
ASSESSING THE REQUIREMENTS FOR ELECTRONICALLY LINKING FARMERS WITH MARKETS

A MEAS Action Pilot Research Project
June-September, 2011

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Project Areas: Ethiopia, Rwanda, Bangladesh

Research conducted and report prepared by:

Dr. Khin Mar Cho (Research Associate)

Dr. Donald Tobias (Executive Director)

Cornell University Cooperative Extension, New York City

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EXECUTIVE SUMMARY

Since the early 2000's the interest in the use of phone apps as a means of communicating important information relative to agricultural issues has increased. It is only natural then to assume that the desire to expand markets has included this technology and has been effective in linking producers to urban markets. We believe that the basic idea of using this technology to expand markets for producers is sound but that previous attempts imposed technology that did not have the appropriate features. Top down interventions are often met with resistance from end users and have less "street credibility". With funding from the USAID and its project "Modernizing Extension and Advisory Services" we have solicited information from farmers and brokers in three developing countries to better understand which cell phone features are both desirable and feasible for connecting rural farmers with urban markets as well as what issues need to be addressed to improve market access.

We have used a process based on the "Concept Mapping" methodology to collect this information. Concept Mapping is a process that allows information to be collected from a variety of stakeholders and to be organized using sophisticated statistical analysis that produces a visual representation that captures common trends. This process combines "bottom up" participation with rigorous analysis. The project staff from Cornell University conducted Concept Mapping workshops and interviews in Bangladesh, Rwanda and Ethiopia including representative stakeholder groups i.e. producers, agricultural extension agents, and agribusiness representatives.

The Concept Mapping process requires a "prompt statement" that will generate a single idea to complete the thought. The "prompt statement" used was "I would be much better able to market and distribute my products if...." This prompt was shared in two ways; first, during group meetings with participants where they "brainstormed" responses; secondly, during the course of one-on-one interviews that we conducted in market and community settings. Together these activities produced between eighty and ninety statements for each of the three countries. The statements were reviewed and received some minor editing and then were printed on cards (one statement per card) creating a "deck" of statements. Each participant was given a deck of statements and asked to sort them into piles. Each pile represented the group of statements that the participant felt belonged together. Participants were then asked to name each pile of statements that they had sorted, record the information and present it to the research team. Next each participant was asked to rate each of the statements on two five-point scales. One scale measured importance and the other feasibility of each statement.

Data analysis consists first of quantifying the sorting process by performing regression analysis that produces a point map. Clusters of statements are created using the sorting that participants conducted and each "Cluster" is named based on names used by participants. Using the rating information provided by participants we were then able to determine which individual statements and/or groups of statements were most important and most feasible. Using the average ratings of statements within Clusters we were able to display those items that were rated high on both importance and feasibility. This produced Concept Maps, which are visual representation of how the various participants view and value individual statements and groups of statements. Further we created "Go-Zone Graphs" which are visual representations of those statements rated as both important and feasible by the participants. We then took those statements that were rated highly and organized them into three groups: 1) technology preferences 2) market place issues and 3) policy or social contextual issues.

In summarizing the concept maps generated by participants in Ethiopia, Rwanda and Bangladesh, there are some common themes across the countries. Those themes can be expressed as follows:

- ❖ All three countries express a need for commodity prices based on local markets and available in a timely manner, although it would appear that at least in Ethiopia, improved production capacity might be the first order of business.
- ❖ All participants want a mobile device platform that is simple to use consistent with local language; appropriate literacy levels and includes basic commodities
- ❖ Cost of purchasing and using mobile devices can become a significant deterrent to the success of a mobile device system for marketing and needs to be addressed by government or NGO involvement
- ❖ Participants suggested that any mobile device marketing system be introduced slowly beginning with a few commodities
- ❖ In all cases training programs related to purchasing and using mobile devices and how best to use them for marketing purposes are required at all steps of the food chain.
- ❖ Participants stated that a mobile device system should include accurate local weather information
- ❖ SMS platform should include information about accessing agricultural resources i.e. e, seed, fertilizer, equipment, pesticide, packing and processing
- ❖ Mobile device systems should provide an opportunity to create a virtual market place connecting any stakeholder in the food distribution chain

The results of this study can be examined from three perspectives. First, there is a high degree of similarity in the features that farmers consider most desirable. Issues of affordability, ease of use, language preferences, daily commodity prices at the market and weather information are common desires. Secondly, there are common issues around the type of market information that farmer's desire. While most want basic commodity prices at the market on a daily basis, there are additional expectations around market location information, ability to deal via cell phone with brokers and retail representatives as well as information about product quality, consumer preferences, and contact information. Lastly, there are contextual issues; many farmers wanted to use technology as a means of organizing themselves into co-ops, and influence policy in regard to quality and price of storage, pesticides, seeds and equipment.

This study examined three countries and the needs of farmers, middlemen and retailers in regards to moving products to and through the food chain. While the study has generated information about preferences related to a SMS platform for delivering market information, it has also brought to light larger contextual issues that would need to be addressed if a mobile phone program was to be fully successful. Additional study in another cohort of countries would validate these findings and further synthesize the areas that represent core needs across countries and cultures.

1. INTRODUCTION

The easy accessibility of cell phones and their relatively inexpensive costs have made them the most popular communication device in the world. Since the early 2000's the interest in the use of phone apps as a means of communicating important information relative to agriculture issues has increased. It is only natural then to assume that the desire to expand markets has included this technology and has been effective in linking producers to urban markets. A number of private and public sector efforts to introduce phone-based market apps have, thus far, met with limited success. We believe that the basic idea of using this technology to expand markets for producers is sound but that previous attempts imposed technology that did not have the appropriate features.

A successfully managed food supply chain enables the fluid and agile movement of product, market intelligence and capital that results in the most optimal distribution of resources. A supply chain model where supply chain actors work cooperatively to maximize profits should be the goal because a model where the profits for one group within a supply chain are derived at the expense of another is not economically sustainable. Improved market access and new efficiencies in sustainable production and distribution are all key elements to a food market system that improves the well-being of all of its participants.

Cornell University Cooperative Extension is in a unique position to work on this Modernizing Extension and Advisory Services (MEAS) project given its history with "MarketMaker" the web-based platform for connecting rural farmers to urban markets. Cornell was one of the early adopters of this program and continues to work closely with the University of Illinois who developed the program and maintains the national network. Cornell Extension maintains the New York State site, which has over 2,000 producers registered and receives over 100,000 hits a month. Additionally, Dr. William Trochim of Cornell University is the creator of the "Concept Mapping" process, which is used by National Institutes of Health, National Science Foundation and researchers world wide to gather information from discreet groups and organize it for planning and evaluation purposes.

This project will solicit information from the users and designers to better understand which cell phone features are both desirable and feasible for connecting rural farmers with urban markets. Concept Mapping is a process that allows information to be collected from a variety of stakeholders and to be organized using sophisticated statistical analysis that produces a visual representation that captures common trends without losing the more subtle information. The MEAS project staff from Cornell University conducted Concept Mapping workshops and interviews in Bangladesh, Rwanda and Ethiopia including representative stakeholder groups i.e. producers, agricultural extension agents, agribusiness representatives (retailers, wholesalers, distributors, buyers, packers), government officials, and IT specialists to determine the technologies they are using and the technologies and features they desire. The results of this Report may be used by a variety of stakeholders with some modifications in presentation. The Report represents all of the findings and their analysis which will be of more interest to some audiences. This information is useful to academics for research purposes, policy makers to inform broad decisions, government officials to design platforms and extension professionals to identify training program opportunities. Farmers, brokers and community members may find that a scaled down report that simply lists preferences and issues is more useful for local discussion and validation.

2. PROCESS AND PROCEDURE

The goal of this project is to offer specific recommendations that will lead to the development of cell phone platform technologies that will assist local farmers in maximizing profits and accessing markets. Access to technology is important to the marketing process but adoption of new technologies is dependent in part on a clear understanding of their utility and value. To that point the use of “Concept Mapping” insurers high levels of participation by all stakeholders and a process that produces a technology that is compatible with the needs of the end user¹. The audience for this project is broad and includes: policy makers, NGO’s, farmers, brokers, retailers and extension professionals. The results of the Concept Mapping can be presented in a variety of ways that best meet the needs of any one group; i.e. brief visual displays of the high priority outcomes or more academic examination of relationships between priority areas. We have used Concept Mapping in a broad variety of projects that required high levels of stakeholder involvement and address the complexities of merging input from audiences with different viewpoints, literacy levels and expertise. In developing programs, curriculums, policies, and evaluations this tool moves the process forward mixing broad input with statistical analysis. We designed the MEAS project with a commitment to inclusion and analysis.

We began this project by identifying in country liaisons for the three countries we would study (Rwanda, Bangladesh and Ethiopia) to help us gather information before arriving in country, to review materials for their appropriateness and to assist in recruiting participants and arranging meeting sites. In Ethiopia we were fortunate that Cornell University has projects in place and had a working relationship with an individual working with technology and Dr. Cho had a former colleague who was working with the U.N. High Commission on Refugees who was able to assist us. In the case of Rwanda the local World Vision offices and the Agency for International Development office in the U.S. Embassy for Rwanda assisted us. In Bangladesh we connected with colleagues of Dr. Cho at the Bangladesh Agricultural University. In each case their help allowed us to come in country well prepared and to quickly meet lots of potential participants. Additionally, we developed initial materials and mapping prompts that we field-tested with New York farmers. We also received assistance from the University of Illinois MarketMaker team who has worked with individuals at all points of the food chain. This helped us refine our materials before they were further tested by in country collaborators.

The Concept Mapping process requires a “prompt statement” that will generate a single idea to complete the thought. After discussions with our liaisons we decided on a prompt that would solicit responses that informed not only the features needed in a mobile app but also what marketing issues needed to be addressed. In our introduction of the prompt we explained that we were interested in using cell phones to address marketing and distribution issues but wanted to know what problems they could help overcome. The “prompt statement” used was “I would be much better able to market and distribute my products if...” This prompt was shared in two ways; first, during group meetings with participants where they “brainstormed” responses; secondly, during the course of one-on-one interviews that we conducted in market and community settings. Together these activities produced between eighty and ninety statements for each of the three countries.

The statements were reviewed and received some minor editing and then were printed on cards (one statement per card) creating a “deck” of statements. Participant groups were convened to “rate and sort” statements. Each participant was given a deck of statements and asked to sort them into piles. Each pile represented the group of statements that the participant felt belonged together. Some participants will have a number of piles with discreet groupings while others will have fewer piles

¹ For more information about Concept Mapping System, please contact Don Tobias at djt3@cornell.edu.

including more statements. Participants were then asked to name each pile of statements that they had sorted, record the information and present it to the research team. Next each participant was asked to rate each of the statements on two five-point “Lickert” scales. One scale measured importance and the other feasibility of each statement. Finally each participant completed a small demographic form to establish their affiliations and if they used a cell phone. The research team again collected this information and all data was entered into the Concept Mapping software.

Data analysis consists first of quantifying the sorting process by performing regression analysis that produces a point map. Researchers are able to create “clusters” of statements by suggesting a total number of clusters for a map. The researcher reduces the number of clusters in a map until the point that the “bridging value” suggests that this is the minimum number of clusters that can be presented and still maintain the efficacy of the individual statement groups. The researcher then asks the program to name the clusters and the software chooses from among the names participants gave piles of statement with similar composition. The Ratings that participants gave each statement are now totaled and used to provide a mean value for each statement. The Rating data allows the researcher to determine which individual statements are relatively more important or feasible as well as which Clusters are viewed as more important or feasible. Next the researchers can produce a “GO-ZONE” chart for each cluster. This chart is a product of creating a four-quadrant diagram with the mean scores of all statements within that Cluster displayed. The quadrants are created by determining the mean score for all statements in that cluster for both importance and feasibility and plotting those on the X and Y-axis. Plotting an overall Cluster mean “importance” score on the X-axis and an overall mean feasibility score on the Y-axis creates four quadrants. Then each statement point is placed at the intersection of the Importance and Feasibility scores for that statement which indicates its position relative to both Importance and Feasibility. Statements that are displayed in the upper right quadrant of the “GO-ZONE” chart are items that were rated above the mean in both importance and feasibility are thought of as likely successes for implementation or support. Statements that are only above the mean on one dimension are displayed in either the High Importance or High Feasibility quadrants and those statements that are below the mean in both measures are in the Low Feasibility and Importance quadrant.

Analysis of a Concept Map provides a wealth of information about perceptions of issues or needs and wants and desires. In the case of these three countries the maps provide three kinds of information. First each Map has identified a single Cluster of statements that deal specifically with SMS or cell phone technology and addresses the features that are most needed by farmers and distributors. Secondly, each Map has a set of Clusters that deal with the “Market Place” including the “Analysis of” or “Availability of Marketing Information”. Many of these statements suggest direct ways that the mobile device could be used to address Market needs. Third, each Map has a set of Clusters that are contextual. That is to say they represent needs associated with the food distribution chain but that might not be directly addressed by the cell phone technology. Examples of this might include a Cluster named “Transportation” or “Training”. Some of these statements could be addressed by using the mobile technology to link to other information sources and others by policy or regulatory activity on the part of government or agricultural related entities.

While the Concept Mapping process clarifies questions related to the attributes and issues in cell phone applications to agricultural marketing it will also highlight other needs. Clearly, there are a variety of issues associated with how farmers create business models related to their activities. For some farmers the shift from a passive producer to a more assertive small business owner will require training and fundamental shifts in their thinking. The ability to access more information will create a need for more training in methods of decision making and planning. Entrepreneurship is a learned activity and in

societies where this has not been modeled or reinforced this has the potential of blunting efforts to improve productivity and profitability.

3. RESEARCH FINDINGS - ETHIOPIA

The Concept Mapping project for MEAS conducted in Ethiopia had over 50 participants with expertise in crop production, distribution, marketing, and food related businesses that participated in a brainstorming activity. The participants included brokers, farmers, distributors and government officials. Statements were gathered through interviews in community settings and at formal group meetings. The focus for the brainstorming was “**I would be much better able to market and distribute my products if...**” Participants responded to this brainstorming prompt and generated a total of 85 statements. These responses were rated and grouped by 37 participants and then analyzed using the Concept Mapping program. This program uses regression analysis to create point maps that represent the collective thinking of groups about the value and relationship of generated statements. In the case of the Ethiopia Concept Map this produced a nine-cluster map that included the following clusters: 1) Mobile Phone & Agriculture, 2) Market Analysis, 3) Market Coordination, 4) Producer/Market Linkage, 5) Agricultural Information, 6) Capital, 7) Increased Production, 8) Training, and 9) Transportation.

3.1 Importance

Participants rated each statement on a five point scale with 5 representing Most Important and 1 the Least Important. Values for all statements rated by participants were collected, combined and generated a mean score for each statement within a Cluster. The collected value of these statements can then be used to generate a Mean Score for the entire Cluster. The Cluster Map shows the overall value of a Cluster by the number of levels displayed.

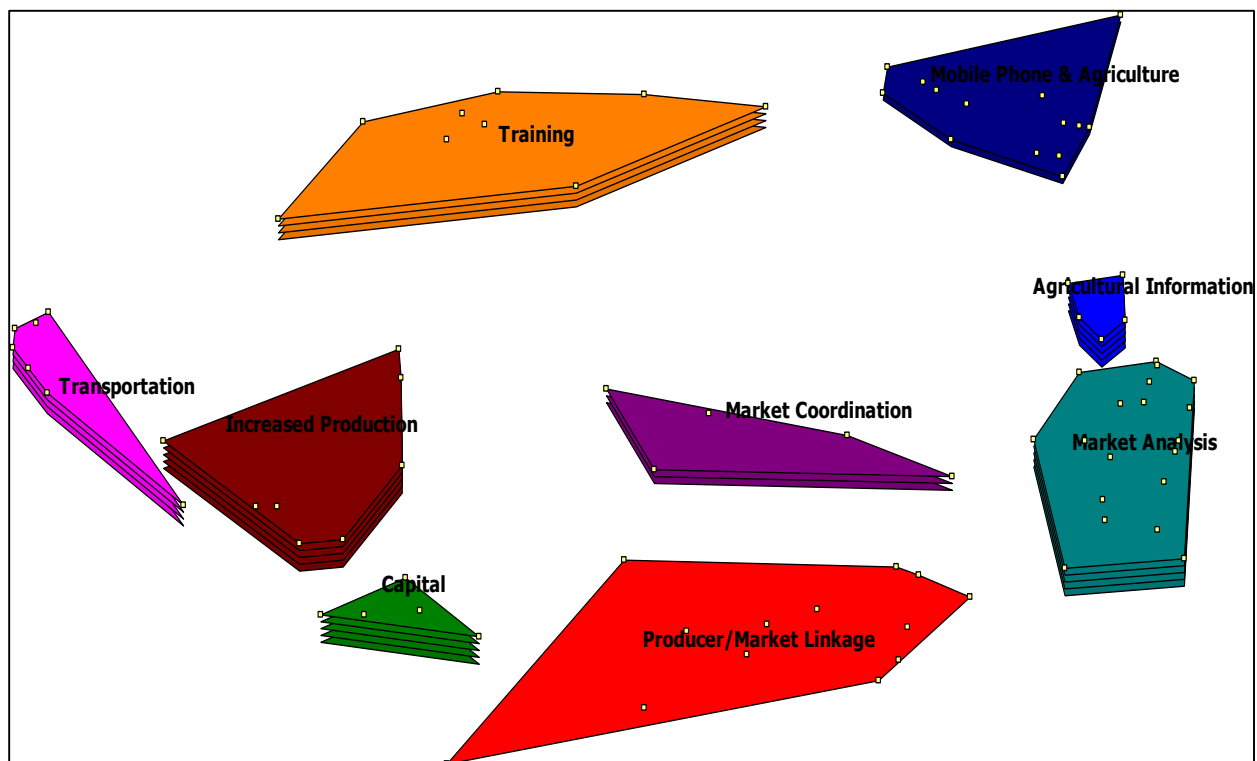


Figure 1: Point Cluster Rating Map for Importance Ratings in the MEAS Project in Ethiopia (See Appendix A for statement list for each cluster)

Figure 1 shows the Cluster Rating map for the importance ratings in the MEAS Market Information study in Ethiopia. Statements for each cluster with average rated value are listed in Table 2 (See Appendix A). The results suggest that Increased Production and Market Analysis are considered relatively more important than Mobile Phone & Agriculture, Agricultural Information, Market Coordination, Producer/Market Linkage, Capital, Training, and Transportation. *Increased Production* has two primary foci; first the need to know more about improving crop production, soil, farming techniques, general agricultural education, etc. and second post harvest issues of processing, and value-added activities. *Market Analysis* has a focus on customer preferences but adds the notion of direct marketing if the potential customer/market could be located.

3.2 Feasibility

The group rated almost all the Clusters of statements as high in Feasibility with the notable exceptions of *Transportation*. Figure 2 shows the Cluster Rating map for the feasibility ratings in the MEAS Market Information study in Ethiopia. *Mobile Phone & Agriculture* was seen as relatively less important, however this cluster was seen as high in feasibility. Statements for each cluster with average rated value are listed in Table 2 (See Appendix A)

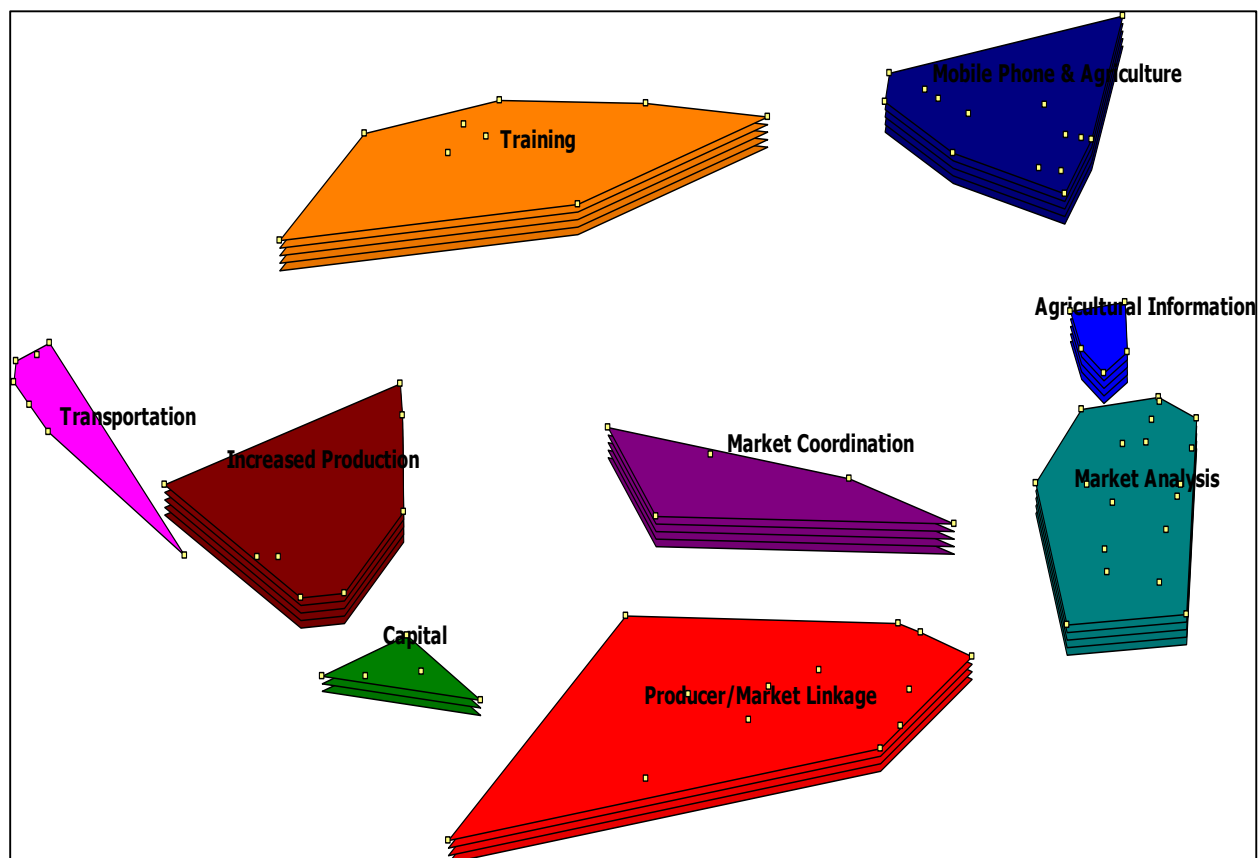


Figure 2: Point Cluster Rating Map for Feasibility Ratings in the MEAS Project in Ethiopia (See Appendix A for statement list for each cluster)

3.3 Analysis

The group rated almost all the clusters of statements as high in feasibility. We cannot place a directional interpretation on these results but some antidotal observations are helpful. In general discussion many of the participants were very interested in accessing technology and supported a positive assumption that a general trend towards accessing more market information would happen soon. The proliferation of cell phones and awareness if not access to computer or web-based sources of information supported this belief. This could help explain a positive attitude about the feasibility of technology.

The following chart illustrates the Clusters and the value or strength of each cluster. It is interesting to note that while an individual statement or Cluster of statements may have a high value for Importance, participants may feel that it is unlikely that anything can be done about this so it receives a low rating in Feasibility. In other cases a statement or cluster that is seen as of relatively low importance may be also seen as something easily done. The most interesting statements are those that are seen as both high in Importance and feasibility. The central question of this study is the use of SMS mobile technology, which is directly addressed by “Statement Cluster”, focused on Mobile Technology (first group) and Market Analysis and Access (second group). We have grouped the remaining “Statement Clusters” into a category we call *contextual issues*. The statements in this third category suggest policy issues or possible linkages to other information sources. Figure 3 shows the combined grouping clusters of needs and desires of stakeholders from Ethiopia. We have selected two areas for specific analysis: mobile technology and those Clusters related to market. The appendices section on Ethiopia has GO-ZONES for all Clusters (See Appendix A).

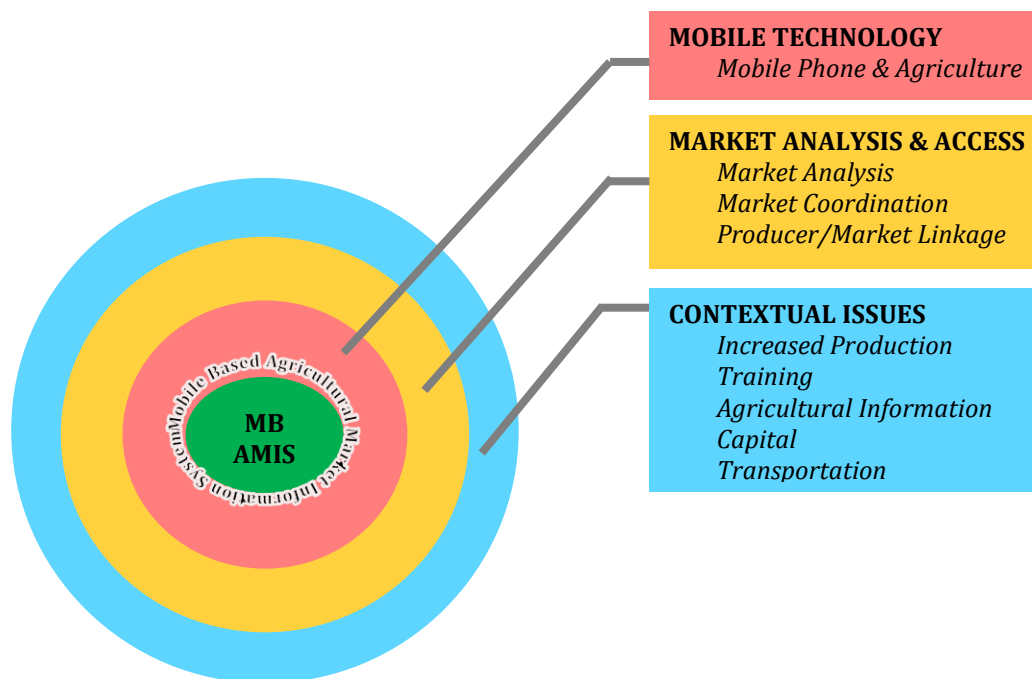


Figure 3: Grouping Clusters of Needs and Desires of Stakeholders for Mobile Phone Based Agricultural Market Information System (MBAMIS) – ETHIOPIA

3.4 GO-ZONES

A GO-ZONE Chart is created for each Cluster. The X-axis is created by creating a horizontal line representing the highest and lowest mean score for statements rated for Importance within that Cluster. Using the highest creates the vertical line and lowest mean scores for the statements within this cluster as they are rated for Feasibility. The mean values for feasibility and importance are established and then intersecting lines form the four quadrants. Statements that fall in the green or GO-ZONE are those statements that were rated above the mean in both Importance and feasibility. The statements that fall in either the brown or yellow quadrants are interesting but not as likely to be easily adopted or supported. The items in the gray zone will be the most difficult to accomplish (See Figure 4 and 5; Box 1 and 2).

