

**Initial findings and potential
intervention areas for improvement
of traceability for food safety of
F&V supply chains in Vietnam**

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I. Project background

General information

1. **Project name:** Assessment of the Use of Digital Technologies to Improve Traceability and Monitoring of Food Safety Standards Compliance in Fruit and Vegetable Value Chains in Vietnam
2. **Donor:** The World Bank

Objectives & Tasks

1. Objectives:

- To assess the needs to improve product traceability in Vietnam's F&V value chains,
- To lay out (technology, institutional, regulatory) options to create or strengthen such traceability systems
- To assist stakeholders to make decisions regarding these options so that specific investments might be piloted or scaled up during Agri-Food System Project implementation

2. Tasks:

- **Task 1:** Review of the current status of existing traceability systems in Vietnam's fruit and vegetable value chains and of pertinent policies and regulations
- **Task 2:** Review international practices and their potential applicability to Vietnam
- **Task 3:** Knowledge dissemination and linking technology providers with potential clients and policy makers

Outcomes

Recommendations for improvement of application of digital-technology based traceability in F&V supply chains.

II. Project update

Draft Report 01, 02 and 03 submitted to The World Bank

Analysis of selected F&V supply chains in Vietnam

- Identifying key food safety risks of the selected F&V supply chains (leafy green and dragon fruit supply chains)
- Identifying key players of the selected F&V supply chains and their main characteristics

Review of the current application of food traceability in selected F&V supply chain

- Current application (users, applied technologies) of food traceability in selected F&V supply chains
- Existing solution providers

Review of current legal and institutional framework for food traceability in Vietnam

- Legal framework (mandatory provisions and voluntary technical standards) for food traceability
- Institutional framework
- Initiatives of the government to promote traceability

Study on international practices

- Developing legal and institutional framework for food traceability
- Implementing traceability system
- Applicable digital technologies

Key findings on the
current state
&
Potential intervention
areas for Vietnam



Section II

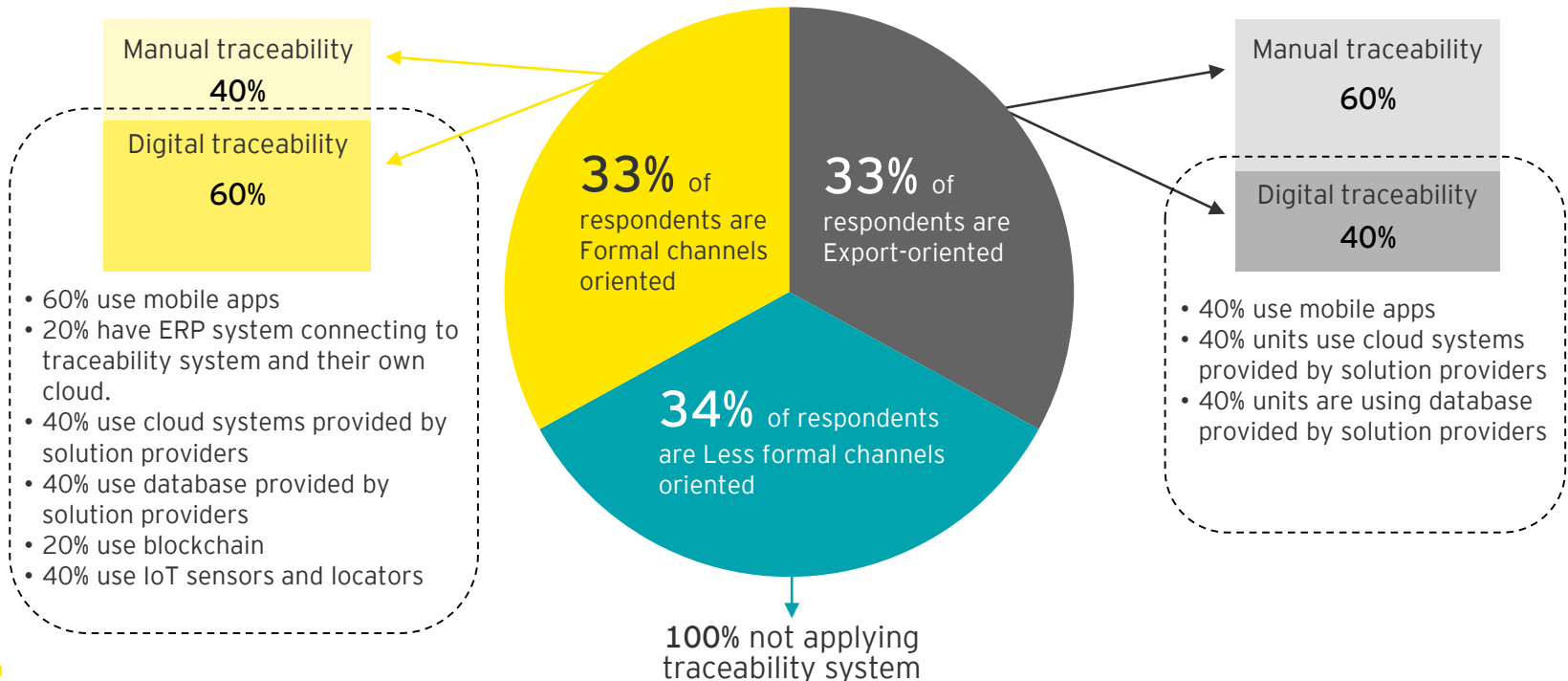
Initial findings and potential intervention areas

