



# Mobile Market Information for Agri VAS Operators: A Quick Start Guide

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## NOTE TO READER:

Although this document is focused on mobile MIS, we strongly advocate bundling mobile MIS with other agriculture information and advisory services (crop, livestock and weather advisories, market linkages, financial services, etc.). This is in order to reach financial viability and is touched on throughout the document.

If you are new to the Agricultural Value Added Service (Agri VAS) concept, it's highly advised you first review the [Agri VAS Market Entry Toolkit](#).

## 1. INTRODUCTION

Access to accurate and actionable market information is critical for farmers whose livelihoods are greatly affected by the price their produce can fetch at market.

Market Information Systems attempt to fill this information void by collecting, analysing and distributing relevant market data to those who need it (farmers, buyers and traders). Traditional market information systems found in most developing countries range from sophisticated, centrally managed exchanges, to message boards at small rural markets. However, most of these operations face common challenges around:

1. Logistics and quality of data collection – they cannot collect enough quality data from enough markets with enough frequency and deliver their information to enough farmers (scale)
2. Financial sustainability – limited value proposition (willingness to pay) and revenue sources

Because mobile phones are increasingly prevalent in many rural communities, they are well placed to improve data collection and dissemination, and can also be used for revenue collection. However, the simple addition of mobile channels won't ensure success. Challenges around enumeration (*quality* data collection) and financial sustainability tend to remain for many stand-alone mobile MIS.

Proper enumeration and data processing are prerequisites to offering a strong value proposition. Offering a mobile MIS on a stand-alone basis is generally discouraged as this tends not to address most of the barriers farmers face in increasing their incomes and thus their willingness to pay for a mobile agriculture service. Rather, it is advocated to bundle a mobile MIS with broader mobile agriculture services such as crop, livestock and weather advisories, market linkages and financial services, etc.. This bundled style service is better positioned to address some of the additional barriers beyond a lack of market information.

## 2. PREPARATION & MARKET ASSESSMENT

When considering whether to offer mobile MIS, many find themselves unsure where to begin. Before making any decisions, proper market assessment needs to be conducted around user needs, value chains, market dynamics, competitors/substitutes, partnerships and complimentary services. *By the end of this section, readers should have an understanding of the approach to assessing their market requirements and what partnerships are needed*

One of the key decisions made in this preparation phase is deciding between building the service from scratch or utilizing partnerships. Due to the start-up costs and complexities required to build a new MIS, namely the data collection networks and analysis, **we strongly advocate partnering with organizations that have already made these investments. Only in markets where no good partners exist should providers consider building from scratch.**

### a) USER RESEARCH:

The first step in understanding potential users of a MIS is to define the target segments. In most cases the primary target will be rural smallholder farmers followed by traders and buyers. The next step is to conduct careful research to understand the users and their wants and needs. As the output of this research will feed into the design and development stage, it needs to be actionable and specific.

It is also important to note some of these answers are VERY difficult to get. In many cases target users might not know exactly what they want or may not articulate it. For this reason, it is highly advisable to consult a specialized design firm experienced in working with these populations and extracting these sorts of difficult answers.

The following are some examples of questions that should be answered during the user research stage:

1. **Is there a need (and if so, what is its magnitude)?**
  - a. Where do they presently get information from; are they happy with this? If not, why not? What are the gaps in the information they presently receive? Do they want to improve the way they are currently learning about market prices?
  - b. What other MIS related information do they want (transport availability/costs, value addition, etc.)?
  - c. What and how are they willing to pay?
2. **What information do they need and how do they want to use it?** For an MIS pricing advisory to be meaningful and of value, it needs to be delivered in the complete context (location, product variety, unit of measurement, quality, time, etc.). Only within the complete context can farmers use the information to make good decisions. In order to deliver the information in context, we need to understand what farmers want and need.
  - a. What crops or value chains do users want and need prices for, which price (which type of market – local, wholesale, assembly, retail, region, etc.)?
  - b. How will they use this information (decide when/where to sell, store, what to plant, value addition, transport, etc.)?
  - c. Do they want qualitative advice on how prices will behave (projections or forecasts)?
3. **How do they want to receive the information?** It is worth bearing in mind that in many cases, rural populations tend to face challenges in accessing and using mobile services due to lower mobile phone literacy, trust, willingness to pay or basic awareness of what services are available and how they work.
  - a. Do they own/have easy access to mobiles and which features are they most comfortable with (SMS, USSD, Voice, etc.)?
  - b. What other mobile value-added services are popular or commonly used?
  - c. Do they want a subscription service (push) or to pay per request (pull)?
  - d. Do they want to store the information (this may require SMS)?
  - e. What measurement of quantity and quality (produce grade) will they understand?