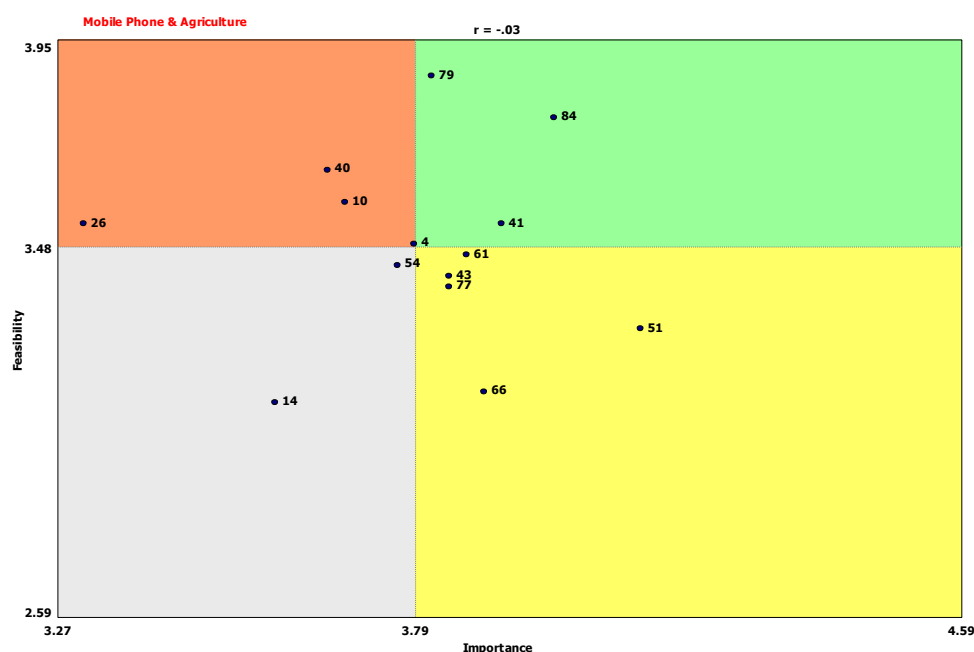


Figure 4: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Mobile Phone & Agriculture (Ethiopia)

Box 1: Go-Zone Statements for Mobile Phone & Agriculture (Ethiopia)	
4	Mobile phone marketing information technology was slowly introduced into the market place
41	I can receive marketing messages on my cellular phone
79	Telecommunication industries encouraged the use of mobile phone marketing technology
84	Farmers' use of mobile technology increased
43	Mobile phone usage costs were affordable for farmers
51	Mobile phone marketing information was coordinated with existing marketing information resources
61	Mobile phone messages were simple and clear
66	Literacy levels of mobile information were appropriate
77	Farmers' had access to mobile phone for marketing information
10	I can use my mobile phone with simplified text messaging system
26	Mobile phone marketing was introduced with only one or two popular commodities
40	Mobile phone marketing information was tested in the areas around Addis Ababa
14	A mobile phone application for marketing information was inexpensive/free
54	Mobile phone for farmers were affordable

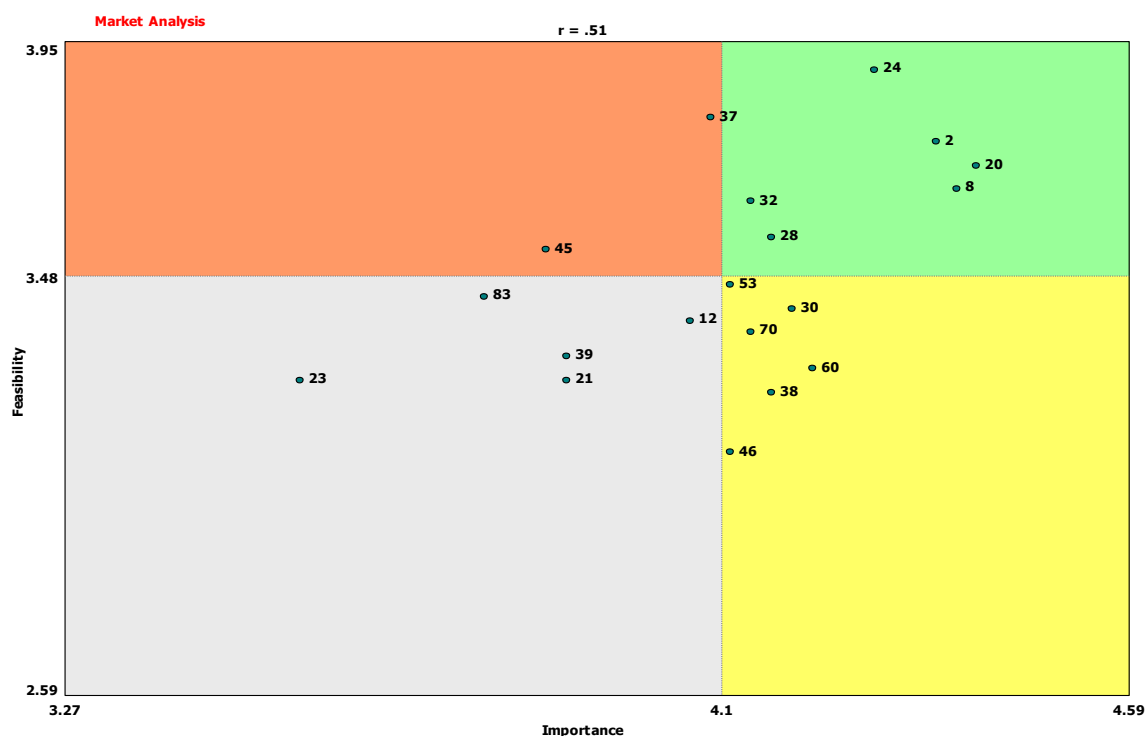


Figure 5: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Market Analysis (Ethiopia)

Box 2: Go-Zone Statements for Market Analysis (Ethiopia)

- | | |
|----|--|
| 2 | I knew the current prices of different commodities |
| 8 | I knew the up-to-date agricultural commodities prices information |
| 20 | I knew market information |
| 24 | I know current market price information |
| 28 | I knew when/where products are available |
| 32 | There was improvement in existing sources of marketing information |
| 30 | I knew consumers preferences |
| 38 | Daily price fluctuation information was available to everyone |
| 46 | Market information was available to farmers distant from urban centers |
| 53 | There was more market information organized by commodities |
| 60 | There was marketing information by geographic locations |
| 70 | Farmers knew consumers' preferences |
| 37 | I knew the different market locations |
| 45 | I knew the urban market prices |
| 12 | I knew new marketing channels |
| 21 | I had access to business profiles |
| 23 | I had information about smaller producers |
| 39 | Real time market information is accessible for middlemen |
| 83 | Access to current information about international market was available |

3.5 Key Recommendations/Comments - Ethiopia

Mobile Technology

- Access to mobile phones can be improved by lowering cost of purchase and free app service. What programs could be created to make this more affordable?
- Mobile phone systems need to be coordinated with existing sources of market information including print and web based.
- SMS system should use simplified text messaging system.
- Mobile phone system needs to be at a literacy level appropriate to the largest audience.
- There needs to be a basic SMS system that provides market price information on a daily basis.
- Phone system should be a means for buyers and sellers to connect. Simple virtual marketplace connection is desired.

Market Analysis and Access

- Initially phone system should focus on one or two commodities to demonstrate its effectiveness. Farmers advise building a “credible” program slowly.
- Farmers wish to know current commodity prices, with an emphasis on timeliness. Farmers want current information daily.
- Brokers and retailers want to know customer preferences and where product is located. Producers can go out of business or run out of product; brokers and retailers want quick information on alternative suppliers.
- There is general interest in expanding the information about producers to include more small operations and learn more about international markets. This system needs to be able to represent a broad array of producers and markets.
- There is general interest in identifying processing opportunities or “value added” activities. Farmers understand that locale processing can increase the value of their crops but are unclear about which products need to be produced and how to achieve value added status.

Contextual Issues

- Training around issues of quality standards is needed. Improved product quality should lead to better prices for product.
- More extension services in rural areas with a focus on marketing, best farming practices and mechanical training. Farmers want to access more information that will have a direct impact on production.
- Farmers see extension service as a viable source of information on how to use mobile technology and would like more services.

In Ethiopia, the level of importance given to “Increased Production”, and other Contextual Issues, suggests that the supply chain participants believe current levels of production will need to be increased to adequately support an enhanced technology driven marketing and distribution model. If a farmer has only modest surpluses improved access to market has limited value. Training to improve productivity should be implemented in tandem with ICT enabled market access so that, as surplus production is eked out at the farm level, a market system should already be in place and poised to move product from farm to fork. Without that, farmers will have little incentive to engage in new practices.



Participants are Focusing on Sorting & Rating Exercises
United Nations Office, Addis Ababa, ETHIOPIA

4. RESEARCH FINDINGS - RWANDA

The Concept Mapping project for MEAS conducted in Rwanda had 96 participants who generated ninety (90) responses to the prompt “**I would be much better able to market and distribute my products if...**” These responses were rated and grouped by 47 participants and then analyzed using the Concept Mapping program. This program uses regression analysis to create point maps that represent the collective thinking of groups about the value and relationship of generated statements. In the case of the Rwanda Concept Map this produced a nine-cluster map that included the following clusters: 1) Mobile Phone Technology, 2) Market Analysis, 3) Market Coordination, 4) Value-Added Technology, 5) Climate & Weather, 6) Increased Production, 7) Training, 8) Increased Capacity, and 9) Improved Infrastructure. One aspect of this map is the ability to determine which statements and groups of statements are seen as either important or feasible.

4.1 Importance

Participants rated each statement on a five point scale with 5 representing Most Important and 1 the Least Important. Values for all statements rated by participants were collected, combined and generated a mean score for each statement within a Cluster. The collected value of these statements can then be used to generate a Mean Score for the entire Cluster. The Cluster Map shows the overall value of a Cluster by the number of levels displayed. The Rwanda Concept Map is interesting in the Statement Clusters that were seen as important to the group. These included; Value Added Technology, Market Analysis, Increased Production and Climate & Weather (See Figure 6). Statements for each cluster with average rated value are listed in Table 4 (See Appendix B).

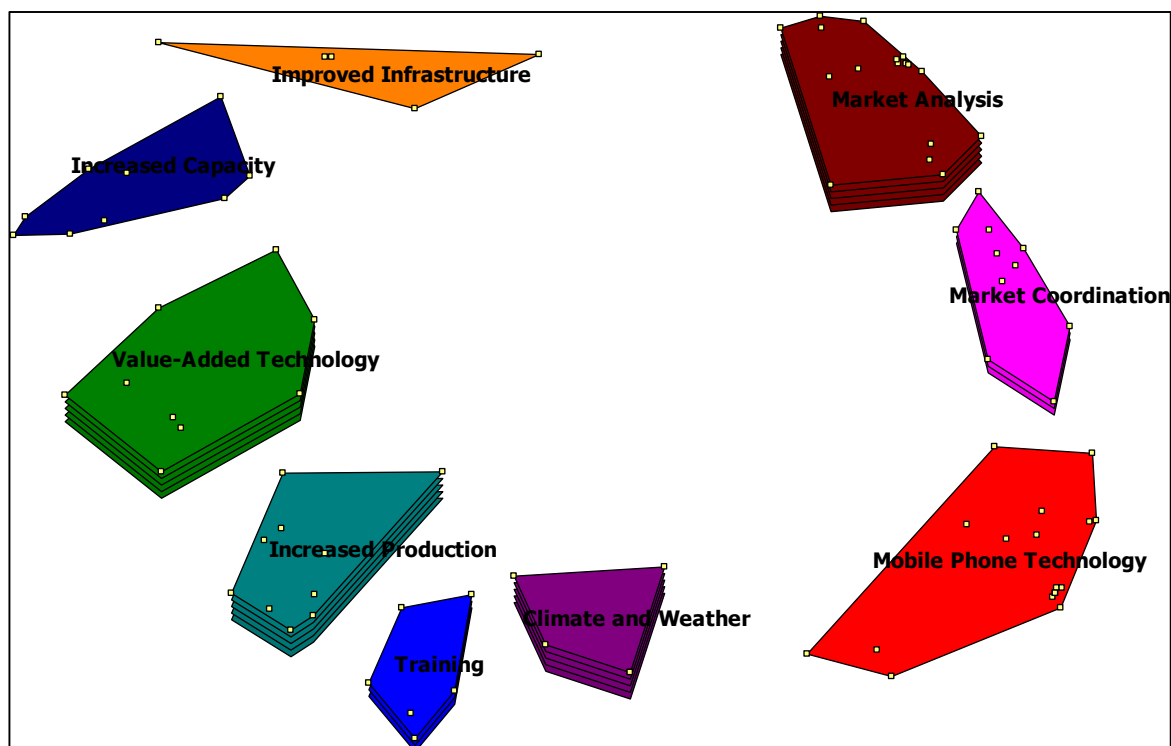


Figure 6: Point Cluster Rating Map for Importance Ratings in the MEAS Project in Rwanda (See Appendix B for statement list for each cluster)

Value Added Technology focuses on issues related to quality of products and customer preferences there is also some reference to the need for storage facilities. *Market Analysis* again has a focus on customer preferences but adds the notion of direct marketing if the potential customer/market could be located. *Increased Production* has two primary foci; first the need to know more about improving crop production, soil, farming techniques, general agricultural education, etc. and second post harvest issues of processing, value-added activities. *Climate & Weather* the overall request is for more weather information that is accurate and timely. In addition there is a need to know what crops should be grown given changing climate conditions. *Mobile Phone Technology cluster* was rated lower in importance the research team believes this was a product of having the existing system (e-soko). Consequently we view these statements as consumer preference for adaptations or improvement on the existing system. This is not to suggest that all participants were using the e-Soko system but many were familiar with it.

4.2 Feasibility

The group rated almost all the clusters of statements as high in feasibility with the notable exceptions of Improved Infrastructure (See Figure 7). We cannot place a directional interpretation on these results but some antidotal observations are helpful. Of the countries studied Rwanda was the only one with a mobile device system (e-soko) in place. Feasibility could be influenced by the observation that such a device is in place and so it is obviously possible to provide these services.

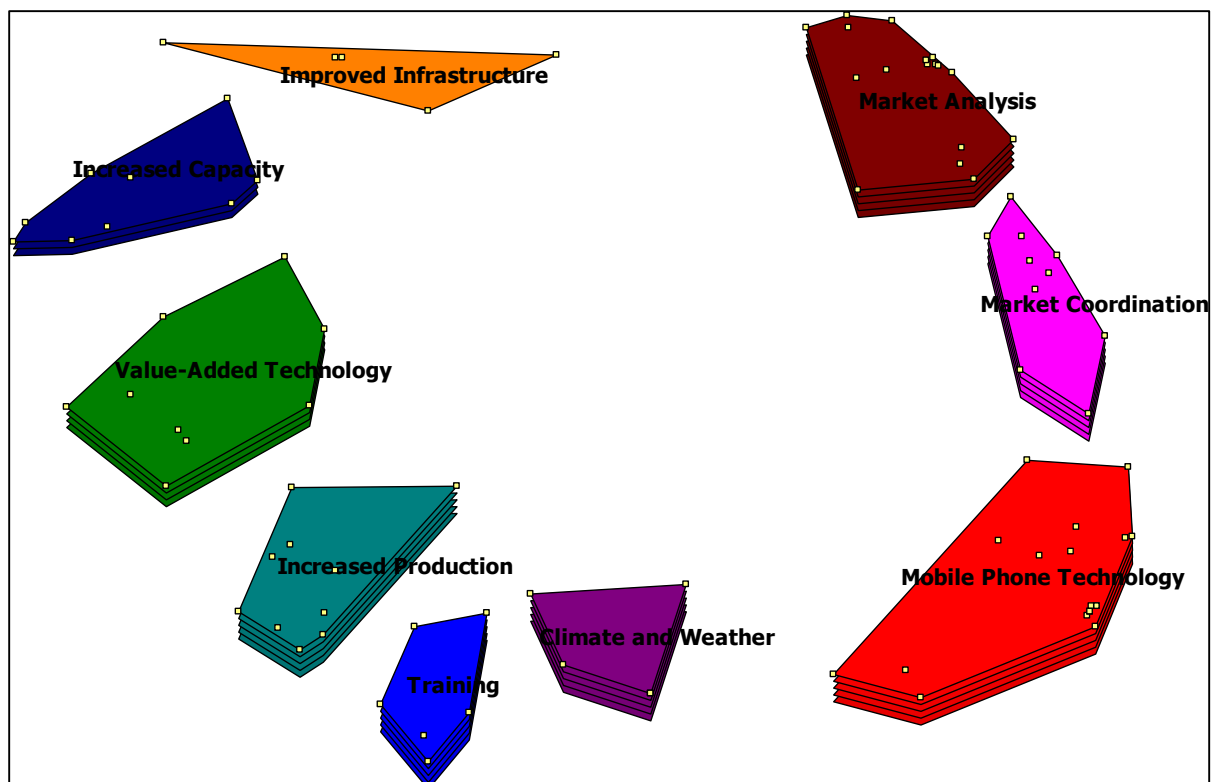


Figure 7: Point Cluster Rating Map for Feasibility Ratings in the MEAS Project in Rwanda (See Appendix B for statement list for each cluster)

4.3 Analysis

The following chart illustrates the Clusters and the value or strength of each cluster. It is interesting to note that while an individual statement or Cluster of statements may have a high value for Importance, participants may feel that it is unlikely that anything can be done about this so it receives a low rating in Feasibility. In other cases a statement or cluster that is seen as of relatively low importance may be also seen as something easily done. The most interesting statements are those that are seen as both high in Importance and feasibility. The central question of this study is the use of SMS mobile technology, which is directly addressed by “Statement Cluster”, focused on Mobile Technology (first group) and Market Analysis and Access (second group). We have grouped the remaining “Statement Clusters” into a category we call *contextual issues* (See Figure 8). The statements in this third category suggest policy issues or possible linkages to other information sources. We have selected two areas for specific analysis: mobile technology and those Clusters related to market. The appendices section on Rwanda has GO-ZONES for all Clusters (See Appendix B).

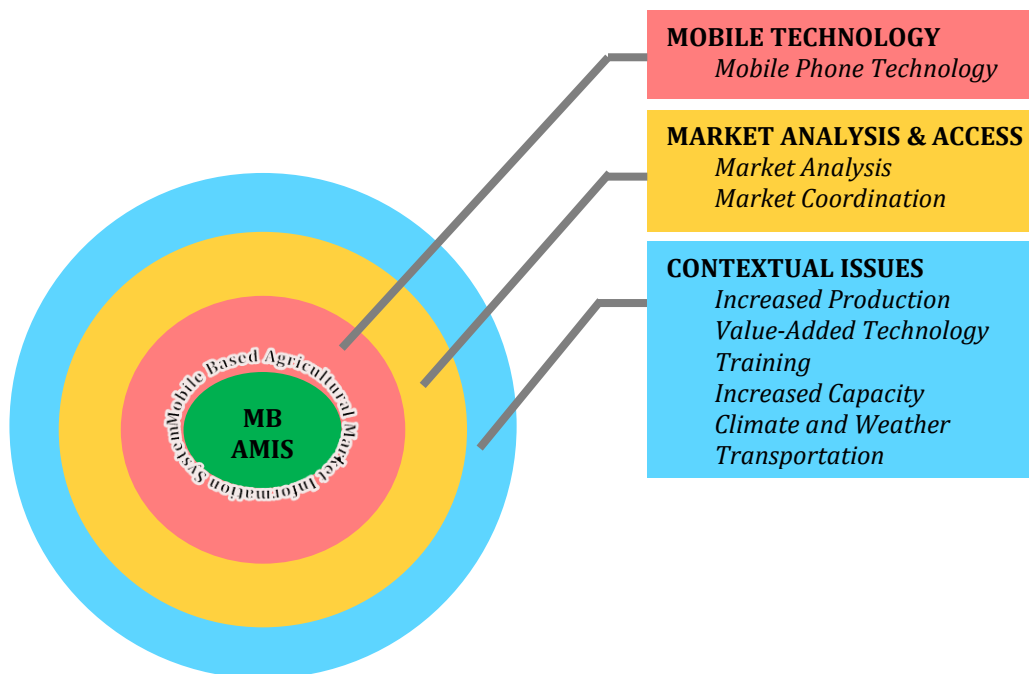


Figure 8: Grouping Clusters of Needs and Desires of Stakeholders for Mobile Phone Based Agricultural Market Information System (MBAMIS) - RWANDA

4.4 GO-ZONES

A GO-ZONE Chart is created for each Cluster. The X-axis is created by creating a horizontal line representing the highest and lowest mean score for statements rated for Importance within that Cluster. Within the same Cluster Feasibility ratings are displayed on the vertical Y-axis again displayed lowest to highest mean scores. The mean values for all feasibility statements and all importance statements are established and then the intersection of these means form the four quadrants. Statements that fall in the green or GO-ZONE are those statements that were rated above the mean in both Importance and Feasibility. The statements that fall in either the brown or yellow quadrants are

interesting but not as likely to be easily adopted or supported. The items in the gray zone will be the most difficult to accomplish (See Figure 9 and 10; Box 3 and 4).

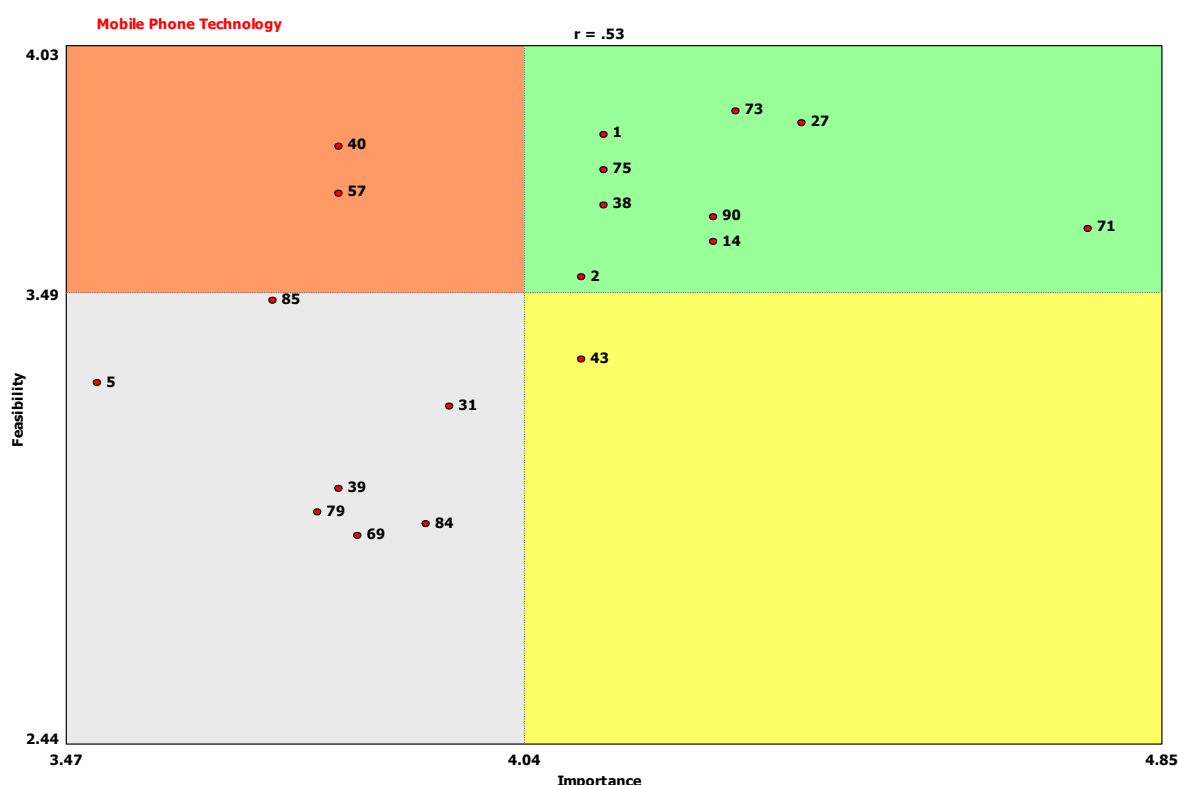


Figure 9: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Mobile Phone Technology (Rwanda)

Box 3: Go-Zone Statements for Mobile Phone Technology (Rwanda)	
1	There was a mobile phone based market information system to access to urban markets
2	Literacy levels of mobile phone information were appropriate
14	Mobile phones for farmers are affordable
27	There were improved system for delivering important information to farmers
38	I had the ability to recharge mobile phone
71	Farmers preference for local language instead of French on mobile phone
73	I had a mobile phone with a user friendly system
75	I had mobile phone system that connected buyers and sellers
90	There was a mobile phone text message system with language easy to understand by Farmers
43	Mobile phone text messages were simple and clear
40	I had training for both purchasing and using mobile phone
57	Mobile phone marketing information was coordinated with the existing marketing information resources
5	Farmers had geographically specific weather information using mobile phone
31	I had short and simple information about best practices of crop technology on my mobile
39	I had access to variety of mobile phones
69	There was training for small farmers who seldom use internet and mobile phone
79	There was a web site available to create virtual buyer and seller connection
84	Telecommunication industries encourage the use of mobile phone marketing technology
85	Mobile phone marketing was introduced initially with only one or two popular commodities

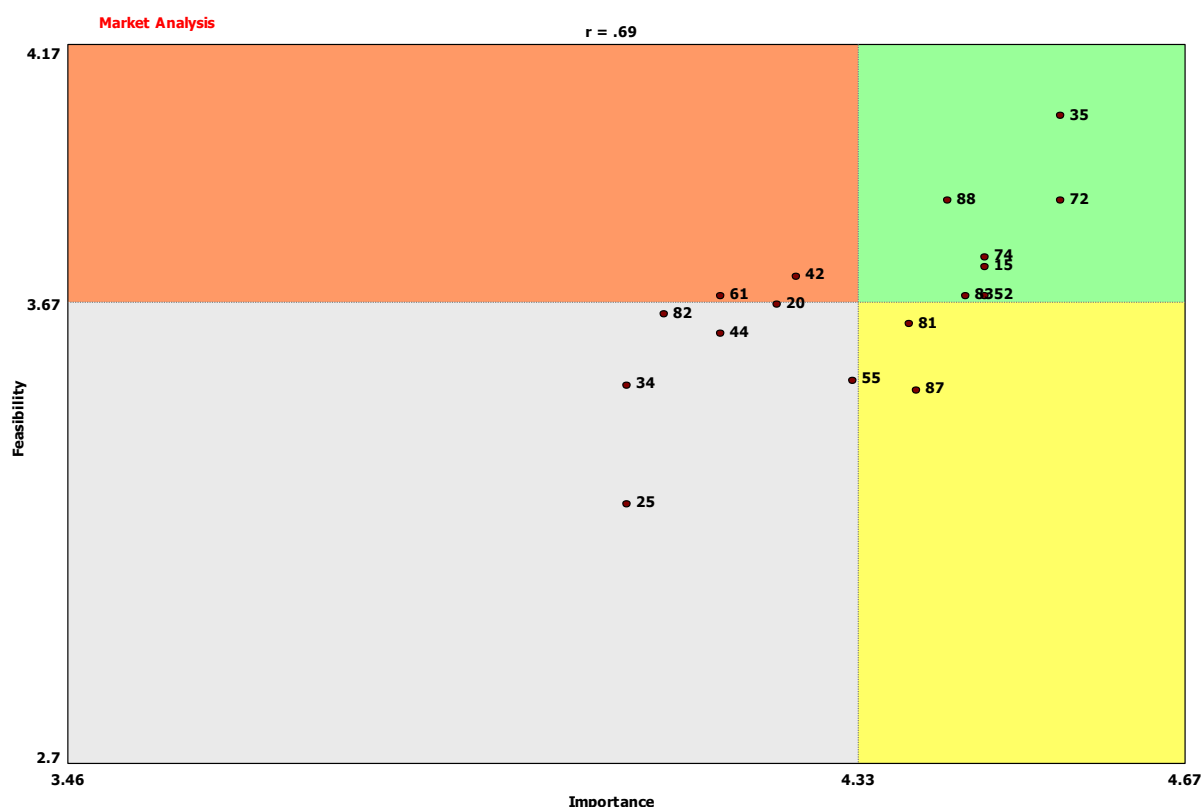


Figure 10: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Market Analysis (Rwanda)

Box 4: Go-Zone Statements for Market Analysis (Rwanda)	
15	I knew the consumers preferences
35	There were more market opportunities for rural farmers
52	I knew consumer preferences I can get a higher price
72	I knew current market information
74	I knew what surplus exists that can be sold rather than consumed locally
83	There was an opportunity for small scale farmers to participate in the market
88	I knew the different market locations
81	I knew the current prices of different commodities
87	There were reliable suppliers
42	Farmers knew market locations
61	I knew market information
20	I had better interaction with traders and dealers
25	I had more information about future market trends
34	I had the availability to do direct sale to market to increase profits
44	I could identify community with enough money to buy products
55	I knew how to collaborate to take products to market: trucking, marketing, etc.
82	Local economy is stronger I can get a better price

4.5 Key Recommendations/Comments - Rwanda

Mobile Technology

- Farmers prefer SMS system to use locale language.
- SMS based marketing system needs to be affordable for farmers.
- SMS system needs to connect farmers and buyers in a simple direct manner.
- Mobile phone system needs to use language appropriate to farmer literacy levels.
- Telecommunications industry needs to encourage the use of SMS system for marketing.
- Rural users need to be able to recharge mobile devices.
- A SMS system that could provide locale weather information will attract users.
- There needs to be training programs for farmers on the variety of phones, how to use them and how to use the information they provide.

