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**AN OVERVIEW OF  
AGRICULTURAL MARKET INFORMATION SYSTEMS  
SPECIAL REFERENCE TO MOROCCO**

by

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# AN OVERVIEW OF AGRICULTURAL MARKET INFORMATION SYSTEMS

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## INTRODUCTION

As Morocco moves toward liberalization of cereals and other agricultural markets, market information will become increasingly important to farmers, traders and food processors as well as to the government and other market regulatory agencies. The following is an overview of key considerations in establishing market information systems in developing countries. It is intended to provide a basic framework for designing improved market information systems which will help meet the challenges of the newly evolving marketing environment.

Even though there has been considerable experience in establishing agricultural market information systems, the literature on this topic is fragmentary. The References listed at the end of this report contains what appears to be a substantial portion of what has been written on market information and related subjects over the past several decades. While key sections of a number of these documents have been woven into the report, a careful study of the original documents should provide highly valuable as "case studies" for those responsible for the design and management of market information systems in Morocco.

Finally, it should be noted that this report was prepared as one part of a group effort by representatives from ONICL and DPAAE to arrive at a preliminary plan of action for improving market information systems within the MARA. Further details on technical issues, can be found in the group's report "Système d'Information sur le Marché des Céréales: Plan d'Action Proposé" (CMR Report 15).

## EXECUTIVE SUMMARY

"...Improvement in market transparency is probably the most important single support which can be given to the establishment and protection of a competitive marketing system."

- (E. Ruesse in *Food Policy*, November, 1987)

The major objective of a market information system (MIS) is to increase "market transparency" or the degree of information that farmers, traders, final consumers and market control institutions have about the parameters relevant to their marketing decisions.

Enhancing market transparency can help meet the marketing information needs weaker market participants, such as farmers and small scale traders. Increased farmer bargaining power, and the resulting higher income and production incentives is perhaps the fundamental goal, but traders, consumers and government and other institutions can also benefit.

With prices serving as the main "signals" which allocate economic resources, enhanced price information can serve to better allocate resources as well as to increase competition, thereby causing markets to operate more efficiently. For example, short term inter-regional supply/demand imbalances can sometimes result in part from limited availability of information. Timely and accurate market information can help stimulate commodity flows to mitigate surplus and deficit situations, thereby reducing extreme price fluctuations, decreasing possible spoilage of the surplus goods, narrowing marketing margins and improving overall food security. Market information can also serve as a key input to improved decision making by government, financial institutions, international aid agencies and other institutions.

A number of factors cause limited market transparency, especially in developing countries. These often include inadequate infrastructure, illiteracy, lack of standardization of weights, packaging, qualities and contract conditions; and "opaque" trading practices. Enhancing market transparency is obviously not a panacea for all marketing problems, and clearly many market participants already have their own means of acquiring information on which to base their marketing decisions. Still, the overall benefits to the national economy can far outweigh the modest costs of such a service.

Market information is often considered a "public good" which the state has a legitimate role in providing. Furthermore, the ongoing process towards privatization of agricultural markets requires that the government take on new roles and responsibilities such as providing market information and improving credit markets. In addition, ready access to market information, both domestic and foreign, is a crucial element in a successful export diversification program.

Market information can mean different things to different people. However, it is highly unlikely that a market information system can be "all things to all people". Therefore, a market information system must focus on meeting the most vital information requirements of selected user groups. A market information system, sometimes referred to as a "Market News Service" focuses on rapid public dissemination of basic information concerning prices and market conditions for key commodities in domestic markets. Timeliness, rather than extensiveness, is the key. However, the system's objectives are closely related to, but still distinct from those of other market intelligence systems or institutions, such as outlook and situation services, commodity analysis systems early warning systems for food security, trade information/market research services and marketing extension programs.

Since it is crucial that the various users of the MIS have confidence in the reliability of the information disseminated, extreme care must be taken in designing the system. This means that projects involving market information cannot rely on a "trial and error approach" - information must be reliable right from the start of the dissemination process. The fact that information must also be timely is another reason for the need for careful planning.

The main criteria for an agricultural market information system can be summarized as follows:

1. Provide timely, relevant, accessible and consistent information to targeted user groups in an effective and efficient manner;
2. Adaptable structurally and conceptually to changing conditions;
- and 3. Consistent with human, financial and institutional capabilities.

There is often a tendency to overly ambitiousness when formulating information systems - the practical day-to-day requirements are easily underestimated. A major challenge stems from the fact that a government agency is attempting to meet the needs of the private sector. The fast-paced and ever-changing world of the marketplace is in sharp contrast to the environment of the typical government bureaucracy.