1. Interview results
2. Initial findings on the current state of food traceability application of Vietnam F&V supply chains
3. International benchmarking and potential intervention areas

1. Interview results

Roles	Segments	Less formal markets	Formal markets	Export-oriented
Producers		Covered	Covered	Covered
Collectors		Covered	Covered	Covered
Processors		-	Covered	Covered
Distributors		-	Covered	Covered
Traceability solution providers		Covered	Covered	Covered

Key summary of our interview results (focus on leafy green and dragon fruit supply chains)



2. Initial findings on the current state of food traceability application of Vietnam F&V supply chains (1/2)

Initial findings

1. Policy and Regulations

No detailed guidance on traceability for specific agricultural product group	Vietnam has mandatory provision on traceability for all agricultural products and recommended national technical standard on traceability of general F&V products. However, no detailed guidance on traceability has been issued for specific product.
Lack of mechanism to promote traceability for stakeholders of less formal markets	<ul style="list-style-type: none"> ▶ Many small farmers and food operators are still unknown to administrators. ▶ Other registered small-scale businesses are only required to sign minutes on commitment to follow food safety regulations with the state management agencies. Inspections are carried out only in case of food safety incidents or as requested by provincial PC.
Lack of the resources for law enforcement	<ul style="list-style-type: none"> ▶ With a total of 10,603 communes, Vietnam lacks capacity for ensuring control and management at every administrative level. ▶ Inspection on compliance with traceability requirements are included as one of food safety inspection criteria, however, due to lack of resources, it has not been performed for all food operators.
National traceability system is not implemented	Vietnam government has not implemented national traceability system for any type of commodity.
Lack of policy framework to promote the use of digital technology	Vietnam government issued 2 TCVN on general requirements for traceability and traceability for fresh F&V supply chain. However, there is no technical standards on specific digital technology for traceability (e.g. QR code, traceability for e-commerce transactions, RFID, ...).

2. Public awareness

Low consumer's trust in safe fruits and vegetables: The demand for products with traceability features is not significant enough for consumers to purchase high cost products (increases in price due to application of digital traceability system), especially in less formal sector of Vietnam.

2. Initial findings on the current state of food traceability application of Vietnam F&V supply chains (2/2)

Initial findings

3. Existing capacities

Financial capacities	<ul style="list-style-type: none">▶ Vietnam F&V sector still largely depends on small-scale and fragmented production areas and distribution channels who face shortage of finance.▶ F&V products produced by farmers are mostly low value commodities due to low quality. Hence, the total sales cannot offset the incurred costs.
Technical capacities	<ul style="list-style-type: none">▶ Vietnam F&V sector still largely depends on small-scale and fragmented production areas and less formal distribution channels who lack:<ul style="list-style-type: none">• Technical knowledge and need lot of training to implement digital traceability systems• Existing digital infrastructure▶ Lack of the Interoperability between systems Interoperability is a critical component to enable full-chain digital traceability; but it is almost nonexistent in the selected supply chains in Vietnam. The systems applied in Vietnam have not followed any agreed standardization for the application of digital technology amongst their traceability systems.<ul style="list-style-type: none">→ Data might not be exchanged easily and interpreted with the same meaning across several systems.▶ Low level of data security Vietnam is lagging behind the world in cybersecurity and require further investment to keep up with the rising demand for security and privacy in cyberspace.