Market Analysis and Access

- Mobile device system should increase market accessibility for farmers, especially small farmers.
- More information about consumer preferences should be available for farmers and brokers.
- There is a need to know market information on a daily basis.
- SMS system should be used to determine where surplus product is and location of markets.
- More direct sales to urban markets should be supported by mobile device system.
- Market information should be available by geographical location.
- Expand existing mobile system (e-soko) to include more features.

Contextual Issues

- Storage capacity is an important issue for many farmers.
- There is a need to have more information about quality standards.
- Access to fertilizer, seed and other resources of a high quality and affordable is a potential feature.
- More training on post-harvest activities that would affect price is needed.
- More extension education about production practices is needed.
- More training relative to 'Fish Farming' is needed.
- More training in tilling and planting technology is desired.
- The need for more refrigeration could be addressed through promoting regional sites.
- Livestock processing is a need that could be addressed with more information about processing sites.
- Weather information is a clear need and the desire that it be locale and accurate are expectations.
- Farmers have a variety of needs around transportation including: gas prices and road conditions. Technology that could improve combining shipments or centralizing pick-ups could help address these issues.

The comments from participants in the Rwandan Concept Mapping exercise indicate a relatively sophisticated understanding of the technology as well as the kinds of market intelligence that could grow markets in that country. For example an interest in consumer preferences are subtle indicator of an understanding and appreciation for product differentiation and market segmentation both of which are strategies for more developed markets.

While every country in this report could benefit to some degree from ICT enabled resources and Extension Service collaboration. Rwanda may represent the best opportunity for a MEAS lead effort to add value. Perhaps, the E-soko program has created “an appetite and appreciation” for ways that technology can help build agricultural markets. Since many of the needs go beyond what can practically be accomplished through a simple mobile platform, a MEAS team could provide support to create a web based “technology hub” that would complement the e-soko platform. A collaborative pilot effort with e-soko could provide a robust demonstration project that could be the model for future projects.



Participants are Focusing on Sorting & Rating Exercises
World Vision-Rwanda Office, Northern Kigali, RWANDA

5. RESEARCH FINDINGS - BANGLADESH

Bangladesh is primarily an agrarian economy, generating export earnings not only in farming but also by an agricultural manufacturing sector. Rural development has become a function of agricultural growth. But as there are many small farmers and less than perfect information for stakeholders in the sector, the market is volatile to manipulation and uninformed actions. Farmers' participation in market and transport management is so poor that most of the time they are being forced to sell their products to local middlemen at dumped prices. Under these circumstances, experts opine that this deprivation on part of the growers may greatly be reduced if they would have been empowered with information. Timely and unbiased agricultural marketing information will help farmers to bargain with the middlemen for a fair price and gain profitable decisions in the short term with regard to what price to produce and what price to expect. In addition to farmers this information is also important to the wholesalers, retailers, consumers, ministry of agriculture, researchers and policy makers. Like farmers, wholesalers may have the opportunity to locate their profitable market whereas retailers can buy and sell their products at market prices from the wholesalers and to the customers respectively. The Government of Bangladesh has taken a number of steps in order to disseminate agricultural market information to the concerned stakeholders, specifically farmers, traders, policy makers and the media. However, progress has been scarce as technology used has been over the top and as local organization for information captures and input has been problematic. While mobile technology is generously available in rural Bangladesh, as in many other developing countries, innovations in its use for agricultural market information system and agricultural extension education have been surprisingly slow to materialize.

We have conducted the Brainstorming session of Concept Mapping workshop at the Department of Agricultural Extension Education (DAEE), Bangladesh Agricultural University (BAU) in Mymensingh. About 60 stakeholders of different categories such as farmer producers, traders, wholesalers, retailers, businessmen, field extension workers/agents, extension officers, faculty members and graduate students of DAEE participated in the workshop. They responded to the focused question, the prompt **"I would be much better able to market and distribute my products if..."** and were able to generate a list of 90 statements that represented key areas for marketing as well as significant barriers to improving access to markets. These responses were rated and grouped by 50 participants and then analyzed using the Concept Mapping program. This program uses regression analysis to create point maps that represent the collective thinking of groups about the value and relationship of generated statements. In the case of the Bangladesh Concept Map this produced a nine-cluster map that included the following clusters: 1) Mobile Phone & Agriculture, 2) Market Analysis, 3) Market Coordination, 4) Sourcing Quality Products, 5) Farmer Awareness, 6) Government Initiative, 7) Training & Technology, 8) Seed & Pesticide Regulations, and 9) Transportation.

5.1 Importance

Participants rated each statement on a five point scale with 5 representing Most Important and 1 the Least Important. Values for all statements rated by participants were collected, combined and generated a mean score for each statement within a Cluster. The collected value of these statements can then be used to generate a Mean Score for the entire Cluster. The Cluster Map shows the overall value of a Cluster by the number of levels displayed. The Bangladesh Concept Map is very interesting in the Statement Clusters that Mobile Phone & Agriculture was seen as the most important to the group, Market Analysis, and Market Coordination were seen relatively more important than Transportation, Government Initiative, Sourcing Quality Products, Farmer Awareness, Training & Technology, and Seed and Pesticide Regulations (See Figure 11).

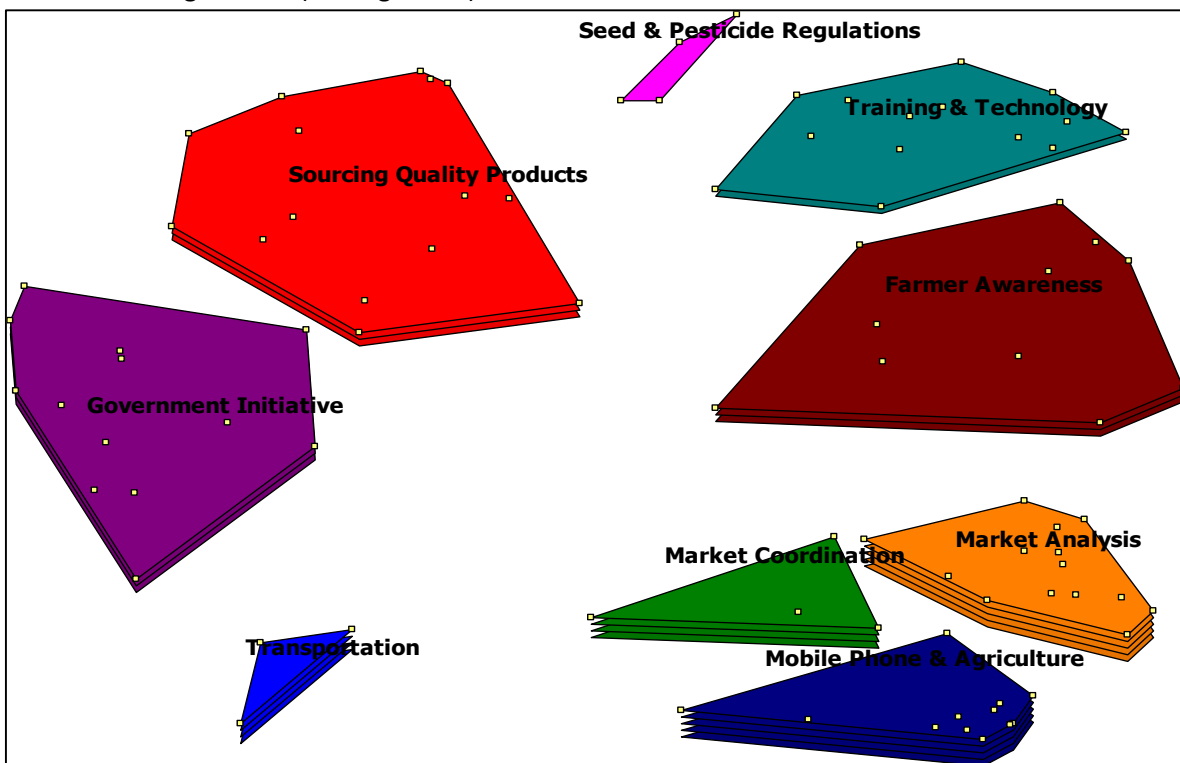


Figure 11: Point Cluster Rating Map for Importance Ratings in the MEAS Project in Bangladesh (See Appendix C for statement list for each cluster)

5.2 Feasibility

Figure 12 shows the Point Cluster Rating map for feasibility ratings in the MEAS market study in Bangladesh. The group rated *Mobile Phone & Agriculture cluster of statements* as the highest in importance and feasibility. *Market Analysis and Market Coordination* are rated as high in feasibility and the remaining clusters of statements are seen as low in feasibility. Statements for each cluster with average rated value are listed in Table 6 (See Appendix C).

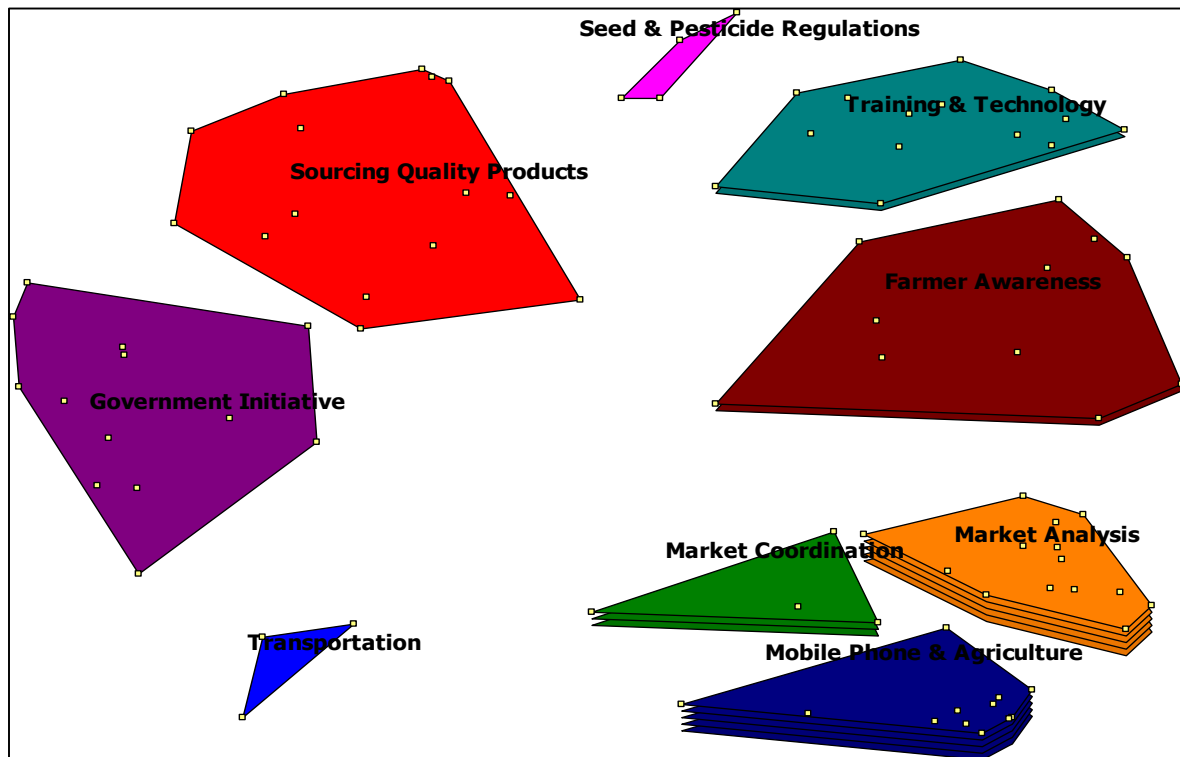


Figure 12: Point Cluster Rating Map for Feasibility Ratings in the MEAS Project in Bangladesh (See Appendix C for statement list for each cluster)

5.3 Analysis

The following chart illustrates the Clusters and the value or strength of each cluster. It is interesting to note that while an individual statement or Cluster of statements may have a high value for Importance, participants may feel that it is unlikely that anything can be done about this so it receives a low rating in Feasibility. In other cases a statement or cluster that is seen as of relatively low importance may be also seen as something easily done. The most interesting statements are those that are seen as both high in Importance and feasibility. The central question of this study is the use of SMS mobile technology, which is directly addressed by “Statement Cluster”, focused on Mobile Technology (first group) and Market Analysis and Access (second group). We have grouped the remaining “Statement Clusters” into a category we call *contextual issues* (See Figure 13). The statements in this third category suggest policy issues or possible linkages to other information sources. We have selected two areas for specific analysis: mobile technology and those Clusters related to market. The appendices section on Bangladesh has GO-ZONES for all Clusters (See Appendix C).

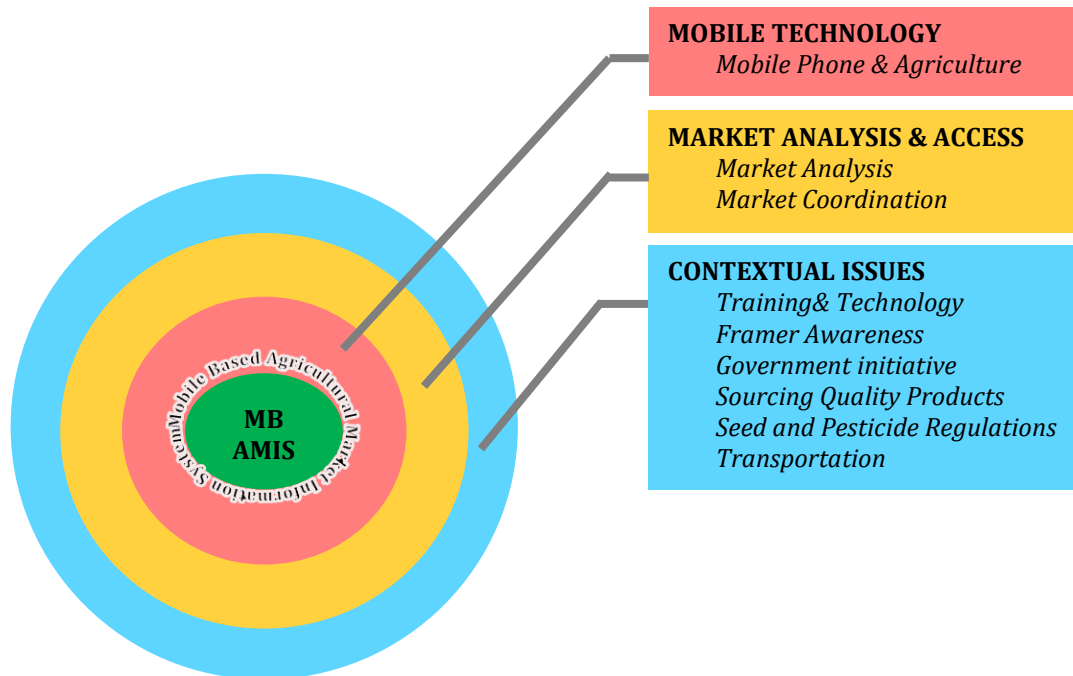


Figure 13: Grouping Clusters of Needs and Desires of Stakeholders for Mobile Phone Based Agricultural Market Information System (MBAMIS) - BANGLADESH

5.4 GO-ZONES

A GO-ZONE Chart is created for each Cluster. The X-axis is created by creating a horizontal line representing the highest and lowest mean score for statements rated for Importance within that Cluster. Within the same Cluster Feasibility ratings are displayed on the vertical Y-axis again displayed lowest to highest mean scores. The mean values for all feasibility statements and all importance statements are established and then the intersection of these means form the four quadrants. Statements that fall in the green or GO-ZONE are those statements that were rated above the mean in both Importance and Feasibility. The statements that fall in either the brown or yellow quadrants are interesting but not as likely to be easily adopted or supported. The items in the gray zone will be the most difficult to accomplish (See Figure 14 and 15; Box 5 and 6).

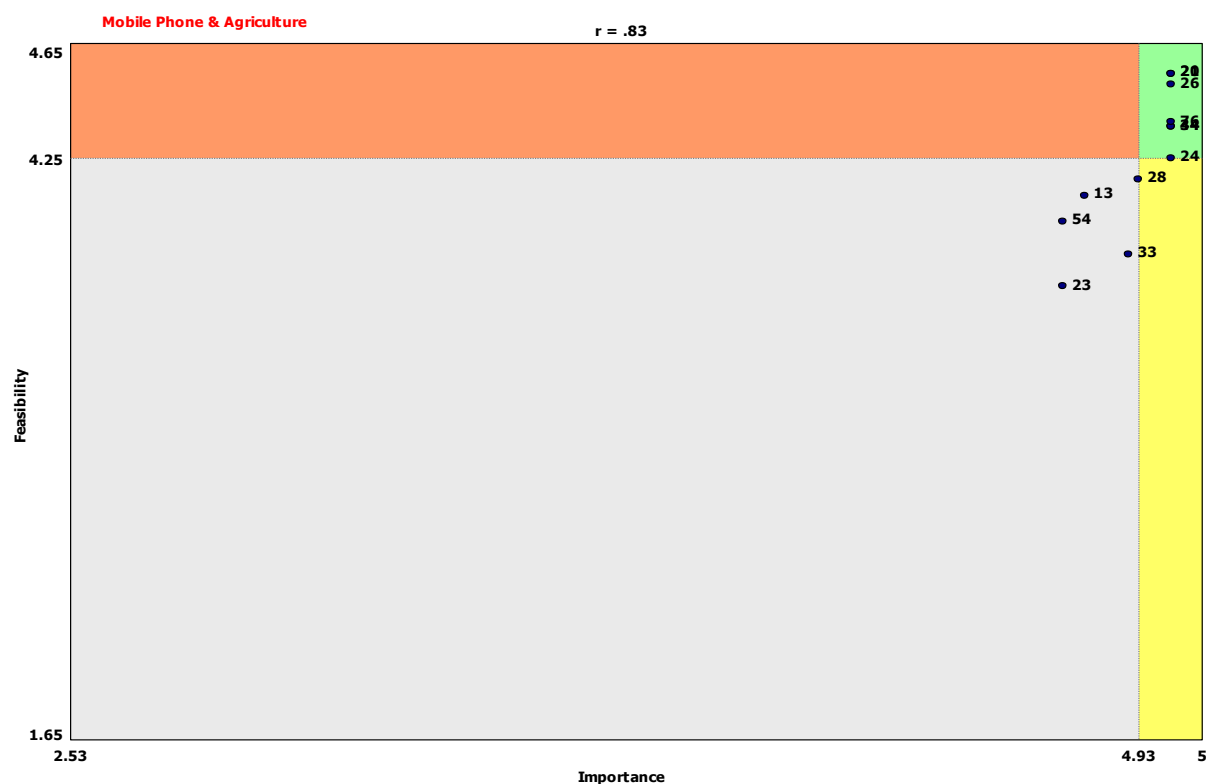


Figure 14: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Mobile Phone & Agriculture (Bangladesh)

Box 5: Go-Zone Statements for Mobile Phone & Agriculture (Bangladesh)	
20	I could use mobile phone to inform the retailer before harvesting my product
21	I could use mobile phone to communicate to the retailer before marketing my poultry
24	I could talk to different middlemen/retailers using mobile phone before fixing price of my product
26	I could use mobile phone to know the latest market price and availability of seasonal fruits
34	There was a mobile phone system that provide honest and accurate market information
44	I had access to internet based market information system in combination with mobile phone system
76	Mobile phone marketing technology was slowly introduced into the market place
28	More training and information about 'mobile marketing' and or 'internet marketing' was available
13	I could receive more advice from a veterinary surgeon by using mobile phone
23	I received fair price through direct marketing in Mymensingh
33	There was internet facility to know accurate market information
54	Government and NGO support for SMS and mobile device agricultural information system existed

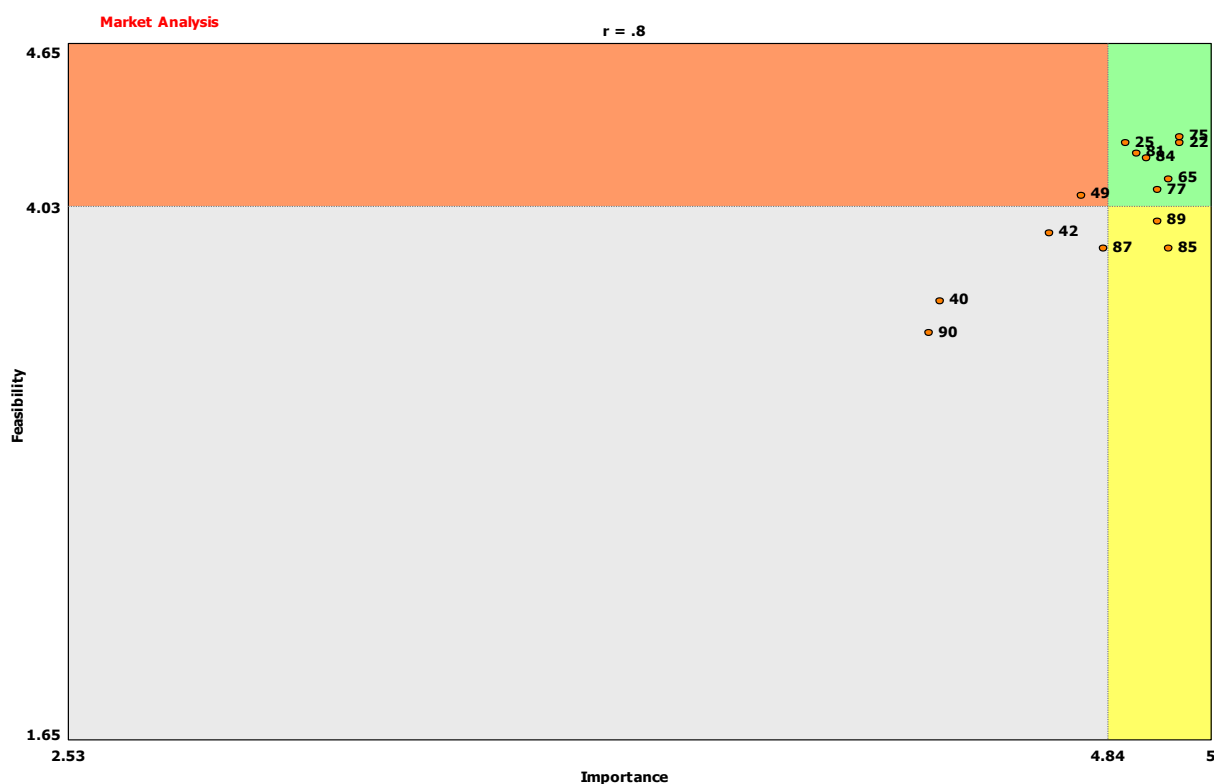


Figure 15: Go-Zone from the MEAS Project showing Average Ratings for Importance and Feasibility for Market Analysis (Bangladesh)

Box 6: Go-Zone Statements for Market Analysis (Bangladesh)	
22	I could sell my vegetables and rice in local market directly
75	I knew the up-to-date agricultural commodities price information
65	Small farmers had direct access to market
77	I knew the current prices of different commodities
84	I knew the different market locations
81	Retailers had direct access to farmers
25	I could buy fruits from different retailer market directly
85	Daily price fluctuation information was available to everyone
89	There was marketing information by geographic locations
49	Current market and price information at local and district levels was available
42	I had access to the same market information that big merchants have
40	I had access to more information about market changes in future direction
87	Wholesalers wishing to increase profits could contact farmers
90	I had more information about exporting my products

5.5 Key Recommendations/Comments - Bangladesh

Bangladesh will require significant education/preparation for any new mobile device technologies. There is an opportunity to build on a successful relationship with Bangladesh Agricultural University (BAU) to develop some in-country awareness and training activities. Secondly, the “paperless” style of nutrition education that has been developed by Cornell Cooperative Extension is suitable for replication in Bangladesh and could be part of a larger “grassroots” project to improve nutrition education and relate that to impacting the food production and supply chain issues. This could result in an increased demand for High Value Crops (HVC) and other new markets.

There is a need to develop training courses for field extension agents that facilitate community agricultural development processes and impart knowledge and skills to smallholder farmers and other rural actors on how to produce profitably and sustainably and how farmers can add value to their product to get a higher price when they sell it. Improving agricultural market information system in Bangladesh, Department of Agricultural Extension (DAE) in collaboration with Department of Agricultural Marketing (DAM) should plan and deliver a training program that builds farmer capacity to select products, analyze markets, prepare a business and implementation plan, and evaluate business performance.

Mobile Technology

- There is a very high interest in having a mobile phone system that can provide timely and accurate commodity prices and market locations.
- Respondents suggested that a mobile device based system be introduced slowly into the market.
- A SMS platform should allow farmers to contact retailers directly to establish commodity price and volume before any harvesting.
- There is an expressed need for more training on the use of mobile devices for marketing.

Market Analysis and Access

- There is strong support for commodity price information as a means of dealing with daily market fluctuations and to support direct sales at locale markets.
- Respondents made a point of wanting market information by location as a means of addressing the differences in market pricing.
- The desire to have direct contact between producers and retailers was identified by a number of respondents.
- Some respondents seem to feel that access to market information could increase farmer profits and insure fair prices. This assumption needs to be tested.

Contextual Issues

- There is an expressed desire for government and NGO support for a mobile device platform for accessing market information.
- Mobile device platform should be a source of information about locating quality resources i.e. seed, fertilizer, fingerlings, processing, packing, and pasteurization.
- A SMS platform could be a means of dealing with issues of pesticide management and regulation.
- Farmers are in need of more information regarding best practices, alternative products and sources of reliable farm machinery.

- Farmers see a role for government in agriculture specifically; support for more storage facilities, regulating quality issues, and the support of “Co-Operatives”.
- Farmers have expressed a strong desire for more training by extension professionals conducted locally and in areas of technology, farming techniques, harvest timing, use of fertilizers, post harvest and value added strategies.

Bangladesh appears to share the common interest in price discovery that was expressed by Rwanda and Ethiopia. Comments however seem to support an equal interest in improved communications among supply chain partners. In this instance ICT is asked to play more of a social networking role as opposed to a market intelligence dissemination role (i.e. price discovery). Harvest which is timed around communications with retailers is a good example of interactions which take place in a well- networked supply chain. ICT can create the platform that fosters communication and information sharing based on relationships. The success of this model requires the participation of all supply chain members but if accomplished will provide a robust system is agile and much better able to react to new market opportunities.

There also seems to be sensitivity in the comments to the unique challenges of small farmers and a need for fair market access. If fair and equal access to valuable market information is to be achieved, careful consideration should be made to develop a system that does not discriminate against smaller farmers either by way of technology access and literacy or usage fees.



