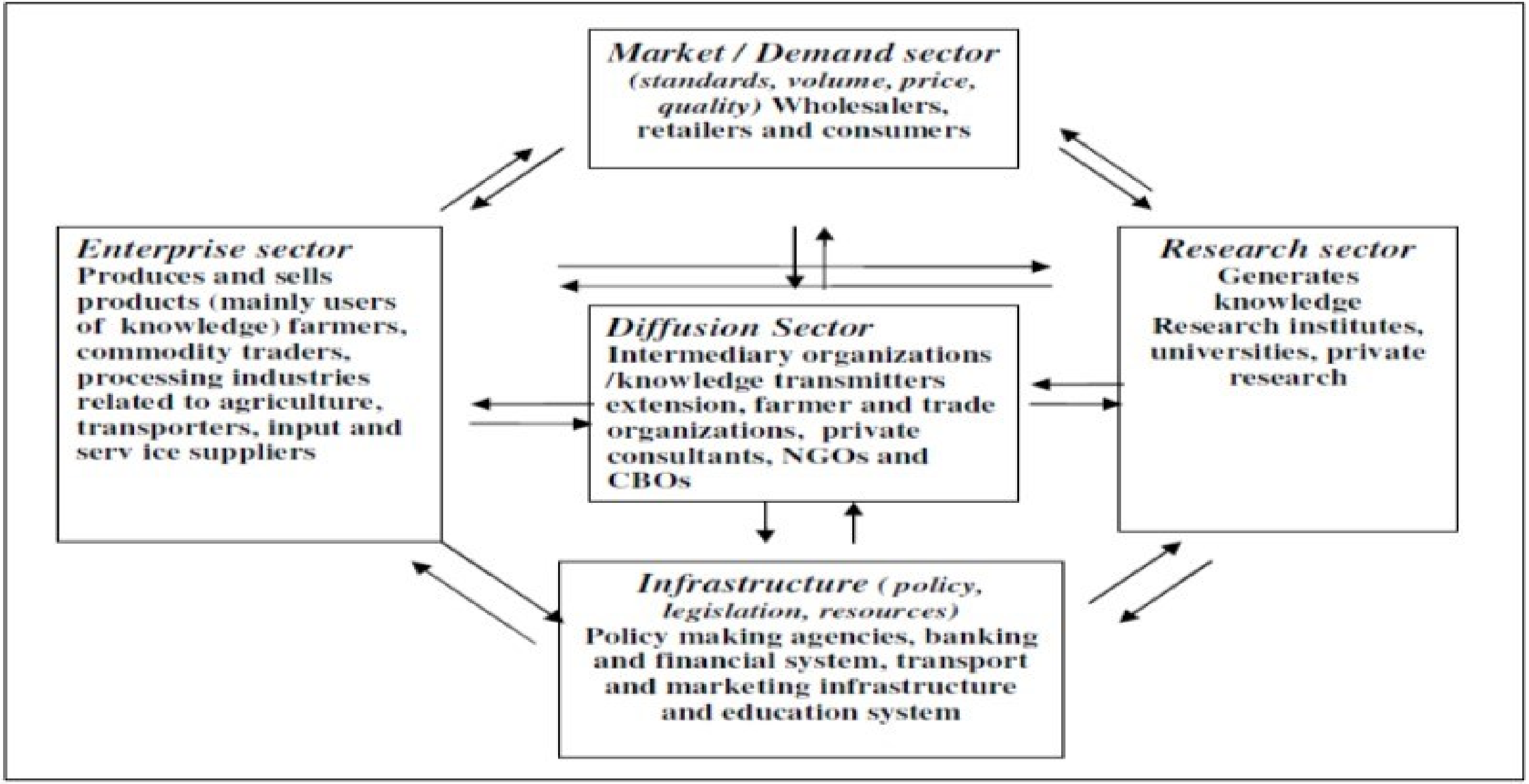
Theoretical Background

- Revolves around Innovation Systems



Relationship between innovation systems levels (J. Van Lancker et al., 2016)

Agricultural Innovation System



Source: Agwu et al. (2008)

Research Methodology

- Based on Interpretivist Epistemology and Constructionist/Constructivist Ontology
- Research Approach

  The investigation was done in two components:

  1. Initial/Preliminary Investigation
  2. Final investigation

Why was this approach selected?