3. International benchmarking and Potential intervention areas for Vietnam (1/4)

Challenges in applying traceability for F&V supply chains in Vietnam		International practices review	Potential intervention areas for Vietnam
Policy and Regulations	No detailed guidance on traceability for specific agricultural product group	<p>EU, Italy, and Korea have requirements towards high-risk and high-value products.</p> <ul style="list-style-type: none"> • EU has specific requirements on traceability towards high-risk products: <ul style="list-style-type: none"> ○ animal products ○ sprouts and seeds intended for the production of sprouts • Italy follows EU requirements, and also focuses on traceability of their signature and high-value products <ul style="list-style-type: none"> ○ olive oil ○ wine • Korea has specific requirements on traceability for <ul style="list-style-type: none"> ○ high-risk product: (i) animal products and (ii) health functional food ○ products for babies: baby formula product ○ products relating to government: agro-products purchased or imported or processed by/on behalf of the Government • China has specific national standards on traceability for <ul style="list-style-type: none"> ○ their signature product: tea ○ products for babies: infant formula products <p>China GOV also promotes traceability standards for cold-chain activities and e-commerce transactions.</p>	<ul style="list-style-type: none"> • Develop specific traceability guidance (voluntary technical standards) targeting high-risk, high-value products. • Specific guidance for activities which largely involved in F&V supply chains and having potential to apply digital technologies are also encouraged.

3. International benchmarking and Potential intervention areas for Vietnam (2/4)

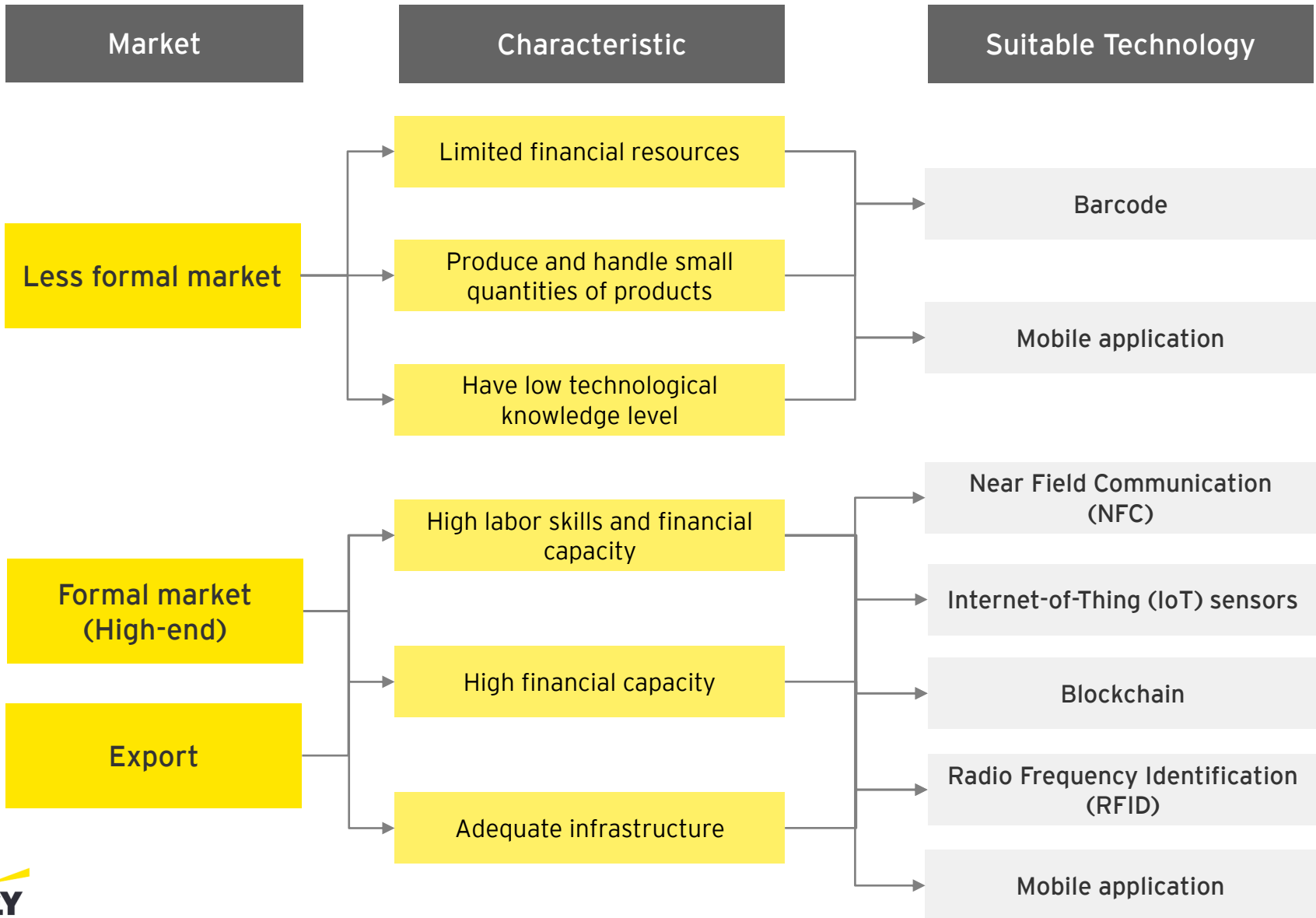
Challenges in applying traceability for F&V supply chains in Vietnam		International practices review	Potential intervention areas for Vietnam
Policy and Regulations	Lack of the resources for law enforcement	<ul style="list-style-type: none"> • Italy: performing thousand of checks on compliance of food operators with traceability every year. The inspectors are well trained with traceability requirements. • China: after recent issuance of national technical standards on traceability, has planned to conduct training for their inspection workforce. 	<ul style="list-style-type: none"> • Mainstreaming training of traceability requirements into food safety regulations for the inspection workforce by conducting trainings.
	National traceability system is not implemented	<p>National traceability systems help reduce the costs of product recall and enhance information transparency.</p> <ul style="list-style-type: none"> • EU: (i) system for animal products and (ii) system for sharing food safety information among EU members • Italy: systems for (i) olive oil and (ii) wine • China: (i) national system agricultural product and (ii) provincial systems for meat and vegetable products. • Korea: (i) systems for banning sales of non-compliant products and (ii) systems for agricultural products. 	<ul style="list-style-type: none"> • Develop a pilot national portal on food traceability focusing on high risk, or high value food products, • Expanding the pilot's scope to cover other food products.
	Lack of policy framework to promote the use of digital technology	<ul style="list-style-type: none"> • China government issued national technical standards (Guobiao standards) enabling application of digital traceability systems: <ul style="list-style-type: none"> ○ Specifications for traceability management platform construction ○ General technical requirement for QR code of food traceability. 	<ul style="list-style-type: none"> • Develop national technical standards for some applicable digital technologies which are specifically for traceability systems.
Public awareness	Low consumer's trust in safe fruits and vegetables	<ul style="list-style-type: none"> • In Korea, for 20 years, annual Food Safety Day has been held by MFDS to raise public interest in food safety and promote safety awareness of food-related workers. 	<ul style="list-style-type: none"> • Disseminate knowledge and enhance consumers' awareness of food traceability via national/regional food safety events. • Promote the benefits of food traceability to the public.