Brainstorming, Sorting & Rating - Workshop Participants
Bangladesh Agricultural University, Mymensingh, BANGLADESH

6. MULTI-NATION RECOMMENDATIONS AND POLICY IMPLICATIONS

In reviewing the concept maps generated by participants in Ethiopia, Rwanda and Bangladesh, there are some common themes across the countries. Those themes can be summarized as following:

- ❖ All three countries having needs for commodity prices based on local markets and available in a timely manner, although it would appear that at least in Ethiopia, improved production capacity might be the first order of business.
- ❖ All three countries require a mobile device platform that is simple to use consistent with local language preferences at literacy level appropriate to users and includes basic commodities.
- ❖ Cost of purchasing and using mobile devices can become a significant deterrent to the success of a mobile device system for marketing and needs to be addressed by government or NGO involvement.
- ❖ Participants suggested that any mobile device marketing system be introduced slowly beginning with a few commodities.
- ❖ In all cases training programs related to purchasing and using mobile devices and how best to use them for marketing purposes are required at all steps of the food chain.
- ❖ Participants stated that a mobile device system should include accurate local weather information.
- ❖ SMS platform should include information about accessing agricultural resources i.e., seed, fertilizer, equipment, pesticide, packing and processing.
- ❖ As a mobile device system matures there should be an opportunity to create a virtual market place that would allow producers and retailers to connect directly as well as any stakeholders in the food distribution chain.

Any ICT pilot project should be defined by the needs and capacity of the countries involved however the following are seen as considerations that are important regardless of the region.

Building Human Capital: In all cases, technology development is secondary to the development of human capital. Simple technologies that can engage the most members of the supply chain are preferred to complex technologies that leave out those with limited IT access and/or literacy.

Blended Technologies: Even though market information can be disseminated much more quickly with technology most regions will need to implement a hybrid system that employs technology when the appropriate infrastructure exists but can still connect with parts of the supply chain that don't have the same level of access. Farmers with no ICT resources may rely on an information aggregator who can use technology to gather important market information and in turn share it with local farmers. In some cases more sophisticated ICT systems can be linked with simpler technologies to relay important information until it reaches the individual farmers.

Financial Sustainability: Any plan to move forward must include features that make the system financially sustainable. What features and functions can and will be embedded into the platform which will be revenue generators in the long term. The MEAS team can offer a menu of potential revenue models but the viability of those models are based on the countries themselves.

Educational Support: The broad and instantaneous adoption of ICT to advance food systems in developing countries cannot be presumed. Education is perhaps more critical to the successful development of ICT platforms than the technology itself.

Clear Identification of Information Needs: What information do farmers, food buyers and intermediaries need to know about one another to make the best decisions? What kinds of market intelligence broadly shared would help farmers access to new markets. While price is obviously the minimum amount of information buyers and sellers there are many other things that should influence buying a purchasing decisions.

Typically, a good information sharing system can answer the following:

- WHO are the farmers, buyers and middlemen in a particular region?
- WHAT products do they produce, purvey and/ or purchase and at what price?
- WHERE are the farmers and markets located that need to be connected?
- WHEN are the products available and when are they needed in the marketplace?

7. OUTLOOK

This study examined three countries and the needs of farmers, middlemen and retailers in regards to moving products to and through the food chain. While the study has generated information about preferences related to a SMS platform for delivering market information, it has also brought to light larger contextual issues that would need to be addressed if a mobile phone program was to be fully successful. The results of this study can be examined from three perspectives. First, there is a high degree of similarity in the features that farmers consider most desirable. Issues of affordability, ease of use, language preferences, daily commodity prices at the market and weather information are common desires. Secondly, there are common issues around the type of market information that farmer's desire. While most want basic commodity prices at the market on a daily basis, there are additional expectations around market location information, ability to deal via cell phone with brokers and retail representatives as well as information about product quality, consumer preferences, and contact information. Lastly, there are contextual issues; many farmers wanted to use technology as a means of organizing themselves into co-ops, and influence policy in regard to quality and price of storage, pesticides, seeds and equipment.

Additional study conducted in another cohort of countries would serve to validate the initial finding and to further explore these common themes. A second study would also allow the researchers an opportunity to solicit more information about "contextual" issues. Using the results of the first study we can construct a universal model for market data collection and distribution and invite commentary from these additional countries. A second study could be more prescriptive in suggesting not only what the audience desires but also how to achieve it. These recommendations could form a significant impetus for modernizing extension and advisory services in the role of extension professional in developing countries.

APPENDIX A

Table 1: List of Brainstormed Statements (ETHIOPIA)

Number of Statements	Name of Statements
1	There was a reliability index of producers
2	I knew the current prices of different commodities
3	Poor transportation infrastructure was improved
4	Mobile phone marketing information technology was slowly introduced into the market place
5	I had a truck
6	There was availability of processing in rural areas
7	Farmers and retailers had better communication about livestock market
8	I knew the up-to-date agricultural commodities prices information
9	Marketing extension education at rural centers was available
10	I can use my mobile phone with simplified text messaging system
11	There was a better communication between rural and urban areas
12	I knew new marketing channels
13	There were reliable suppliers
14	A mobile phone application for marketing information was inexpensive/free
15	There was no shortage or unavailability of various products
16	There was not a high percentage of food products imported
17	There was support for the 90% of fresh products that are locally produced
18	There was an increase farmers' yield
19	I had easier transportation and lower gas costs
20	I knew market information
21	I had access to business profiles
22	Retailers had direct access to farmers
23	I had information about smaller producers
24	I know current market price information
25	The role of the middlemen did not reduce the profit for the farmers
26	Mobile phone marketing was introduced with only one or two popular commodities
27	I could control transportation costs
28	I knew when/where products are available
29	Producers interested in direct sales could reduce transportation costs
30	I knew consumers preferences
31	Quality standards were known within commodity group
32	There was improvement in existing sources of marketing information
33	I can get up-to-date information on agro-inputs
34	We reduce the role of the middlemen and reduce the price for consumers
35	I had better interaction with traders/dealers
36	We support the role for middlemen/brokers/suppliers in organizing small producers
37	I knew the different market locations
38	Daily price fluctuation information was available to everyone
39	Real time market information is accessible for middlemen
40	Mobile phone marketing information was tested in the areas around Addis Ababa
41	I can receive marketing messages on my cellular phone
42	We controlled transportation costs which are critical in determining price
43	Mobile phone usage costs were affordable for farmers
44	More capital is available to producers interested in direct sales

Table 1: List of Brainstormed Statements (ETHIOPIA) continued

Number of Statements	Name of Statements
45	I knew the urban market prices
46	Market information was available to farmers distant from urban centers
47	Wholesaler wishing to increase profits could contact farmers
48	I could get access to urban markets
49	More storage facilities which affect wholesalers' profit were available
50	Both farmers and middlemen had more information about processing costs
51	Mobile phone marketing information was coordinated with existing marketing information resources
52	Government support was available for increasing production capacity
53	There was more market information organized by commodities
54	Mobile phone for farmers were affordable
55	There was fair price for livestock
56	Farmers got training on best marketing practices
57	There was an opportunity for small scale producers to participate in market
58	Extension provided training programs on mobile phone use
59	Government supports were available for trucks and warehouse
60	There was marketing information by geographic locations
61	Mobile phone messages were simple and clear
62	There was support for business ownership
63	Fewer people were involved in marketing channel
64	Farmers knew information about the new varieties
65	There was efficient production planning to reduce supply shortages
66	Literacy levels of mobile information were appropriate
67	Training for farmers about quality standards was available
68	Customers' preferences influenced quality standards
69	There was support increased opportunity to farm
70	Farmers knew consumers' preferences
71	Local marketing center for vegetables were established
72	Agricultural authorities supported the use of mobile phone marketing technology
73	More extension service in rural areas were provided
74	Fertilizer costs were reduced
75	If improved varieties resulted in higher profits for farmers
76	If government stabilizes market prices fluctuations
77	Farmers' had access to mobile phone for marketing information
78	Farmers got continuing education in best practices
79	Telecommunication industries encouraged the use of mobile phone marketing technology
80	There was a competitive price for improved seeds
81	Affordable fuel prices (irrigation/transportation) were possible
82	There was access to farm mechanical training
83	Access to current information about international market was available
84	Farmers' use of mobile technology increased
85	Farmers received training in communication skills

Table 2: List of Statements by Cluster with Average Ratings (ETHIOPIA)

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 1: Mobile Phone & Agriculture</u>			
51	Mobile phone marketing information was coordinated with existing marketing information resources	4.14	3.27
84	Farmers' use of mobile technology increased **	4.00	3.81
41	I can receive marketing messages on my cellular phone **	3.92	3.54
66	Literacy levels of mobile information were appropriate	3.89	3.11
61	Mobile phone messages were simple and clear **	3.86	3.46
77	Farmers' had access to mobile phone for marketing information	3.84	3.38
43	Mobile phone usage costs were affordable for farmers	3.84	3.41
79	Telecommunication industries encouraged the use of mobile phone marketing technology **	3.81	3.92
4	Mobile phone marketing information technology was slowly introduced into the market place **	3.78	3.49
54	Mobile phone for farmers were affordable	3.76	3.43
10	I can use my mobile phone with simplified text messaging system	3.68	3.59
40	Mobile phone marketing information was tested in the areas around Addis Ababa	3.65	3.68
14	A mobile phone application for marketing information was inexpensive/free	3.57	3.08
26	Mobile phone marketing was introduced with only one or two popular commodities	3.27	3.54
		Ave.: 3.79	Ave.: 3.48
<u>Cluster 2: Market Analysis</u>			
20	I knew market information **		
8	I knew the up-to-date agricultural commodities prices information **	4.43	3.73
2	I knew the current prices of different commodities **	4.41	3.68
24	I know current market price information **	4.38	3.78
60	There was marketing information by geographic locations	4.30	3.95
30	I knew consumers preferences	4.22	3.27
38	Daily price fluctuation information was available to everyone	4.19	3.41
28	I knew when/where products are available **	4.16	3.22
32	There was improvement in existing sources of marketing information **	4.16	3.57
70	Farmers knew consumers' preferences	4.14	3.65
53	There was more market information organized by commodities	4.14	3.35
46	Market information was available to farmers distant from urban centers	4.11	3.46
37	I knew the different market locations	4.11	3.08
12	I knew new marketing channels	4.08	3.84
39	Real time market information is accessible for middlemen	4.05	3.38
21	I had access to business profiles	3.89	3.30
45	I knew the urban market prices	3.89	3.24
83	Access to current information about international market was available	3.86	3.54
23	I had information about smaller producers	3.78	3.43
		3.54	3.24
		Ave.: 4.10	Ave.: 3.48
<u>Cluster 3: Market Coordination</u>			
48	I could get access to urban markets **		
71	Local marketing center for vegetables were established **	4.11	3.54
35	I had better interaction with traders/dealers **	3.95	3.70
22	Retailers had direct access to farmers	3.89	3.57
57	There was an opportunity for small scale producers to participate in market	3.76	3.05
		3.68	3.54
		Ave.: 3.88	Ave.: 3.48

Table 2: List of Statements by Cluster with Average Ratings (ETHIOPIA) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 4: Producer/Market Linkage</u>			
13	There were reliable suppliers **	4.22	3.38
80	There was a competitive price for improved seeds **	4.05	3.59
31	Quality standards were known within commodity group **	3.86	3.54
55	There was fair price for livestock	3.81	3.05
15	There was no shortage or unavailability of various products	3.81	3.03
47	Wholesaler wishing to increase profits could contact farmers	3.76	3.27
68	Customers' preferences influenced quality standards **	3.70	3.65
25	The role of the middlemen did not reduce the profit for the farmers	3.65	3.19
1	There was a reliability index of producers	3.65	3.24
34	We reduce the role of the middlemen and reduce the price for consumers	3.51	3.32
16	There was not a high percentage of food products imported	3.41	3.08
36	We support the role for middlemen/brokers/suppliers in organizing small producers	3.38	3.41
63	Fewer people were involved in marketing channel	3.27	3.22
Ave.: 3.70		Ave.: 3.31	
<u>Cluster 5: Agricultural Information</u>			
33	I can get up-to-date information on agro-inputs **	4.32	3.49
64	Farmers knew information about the new varieties **	4.27	3.43
11	There was a better communication between rural and urban areas **	4.08	3.62
7	Farmers and retailers had better communication about livestock market	3.92	3.41
50	Both farmers and middlemen had more information about processing costs	3.62	3.14
Ave.: 4.04		Ave.: 3.42	
<u>Cluster 6: Training</u>			
67	Training for farmers about quality standards was available	4.30	3.28
9	Marketing extension education at rural centers was available **	4.19	3.73
73	More extension service in rural areas were provided **	4.14	3.70
78	Farmers got continuing education in best practices **	4.05	3.70
56	Farmers got training on best marketing practices **	4.05	3.51
82	There was access to farm mechanical training **	4.05	3.51
85	Farmers received training in communication skills	3.95	3.62
72	Agricultural authorities supported the use of mobile phone marketing technology	3.76	3.22
58	Extension provided training programs on mobile phone use	3.59	3.27
Ave.: 4.01		Ave.: 3.51	

Table 2: List of Statements by Cluster with Average Ratings (ETHIOPIA) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 7: Increased Production</u>			
18	There was an increase farmers' yield **	4.43	3.57
52	Government support was available for increasing production capacity **	4.38	3.73
75	If improved varieties resulted in higher profits for farmers **	4.32	3.73
6	There was availability of processing in rural areas	4.03	3.14
76	If government stabilizes market prices fluctuations	4.03	3.16
69	There was support increased opportunity to farm	4.00	3.70
59	Government supports were available for trucks and warehouse	3.92	3.08
62	There was support for business ownership	3.84	3.24
Ave.: 4.12		Ave.: 3.42	
<u>Cluster 8: Capital</u>			
74	Fertilizer costs were reduced	4.59	3.05
65	There was efficient production planning to reduce supply shortages **	4.32	3.51
44	More capital is available to producers interested in direct sales	3.97	3.05
17	There was support for the 90% of fresh products that are locally produced	3.95	3.59
49	More storage facilities which affect wholesalers' profit were available	3.35	3.05
Ave.: 4.04		Ave.: 3.25	
<u>Cluster 9: Transportation</u>			
81	Affordable fuel prices (irrigation/transportation) were possible	4.46	2.86
3	Poor transportation infrastructure was improved **	4.38	3.57
19	I had easier transportation and lower gas costs	4.32	2.89
27	I could control transportation costs	3.84	2.59
42	We controlled transportation costs which are critical in determining price	3.81	2.95
29	Producers interested in direct sales could reduce transportation costs	3.76	3.30
5	I had a truck	3.51	2.84
Ave.: 4.01		Ave.: 3.00	

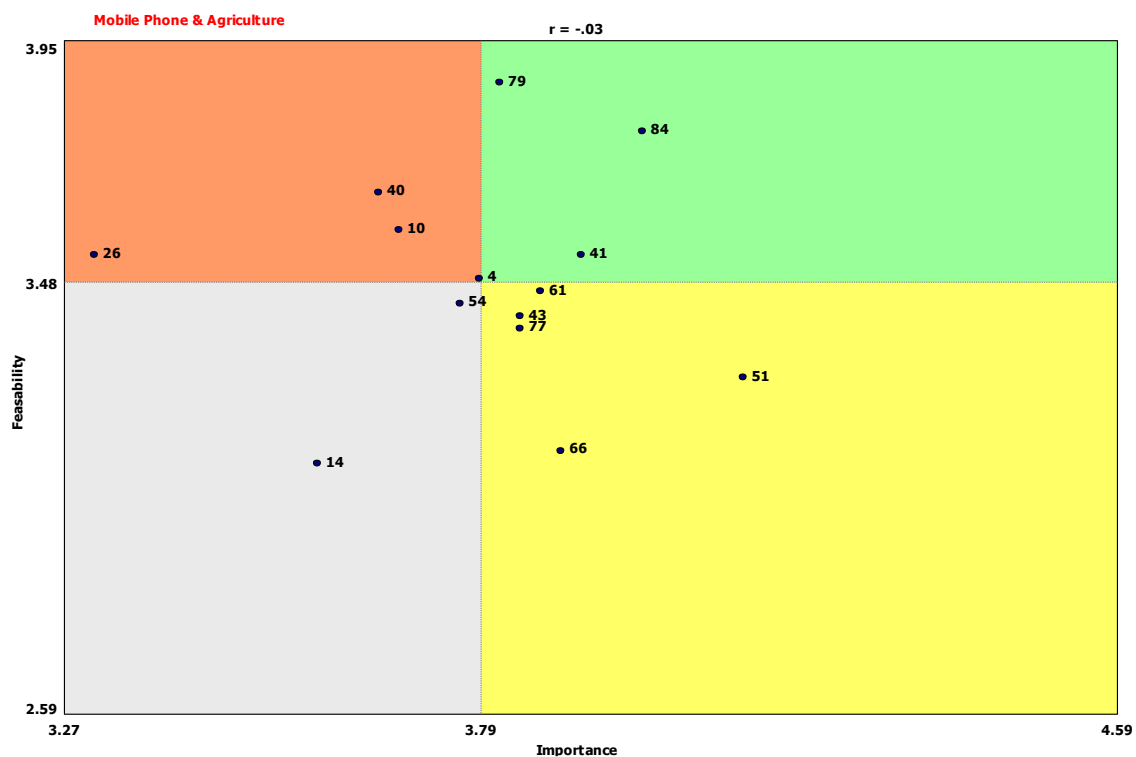


Figure 16: Go-Zone Chart for Mobile Phone & Agriculture Cluster (ETHIOPIA)

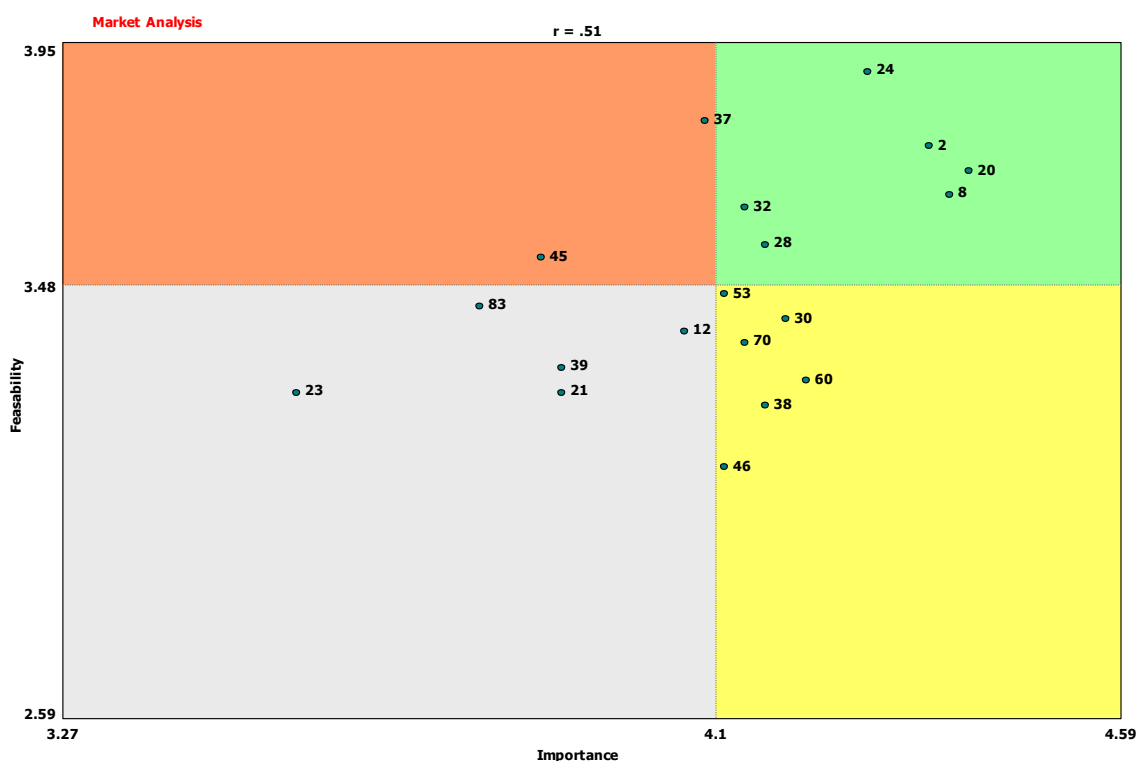


Figure 17: Go-Zone Chart for Market Analysis Cluster (ETHIOPIA)

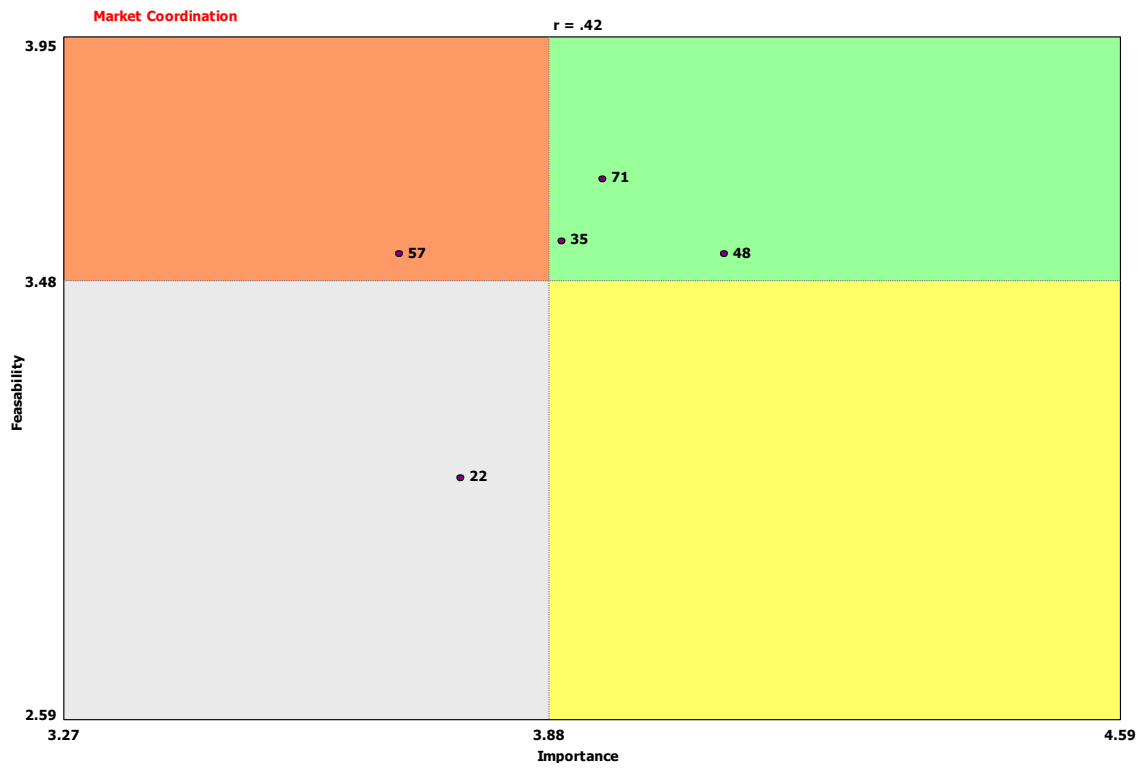


Figure 18: Go-Zone Chart for Market Coordination (ETHIOPIA)

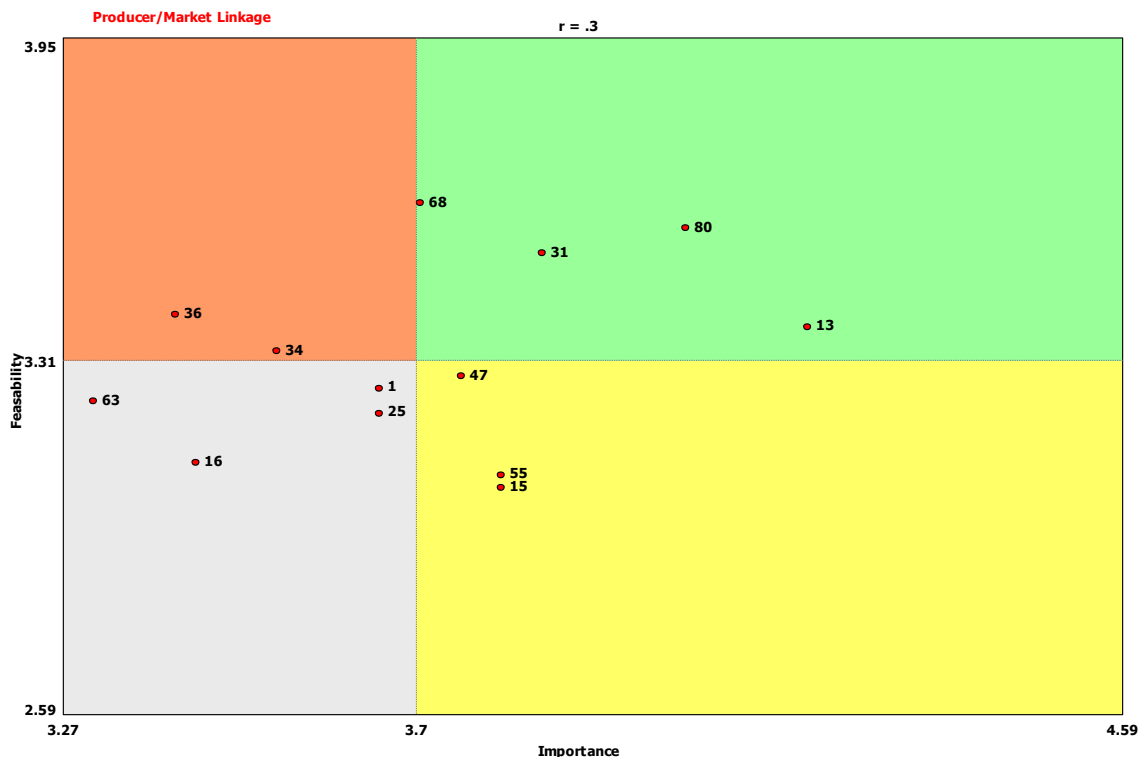


Figure 19: Go-Zone Chart for Producer/Market Linkage Cluster (ETHIOPIA)

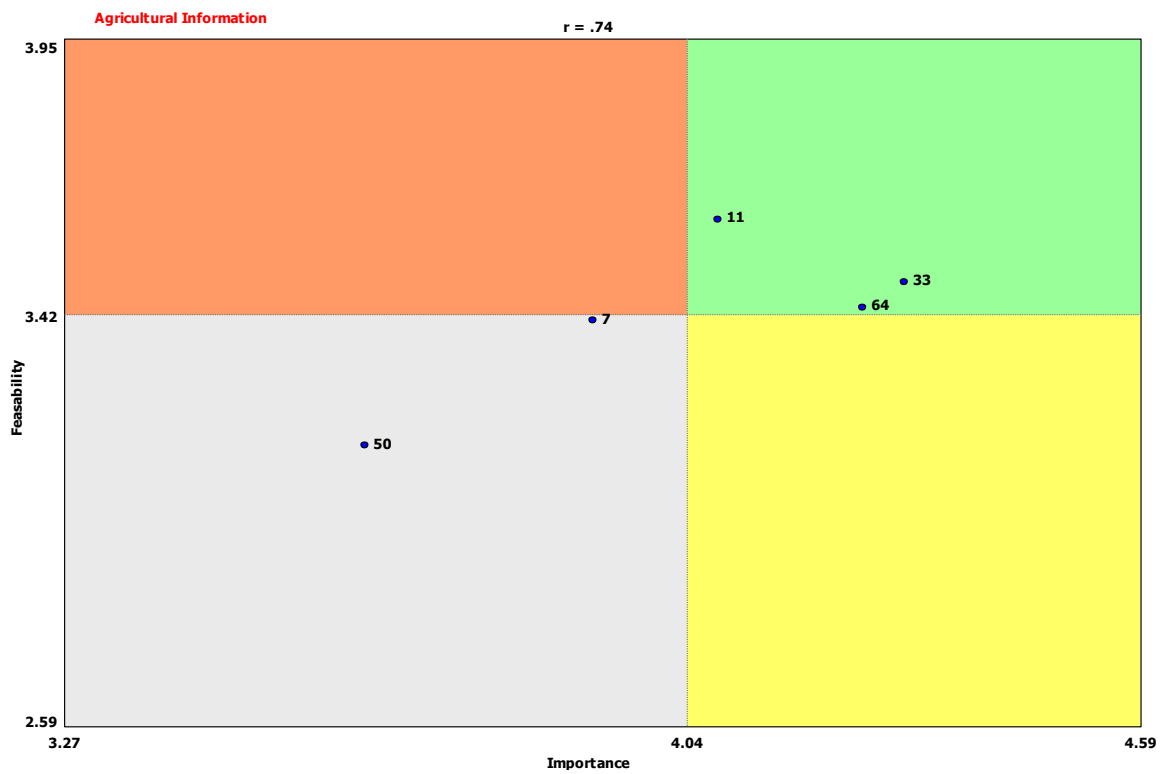


Figure 20: Go-Zone Chart for Agricultural Information Cluster (ETHIOPIA)