Experience in establishing market information systems in developing countries has uncovered several frequently occurring "weak links" which require special attention - nearly all related directly to management issues:

1. How to standardize data collection and ensure reliability;
2. How to speed up the process of data collection, transmission and dissemination;
3. How to control and motivate field staff;
4. How to provide effective overall management to enable "operational discipline and continuity of the supply of resources" (especially funds); and
5. How to assure financial sustainability.

It is critical that the information disseminated is timely, and also be presented in such a way as to be easily understood and useful. This is a complex task. Among the different forms of dissemination, more or less in order of general usefulness for a developing country, are: radio reports, bulletin boards and flyers, newspaper reports, a weekly and/or monthly bulletin, telephone answering machines and other electronic means of information transfer via computers.

## THE ROLE OF MARKET INFORMATION SYSTEMS

"Commerce is inherently an information processing activity. Effective buying selling, brokerage, and transport require a continuous supply of up-to-date information on the availability and prices of numerous goods and services."

- (Robert J. Sanders et al., Telecommunications and Economic Development).

Any government giving serious attention to information requirements of its agricultural sector is faced with the issue of how

to design and implement an information system that will provide timely, relevant, accurate, accessible and consistent information to food and agricultural decision makers in an effective and efficient manner; that will be able to adapt structurally and conceptually to changing conditions in the target world and to evolving policy agendas, thus avoiding conceptual and institutional obsolescence; and that will be consistent with human, financial, and institutional capabilities of the country as those capabilities develop and grow over time - (FAO 1986, p.63).

Information has been called "an essential input to the decision process, much as sunlight is an essential input to the plant growth process". Furthermore, economic theory presents prices (or price information) as the basic signals which allocate various economic resources.

The degree to which a market can most efficiently allocate resources is significantly influenced by the accessibility of information by the individuals whose collective economic decision making comprises the markets.

In a competitive market economy, the bargaining position of buyers conditioned by the degree to which they are informed. The classical economic concept of a perfectly competitive market assumes perfect knowledge - a goal, of course, that is unattainable. Traditionally, agricultural producers have been labelled as "price takers". Part of this reputation stems from lack of effective organization but part also from lack of market information, which, in a systematic sense, may be called market intelligence - (McCoy and Sarhan, p.153).

Because of the prominent role which prices and associated market information play in the economy, a number of governments have attempted to establish agricultural market information systems to help stimulate the free flow of information to assist market participants. Government involvement in such services is seen as part of the public interest. In economic jargon, agricultural market information is often seen as a "public good" due to its high cost of collection and dissemination and due to the difficulties in establishing a viable commercial enterprise dealing in such information. This is particularly true in developing countries, where the perfect competition model is often even more of an "ideal" than it is in the developed countries. "Agriculture, particularly in developing countries, tends to be...an atomistic industry, thus justifying the importance, for the development and operation of the private sector, of government-supplied information" (FAO 1986, p.41).

A market information system as discussed in this report refers to a government service organization which systematically collects and disseminates information to market participants in a form which is relevant to their decision making. The main objective which the service aims at is to increase market transparency, or "the degree of information that primary suppliers, traders, final consumers, and market control institutions have about the parameters relevant to their marketing decisions" (Schubert, 1983, p.2).

Limited market transparency can be a problem in developed as well as in developing countries. In the former, the problem generally stems in large measure from industry structures which are highly concentrated and which therefore lead to various degrees of "inside" knowledge of vital information on markets. The international grain business, in which a handful of major firms handle substantial portions of the total volume of world grain trade is perhaps a case in point. However, that the information advantages which the firms might have are usually extremely short lived, and greatly mitigated by the existence of highly developed public and private information systems which have evolved over many years and which bring news of major factors affecting the markets around the world on a nearly instantaneous basis.

"The provision of information to all market participants is one of the most important conditions for ensuring market transparency and preventing the formation of private monopolies" (Dembele and Staatz, p.15). Another author further explains that "market transparency accelerates horizontal supply or demand adjustment by calling increased numbers of sellers or buyers to markets where price development is out of step, thereby making it difficult for the mono- or oligopolistically-inclined market participant to protect his/her domain. - (Reusse, p.316).

In less developed countries, numerous factors limit market transparency. These often include inadequate infrastructure, including roads, markets and communications facilities; illiteracy and low-level of education in general; lack of standardization of weights, packaging, qualities and contract conditions; supplies which are in units that are unsorted, small, discontinuous and a widely spatially separated; and "opaque" trading practices and general mistrust among market participants which limits the number of sales occurring on a credit or "sight unseen" basis.