- Initial/Preliminary investigation was exploratory to:

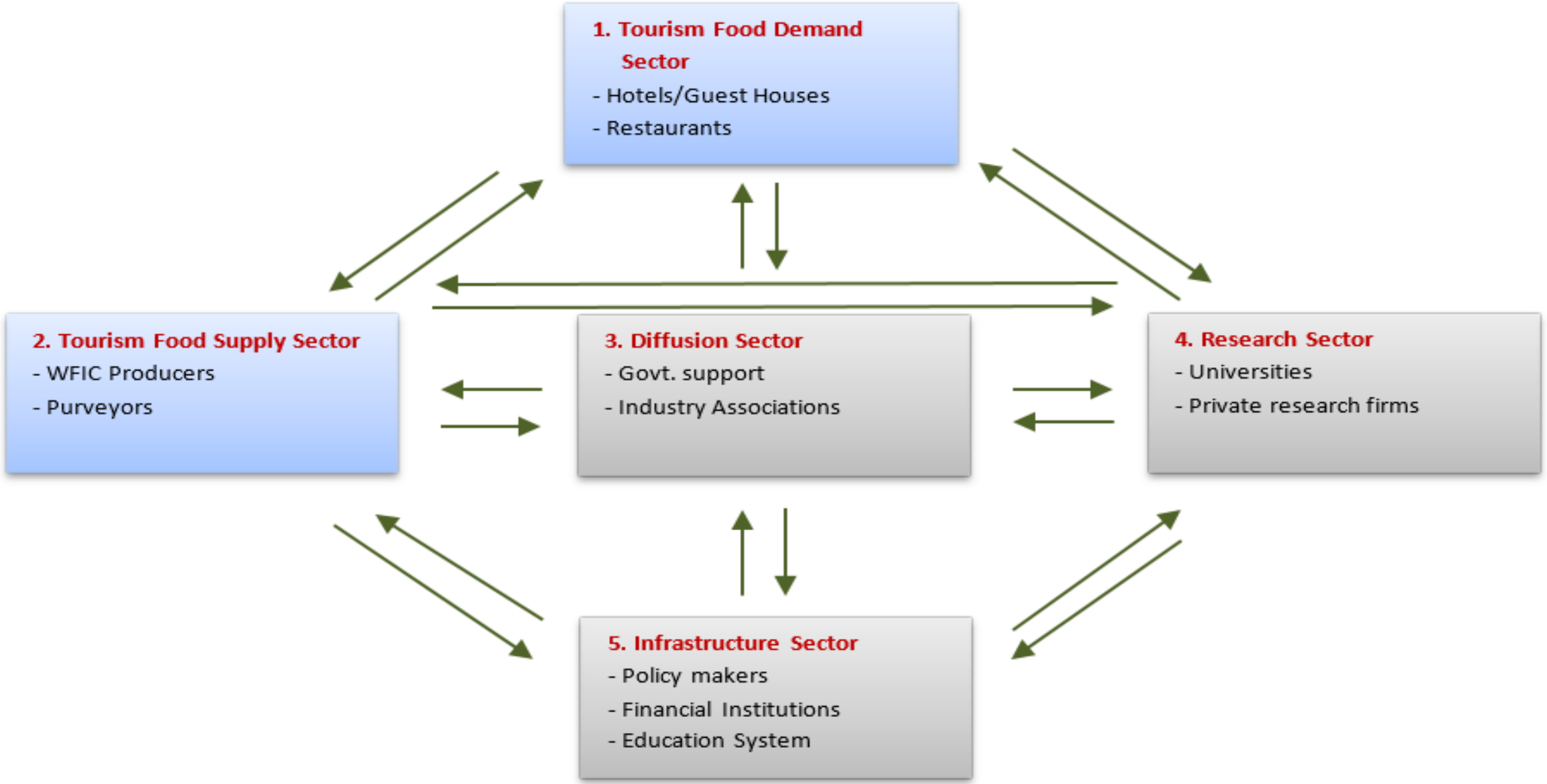
1. Determine the current and potential level of ICT access and use; and
2. To inform the final, in-depth, investigation

Exploratory research is often used to clarify one's understanding of a problem, especially if one is unsure of the nature and extent of the problem (Saunders et al., 2007; van't Riet et al., 2001)