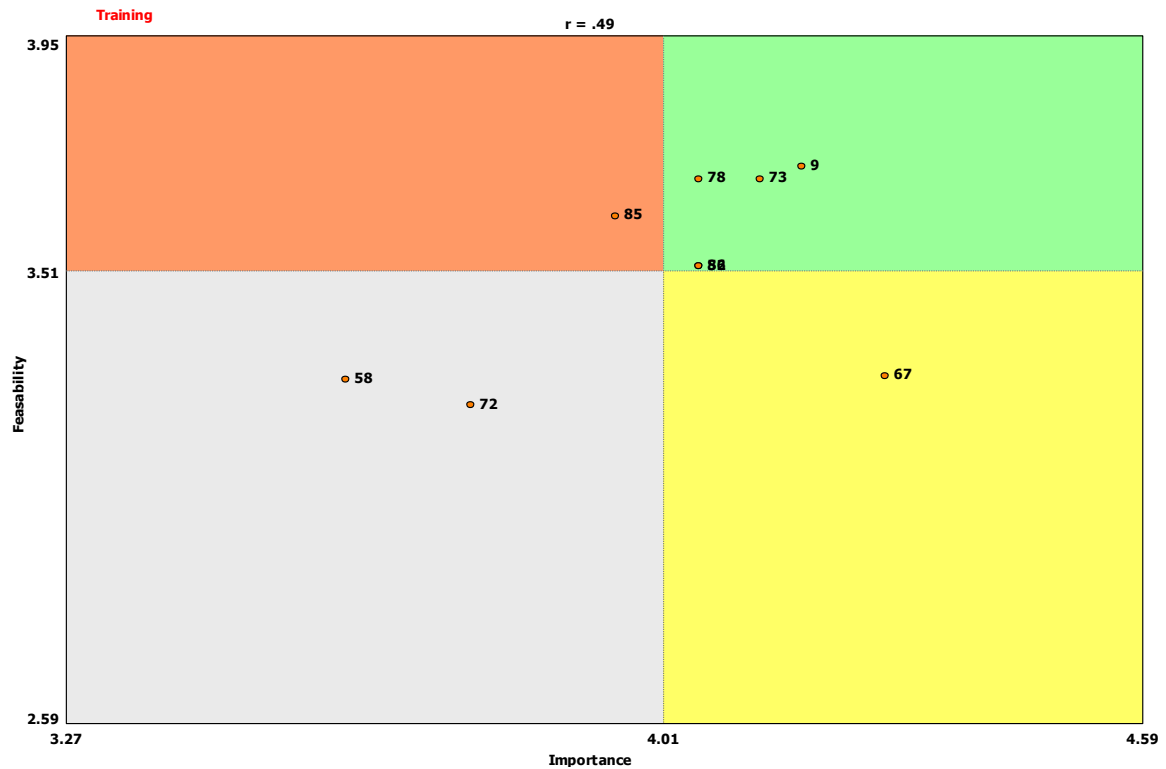


Figure 21: Go-Zone Chart for Training Cluster (ETHIOPIA)

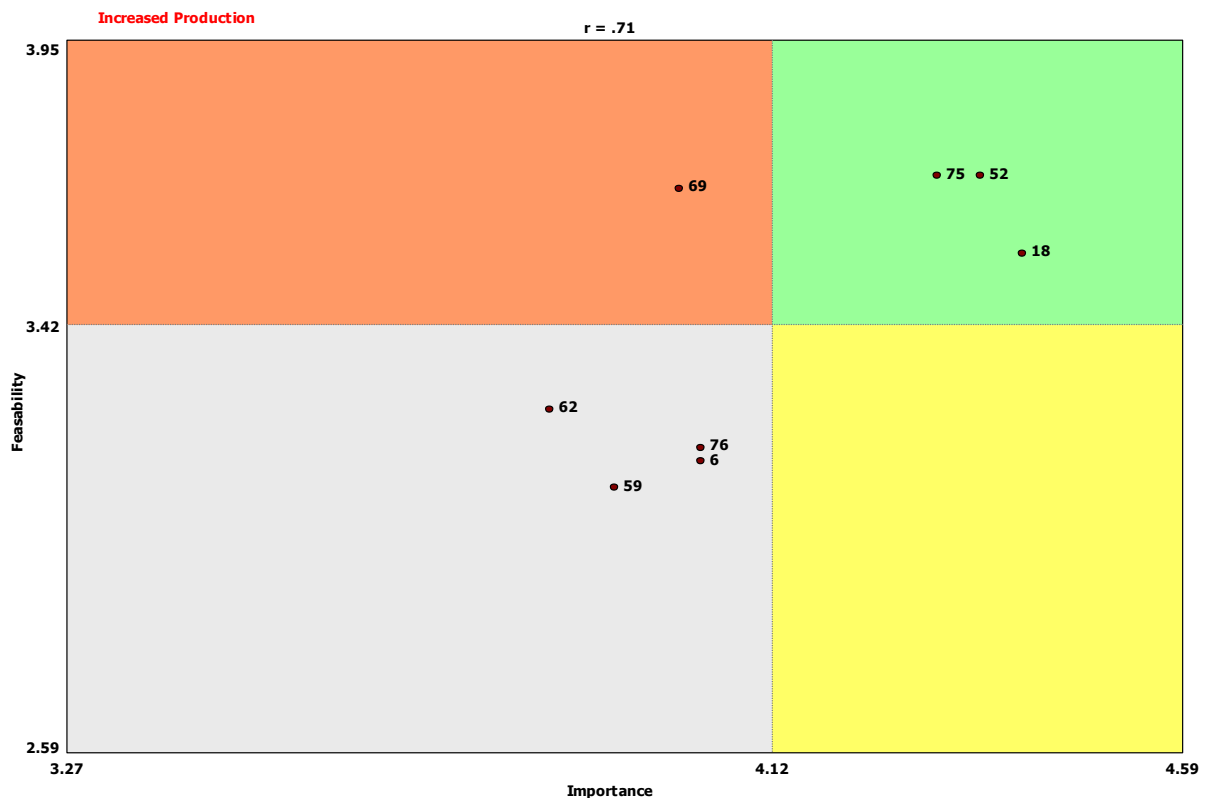


Figure 22: Go-Zone Chart for Increased Production Cluster (ETHIOPIA)

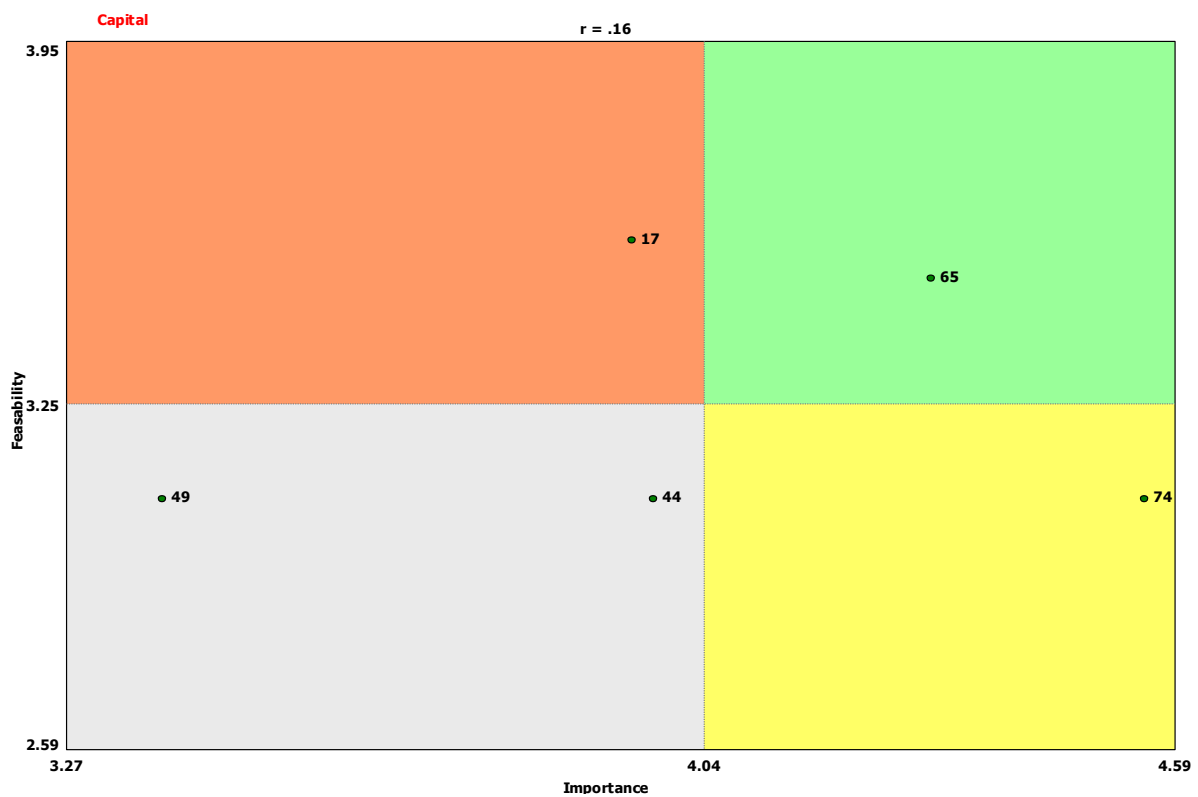


Figure 23: Go-Zone Chart for Capital Cluster (ETHIOPIA)

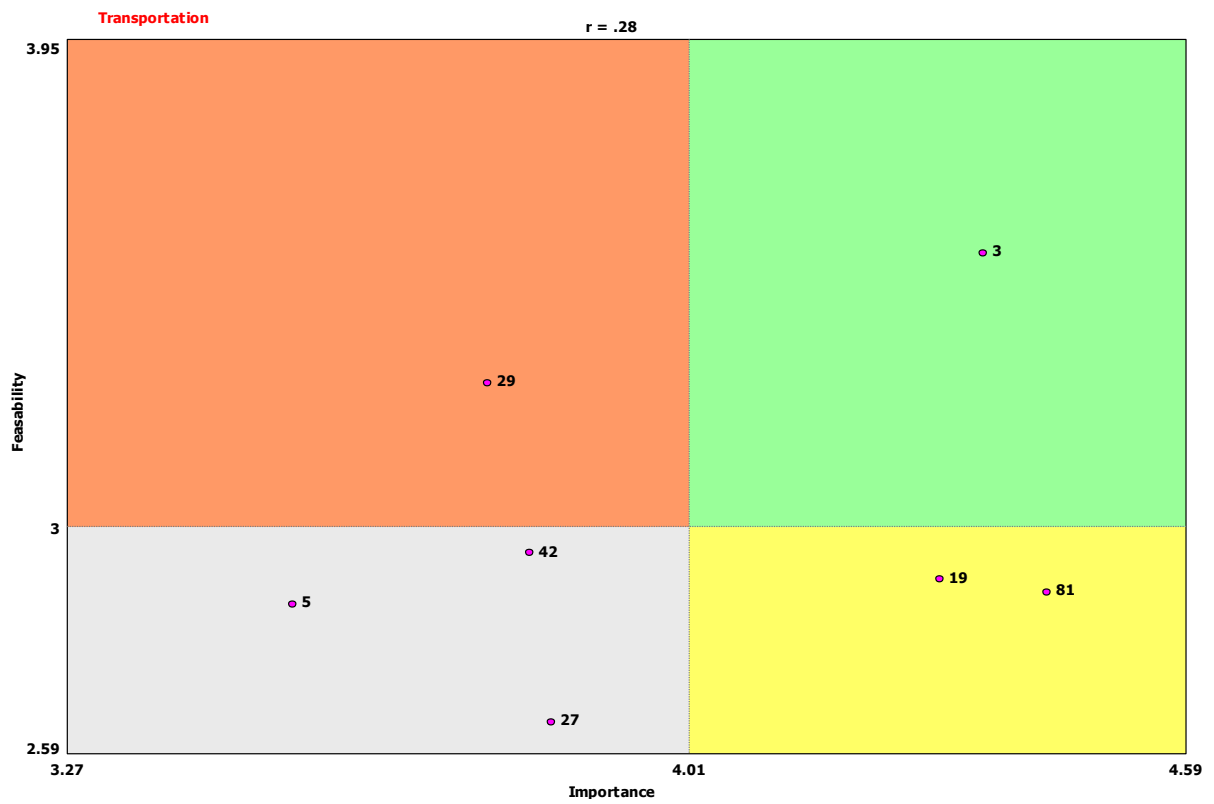


Figure 24: Go-Zone Chart for Transportation Cluster (ETHIOPIA)

APPENDIX B

Table 3: List of Brainstormed Statements (RWANDA)

Number of Statements	Name of Statements
1	There was a mobile phone based market information system to access to urban markets
2	Literacy levels of mobile phone information were appropriate
3	There were marketing information by geographically locations
4	Providers expanded existing marketing information sources like e-soko and others
5	Farmers had geographically specific weather information using mobile phone
6	I produce more quality products
7	I get access to up-to-date agricultural commodities price information
8	Farmers receive information to support improved crop production technology
9	Farmers had financial support to improve irrigation system
10	I knew more about value-added practices
11	I get fertilizer with cheaper price
12	There were better access to fertilizer
13	Wholesalers wishing to increase profits could contact farmers
14	Mobile phones for farmers are affordable
15	I knew the consumers preferences
16	There were easier transportation to get to urban markets
17	I get information about market demands
18	There was a better communication between rural farmers and urban markets
19	Roads and infrastructure were better
20	I had better interaction with traders and dealers
21	There were inexpensive fuel for irrigation
22	I have a better access to tracking
23	I had access to storage facilities for the products
24	There were less expensive/cheap seed available
25	I had more information about future market trends
26	There was more marketing information available
27	There were improved system for delivering important information to farmers
28	There were more crop technology training for farmers
29	Farmers receive accurate information about weather focus
30	There were more agricultural education centers available
31	I had short and simple information about best practices of crop technology on my mobile
32	I knew the crop technology education center in my district
33	Livestock production was done collectively at the local level
34	I had the availability to do direct sale to market to increase profits
35	There were more market opportunities for rural farmers
36	I had better information about market prices
37	Farmers had access to information about export markets
38	I had the ability to recharge mobile phone
39	I had access to variety of mobile phones
40	I had training for both purchasing and using mobile phone
41	Farmers receive up-to-date weather information
42	Farmers knew market locations
43	Mobile phone text messages were simple and clear
44	I could identify community with enough money to buy products
45	I had sufficient capital/loan for crop production

Table 3: List of Brainstormed Statements (RWANDA) continued

Number of Statements	Name of Statements
46	There were Lower gas prices
47	There were storage capacity that allows product distribution when market is high
48	Farmers had agricultural technology to improve soil fertility
49	I had information to get fertilizer with affordable price
50	I had information and support for local processing to create value added products
51	I knew consumer preferences I can get a higher price
52	I knew the most appropriate crop to adapt to local climate
53	I knew how to get a new rice variety appropriate to soil and weather
54	I knew how to collaborate to take products to market: trucking, marketing, etc.
55	Farmers had technical support related to planting technology in hilly areas
56	Mobile phone marketing information was coordinated with the existing marketing information resources
57	The products are good quality
58	I knew more about modern seed and planting techniques
59	I had training on post-harvest value added products
60	I knew market information
61	There were regional facilities available to increase value added products
62	I can grow rice that consumers like
63	I could increase production beyond local needs
64	Livestock processing was available at local level
65	Refrigeration was available for milk production
66	I knew what crops I should grow
67	There were support for increasing crop production
68	There was training for small farmers who seldom use internet and mobile phone
69	There was more training in the use of technology
70	Farmers preference for local language instead of French on mobile phone
71	I knew current market information
72	I had a mobile phone with a user friendly system
73	I knew what surplus exists that can be sold rather than consumed locally
74	I had mobile phone system that connected buyers and sellers
75	Beekeepers knew the new technology for production, processing and marketing
76	There was information and support for the development of fish businesses
77	I knew what external resources are available to solve agricultural problems
78	There was a web site available to create virtual buyer and seller connection
79	There was capital available for purchasing or renting of farm equipment
80	I knew the current prices of different commodities
81	Local economy is stronger I can get a better price
82	There was an opportunity for small scale farmers to participate in the market
83	Telecommunication industries encourage the use of mobile phone marketing technology
84	Mobile phone marketing was introduced initially with only one or two popular
85	commodities
86	Wholesalers and retailers had more information about farmers' business practices
87	There were reliable suppliers
88	I knew the different market locations
89	Technicians were available who can provide weather information as accurate as possible
90	There was a mobile phone text message system with language easy to understand by farmers

Table 4: List of Statements by Cluster with Average Ratings (RWANDA)

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 1: Mobile Phone Technology</u>			
71	Farmers preference for local language instead of French on mobile phone **	4.48	3.74
27	There were improved system for delivering important information to farmers **	4.48	4.09
90	There was a mobile phone text message system with language easy to understand by Farmers **	4.28	3.66
73	I had a mobile phone with a user friendly system **	4.26	3.89
75	I had mobile phone system that connected buyers and sellers **	4.24	3.74
1	There was a mobile phone based market information system to access to urban markets **	4.13	3.94
		4.07	3.09
84	Telecommunication industries encourage the use of mobile phone marketing technology	4.04	3.77
14	Mobile phones for farmers are affordable **	4.02	3.49
2	Literacy levels of mobile phone information were appropriate **	3.96	3.17
79	There was a web site available to create virtual buyer and seller connection	3.96	3.55
43	Mobile phone text messages were simple and clear	3.93	3.36
31	I had short and simple information about best practices of crop technology on my mobile	3.89	3.28
69	There was training for small farmers who seldom use internet and mobile phone	3.87	3.70
38	I had the ability to recharge mobile phone **	3.87	3.87
57	Mobile phone marketing information was coordinated with the existing marketing information resources	3.67	4.00
40	I had training for both purchasing and using mobile phone	3.57	3.34
5	Farmers had geographically specific weather information using mobile phone	3.57	3.55
85	Mobile phone marketing was introduced initially with only one or two popular commodities	3.46	3.30
39	I had access to variety of mobile phones	Ave.: 3.99	Ave.: 3.61
<u>Cluster 2: Market Analysis</u>			
		4.57	4.09
35	There were more market opportunities for rural farmers **	4.57	3.89
72	I knew current market information **	4.48	3.74
15	I knew the consumers preferences **	4.48	3.68
52	I knew consumer preferences I can get a higher price **	4.48	3.77
74	I knew what surplus exists that can be sold rather than consumed locally **	4.46	3.68
83	There was an opportunity for small scale farmers to participate in the market **	4.43	3.89
88	I knew the different market locations **	4.40	3.47
87	There were reliable suppliers	4.39	3.62
81	I knew the current prices of different commodities	4.33	3.49
55	I knew how to collaborate to take products to market: trucking, marketing, etc.	4.26	3.72
42	Farmers knew market locations	4.24	3.66
20	I had better interaction with traders and dealers	4.17	3.60
44	I could identify community with enough money to buy products	4.17	3.68
61	I knew market information	4.11	3.64
82	Local economy is stronger I can get a better price	4.07	3.48
34	I had the availability to do direct sale to market to increase profits	4.07	3.21
25	I had more information about future market trends	Ave.: 4.33	Ave.: 3.67

Table 4: List of Statements by Cluster with Average Ratings (RWANDA) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 3: Market Coordination</u>			
7	I get access to up-to-date agricultural commodities price information **	4.45	3.94
17	I get information about market demands **	4.30	3.68
36	I had better information about market prices **	4.28	3.72
26	There was more marketing information available **	4.20	3.74
18	There was a better communication between rural farmers and urban markets	4.17	3.51
13	Wholesalers wishing to increase profits could contact farmers	4.09	3.47
37	Farmers had access to information about export markets	4.09	3.38
86	Wholesalers and retailers had more information about farmers' business practices	4.07	3.26
3	There were marketing information by geographically locations	3.81	3.66
4	Providers expanded existing marketing information sources like e-soko and others	3.81	3.81
Ave.: 4.13		Ave.: 3.62	
<u>Cluster 4: Value-Added Technology</u>			
10	I knew more about value-added practices **	4.64	3.74
58	The products are good quality **	4.46	4.02
62	There were regional facilities available to increase value added products **	4.43	3.62
12	There were better access to fertilizer **	4.36	3.74
23	I had access to storage facilities for the products **	4.33	3.66
48	There were storage capacity that allows product distribution when market is high	4.30	3.26
6	I produce more quality products	4.23	3.55
64	I could increase production beyond local needs	4.22	3.51
63	I can grow rice that consumers like	3.96	2.91
Ave.: 4.33		Ave.: 3.56	
<u>Cluster 5: Increased Production</u>			
8	Farmers receive information to support improved crop production technology **	4.62	3.79
67	I knew what crops I should grow **	4.59	4.17
51	I had information and support for local processing to create value added products	4.38	3.62
49	Farmers had agricultural technology to improve soil fertility **	4.37	3.87
60	I had training on post-harvest value added products **	4.35	3.91
68	There were support for increasing crop production **	4.28	3.96
76	Beekeepers knew the new technology for production, processing and marketing	4.20	3.70
78	I knew what external resources are available to solve agricultural problems	4.11	3.32
30	There were more agricultural education centers available	4.11	3.28
32	I knew the crop technology education center in my district	3.72	3.26
Ave.: 4.27		Ave.: 3.69	
<u>Cluster 6: Training</u>			
28	There were more crop technology training for farmers **	4.39	3.89
50	I had information to get fertilizer with affordable price **	4.26	3.70
56	Farmers had technical support related to planting technology in hilly areas **	4.26	4.04
59	I knew more about modern seed and planting techniques **	4.24	3.98
70	There was more training in the use of technology	4.09	3.13
77	There was information and support for the development of fish businesses	3.78	2.81
Ave.: 4.17		Ave.: 3.49	

Table 4: List of Statements by Cluster with Average Ratings (RWANDA) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 7: Climate and Weather</u>			
89	Technicians were available who can provide weather information as accurate as possible	4.54	3.62
53	I knew the most appropriate crop to adapt to local climate **	4.48	4.02
41	Farmers receive up-to-date weather information **	4.48	3.79
29	Farmers receive accurate information about weather focus **	4.39	3.87
54	I knew how to get a new rice variety appropriate to soil and weather	3.80	2.89
	Ave.:	4.34	Ave.: 3.64
<u>Cluster 8: Increased Capacity</u>			
65	Livestock processing was available at local level **	4.67	3.62
11	I get fertilizer with cheaper price **	4.06	3.63
45	I had more information and support to improve irrigation practices	4.00	3.21
46	I had sufficient capital/loan for crop production	3.98	3.45
80	There was capital available for purchasing or renting of farm equipment	3.96	3.21
24	There were less expensive/cheap seed available	3.93	3.64
33	Livestock production was done collectively at the local level	3.93	3.57
66	Refrigeration was available for milk production	3.89	3.38
9	Farmers had financial support to improve irrigation system	3.70	3.15
	Ave.:	4.02	Ave.: 3.43
<u>Cluster 9: Improved Infrastructure</u>			
19	Roads and infrastructure were better **	4.48	3.70
16	There were easier transportation to get to urban markets	4.22	3.11
22	I have a better access to tracking	3.87	3.41
47	There were Lower gas prices	3.69	2.94
21	There were inexpensive fuel for irrigation	3.63	2.70
	Ave.:	3.98	Ave.: 3.17

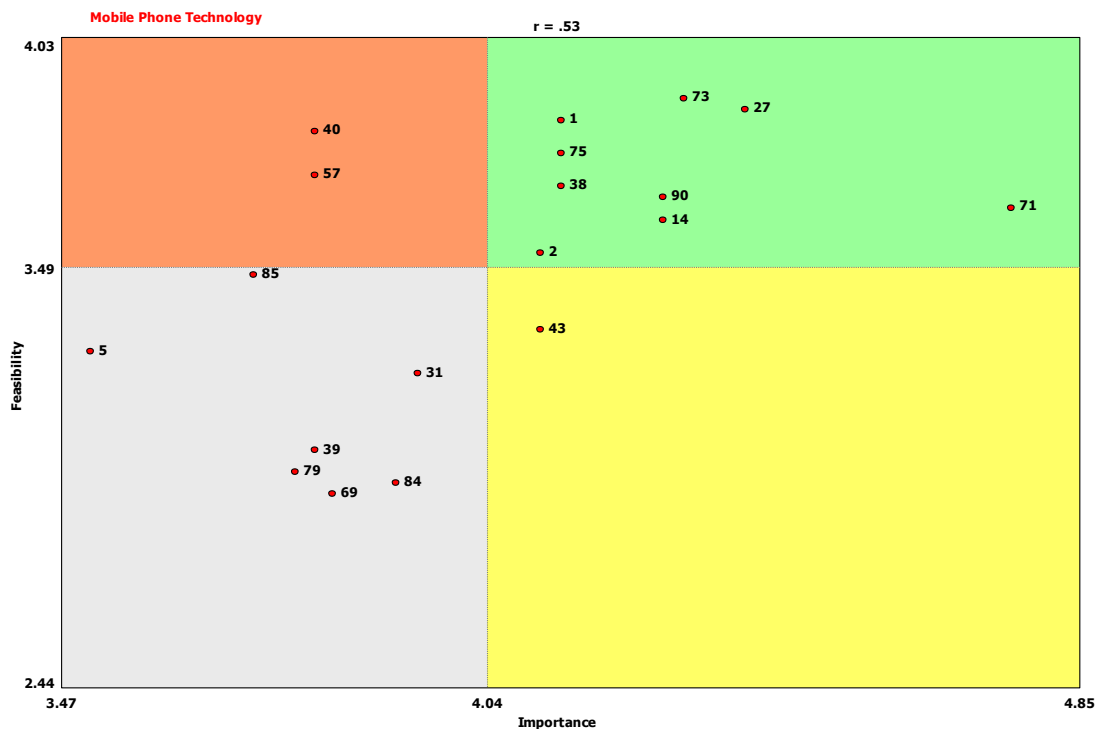


Figure 25: Go-Zone Chart for Mobile Phone Technology Cluster (RWANDA)