3. International benchmarking and Potential intervention areas for Vietnam (3/4)

Challenges in applying traceability for F&V supply chains in Vietnam		International practices review	Potential intervention areas for Vietnam
Existing capacities	Financial capacities	<ul style="list-style-type: none"> Users with lack of financial capacities may join the national traceability systems invested and implemented by the government that meet minimum requirements to perform traceability. In China, the fees are offered at low rate 	<ul style="list-style-type: none"> Provide financial supports regarding the implementation of traceability system for less formal segments. For less formal market: <ul style="list-style-type: none"> start with a more manual traceability systems (involvement of some common technologies with low implementation cost such as barcode, QR code, mobile applications are encouraged) record minimum data required to ensure the compliance with the 'One-step-back and One-step-forward' principle. For formal market: due to having sufficient to strong financial capacities <ul style="list-style-type: none"> consider to apply more advance digital traceability system for better control of the traceability of the product consider to record also internal traceability data (as proposed in the appendix A.) to ensure the stronger linkage of the food products and ability to identify unsafe internal stages.
	Technical capacities	<ul style="list-style-type: none"> These markets establish guidance on the application of traceability system and digital traceability systems for user to learn from. In China, QR-code are widely promoted and used by both major retailers and street markets due to its low implementation costs and ease of application. 	<ul style="list-style-type: none"> Hold or promote capacity building events to improve technical knowledge of food operators, especially those in less formal markets. For less formal market: start with a more manual traceability systems with involvements of common technologies such as QR code and mobile application. For formal market: consider to apply more advance digital traceability system for better control of the traceability of the product.

3. International benchmarking and Potential intervention areas for Vietnam (4/4)

Stakeholders with different existing capacities and needs suit different digital technologies.



Applicable digital technology for food traceability

The following digital technologies are derived from our analysis of existing traceability systems implemented in Vietnam and in some foreign countries.

Some of these technologies can be used interchangeably, and some of them can be used in conjunction to form a complete traceability system.

Functions covered	Barcode	RFID	NFC	Blockchain	IoT sensors	Mobile application
Identifications	Barcode	RFID tag	NFC tag	-	-	(*)
Automatic capture	Barcode scanner	RFID reader & antenna	NFC reader	-	-	Mobile application (acting as tag/code reader)
Recording & Sharing	-	-	-	Blockchain database	IoT sensors	Mobile application

(*) in some cases, mobile application may also act as barcode (code emulation form). But it is not common due to incurring much higher cost compared to the printed one.

Characteristics of a good traceability systems