Research Design and Methods

1. Initial/Preliminary Investigation conducted in 2 phases using mixed methods:

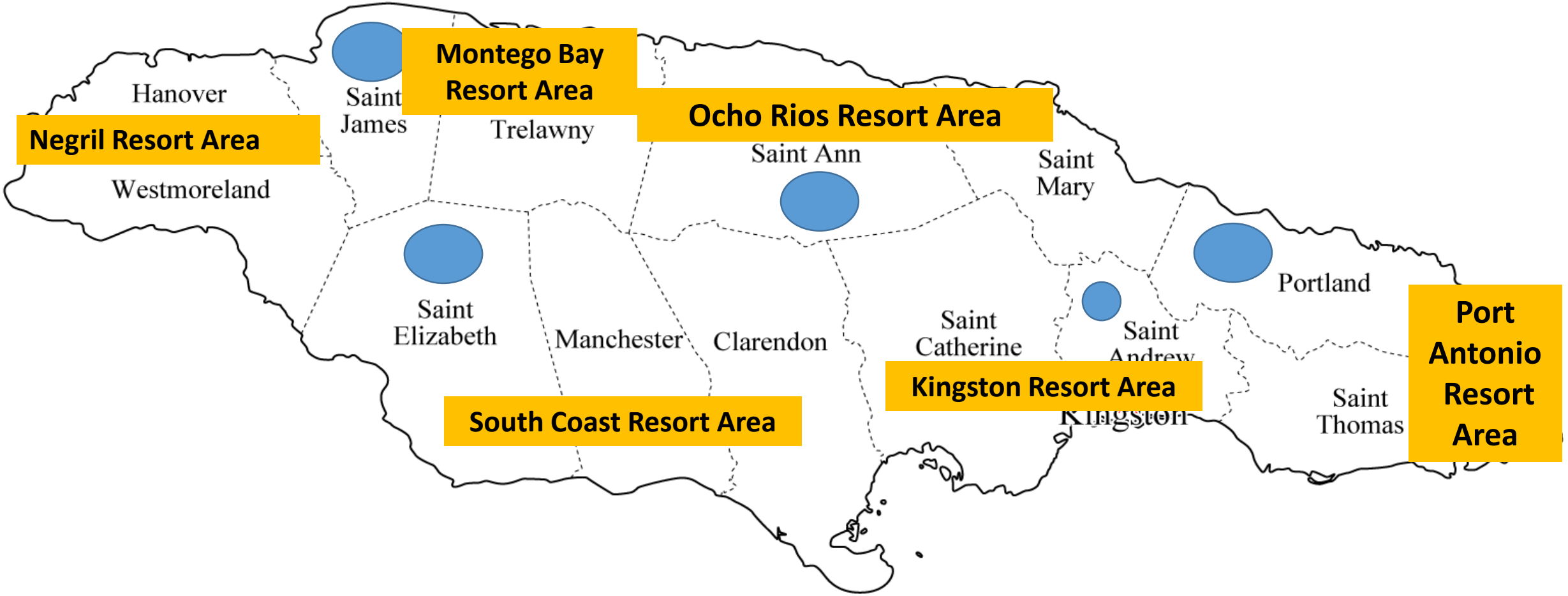
   - Phase 1 (2009 and 2010) – to verify the structure of the sector and the attitude towards ICT usage; and
   - Phase 2 (2011) – to determine the crops produced and the use of ICT by farmers to conduct operations.



3. THEORETICAL/CONCEPTUAL FRAMEWORK

Source: Author (2013) – adapted from Agwu et al. (2008)