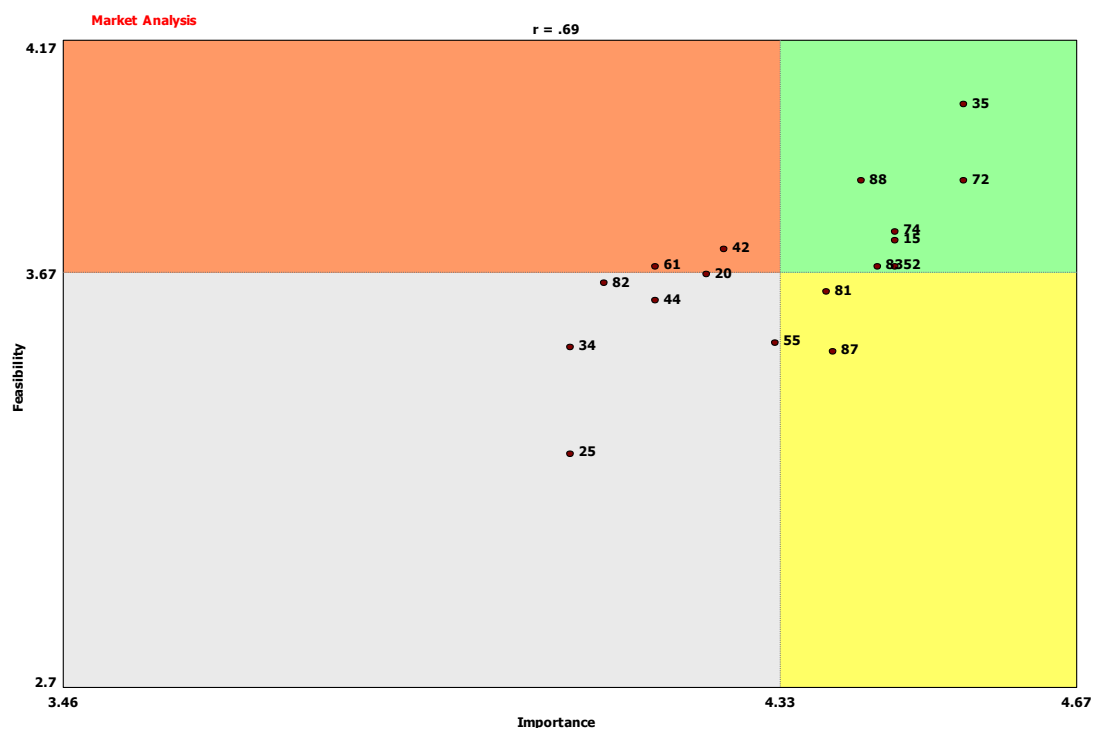


Figure 26: Go-Zone Chart for Market Analysis Cluster (RWANDA)

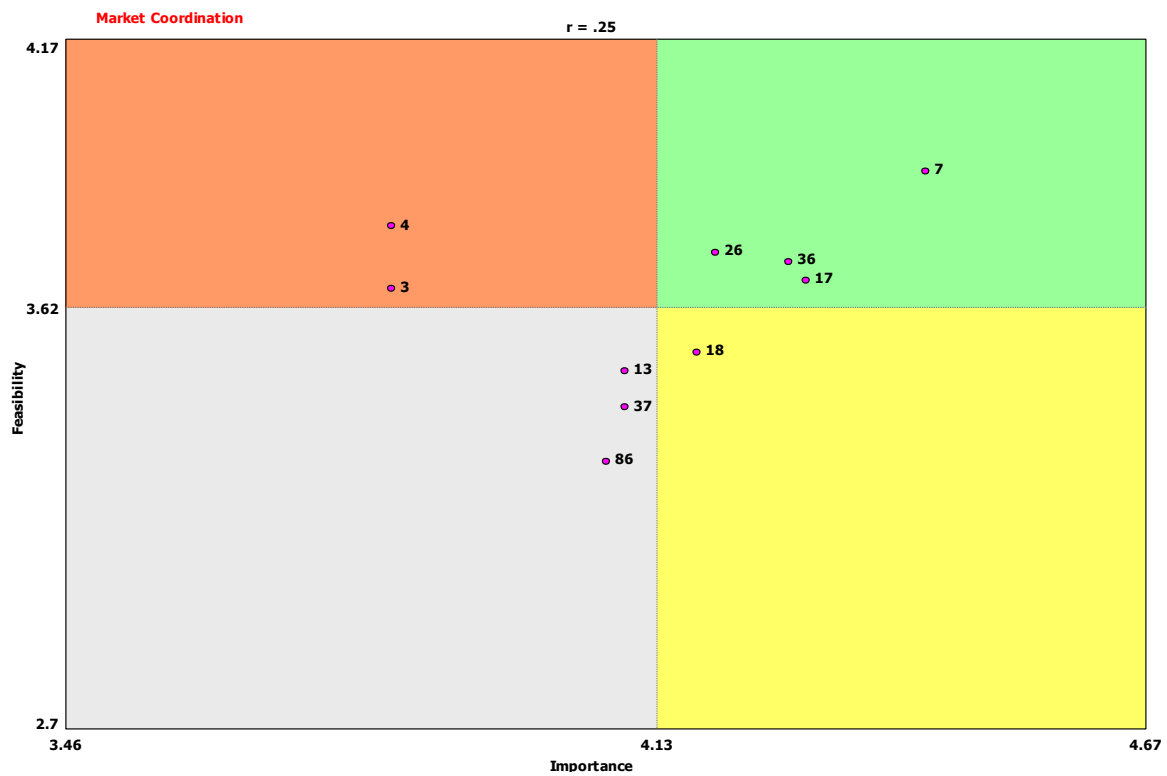


Figure 27: Go-Zone Chart for Market Coordination Cluster (RWANDA)

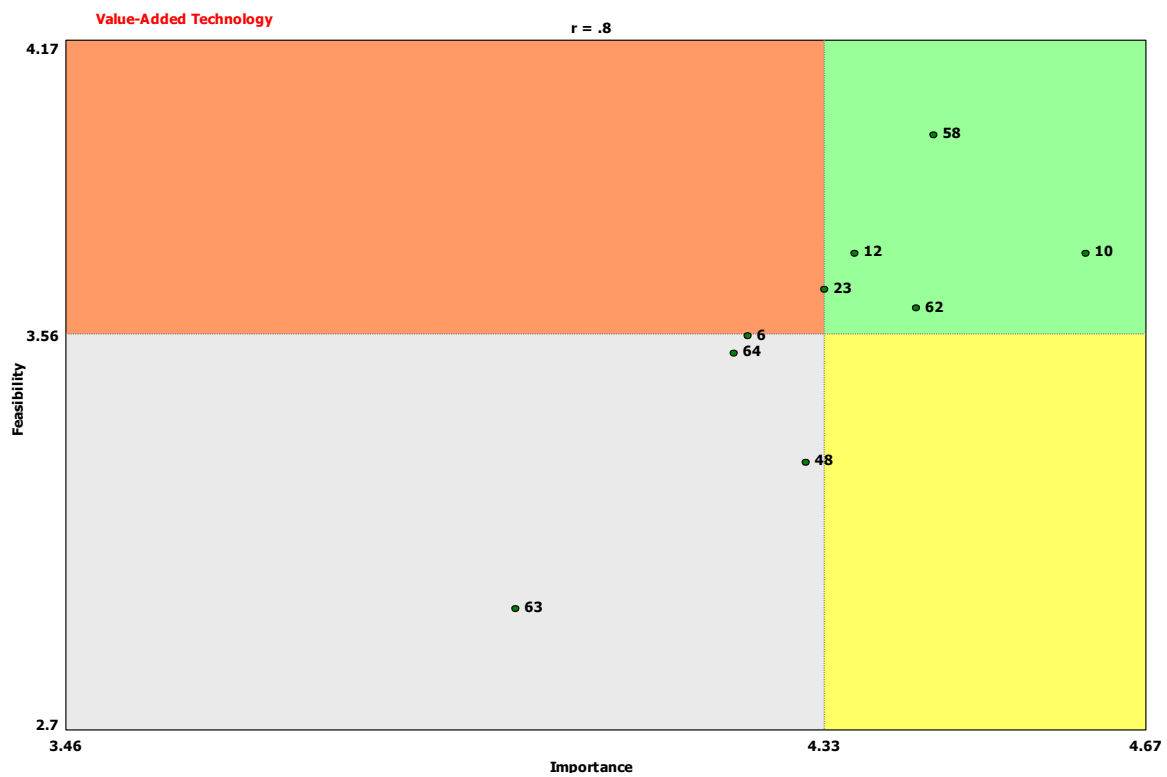


Figure 28: Go-Zone Chart for Value-Added Technology Cluster (RWANDA)

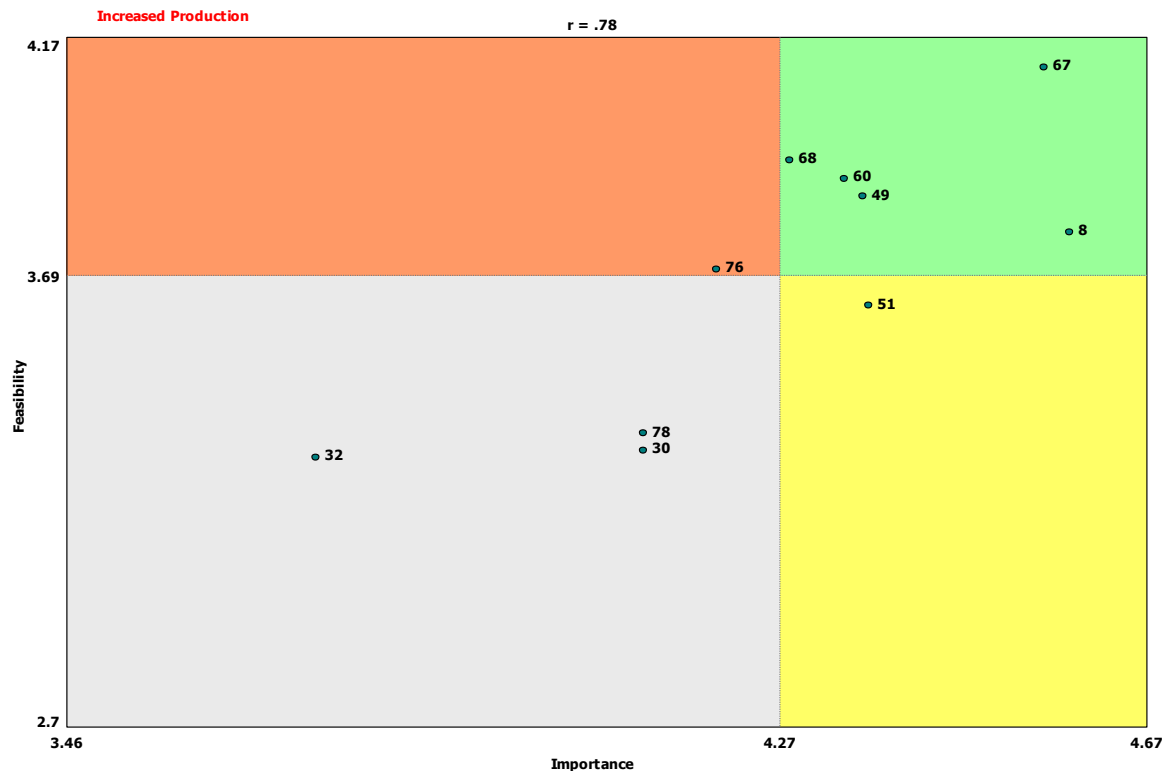


Figure 29: Go-Zone Chart for Increased Production Cluster (RWANDA)

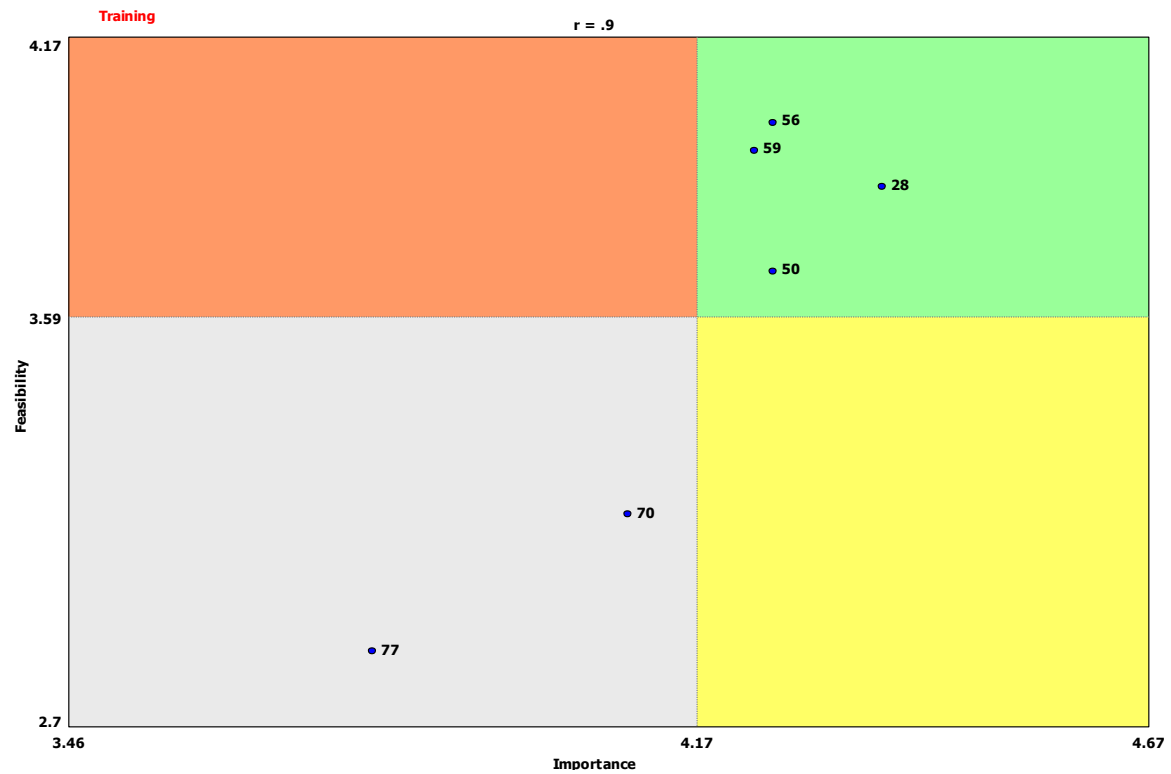


Figure 30: Go-Zone Chart for Training Cluster (RWANDA)

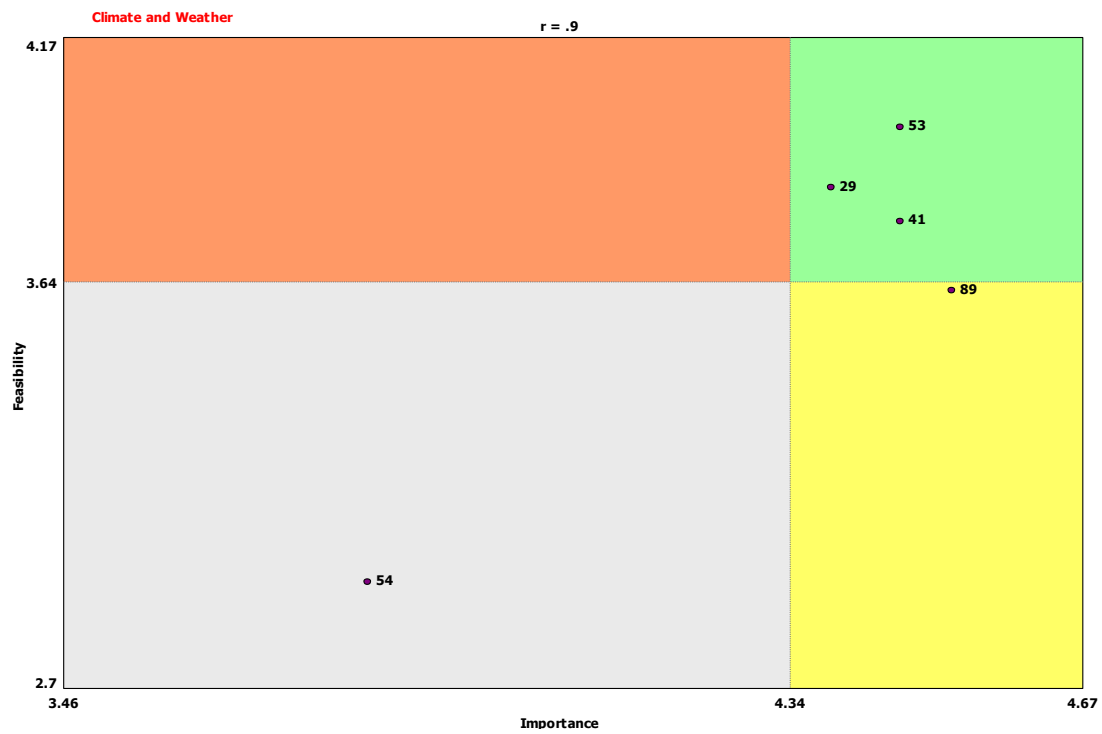


Figure 31: Go-Zone Chart for Climate & Weather Cluster (RWANDA)

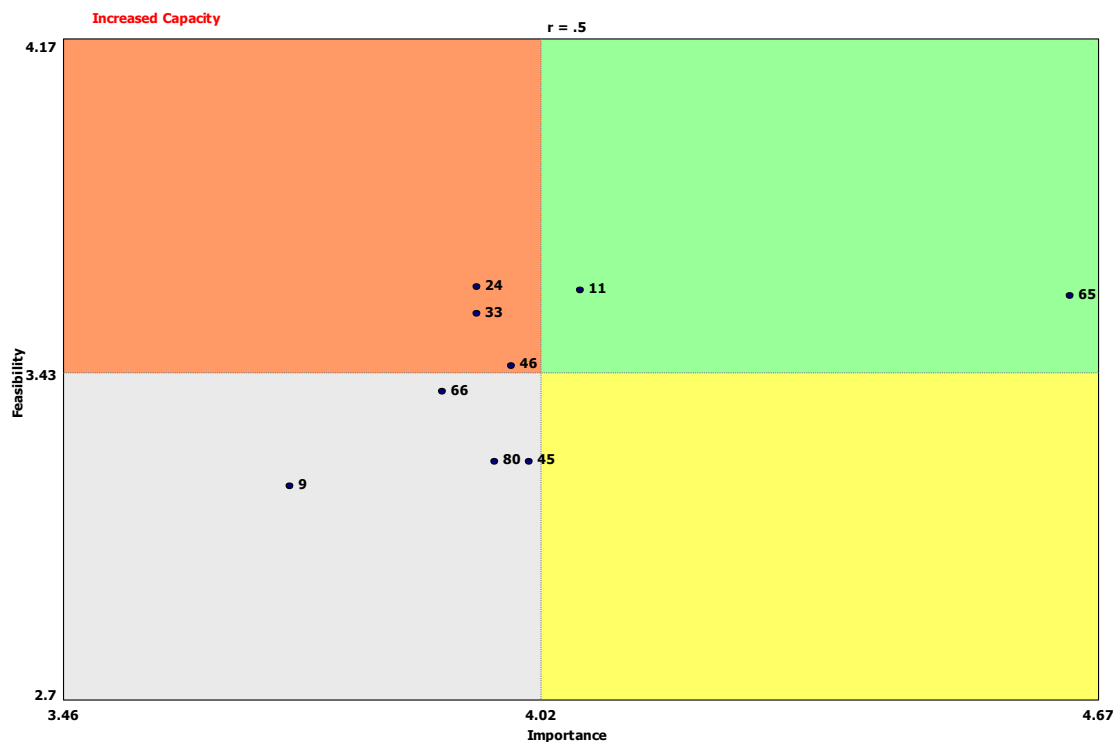


Figure 32: Go-Zone Chart for Increased Capacity Cluster (RWANDA)

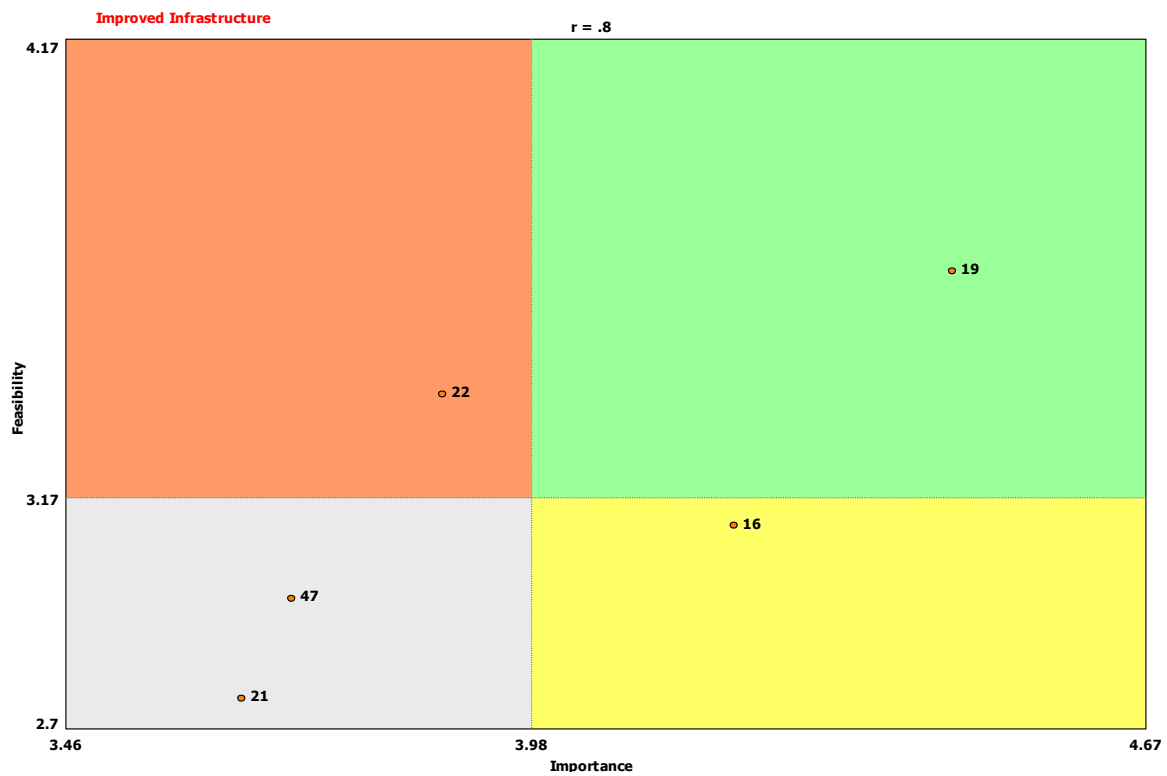


Figure 33: Go-Zone Chart for Improved Infrastructure Cluster (RWANDA)

APPENDIX C

Table 5: List of Brainstormed Statements (BANGLADESH)

Number of Statements	Name of Statements
1	I had access to quality seed for rice and vegetables
2	Farmers knew the recommended doses of fertilizers to use
3	Poultry Farmers could buy feed and medicines on credit
4	There were government standards for quality seed and supply
5	There were more suggestions on what to do about labor wages in rice production
6	Farming costs did not rise faster than the market prices
7	Fertilizer prices were reduced or government incentives provided
8	There was an ability to communicate with the local dealer to check the availability of fertilizers and insecticides
9	Extension agents routinely visited my home or farm
10	I knew the best practices of other farmers
11	Local traders had accurate information about the name and doses of pesticide for insect infestation
12	Veterinary surgeon was available to advise and visit my poultry farm
13	I could receive more advice from a veterinary surgeon by using mobile phone
14	I can get poultry autopsy diseases information without traveling to the city
15	Advice of veterinary surgeon was not expensive
16	I had more access to the Upazila Fisheries Officer
17	We supported the extension agents who give good advices and are available in common places
18	Government can continue to improve road communication
19	Truck transporting costs were reduced
20	I could use mobile phone to inform the retailer before harvesting my product
21	I could use mobile phone to communicate to the retailer before marketing my poultry
22	I could sell my vegetables and rice in local market directly
23	I received fair price through direct marketing in Mymensingh
24	I could talk to different middlemen/retailers using mobile phone before fixing price of my product
25	I could buy fruits from different retailer market directly
26	I could use mobile phone to know the latest market price and availability of seasonal fruits
27	There was farmers' cooperative system
28	More training and information about 'mobile marketing' and or 'internet marketing' was available
29	I had access to quality seeds
30	There was more availability of quality fingerlings
31	There was better cold storage facility for fish
32	There was improved storage so I could get higher prices for products
33	There was internet facility to know accurate market information
34	There was a mobile phone system that provide honest and accurate market information
35	I can produce more high quality products
36	There were standard Bangladesh regulations for pesticide use
37	Pesticide products were the better quality
38	I had access to improve quality of seed
39	There was improved quality of fertilizer
40	I had access to more information about market changes in future direction
41	I had access to quality feed
42	I had access to the same market information that big merchants have
43	More information about certain poultry bird diseases was available
44	I had access to internet based market information system in combination with mobile phone system

Table 5: List of Brainstormed Statements (BANGLADESH) continued

Number of Statements	Name of Statements
45	Support for developing cooperative to assist investment and loans was available
46	There was more access to general storage capacity for crops of small and medium size farmers
47	Government would support compensation to farmers re their loss of investment due to bird flu and other diseases
48	More training on bio security for poultry farmers was available
49	Current market and price information at local and district levels was available
50	There was increase training for farmers on timing crop harvest for maximum profits
51	Training on shell life and post-harvest technologies was available
52	Increase opportunity for processing and packing crops at the local or district level existed
53	More seed trials in a variety of geographical locations took place
54	Government and NGO support for SMS and mobile device agricultural information system existed
55	Government subsidized cold storage
56	Increased training for farmers in crop production technology, market information, processing, and post harvest was available
57	Farmers had training on information technology
58	Farmers had training on analysis of future market trends
59	There was improve quality control system
60	Farmers had a better idea of how to use extension workers information, advice and expertise
61	Government support of training for local traders who sell seed variety was available
62	General media (newspaper, TV, radio) made more agricultural information available
63	Customers had more information about agricultural products
64	There were more government regulations on the quality of imported fish
65	Small farmers had direct access to market
66	There was a permanent market with a guaranteed minimum price for selected crops
67	There was required milk pasteurization for farmers and consumers
68	There were more pasteurization centers for milk farmers
69	There were more training for farmers provided by NGO and other organizations
70	There were more government support for livestock farmers
71	There were more government support for fish farmers
72	There were more consistency between agricultural policy and practices
73	There was consistent and reliable products supplied by farmers
74	There were more women extension agents available to work with female farmers
75	I knew the up-to-date agricultural commodities price information
76	Mobile phone marketing technology was slowly introduced into the market place
77	I knew the current prices of different commodities
78	Poor transportation infrastructure was improved
79	There was availability of processing in rural areas
80	There was an increase farmers' yield
81	Retailers had direct access to farmers
82	The role of the middlemen did not reduce the profit for farmers
83	Transportation costs could be reduced
84	I knew the different market locations
85	Daily price fluctuation information was available to everyone
86	I had accurate source of local weather information
87	Wholesalers wishing to increase profits could contact farmers
88	There were fair price for livestock
89	There was marketing information by geographic locations
90	I had more information about exporting my products

Table 6: List of Statements by Cluster with Average Ratings (BANGLADESH)