4. **What other topics (non-MIS) are they interested in learning about or receiving information on?** For example:
- a. Value addition? Crop production? Weather? Banking? Insurance?
  - b. The basics of farming and market economics?
  - c. Export opportunities and quality standards?
  - d. Bulk selling or buyer/seller match making (e-trading platforms, virtual market places)?

**b) UNDERSTANDING VALUE CHAINS:**

In the preparation stage it is also important to understand the major agricultural value chains, their economic value to the defined location, and what factors impact their prices. Some examples of factors that should be considered when planning an MIS include:

1. Quantitative:
  - a. Ratio of production of the value chain against others
  - a. Historical and current production levels and price trends at regional and national markets
2. Qualitative
  - a. Major buyers or producers impacting supply and demand: who are they, what value chains and what supply/demand volumes?
  - b. Weather trends (drought or excessive rains)
  - c. Seasonal trends (holidays) which may drive up demand
  - d. Performance of substitutes which impact demand for other crops
  - e. Is there sufficient price diversity to warrant a need for analysis, or are prices usually stable?

**Understanding Value Chains – Example from West Africa:**



Rice: In West Africa, rice is one of the main food crops. In most countries in the region more than half the annual consumption is imported from Asia (Thailand, Vietnam and India mainly). Because of this, it is important to not only consider the local value chain (farmer, trader, retailer, consumer), but also pay close attention to broader issues like the import market. To take an example, if farmer members of the COOPARIZ cooperative receive market price advisories indicating a low price, and that the national output is expected to be good this year, they may believe the price will stay low and sell. However, what that advisory did not say was that rice stocks in India and China are expected to be very low, so low that imports will be cut and cause prices to increase. Some weeks after selling their stocks at a lower price, farmers will find the price of rice increasing fast. In this scenario, members of the cooperative would lose confidence in COOPARIZ and the information given by the MIS.

In another situation, rice production in West Africa is growing fast and in some countries, given good weather; it can reach the level of national demand. Here, the local value chain becomes equally important to monitor and can bring big changes in the market situation. One year, the price of rice on the local market can depend on international markets and the year after it can be mostly driven by the local situation (for example local overproduction). So in this case, as in many, several drivers of the market must be monitored in parallel.

Sesame: Sesame seed is an important cash crop in West Africa. Because local demand consists of 10% of production, providing data on the *local* market might not be very useful to farmers. Furthermore, the European market is one of the destinations of West African sesame seeds and many exporting companies in the sector are European, meanwhile as Asian countries consume more than 50% of the world production, international prices are not decided in Europe but in India and China. That is why a local MIS which communicates information on sesame seed must also consider supply chain exports to Asia to gather the best information for farmers, traders and local processors.

### c) MARKET DYNAMICS:

Understanding the various markets and actors across the individual value chains will help to develop a high quality and useful MIS. The following chart outlines the various types of markets and key characteristics for farmers:

Markets & Actors	Cost & Transport Requirements	Difficulty to Access	Benefit & Results	Value Addition Requirements
Farm-gate	None	Easy  More Difficult	Low costs, easy, lowest price	None
Assembly market	Medium transport		Slightly higher price, access to more traders	Typically none
Wholesale market	Higher transport		Even higher price	Typically none
Retailers & Agri-processors	Transport and preparation		 Highest price	Washing, packing, light processing
Retail market	Highest transport & Time spent at market			Washing, packing, light processing, sorting
Export	Highest transport cost & high quality standards			Washing, packing, light processing, sorting
Contract farming	Opportunity costs, may be required to use particular inputs	n/a	Security in having a fixed price/ quantity.	Depends on contract

*\*Adapted from FAO Understanding and Using MIS available at <ftp://ftp.fao.org/docrep/fao/012/x8826e/x8826e00.pdf>*

1. Farm-gate – traders visit the farmers' plot to buy
2. Assembly market – farmers sell produce to traders
3. Wholesale market – retailers and businesses buy their supply from traders
4. Retailer & Agri-processor – organizations who tend to buy large quantities of produce and set quality standards
5. Retail market – markets where consumers buy their supplies
6. Export – market to sell produce outside the country
7. Contract farming – fixed agreement to buy/sell produce at an agreed price, quality and quantity before the season is over (tends to involve provisioning of inputs, technical advice and other support)