MAP OF JAMAICA ILLUSTRATING RELATIVE LOCATIONS OF THE 14 PARISHES



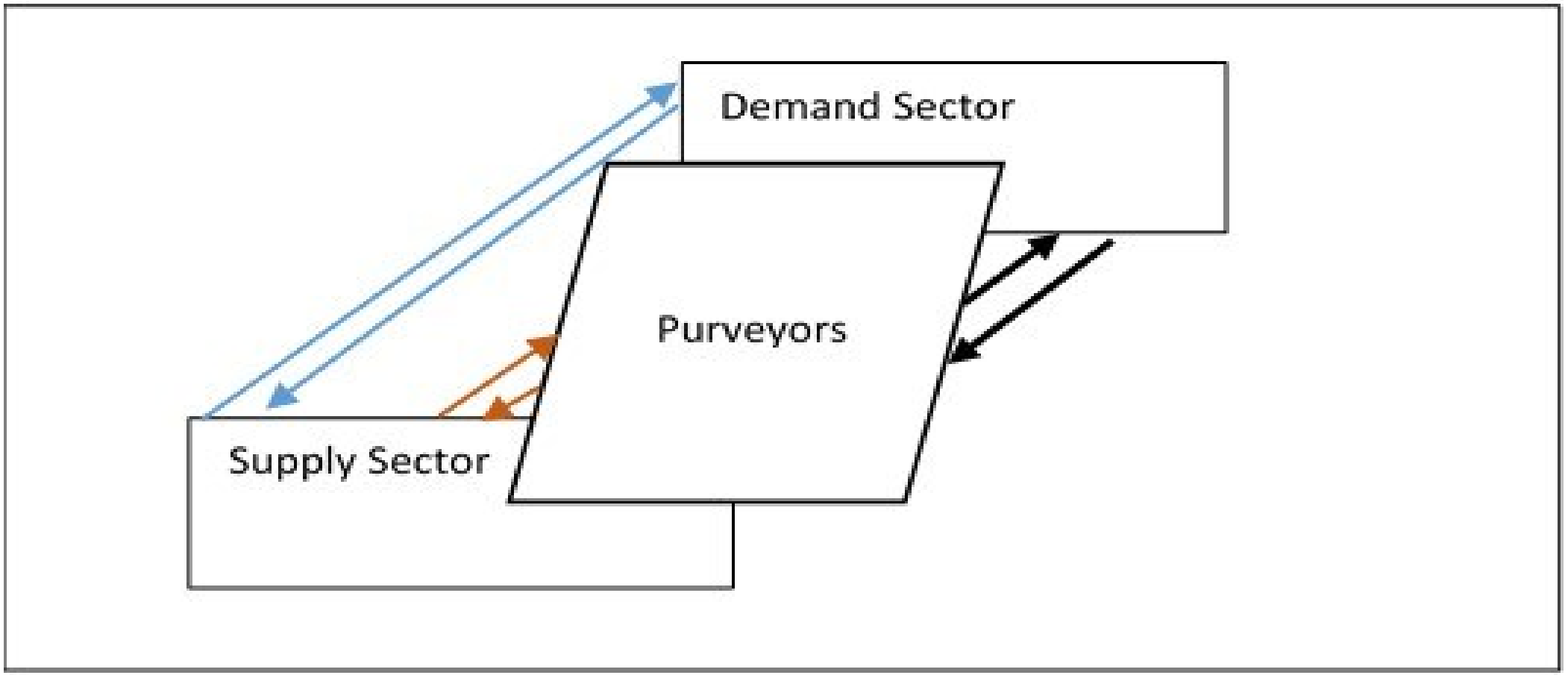
Some important Findings

- Main Themes

Theme	Demand Sector	Supply Sector
Culture	X	X
Trust	X	X
Lack of information	X	X
Logistics and distribution	X	
Consistency		X
Pricing		X
Quality		X
Variety		X

5. SUMMARY OF FINDINGS

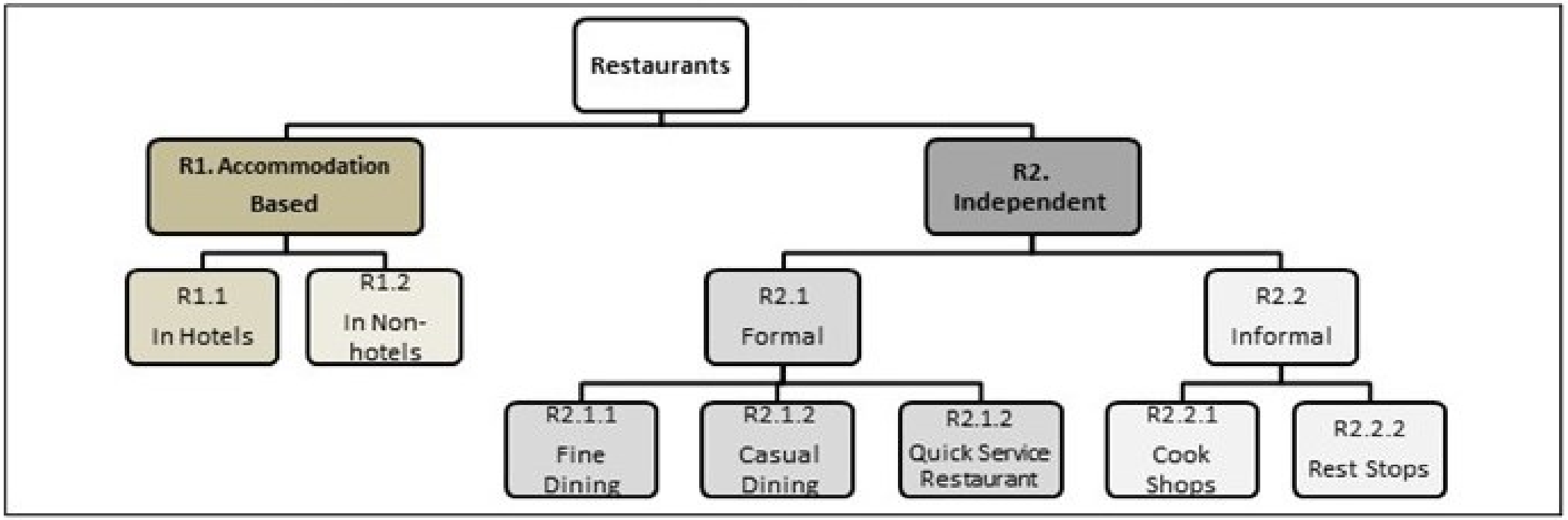
SUPPLY/DEMAND INTERACTION (STAGE 1)