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 1: Mobile Phone & Agriculture</u>			
44	I had access to internet based market information system in combination with mobile phone system **	5.00	4.40
26	I could use mobile phone to know the latest market price and availability of seasonal Fruits **	5.00	4.60
34	There was a mobile phone system that provide honest and accurate market information **	5.00	4.40
24	I could talk to different middlemen/retailers using mobile phone before fixing price of my product **	5.00	4.25
21	I could use mobile phone to communicate to the retailer before marketing my poultry **	5.00	4.65
20	I could use mobile phone to inform the retailer before harvesting my product **	5.00	4.65
76	Mobile phone marketing technology was slowly introduced into the market place **	5.00	4.43
28	More training and information about 'mobile marketing' and or 'internet marketing' was available	4.93	4.15
33	There was internet facility to know accurate market information	4.90	3.80
13	I could receive more advice from a veterinary surgeon by using mobile phone	4.80	4.08
23	I received fair price through direct marketing in Mymensingh	4.75	3.65
54	Government and NGO support for SMS and mobile device agricultural information system existed	4.75	3.95
		Ave.: 4.93	Ave.: 4.25
<u>Cluster 2: Market Analysis</u>			
22	I could sell my vegetables and rice in local market directly **	5.00	4.33
75	I knew the up-to-date agricultural commodities price information **	5.00	4.35
85	Daily price fluctuation information was available to everyone	4.98	3.83
65	Small farmers had direct access to market **	4.98	4.15
77	I knew the current prices of different commodities **	4.95	4.10
89	There was marketing information by geographic locations	4.95	3.95
84	I knew the different market locations **	4.93	4.25
81	Retailers had direct access to farmers **	4.90	4.28
25	I could buy fruits from different retailer market directly **	4.88	4.33
87	Wholesalers wishing to increase profits could contact farmers	4.83	3.83
49	Current market and price information at local and district levels was available	4.78	4.08
42	I had access to the same market information that big merchants have	4.70	3.90
40	I had access to more information about market changes in future direction	4.45	3.58
90	I had more information about exporting my products	4.43	3.43
		Ave.: 4.84	Ave.: 4.03
<u>Cluster 3: Market Coordination</u>			
66	There was a permanent market with a guaranteed minimum price for selected crops **	5.00	3.80
82	The role of the middlemen did not reduce the profit for farmers **	4.80	3.60
88	There were fair price for livestock	4.20	2.88
6	Farming costs did not rise faster than the market prices	3.88	2.95
		Ave.: 4.47	Ave.: 3.31

Table 6: List of Statements by Cluster with Average Ratings (BANGLADESH) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 4: Sourcing Quality Products</u>			
1	I had access to quality seed for rice and vegetables **	4.43	2.93
30	There was more availability of quality fingerlings **	4.33	2.53
29	I had access to quality seeds **	4.25	2.48
79	There was availability of processing in rural areas	4.18	2.20
59	There was improve quality control system	4.10	2.30
46	There was more access to general storage capacity for crops of small and medium size Farmers **	4.08	2.73
52	Increase opportunity for processing and packing crops at the local or district level Existed **	4.05	2.73
41	I had access to quality feed	3.95	2.45
68	There were more pasteurization centers for milk farmers	3.93	2.18
67	There was required milk pasteurization for farmers and consumers	3.93	2.45
38	I had access to improve quality of seed	3.90	2.43
36	There were standard Bangladesh regulations for pesticide use	3.90	2.28
4	There were government standards for quality seed and supply	3.85	2.20
39	There was improved quality of fertilizer	3.78	2.43
8	There was an ability to communicate with the local dealer to check the availability of fertilizers and insecticides	2.58	1.65
		Ave.: 3.95	Ave.: 2.40
<u>Cluster 5: Farmer Awareness</u>			
63	Customers had more information about agricultural products **	4.13	3.28
35	I can produce more high quality products **	4.05	2.85
10	I knew the best practices of other farmers **	4.05	3.05
73	There was consistent and reliable products supplied by farmers **	4.03	2.93
58	Farmers had training on analysis of future market trends **	4.03	3.18
80	There was an increase farmers' yield **	4.03	2.75
14	I can get poultry autopsy diseases information without traveling to the city **	3.90	2.88
16	I had more access to the Upazila Fisheries Officer	3.85	2.48
86	I had accurate source of local weather information	3.70	2.33
62	General media (newspaper, TV, radio) made more agricultural information available	3.65	2.48
43	More information about certain poultry bird diseases was available	3.35	2.05
		Ave.: 3.89	Ave.: 2.75

Table 6: List of Statements by Cluster with Average Ratings (BANGLADESH) continued

Name of Clusters and Statements with Number (** Go-Zone Statements: Rated above the mean in both Importance & Feasibility)		Average Rating Value	
		Importance	Feasibility
<u>Cluster 6: Government Initiative</u>			
27	There was farmers' cooperative system **	4.48	3.15
32	There was improved storage so I could get higher prices for products **	4.20	2.58
55	Government subsidized cold storage	4.20	2.28
18	Government can continue to improve road communication	4.18	2.10
72	There were more consistency between agricultural policy and practices	4.15	2.18
47	Government would support compensation to farmers re their loss of investment due to bird flu and other diseases	4.08	1.70
7	Fertilizer prices were reduced or government incentives provided	4.08	1.95
31	There was better cold storage facility for fish **	4.05	2.40
45	Support for developing cooperative to assist investment and loans was available	3.95	2.55
64	There were more government regulations on the quality of imported fish	3.75	2.40
70	There were more government support for livestock farmers	3.70	2.20
71	There were more government support for fish farmers	3.68	2.25
3	Poultry Farmers could buy feed and medicines on credit	3.68	2.95
Ave.: 4.01		Ave.: 2.36	
<u>Cluster 7: Training & Technology</u>			
56	Increased training for farmers in crop production technology, market information, processing, and post harvest was available **	4.20	3.00
57	Farmers had training on information technology **	4.05	2.88
9	Extension agents routinely visited my home or farm	3.98	2.33
48	More training on bio security for poultry farmers was available	3.95	2.40
15	Advice of veterinary surgeon was not expensive	3.95	1.95
50	There was increase training for farmers on timing crop harvest for maximum profits **	3.93	3.00
69	There were more training for farmers provided by NGO and other organizations **	3.90	2.90
51	Training on shell life and post-harvest technologies was available **	3.83	2.98
60	Farmers had a better idea of how to use extension workers information, advice and expertise	3.83	2.48
12	Veterinary surgeon was available to advise and visit my poultry farm	3.83	2.28
2	Farmers knew the recommended doses of fertilizers to use	3.78	2.70
17	We supported the extension agents who give good advices and are available in places	3.65	2.20
5	There were more suggestions on what to do about labor wages in rice production	3.18	2.15
74	There were more women extension agents available to work with female farmers	3.10	2.10
Ave.: 3.79		Ave.: 2.52	
<u>Cluster 8: Seed & Pesticide Regulations</u>			
61	Government support of training for local traders who sell seed variety was available **	3.55	2.25
37	Pesticide products were the better quality	3.45	1.90
53	More seed trials in a variety of geographical locations took place	3.15	1.88
11	Local traders had accurate information about the name and doses of pesticide for insect infestation	2.53	1.78
Ave.: 3.17		Ave.: 1.95	
<u>Cluster 9: Transportation</u>			
78	Poor transportation infrastructure was improved **	4.53	2.35
83	Transportation costs could be reduced **	4.33	2.35
19	Truck transporting costs were reduced	3.95	2.20
Ave.: 4.27		Ave.: 2.30	



Figure 34: Go-Zone Chart for Mobile Phone & Agriculture Cluster (BANGLADESH)



Figure 35: Go-Zone Chart for Market Analysis Cluster (BANGLADESH)

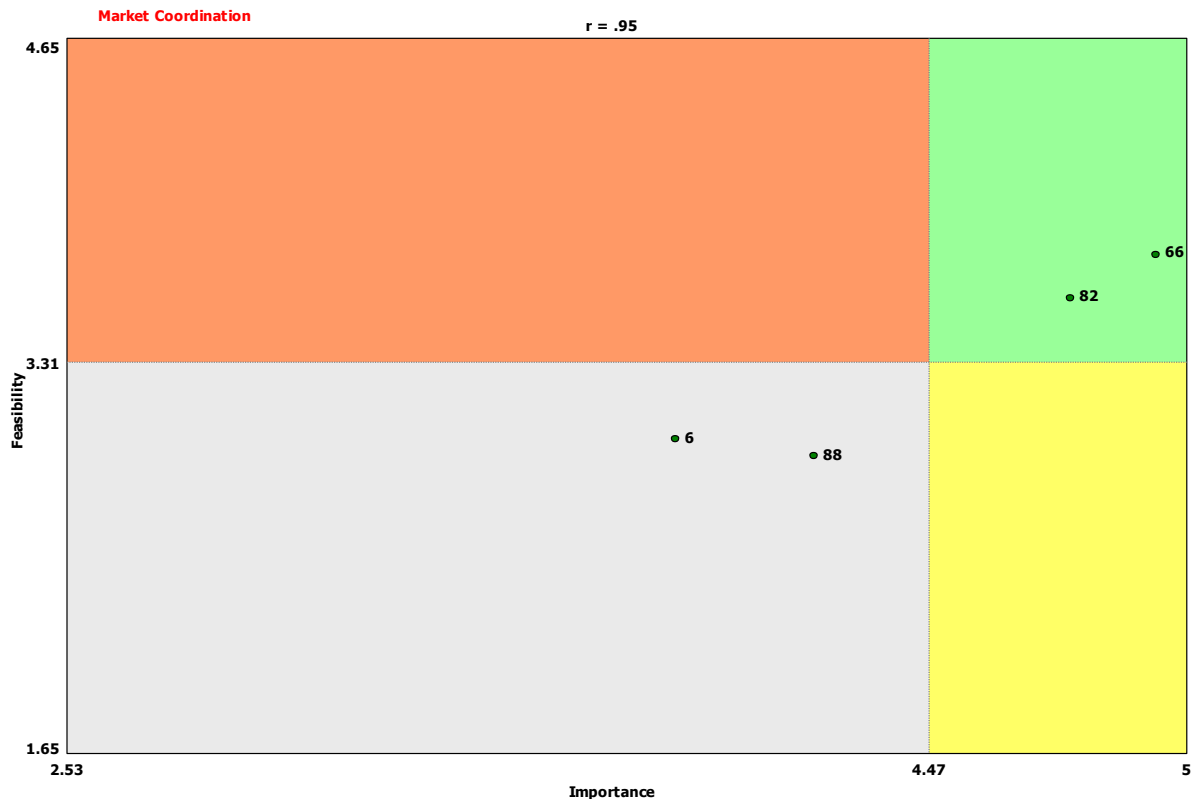


Figure 36: Go-Zone Chart for Market Coordination Cluster (BANGLADESH)

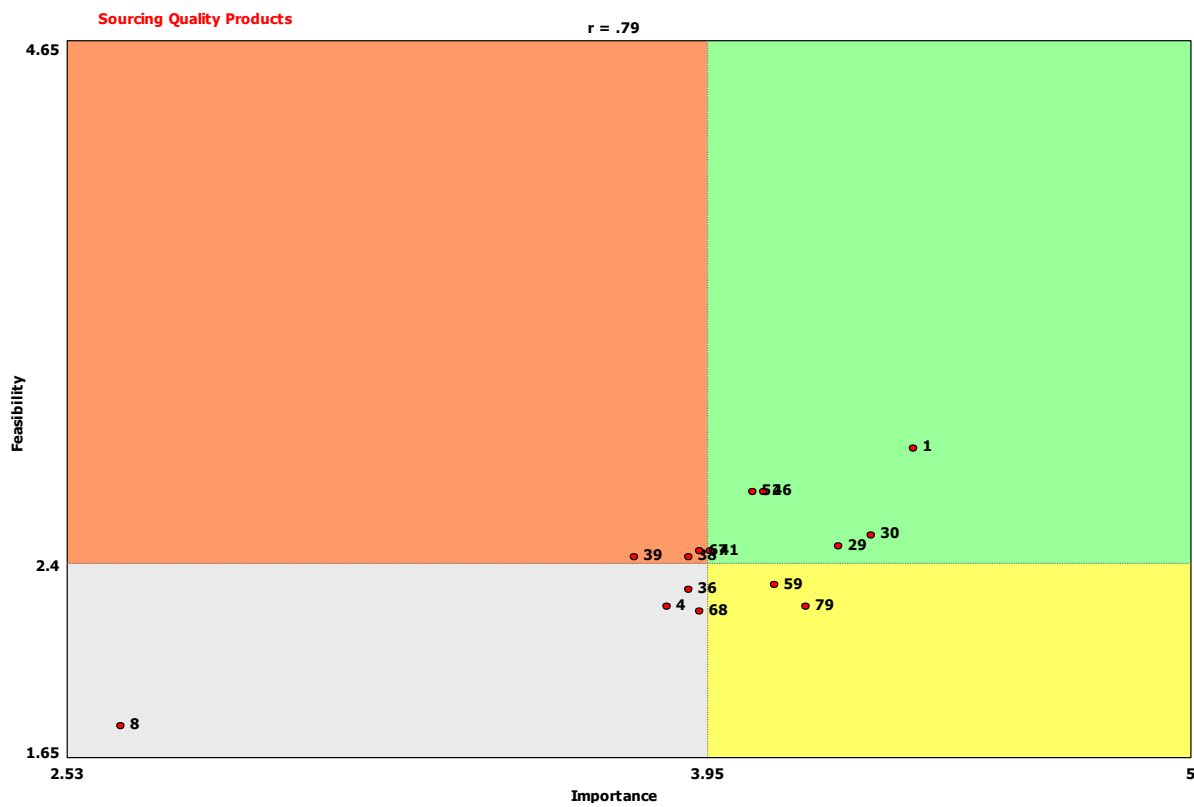


Figure 37: Go-Zone Chart for Sourcing Quality Products Cluster (BANGLADESH)

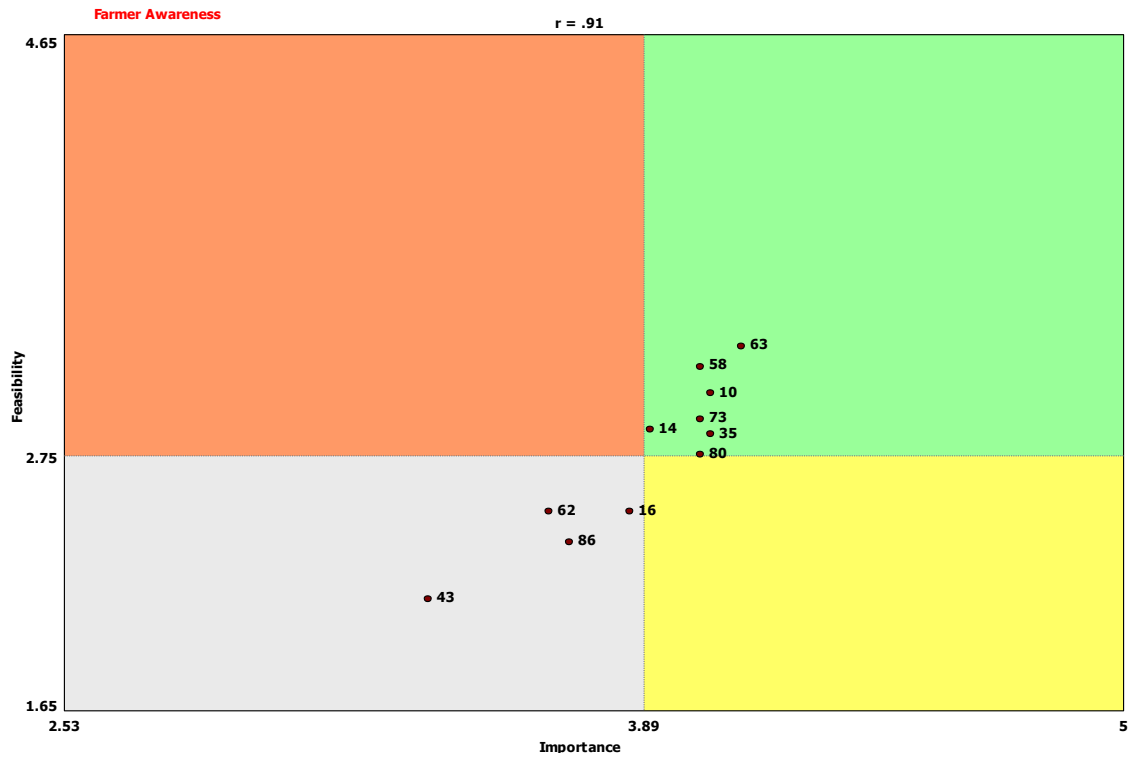


Figure 38: Go-Zone Chart for Farmer Awareness Cluster (BANGLADESH)

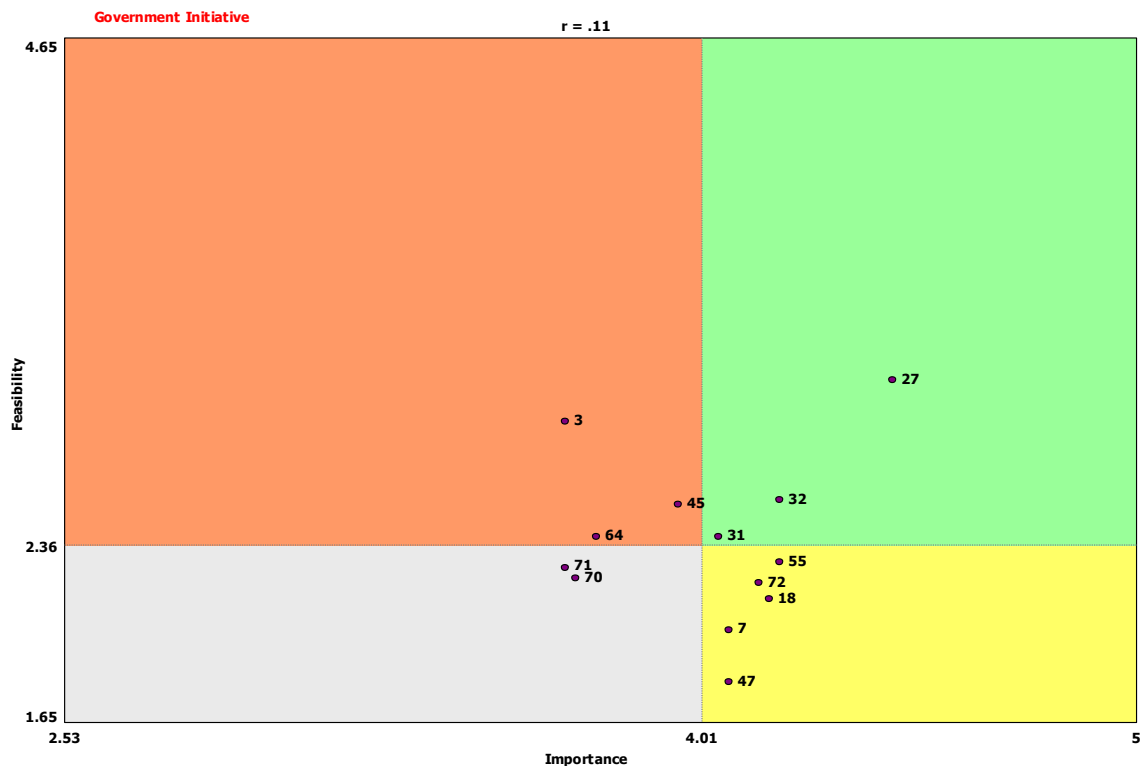


Figure 39: Go-Zone Chart for Government Initiative Cluster (BANGLADESH)

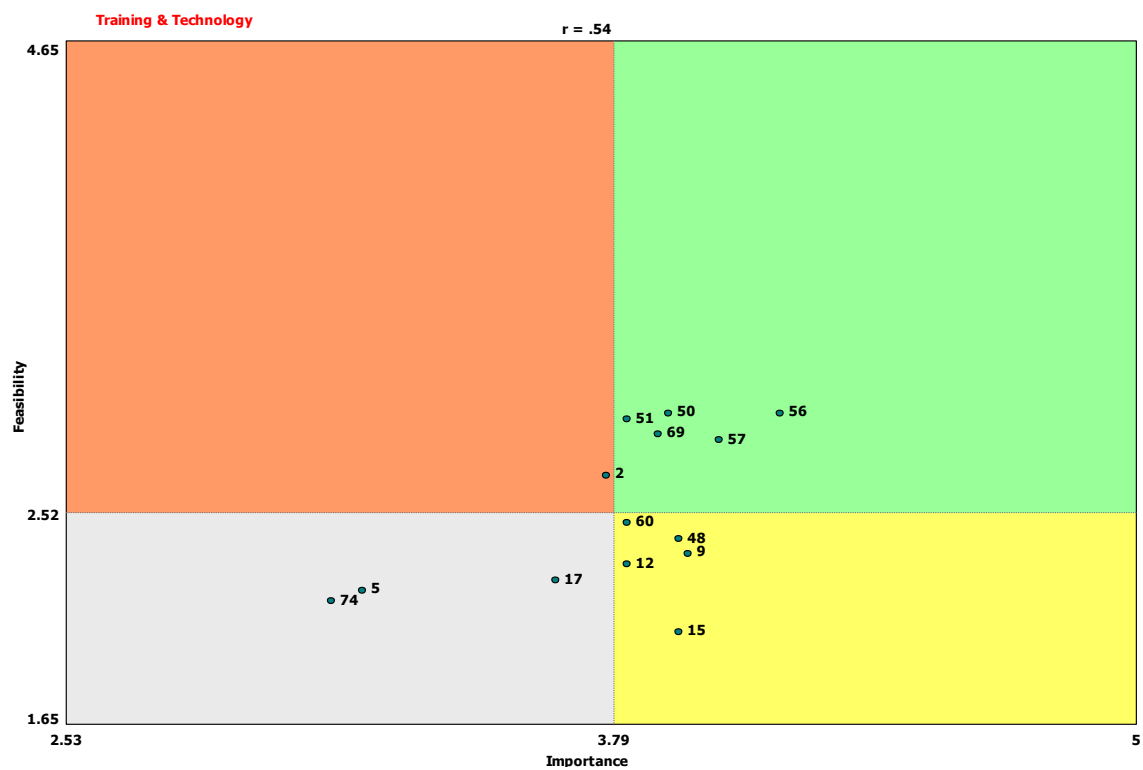


Figure 40: Go-Zone Chart for Training & Technology Cluster (BANGLADESH)

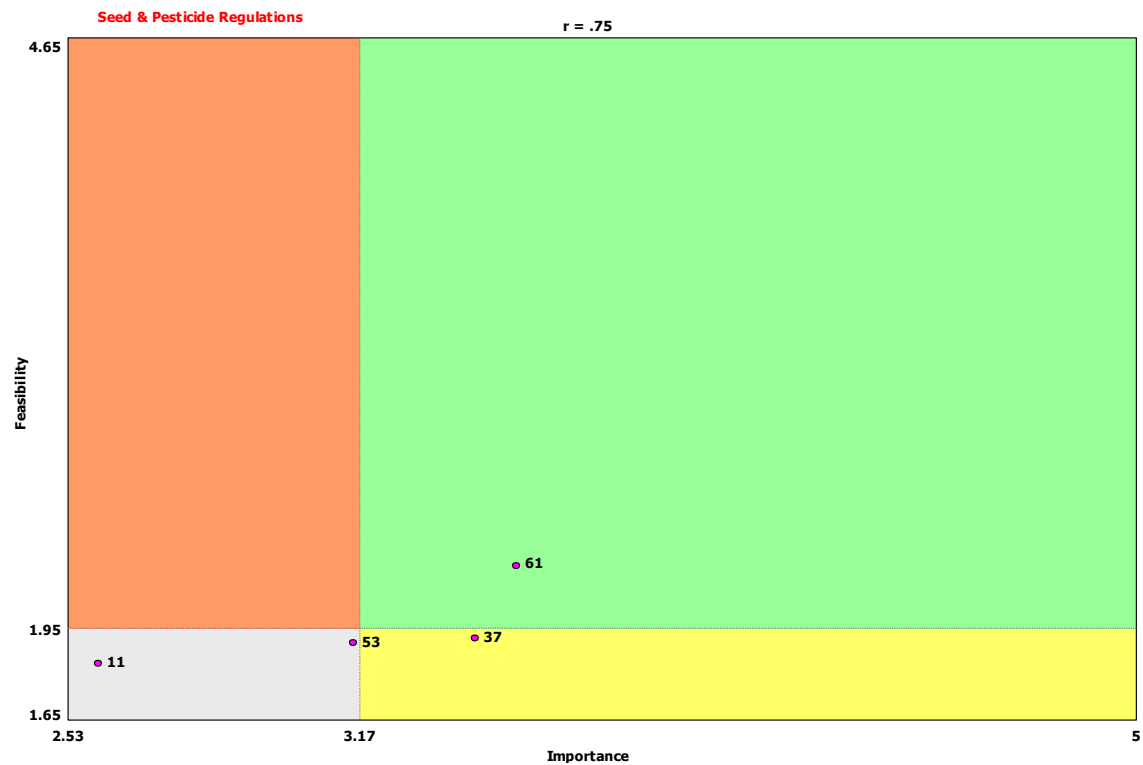


Figure 41: Go-Zone Chart for Seed & Pesticide Regulations Cluster (BANGLADESH)