As a result of the limited degree of market transparency, a number of serious and extremely costly problems occur. Farmers, because of their long hours of work in the fields and general isolation in rural areas, often do not have ready access to information on current market conditions. Farmers in most cases are more adept at production than at marketing. This contrasts with the trader who typically is more mobile, has closer links to market centers and communications systems and perhaps has greater education and a more sophisticated understanding of the markets. The result can often be significant disadvantages in terms of the farmer's bargaining power. In the long run, the lower prices which farmer would otherwise have received act as disincentives to production to the detriment of the farmer and also the country. Limited market transparency on the part of farmers also can reduce their decision making ability regarding planting (what and when) and marketing (where, when, and in what form).

Another facet of the role of market information is presented in the following comments:

It is established fact that economic agents, especially the small rural producers, lack information on current market prices. Moreover, since they are unaccustomed to attending anything but local markets, the resulting effect is a segmentation of the market into micro-markets depending on the agro-ecological area. This in turn prevents the emergence of a national cereal market. The purpose of information system on local prices of cereals (MIS) is to make sure that information is circulated so as to set up a clear, harmonized national market, thus enabling each economic agent to make his own purchasing, transfer and sales decisions with the knowledge of opportunities available to him. With this in mind, the MIS reports are regularly broadcast and published by the media. (COMAC, p.9).

Similarly, supply/demand imbalances between geographically separated markets, can result in part due to limited availability of information. Timely and accurate information can direct traders to take advantage of such imbalances of simultaneous surplus and deficits in different regions of the country, thereby bringing markets into "equilibrium". With price information helping to influence commodity flows in this way, extreme price fluctuations are reduced, spoilage of surplus commodities can be lessened, and overall food security is improved. Traders, exporters and others involved in business not only can benefit from information in short term decision making, they also require the information for long term business planning.

Consumers, whose economic decisions ultimately are the driving force in the markets, can also benefit from improved market transparency. However, retail markets typically have a relatively high degree of transparency as a result of price labeling and advertising.

Improvements in market information can prove highly valuable to governments and other institutions including banks and international development agencies. While not the primary function of a market information system, the periodic reports of the system can eventually form a useful statistical data base.

The move towards liberalization of agricultural markets in Morocco means that market information as a way to enhance market transparency will become increasingly important. This has been clearly recognized by key government officials dealing with agricultural marketing. One article on liberalization of agricultural markets

points out the need to view liberalization as a process rather than a one time event in which the government "gets out of agriculture". If liberalization is to lead to improved market performance, it is not enough that the state stop doing certain things, like running monopoly marketing systems. The state must also take on new responsibilities such as providing public information systems and improving credit markets, in order to facilitate the private trade's ability to respond to its new opportunities... - (Staatz et.al., p.29).

By way of summary, the following straight-forward description of the purpose of the U.S. Department of Agriculture's Market News Service, which has been operating for over 70 years (although not without initial "growth pains") may be of interest:

The up-to-the-minute reports collected and disseminated by professional market reporters are intended to provide both buyers and sellers with the information necessary for making intelligent, informed marketing decisions, thus putting everyone in the marketing system on an equal bargaining position.

## **THE RANGE OF MARKET INFORMATION**

The terms "market information system", "market intelligence system" and "market research" are sometimes used interchangeably, and can be interpreted differently by different people. However, it is highly unlikely that a market information system can be "all things to all people." Therefore, a market information system must focus on meeting the most vital information requirements of selected user groups. Furthermore, when planning for new information systems, it may be useful to have clear conceptions of various alternatives.

Table 1 attempts to clarify what is meant by the general area of "market intelligence" by presenting a concise overview of the most common types of market intelligence systems and institutions. Understanding the basics of these systems should facilitate defining the most appropriate information systems to be developed. This includes defining the "boundaries" of the system - i.e. what is, as well as what is not covered by the system.

For purposes of illustration, six different types of market information systems or institutions are outlined:

1. Situation and Outlook Service
2. Commodity Analysis System
3. Early Warning System for Food Security
4. Market Information or Market News Service
5. Trade Information Service/Market Research
6. Marketing Extension Service.

The categories are somewhat arbitrary since there is considerable overlap in the areas covered by each one. Note that these are for the most part associated with public institutions. Also, no attempt has been made to go into details about the specifics of a management information system used by individual firms or institutions for decision making.