As the Diagram above depicts, farmers who sell further down the value chain can expect a higher price. However, selling further down the value chain requires greater value addition (transport, packing, processing, washing, etc.) which equates to higher costs and risk. **Farmers need data to make a cost/benefit calculation and understand the risks involved.**

### d) MIS SUBSTITUES AND COMPETITORS:

It's important to keep in mind that smallholder farmers do have other sources of market information, such as traders, other farmers, local price boards, NGOs and so on. Although there are major differences between those sources of information and high quality mobile MIS, this differentiation will need to be clear to the market, otherwise, users may not take the risk of using or paying for a new and unfamiliar service. Less mature markets may even require a bit of education combined with the marketing in order for farmers to understand and try the service.

The following chart helps to understand the existing sources of information available to farmers (these are all potential competitors and substitutes for a mobile MIS). In developing a value proposition it's important to consider the strengths and weaknesses of these substitutes and how these can be communicated to users:

	Strengths	Weaknesses	Opportunity
Government MIS	Independent, lack of deliberate bias, tend to collect historical prices for trending	More data collection than dissemination, unreliable quality and frequency, not always disseminated in best formats, push only	Provide accurate, timely, actionable and unbiased market information that reaches the rural smallholder where they are.
Traders	Most up-to-date	Profit motive = bias	
Other Farmers	Easily accessible, knowledgeable	Can be biased, unreliable (may not know standard measurement), may want to brag or show they have the best quality	
Price Boards in Market	Readily available at the market site	Little use at the farmgate, not always updated data or well maintained	
Extension Worker	May have access to a market information specialist via mobile phone	Not that frequently accessible	
NGOs	Lack of deliberate bias	Limited availability, unreliable/varying quality	
Agro-processors	Up to date and actionable (represents direct buy offer)	Very difficult to access, must meet quality requirements	

#### e) PARTNERSHIPS:

The main virtue of partnerships lies in the ability to quickly fill gaps in an organization's capacity to develop and deliver mobile MIS. The main areas of expertise needed to design and operate an MIS revolve around market data collection and dissemination.

1. **Market Data Collection** – Setting up and running a reliable data collection network means deploying and managing a dispersed network of agents collecting market data and transmitting it to a central database. These agents will need to be closely monitored so they collect the right type of price of the right product at the right market, etc. and transmit it to the central database on time. The data will also need to be validated and quality assured. Naturally, because the time, cost and expertise required to develop such a network is quite high, it's one of the first areas to consider for partnership.

While most governments will conduct some form of data collection, their data is more suited for policy analysis rather than for commercial trading. They tend not to have the timeliest data or the right data points (commercial transactions). However, most markets will have NGOs who are already working on market information related programmes. Outsourcing data collection to a partner organization like this, with shared goals and market presence, should be one of the first places to start. To further shepherd the partnership, bespoke software can be useful to help give a structure to a data collection network and quickly mobilize agents (agent set up, defines commodities and markets, and facilitates data submission and payments to the agents).

Esoko, a market leader in providing software and services to manage this data collection process is one example of a potential partner. Case study available [here](#).

2. **Market Data Analysis** –Many farmers may simply want to know the basic and most recent buy/sell prices on offer at a particular market while others may be interested in accessing qualitative forecasts or seasonal projections to assist with planning decisions for the next season. Providing price forecasts is a complicated and some say risky, process and requires different capabilities and an extremely careful approach. Accuracy of price forecasts is of utmost importance as farmers who act on the advice and plant a particular crop based on the forecast data, are reliant on that accuracy. This topic is a source of debate amongst MIS providers and will be explored further in the Design and Development section of this document.

It may be more difficult to identify partners who can provide forecast and projections for an MIS due to the complexity of the process. However, these partners do exist<sup>1</sup> and there are organisations who are providing analytical data that has benefitted farmers. Consider organizations who specialize in this sort of market data analysis and have credibility in the market.

An example of a partner who can support market data analysis is [RONGEAD](#).  
Case study available [here](#).

3. **Market Information Delivery** – For *mobile* MIS, the key information delivery component is the mobile channel. Here two types of partners exist, MNOs or VAS (value-added service) Providers.

Typical benefits of partnering with an MNO range from reduced or no costs for service delivery to significant support for marketing and distribution. MNOs tend to operate on a revenue sharing basis and while they may not invest in the actual service, they will have easy access to robust mobile delivery channels. Because they tend to have good presence in rural areas and have brand recognition, Operators are well positioned to offer marketing and distribution support. One possible trade-off here is if MNOs request exclusivity, at least for a period of time, which could limit the addressable market.