5. SUMMARY OF FINDINGS

Purveyor Type	Organization	Sourcing	Delivery	Infrastructure
Small	Sole trader and active Farmer	Own farm and farms in close proximity to owner's farm	Island-wide	• Basic transportation/ delivery • No Refrigeration (storage, transportation) • No island-wide delivery in close time-frame
Medium	• Small private company • 10 – 20 employees • Family-owned and managed	Farms Island-wide	Island-wide	• Good transportation/delivery network • Refrigeration available (storage, transportation) • Capacity to deliver island-wide simultaneously or in close timeframes
Large or Specialist	• Large (medium-sized), publicly traded company • More than 100 employees • Professional Managers • Access to resource persons	• Farms Island-wide • Farming Cooperatives • Internationally	• Island-wide • Nearby Countries	• Good transportation/delivery network • Refrigeration available (storage, transportation) • Capacity to deliver island-wide simultaneously or in close timeframes

The Demand Sector



Source: Data collected during final investigation

5. SUMMARY OF FINDINGS

TABLE 1 - AGE RANGES OF FARMERS SAMPLED (PRELIMINARY INVESTIGATION, PHASE 2)

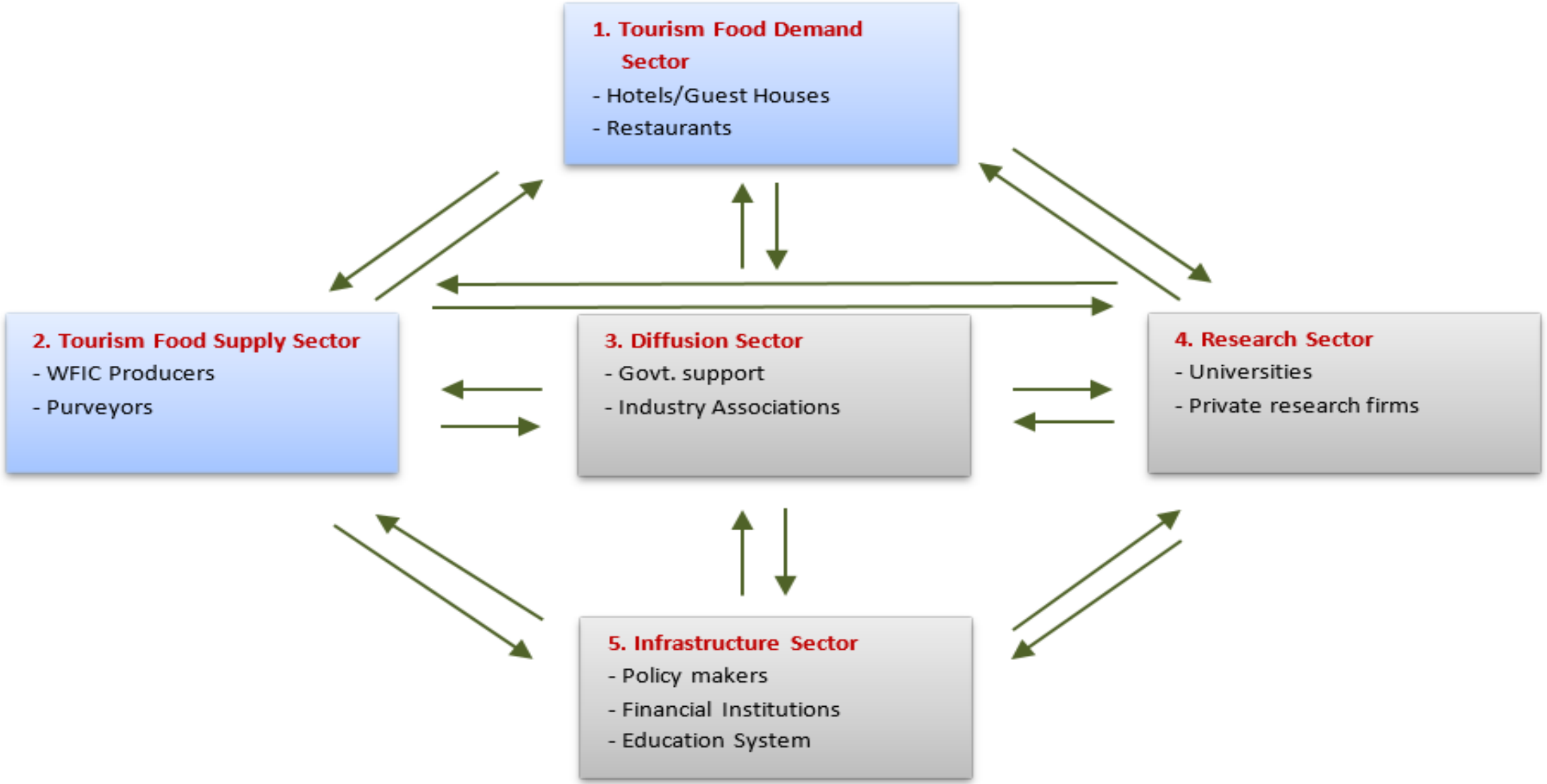
Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 and Under	2	6.5	6.7	6.7
	26 – 34	2	6.5	6.7	13.3
	35 – 44	12	38.7	40.0	53.3
	45 – 54	5	16.1	16.7	70.0
	55 – 64	6	19.4	20.0	90.0
	65 – 74	2	6.5	6.7	96.7
	No Response	1	3.2	3.3	100.0
	Total	30	96.8	100.0	
Missing	System	1	3.2		
Total		31	100.0		