TABLE 1  
 OUTLINE OF VARIOUS TYPES OF AGRICULTURAL MARKET INTELLIGENCE SYSTEMS

SYSTEM TYPE	PURPOSE	COVERAGE	COMMENTS
1. Situation and Outlook System	<ul style="list-style-type: none"> <li>- Inform government policy makers and public (especially farmers) about current and probable future supply/demand situation for specific commodities.</li> </ul>	<ul style="list-style-type: none"> <li>- Supply: Crop estimates, stock, imports.</li> <li>- Demand: Domestic usage (food, feed, industrial, seed, etc.) exports.</li> <li>- Prices: Estimate of general price ranges/price direction.</li> <li>- Other: Factors affecting supply/demand situation               <ul style="list-style-type: none"> <li>- government policies.</li> <li>- general economic conditions, world markets, weather, transportation, etc.</li> </ul> </li> <li>- Time frame: Outlook often covers next one year or one crop cycle. Analysis updated (published monthly/quarterly, semi-annually).</li> </ul>	<ul style="list-style-type: none"> <li>- Carried out by government's of many industrialized countries for public distribution.</li> <li>- International organizations also carry out (FAO, International Coffee Organization, etc.)</li> <li>- In LDC's typically done on adhoc basis and not released to public.</li> <li>- Situation and Outlook often critical input to agricultural policy process, but usually stops short of policy analysis.</li> </ul>
2. Commodity Analysis	<ul style="list-style-type: none"> <li>- Used by Agribusiness Organizations in marketing/purchasing decisions</li> </ul>	<ul style="list-style-type: none"> <li>- Similar to situation and outlook system, but (a) emphasis typically on specific forecasts of prices and; (b) time frame more long run.</li> <li>- Time frame: outlook often one year/crop cycle. However, updates are much more frequent.</li> </ul>	<ul style="list-style-type: none"> <li>- Carried out by private business, market advisory services/consulting firms and commodity brokerage houses.</li> </ul>
3. Early Warning System for Food Security	<ul style="list-style-type: none"> <li>- Inform governments on current and projected food security situation so as to plan for resolving food deficits and surplus.</li> </ul>	<ul style="list-style-type: none"> <li>- Coverage includes many of same factors as outlook and situation system.</li> <li>- Additionally, need to monitor/forecast food security at national, regional and household levels.</li> <li>- Includes food security of households outside/on margin of market economy.</li> </ul>	<ul style="list-style-type: none"> <li>- Recent phenomenon (past 10-20 years) in some Asian and African countries supported by donors (FAO, USAID, EEC, and others).</li> <li>- Still experimental. Previous emphasis was crop forecasting using agrometeorology and remote sensing. Nutrition monitoring now receiving more emphasis.</li> </ul>

TABLE 1 (CONTINUED)

SYSTEM TYPE	PURPOSE	COVERAGE	COMMENTS
4. Market Information or Market News Service	<ul style="list-style-type: none"> <li>- Increase market transparency and thereby boost farmers' bargaining power and improve overall efficiency of markets.</li> <li>- Users: Especially farmers, but also traders, consumers, government and other institutions.</li> </ul>	<ul style="list-style-type: none"> <li>- Emphasis on observed prices but also general market conditions at specific levels of market system (farm, wholesale, retail, etc.)</li> <li>- May include information on other factors affecting markets (quantities sold/offered, weather, transport, etc.)</li> <li>- Focus on reporting on markets - "news" rather than in-depth analysis.</li> <li>- Time frame: Reports updated daily, (sometimes hourly/instantaneously), weekly, or at a maximum monthly.</li> </ul>	<ul style="list-style-type: none"> <li>- Typically carried out by government - Market news is a "public good". News media receives information from government or sometimes collects information directly.</li> <li>- Experiences with market news in Africa are limited mostly to past 10 years. Knowledge/literature in general is "fragmented and hypothetical". However, a number of African countries have recently established market information systems</li> </ul>
5. Trade Information Service/Market Research	<ul style="list-style-type: none"> <li>- Trade Information: assist and educate potential importers/exporters as well as domestic enterprises in order to increase trade.</li> <li>- "Market research" also carried out by private enterprises (often not published).</li> </ul>	<ul style="list-style-type: none"> <li>- Likely to utilize market news, outlook and situation reports as sources of information. Also must consider long term S/D factors.</li> <li>- Considers industry structure, consumer demand, market shares, and market segments, regulations, market requirements, quality standards, packaging, inspection, etc.</li> <li>- Sales methods and strategies, prospective buyers/sellers.</li> <li>- Time frame: (see "comments").</li> </ul>	<ul style="list-style-type: none"> <li>- Carried out by trade organizations (chambers of commerce, export councils commodity associations, etc.).</li> <li>- Time frame: Emphasis on increasing trade over the long term, hence, timeliness of information usually not crucial.</li> </ul>
6. Marketing Extension	<ul style="list-style-type: none"> <li>- Assist in improving production/marketing system which meets consumer demand and maximizes income of rural areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Collection, interpretation and dissemination of market information.</li> <li>- Production and marketing planning/scheduling.</li> <li>- Securing new markets.</li> <li>- Improved post harvest practices.</li> <li>- Coordination of inputs, transport, storage, credit and post harvest facilities.</li> <li>- Time frame: (see comments)</li> </ul>	<ul style="list-style-type: none"> <li>- Marketing extension should help farmers/traders to use market information (outlook reports, market news and market research).</li> <li>- Extension service also provides education or information about marketing in general.</li> </ul>