Partnering with a Value Added Service Provider will bring another set of benefits and challenges. Most VAS providers don't promote a brand and will have little or no brand recognition and can offer little marketing support beyond the mobile channel. This means significant funds will need to be allocated for marketing. Funds may also need to be budgeted to purchase network capacity to deliver the service mobile advisories. One of the main benefits to working with a VAS is the flexibility to offer the service on multiple networks (not limiting scale).

It is advisable to research and compare alternatives to make the best decision and trade-off when it comes to delivery of market information.

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<sup>1</sup> Examples of organisations who provide analytical data include Osiriz (CIRAD) for rice; Fruits Tropicaux (CIRAD) for fruit; Afrique Verte for cereals; RONGEAD for cashew and sesame (and soon on shea, maize, onion, rice, yam, cassava, plantain)



### 3. DESIGN AND DEVELOPMENT

After developing a good understanding of the market environment (end users, value chains, market dynamics and information sources), the design phase can begin. Market Information Services can only be as strong as its weakest link. The three key factors, or links, we'll examine are market data collection, service design and the underlying business case.

#### a. MARKET DATA COLLECTION AND ANALYSIS:

The market pricing advisories delivered to and consumed by end users depend on high quality data being collected. This collection and analysis must follow a careful process.

1. Selecting sources and markets: Depending on the value chain, data collection must be focused on the different stages (farm gate, wholesale markets, retail markets, ports, exchanges, etc.). Which markets to collect from is dependent on a combination of the needs expressed by your target market (see user research) and an assessment conducted by your market analyst (such as influential markets, weather predictions, seasonal demand, etc.).
2. Enumeration: In order to collect reliable and useful information, data collection should be done with multiple agents at each stage. If data collection at a single stage is dependent on one person it can easily be influenced by their personal interest or by having only a single point of view into a dynamic market with multiple moving stakeholders. This is the reason for double verification: horizontal and vertical as shown below in the collection schema for a region or country:

Area 1		Area 2		
Source A	Source B	Source C	Source D	<b>Farm Gate</b>
Source E	Source F	Source G	Source H	<b>Wholesale Market</b>
Source I	Source J	Source K	Source L	<b>Retail Market</b>

*\*Table courtesy of [RONGEAD](#)*

Again, bespoke software designed around the enumeration process can help implement the process.

#### 3. Analysis:

##### a. **Calculating prices**

While many analysts (researchers, journalist, government officials, etc.) reference an average price within the context of markets and economics, practitioners (farmers, traders and buyers) seldom use averages as it is a statistical tool that does not reflect the reality of transactional practices. Market prices are usually whole numbers that move by levels (\$50 USD/ton or by \$0.50 USD/lb., etc). For a farmer or a small trader, average prices which sum up all the prices practiced in a region or market do not provide much value. Market stakeholders always look for ranges of prices and whole numbers.

- What is the minimum price?
- What is the maximum price?
- What is the most practiced price?
- What was the price at the beginning of the day, of the week?
  - What is the price at the end of the day, of the week?

Example: The price of onions in a market moved from \$0.50 to 0.75 USD/kg during a day.

The average price would be \$0.625 USD/kg, but nobody really buys onion at \$0.625 USD/kg, so this figure is not very actionable.

However, if the message reads, “Prices were \$0.50 to 0.75 in the morning and 0.75 in the afternoon”, the recipient will understand the price moved during the morning by \$0.25 USD/kg and stabilized that afternoon at \$0.75/kg. They can also deduce the price for the next morning should be \$0.75 USD/kg.

The same concept applies as prices fluctuate between stages of the value chain.

Example: The wholesale price of onions is \$0.50 USD/kg, but was \$0.10 to \$0.05 USD/kg lower at the farm gate.

It is better to communicate that farm gate price should be between \$0.40 and 0.45 USD/kg than to do an average of the gathering costs and communicate that farm gate price should be around 0.425 USD/kg (a price nobody would ever pay if prices use to move by step of \$0.05 USD/kg).

Remember it is usually better to offer the minimum, maximum, opening and closing prices (like in an exchange) than averages which have are less meaningful.

#### **b. Quality Assurance & Validation**

The communication channel and flow of data between collectors and analysts should be two-way and facilitate the collection of qualitative information to allow the data analysts to understand local context, local evolution, and punctual phenomenon and sort out particular information which should or should not be communicated.