5. SUMMARY OF FINDINGS

TABLE 1 - ICT CURRENTLY USED BY A SAMPLE OF JAMAICAN FARMERS

		Responses		
		n	Percent	Percent of Cases
Current ICT Use	Cell Phone (calls only)	8	26.7%	26.7%
	Cell Phone (SMS and Internet)	6	20.0%	20.0%
	Computer - Internet Access	4	13.3%	13.3%
	Inventory Mgmt. App.	1	3.3%	3.3%
	Business Productivity software	5	16.7%	16.7%
	Agriculture Software	4	13.3%	13.3%
	Fax machine	2	6.7%	6.7%
	Total	**30**	**100.0%**	**100.0%**

5. SUMMARY OF FINDINGS



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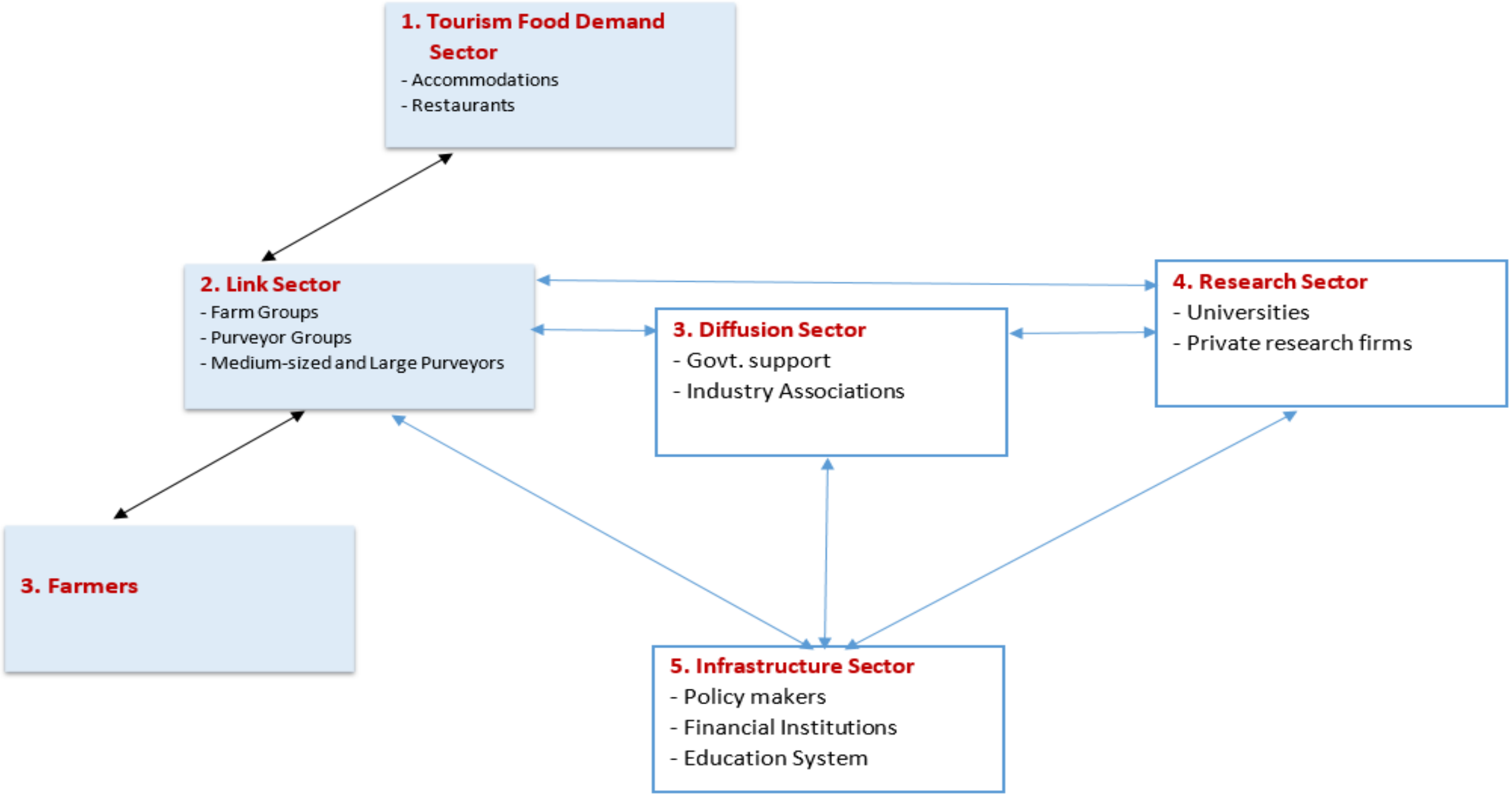
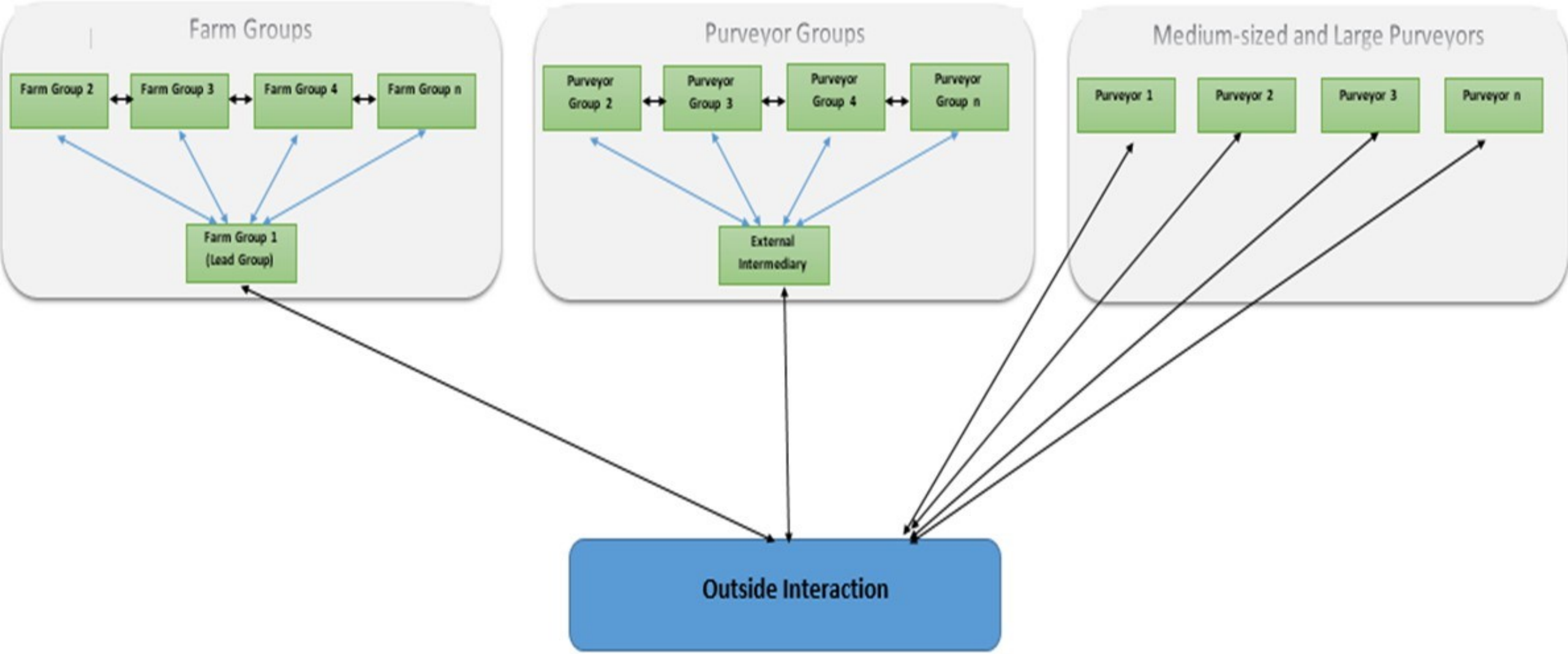
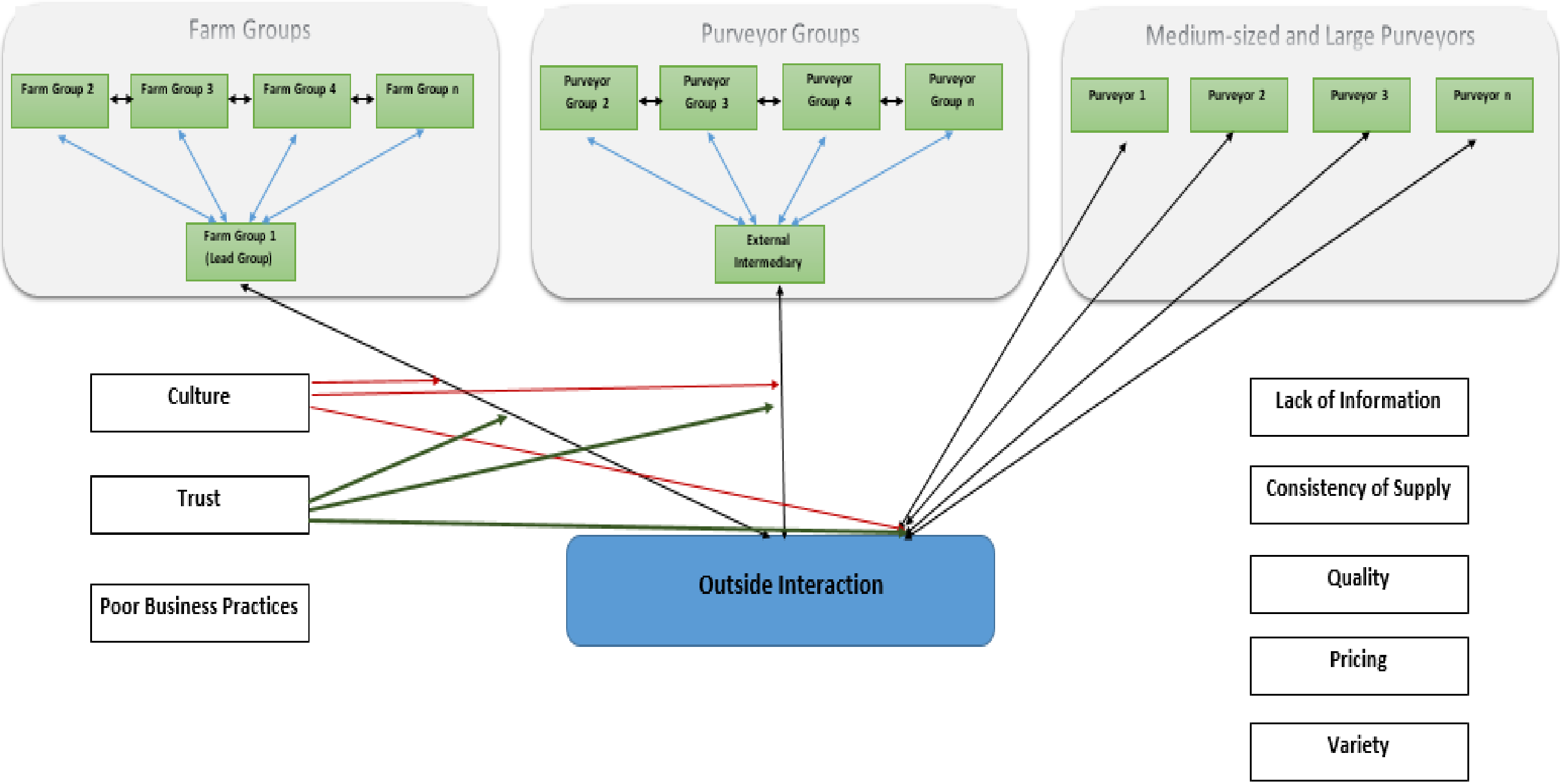