Much of this report will focus on a market "news" or market information system and therefore the distinction between such a system and the others shown in Table 1 should be pointed out. The fundamental differences between the various systems lie in their basic objectives. The different objectives determine the institutional structures and outputs of each of the systems.

The market news service is providing just that - "news". It provides basic information of current market conditions, typically in "flash" form. Timeliness, rather than extensiveness, is the key. Also, as the name implies, a market outlook or analysis system typically is focused on the future, while the market news reporter's goal is to "get the information, get it right and get it out". While the market news reporter must "analyze" market conditions and prepare brief commentaries on the current market picture, he or she plays a different function from the "analyst" who typically has a more global view of the market, is interested in longer term trends, and is likely involved in making market forecasts based on historic data, and other means. In a market news system the main "analysis", apart from the brief market commentaries provided by the system, is the constant monitoring of the data for quality control purposes.

One possible analogy might be the difference between rapidly reporting on current weather conditions versus attempting to forecast the weather - the latter involves significant analysis of past weather patterns combined with current conditions in order to make weather predictions.

The following succinctly puts into perspective the difference between market news (or market information) and market intelligence:

Generally, there is a lack of understanding of the difference between market information and market intelligence. Market information is the result of collecting data regarding supply, prices at various levels of the market system, quality available, etc., while market intelligence involves analyzing this data and forming conclusions about what the data means. Many times data is collected and no analysis is made, while other times the methods of analysis are more sophisticated than can be justified by the data.

In either case, the information presented to the decision makers has limited use. A total market intelligence program must ensure that the decision maker first receives useful information, and then is able to synthesize the information so that it provides useful input to the decision making process. (Schermerhorn, p. i2).

Ensuring that market information is provided in such a way to be useful for decision making is crucial for the MIS. Therefore, in a number of countries, an "activist" approach to market information is taken. This might include marketing "tips" to the various users. The following provides several examples of such approaches:

FAO recommendations for [coffee exporting countries] included: country-wide dissemination of weekly coffee market news during the eight month marketing season including price quotations at the London Terminal Market as well as of the latest...fob

contracts and in assembly markets in the interior; quality premiums and discounts observed in current transactions; stock positions and cumulative export development in comparison with the previous year's performance. World Bank recommendations for Ghana's agricultural market information unit (1985) included a suggestion to monitor and disseminate on-farm, in-trade and public-channel (including aid) grain stock developments on a regular basis.

Market news relays may include discussion of the reasons for low farm-gate prices after harvest and of tentative projections of market developments in the months ahead. This will facilitate farmers' decisions on the optimal timing for release of surplus stock into the markets. While many of them cannot hold back long for liquidity reasons, others are able to buy from these and add to their stocks, thereby relieving the present market glut. Further release can be expected from a multitude of non-farming rural buyers (village shopkeepers, teachers, money lenders, etc) who exploit the opportunity for speculative holding of storable produce, within the limits of their uncommitted funds. These market-balancing rural storage activities however, will be constrained as long lack of public information about changes in government intervention policy leaves traders and producers in the expectation of continued government control over seasonal price developments, which made storage generally unremunerative in the past.

Of equal importance is the dissemination of marketing intelligence about consumer market developments. Once they are made aware that a price hike is due to belated maturity of the local crop, temporary evacuation problems or late arrival of an import shipment, consumers will buy hand-to-mouth or substitute with other staple foods for the moment, thereby helping to calm a price climate of scarcity. - (Reusse, p.315-316).

Finally, Schubert *et al* maintains that a comprehensive market information system is comprised of three components: (1) a "Price Monitoring Service", directed primarily at institutional users, (2) a "Price Information Service" which is intended to assist farmers and traders in their day to day marketing decisions and (3) a Marketing Extension and Advisory Service which "produces and disseminates regular background information about developments in the agricultural commodity markets concerned and extends advice on market related matters to farmers, traders and the government administration" (Schubert et al, p.21). The activities, outputs and user groups of a comprehensive system are well summarized in **Figure 1**.