Example: If data is collected on prices paid for organic products or for a specialized transaction at an unnaturally high price point, it can lead to published market prices which do not reflect the reality of the market. However if the analysts are told the market is changing fast throughout the day, some prices which can seem overly high with respect to others while they reflect very important information: a big jump. That is why the data process cannot be completely automatic and there is a need for analysis based on qualitative aspects of each specific market.

Final validation and decision of broadcasting must be undertaken by a person or a group of people who really understand the market and are available to judge what information is useful and what information can give inaccurate indicators to market stakeholders leading to dangerous marketing choices.

#### **c. Qualitative forecasts**

Depending on the findings from user research, farmers may be satisfied with receiving the most up to date pricing data whereas others may value an MIS that includes forecasts and projections. As mentioned above under Partnerships: Market Data Analysis, going a step further to provide qualitative advisory forecasts may provide more value as farmers can use this for planning purposes such as deciding what crop to plant in the next season, but it definitely requires more resources and can present a bit more risk due to the complexity of getting accurate forecasts.

**b. SERVICE DESIGN:**

The research conducted on end users will inform the service requirements and development.

At this stage, before committing to final requirements, it is critical to test the service with end users. This starts with user testing of various prototypes and then a larger pilot test. The virtue of these tests is to get specific and actionable feedback from the audience you are attempting to serve (the users hold all the answers). Extracting true and honest feedback which is detailed enough to be actionable requires careful planning and at times outside expertise. It is advisable to consult external resources or a design firm specializing in this type of design testing.

Key decisions which need to be made based on user requirements include:

1. What access or delivery channel (USSD, SMS, Voice Message, and Call Centre)?

Deciding which delivery channel to use requires a balance between user requirements, technical capacity and costs. Because smallholder farmers tend to be less mobile literate and may prefer to speak to an expert rather than engage with a machine, they may prefer to get their market information via a call centre agent. However, the costs of operating a call centre are quite high compared to other mobile channels. Alternatively, SMS is a cheaper channel and an additional benefit is that information can be stored for future reference when negotiating with traders. However the messages would need to be carefully worded so less literate farmers can still derive the meaning. In most cases, illiterate farmers will still be able to gain assistance from neighbours, friends or relatives in reading SMSs. It is important to consider the range of mobile delivery channels available including OBD and IVR and test them to see which work best.

2. How will users be charged (subscription or pay-per-use)?

Farmers may initially prefer a pay-per-use billing scheme as they may not need regular access to market prices. They may only feel a need for pricing information when it comes time to sell produce. However, for the sake of financial viability, it is recommended that this service be bundled with a broader Agri VAS which addresses more of the farmer's needs (agriculture, livestock and weather advisories, financial and market linkage services). This broader range of services would then justify subscription pricing which can increase the financial viability more than pay per use.

3. How should the information be formatted (language, units)?

Here we start with the requirements and preferences gathered during the user research activities. It's also important to consider the units of measurement and quality understood by the farmers and those used at the markets. Lastly, testing the content with target farmers is critical in getting the message formats just right.

Like any good service, constantly listening to your customers is a basic requirement of making on-going service improvements and ensuring your users are happy. This requires periodic polling and surveying for overall satisfaction, how they've benefited from the service and improvement requests.

#### 4. BUSINESS MODEL

Regardless if the mobile MIS operation is managed as a for-profit commercial entity or a non-profit NGO, the deployment should be treated as a business endeavour with the goal of at least breaking even. This means collecting enough or more revenue than is budgeted on expenses.

Where most mobile MIS operators fail at is the revenue side. Most farmers may only use a mobile MIS when they're ready to harvest and go to market. They may not have a strong enough need for regular market pricing advisories to warrant continuous usage or a full subscription. This is why stand-alone mobile MIS will probably not gain enough paying users to break even and why we strongly advocate MIS be part of a broader AgriVAS (crop, livestock and weather advisories, financial services and market linkages). The more the service is relevant to farmers throughout the agriculture lifecycle the more they will use the service.

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##### About the GSMA

The GSMA represents the interests of mobile operators worldwide. Spanning more than 220 countries, the GSMA unites nearly 800 of the world's mobile operators with 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in industry sectors such as financial services, healthcare, media, transport and utilities. The GSMA also produces industry-leading events such as Mobile World Congress and Mobile Asia Expo.

##### About Mobile for Development

Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social, economic impact and stimulate the development of scalable, life-enhancing mobile services.

For more information on the GSMA's mAgri programme, please email [mAgri@gsma.com](mailto:mAgri@gsma.com)