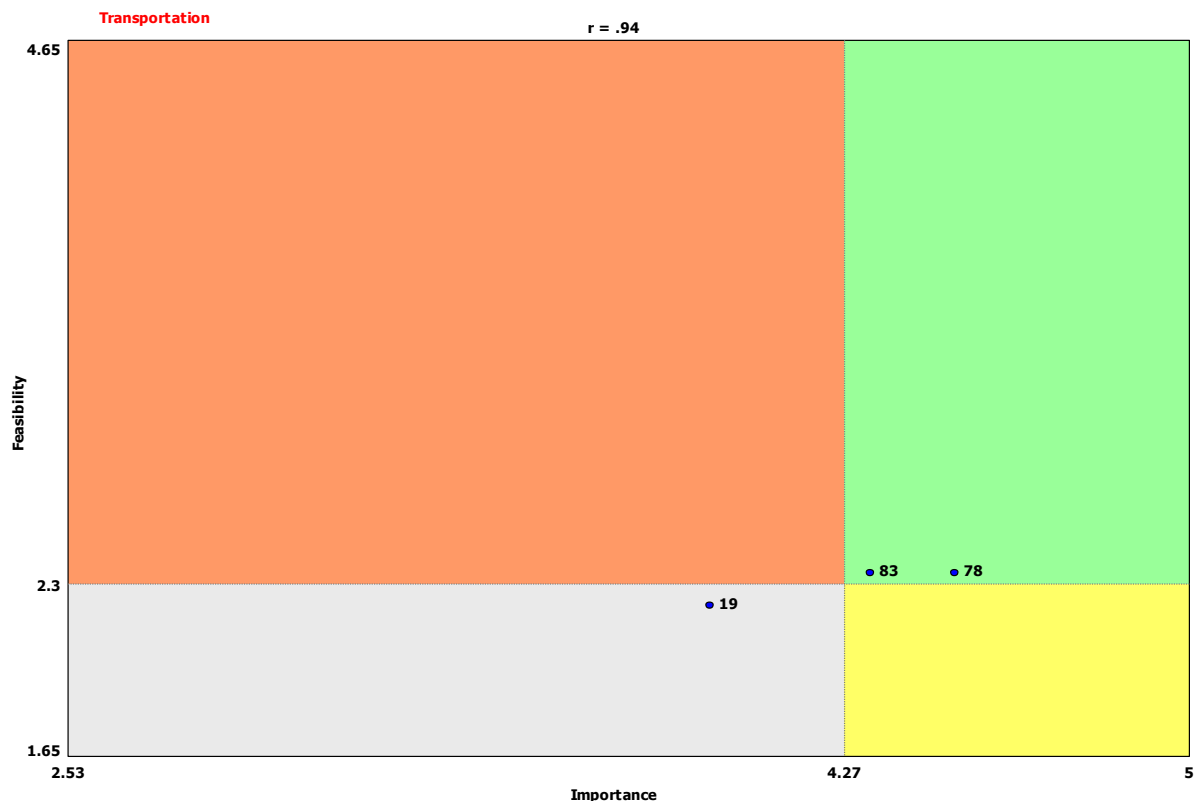
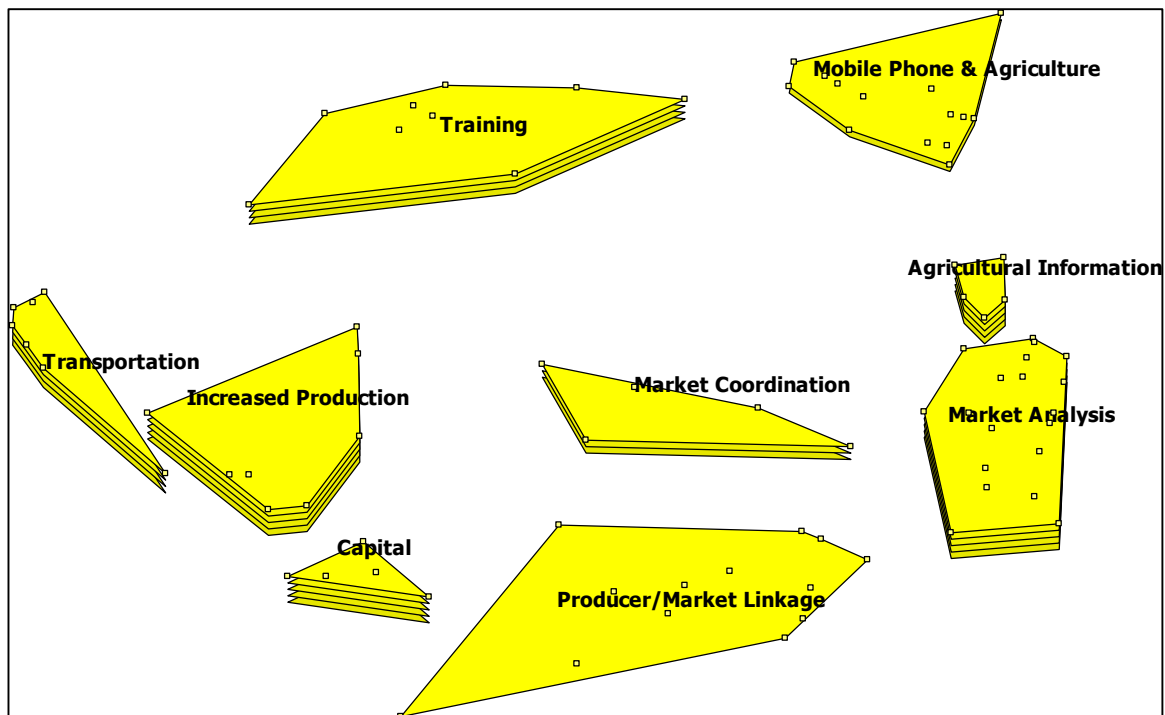
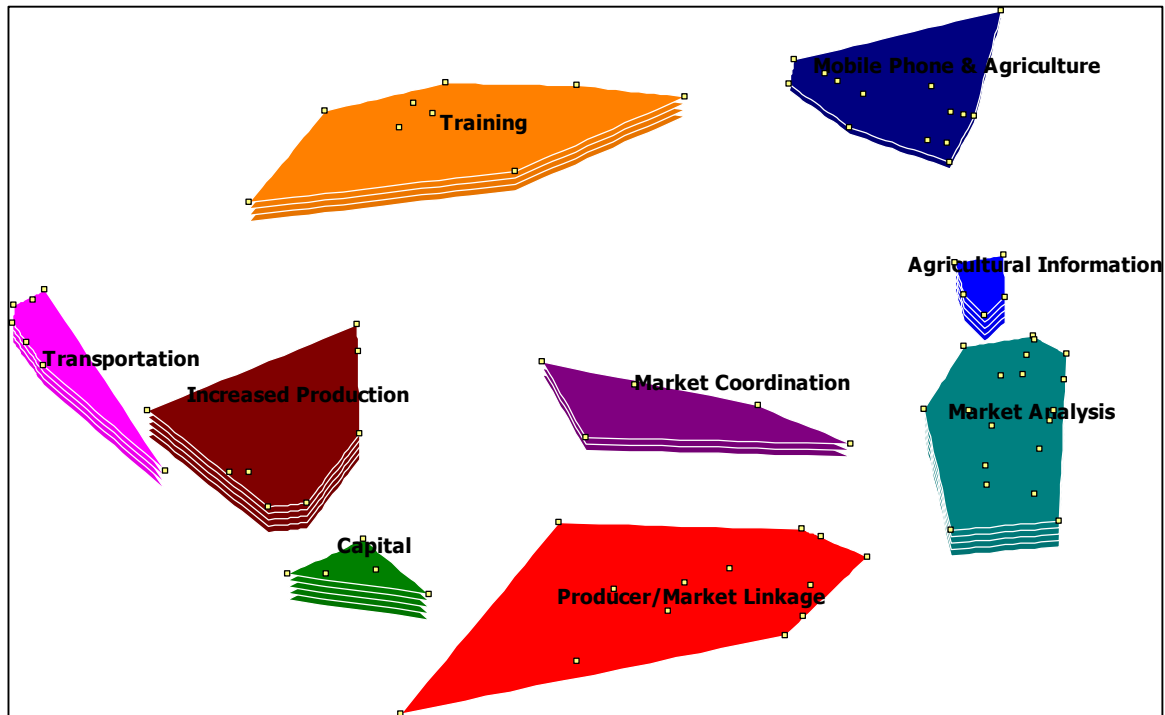
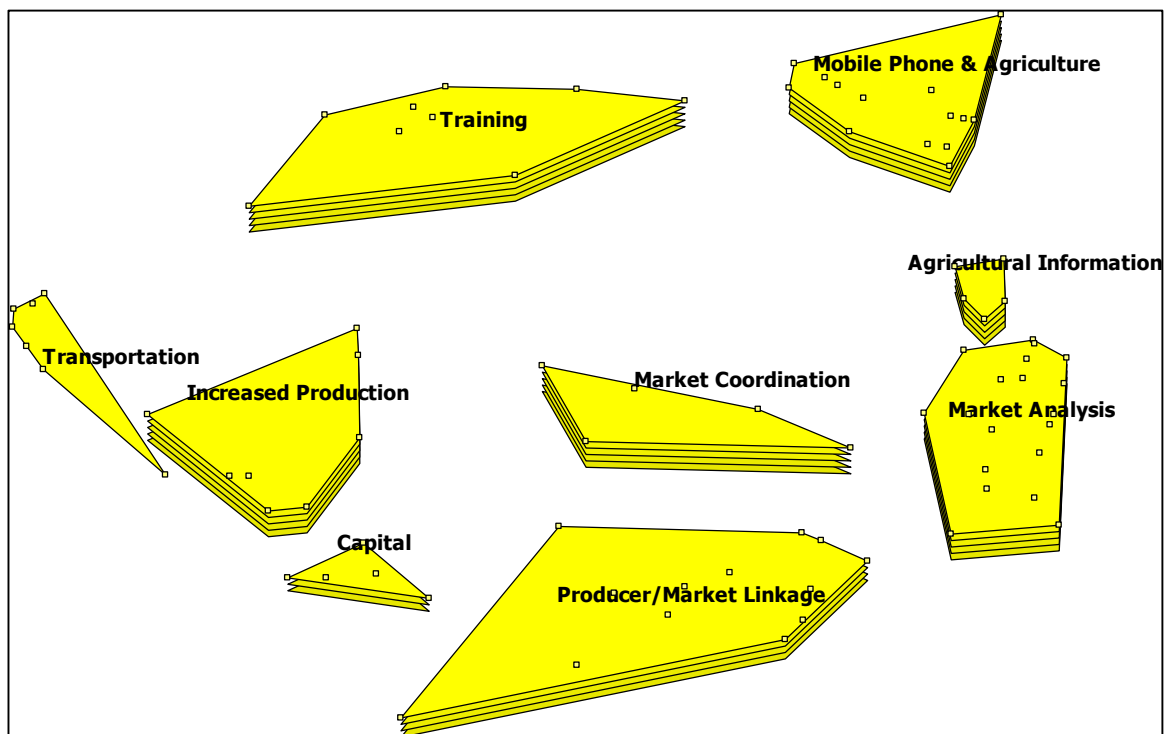
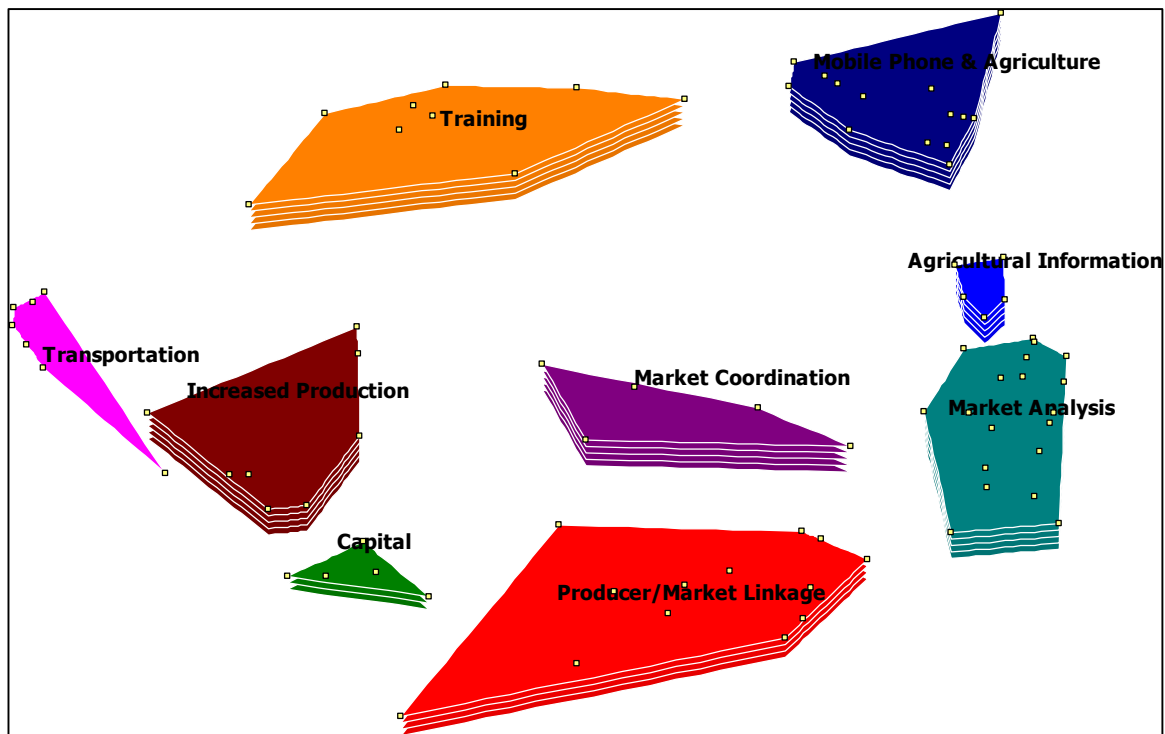


Figure 42: Go-Zone Chart for Transportation Cluster (BANGLADESH)

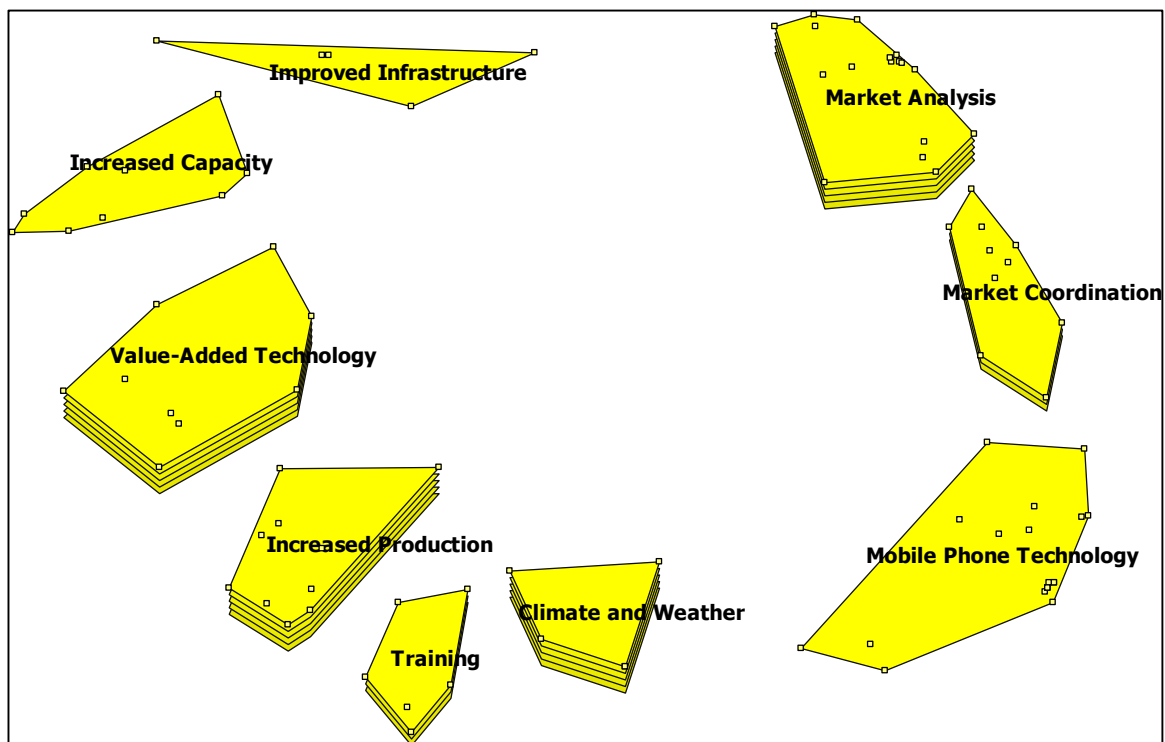
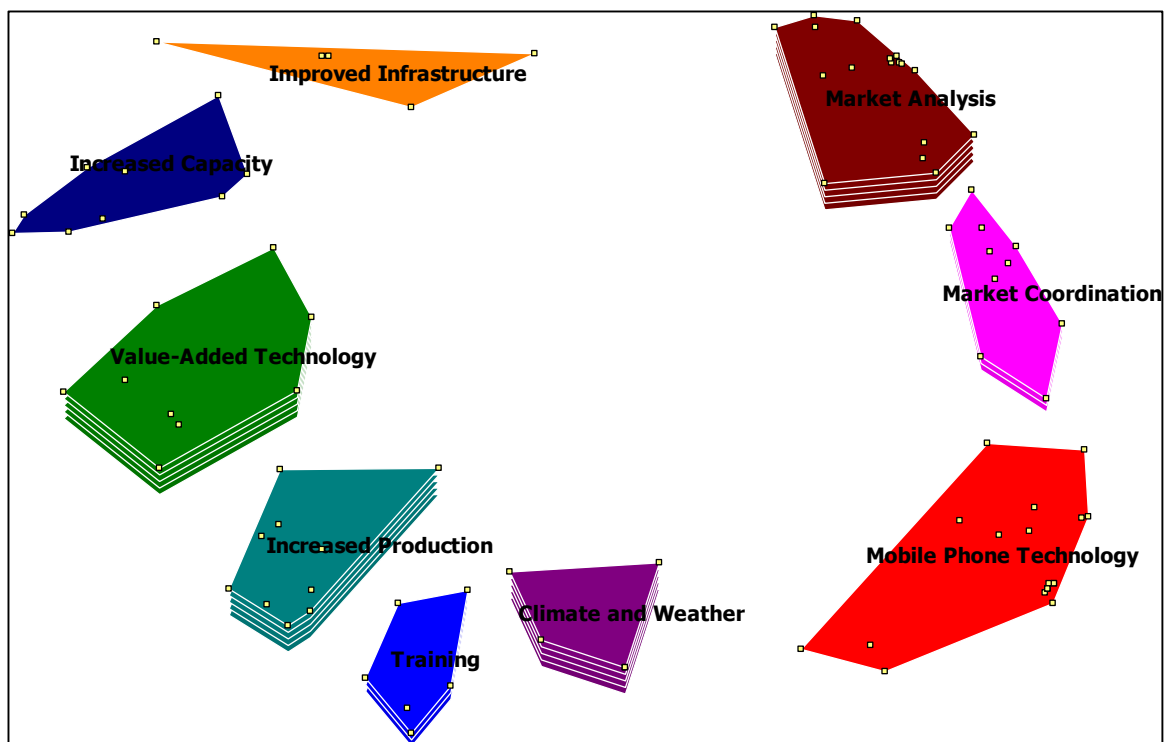
Importance -Ethiopia



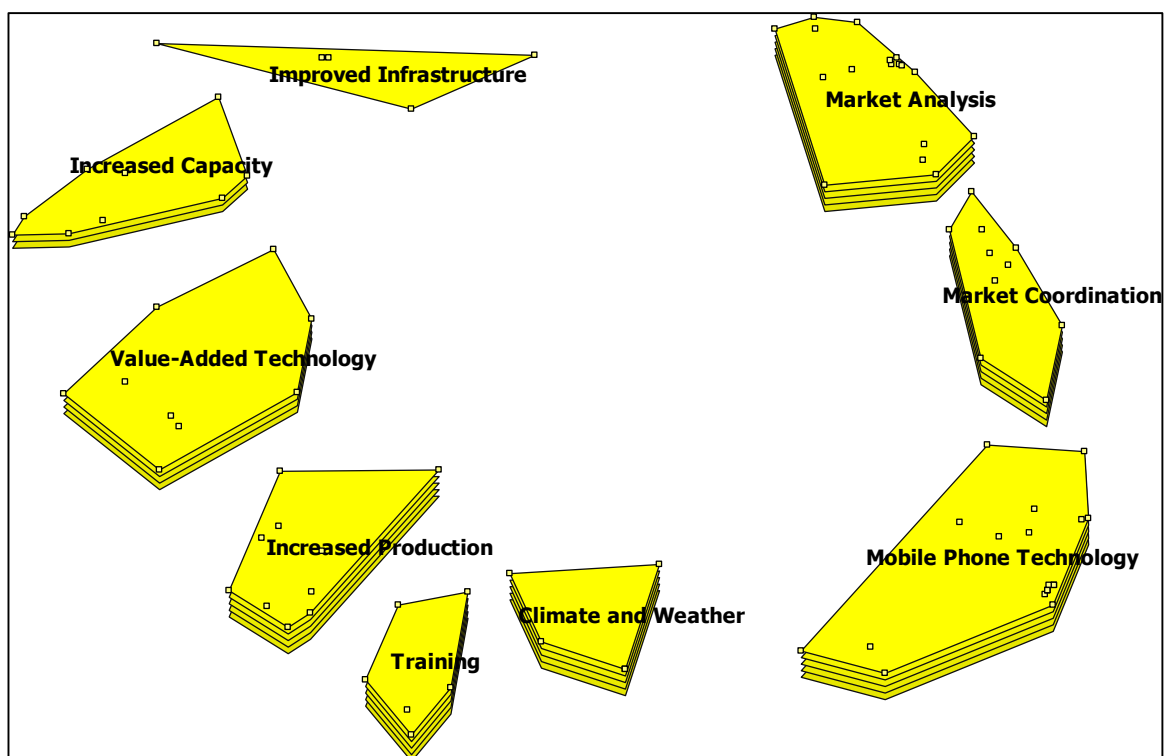
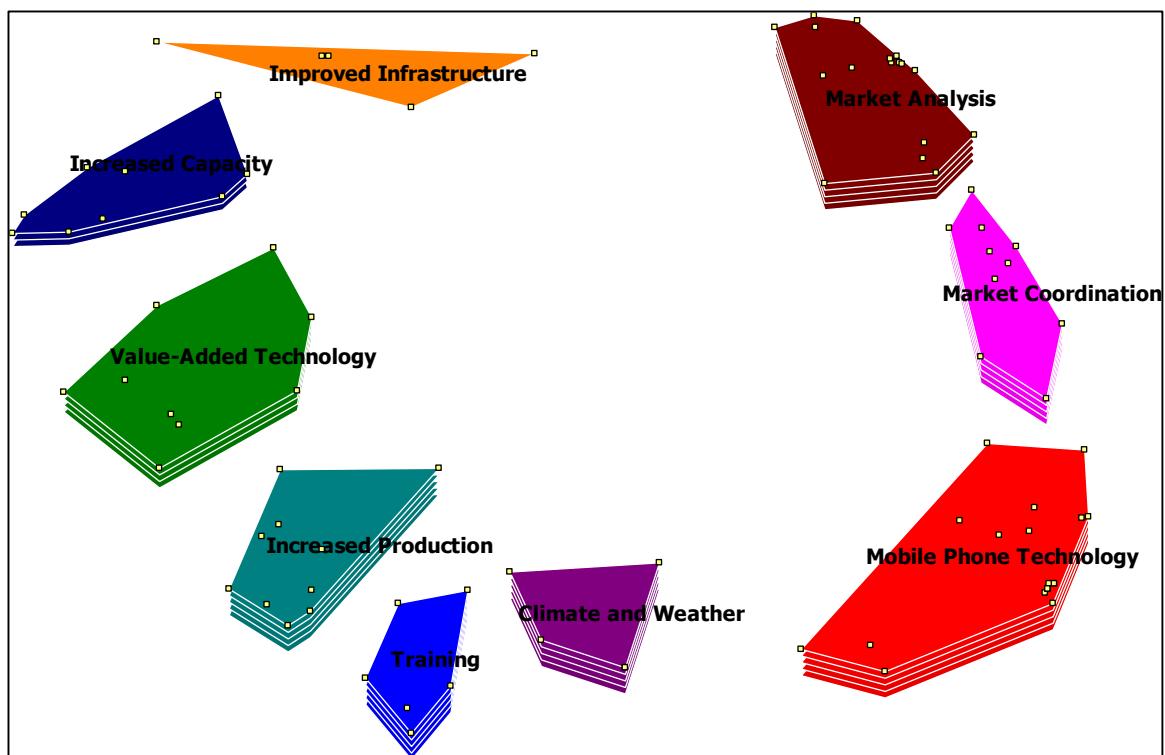
Feasibility – Ethiopia



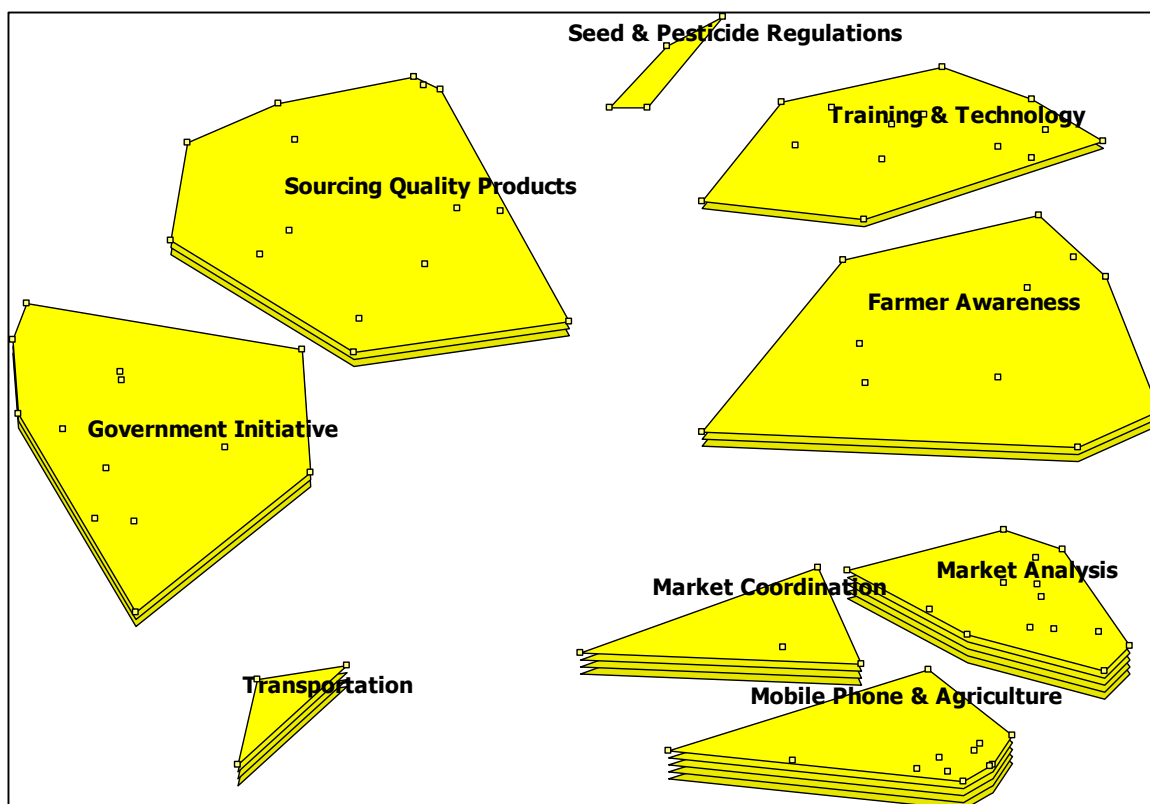
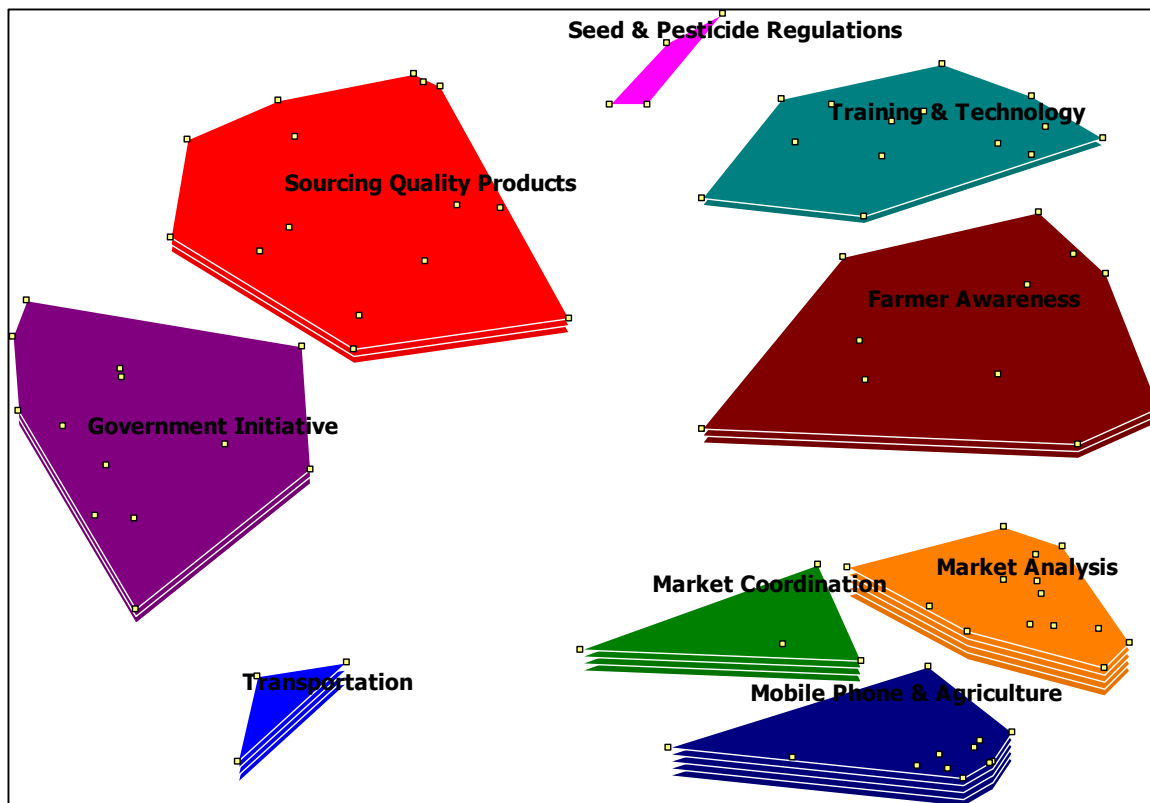
Importance – Rwanda



Feasibility – Rwanda



Importance-Bangladesh



Feasibility-Bangladesh