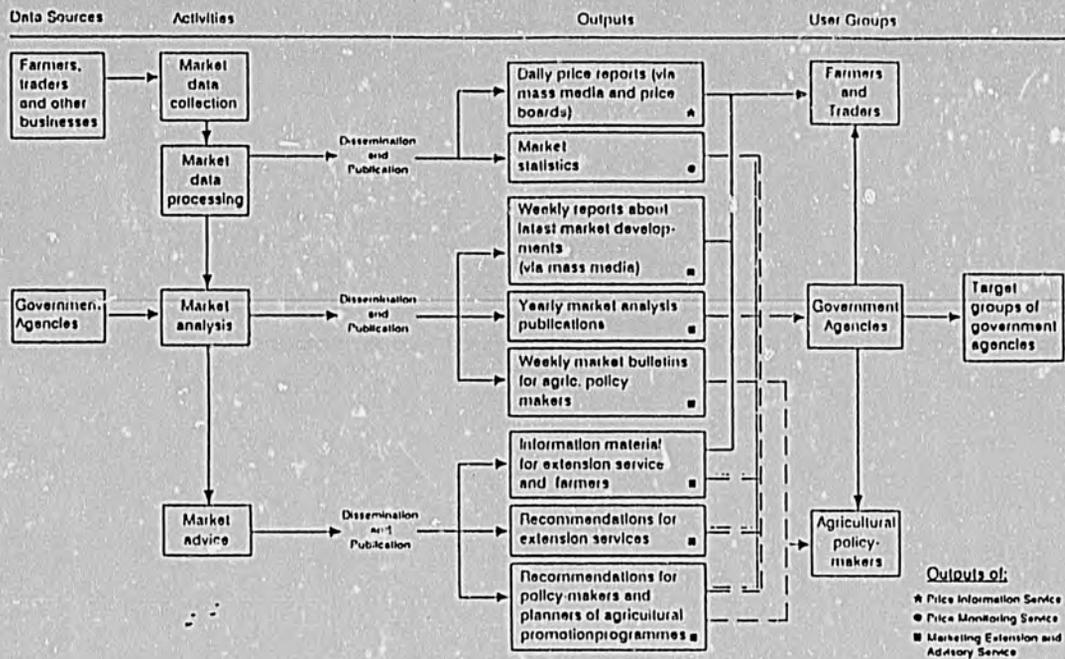
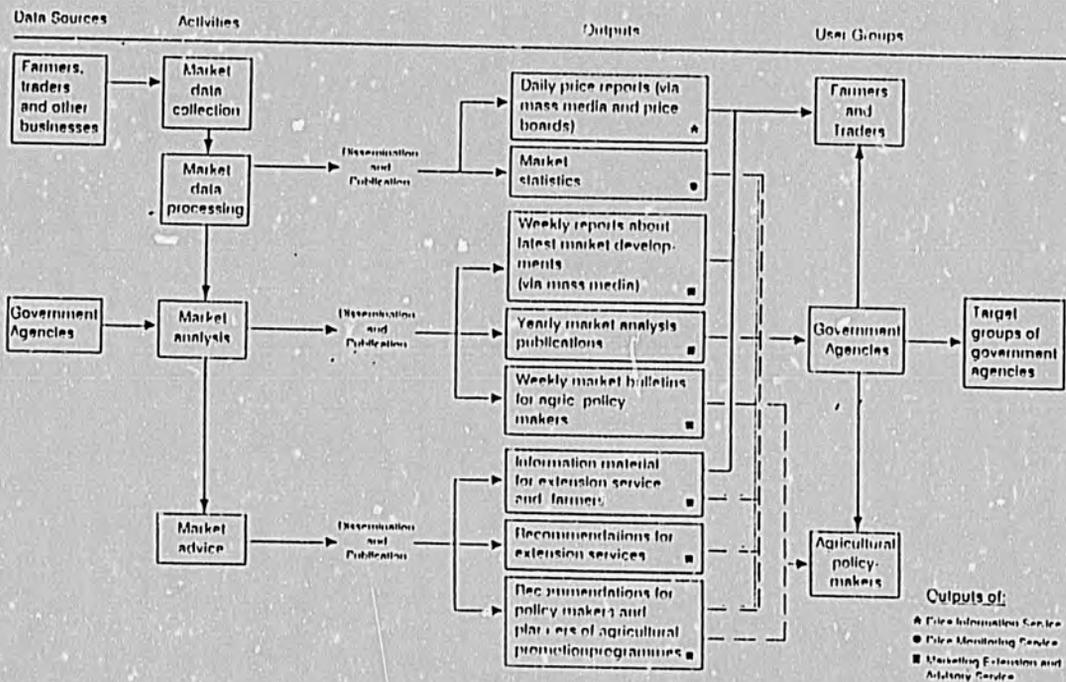


figure. 2

Activities, Outputs and User Groups of a Comprehensive Agricultural Market Information Service