1. Tourism Food Demand Sector
- Accommodations
- Restaurants
2. Link Sector
- Farm Groups
- Purveyor Groups
- Medium-sized and Large Purveyors
3. Diffusion Sector
- Govt. support
- Industry Associations
4. Research Sector
- Universities
- Private research firms
3. Farmers
5. Infrastructure Sector
- Policy makers
- Financial Institutions
- Education System


Farm Groups
Farm Group 2
Farm Group 3
Farm Group 4
Farm Group n
Farm Group 1
(Lead Group)
Purveyor Groups
Purveyor
Group 2
Purveyor
Group 3
Purveyor
Group 4
Purveyor
Group n
External
Intermediary
Medium-sized and Large Purveyors
Purveyor 1
Purveyor 2
Purveyor 3
Purveyor n
Outside Interaction


Farm Groups
Farm Group 2
Farm Group 3
Farm Group 4
Farm Group n
Farm Group 1
(Lead Group)
Purveyor Groups
Purveyor Group 2
Purveyor Group 3
Purveyor Group 4
Purveyor Group n
External Intermediary
Medium-sized and Large Purveyors
Purveyor 1
Purveyor 2
Purveyor 3
Purveyor n
Culture
Trust
Poor Business Practices
Outside Interaction
Lack of Information
Consistency of Supply
Quality
Pricing
Variety

Questions and Comments