## CRITICAL INSTITUTIONAL ISSUES

### The Information System as an Institution

Perhaps the single most critical issue is how to establish and maintain an appropriate institutional structure which will allow the information system to function effectively. This is particularly critical given that the system, being in a sense a news agency, has deadlines which must be met. To do so involves fairly complex logistical and communications processes which require substantial staff discipline. The following statement by the former Chief of the FAO Marketing and Credit Service leaves little room for doubt on the necessity of a solid institutional structure:

The importance of price and marketing information to farmers, traders and extension officers is understood by many governments, with this being reflected in the establishment in recent years of marketing intelligence or market price information services in many countries. However, too often these information services operate inefficiently and invariably ineffectively due to the insufficient realization by governments and operating departments of the resource [requirements with regards to] the provision of adequate manpower and funds. The operation of poorly staffed and poorly organized market information services where data collection, analysis and dissemination are improperly undertaken and where results are inaccurate or published only after lengthy delays is a waste of scarce financial and management resources. (H.J. Mittendorf quoted by Schubert, 1983, p.1 ).

It is essential that the upper management of the government institution in which the MIS is located have a full understanding of the purpose and the operations of the system and that they give it their full support, especially in terms of overall supervision of staff. It is also highly important that those directly involved in the day to day management of the system (who are typically at the middle management level of the institution concerned) have sufficient authority to take the necessary actions required to keep the system operating effectively. In short, **both the management and operational staff of the system must be made keenly aware that "operational discipline and continuity of the supply of resources are the main prerequisites for its effective and sustained operation"** (Schubert et al, p. 84).

Staffing must be sufficient both in terms of numbers and in qualifications to carry out the system's various activities. This involves establishing an organizational structure with clear lines of command and terms of reference for all personnel - both full and part-time. The numbers of full time staff should not be underestimated. While the staffing requirements vary greatly depending on the country and the scope of the system, **minimum** full time staff at headquarters should ideally include an overall Manager, a Computer Specialist, a Market Analyst/Journalist (or Report Writer), a Public Relations/Extension Specialist, an Administrator,

Secretary/Computer Operator(s), and support staff (driver, messenger, etc.). Part time headquarters staff might include Market Reporters, Market Analyst (eg. Specialists by Commodity Groups), and Enumerators for special surveys.

The data collectors in the field offices (who more appropriately should be referred to as "Market Reporters"), ideally should work on market information on a full time basis. A common problem with staff working on market information on a part time basis is conflicts their other duties. "These tasks are delegated to staff who are simultaneously burdened with other duties, and who understandably do not give priority to the work of data collection which is difficult and hard to supervise. Upon visiting these "data collectors" one often finds that they are scarcely able to find the markets in which they have supposedly been regularly collecting prices" (Schubert, 1983, p.12.).

Supervision and motivation of field staff are critically important. The system's management must understand and respond to problems of the field staff. This requires frequent visits to field offices as well as other systematic means monitoring the field staff. High priority must also be given to training. Staff should first be given an appreciation of the purpose and importance of their work and then be able to effectively carry it out. Details of training will be discussed later.

One of the first steps in establishing a MIS is to prepare a "Operations Manual" which provides a clear picture of the goals and the operations of system. The manual also should specify the institutional structure of MIS, including clear lines of command and terms of reference for all personnel - both full and part time. The manual also must cover details of data collection, analysis and dissemination procedures, as well as administrative matters. In other words, if the system is to meet its objectives, a carefully prepared operations guide is needed so that little is left to chance.

### **Meeting User's Requirements**

It is absolutely essential that the staff of the market information service first have a clear understanding of the information requirements of its targeted user groups and secondly have a systematic, and workable approach to meeting user's requirements to the extent possible. "Various market news services initiated under aid programs have not been continued very long after external financing ceased. Evidently they were not well adopted to farmers and traders' requirements" (Abbott, 1986, p.43). While the long-term sustainability of development projects is almost always a major concern, the message for market information projects is clear.

In order to assure that the information system meets users' needs to the extent possible, the users should be closely involved in the ongoing process of designing, monitoring and evaluating the system. A "Users' Advisory Committee" of selected interested representative of key user groups is often established to help assure a regular channel of communication between the system's users and the government officials involved in its operations. The committee can offer invaluable knowledge on the marketing system so that the information collection and reporting procedures are consistent with actual trade practices. The committee can also assist the system's

public relations activities including evaluating the public about what the system is and how to benefit from it, establishing and maintaining information contacts in the markets; and facilitating in the dissemination process.

Finally, "information" can be a somewhat nebulous area and the economic value of a market information system is not easily measured and many times not well understood by those controlling the purse strings. The impacts of a market information system are not so easily measured as for example, the increased crop production from resulting from an irrigation scheme. Therefore, another important function of the committee is to provide system's constituency with a strong voice which will help the system to survive political and institutional changes and potential budget cutbacks.

The decision-maker or purchaser of information does not know the exact value of the information until it is acquired and used, but to determine precisely its value prior to buying it, the purchaser must in effect obtain the information without cost. The importance of credibility and reliability of sources of data and information is stressed by this paradox. When the purchaser of the information is forced to estimate its value prior to receipt, the value is often determined from previous experience with the same supplier. (Reimenschneider and Bonnen, p.154).

### **Other Issues**

A major challenge stems from the fact that a government agency is attempting to meet the needs of the private sector. The fast-paced ever-changing world of the marketplace stands in sharp contrast to the environment of the typical government bureaucracy.

Experience in establishing market information systems in developing countries has uncovered several frequently occurring "weak links" which require special attention - nearly all related directly to management issues: (1) How to standardize data collection and ensure reliability, (2) How to speed up the process of data collection, transmission and dissemination, (3) How to control and motivate field staff, (4) How to provide effective overall management to enable "operational discipline and continuity of the supply of resources" (especially funds) and (5) How to assure sustainability once donor support comes to an end.

To conclude, the following is a well-summarized "checklist" of management activities required for successfully implementing an agricultural market information system. "In order to implement the project plans the management of an agricultural information project needs to perform the basic functions of organizing, allocating, leading, linking and controlling." This involves:

- designing a sound organizational structure for the envisaged Market Information Service;
- determining the mode of operation;
- establishing the required physical infrastructure;
- selecting and training the staff;
- working out job descriptions for all staff members;
- developing a concept for their further formal and in-service training;
- ensuring smooth cooperation with the mass media, extension service and target groups;
- regularly controlling the operation of the Market Information Service to make sure it is up to the performance standards set in the planning;
- evaluating the effects of the service;
- if required, redesigning the service on the basis of the experience gained...in order to increase the efficiency of the service and the benefits for the target groups - (Schubert *et al*, p.83.)

## DATA COLLECTION

In designing the market information system consideration must be given to its coverage in terms of products, geographic locations, frequency, levels of market and more.

Ideally, to increase market transparency, a number of factors affecting markets should be included in the system coverage. Still, prices are perhaps the key indication of market conditions, and when price information is combined with at least a minimum additional information of other market factors, can be a powerful tool for market participants. For example, price reports can be combined with recent or probable future price trends and general "qualitative" commentary on market conditions. Marketing "tips" can also be given as discussed earlier.

The decision as to which market locations should be included in the system should be based on their economic importance, with consideration given representation the various agro-climatic regions of the country. Which products to report also depends upon their economic importance and contribution to food security. The products reported on will not necessarily be the same for locations, and the list can change throughout the year because of seasonality in production.

The required frequency of data collection and reporting varies among the various product groups. For example, highly perishable products such as fruits, and vegetables typically show wide price variability within a season, from day to day, and even within a given day. Therefore, price information would likely have to be collected quite frequently, preferably daily or at minimum several times per week. Prices of non-perishable goods such as grains are generally speaking less volatile, although the degree of variability often varies at different times of the season.

### **Price Collection at Various Levels of Marketing System**

Agricultural product prices can be collected at different levels of the marketing system. These market levels are broadly categorized as follows:

1. producer (or "farmgate")
2. assembly markets
2. wholesale
3. retail (or "consumer") and
4. international prices.

The data collection process and associated issues is different for each level of the market. For most cases, there are different uses or reasons for analyzing prices at the various levels of the market. Table 2 presents an excellent summary of issues involved in various types of price analysis, this table should also help shed light on the distinctions between various levels of the markets.

**Table .2**

Producer prices, prices are of interest especially to government policy makers and others concerned with knowing the welfare of farmers. Producer prices, when multiplied by crop production estimates are often used in measuring national accounts such as GNP.

Because farmers are dispersed over wide areas, the data collection process for farm prices is particularly difficult with transport cost covering farm prices to vary according to distance from market centers, one average farm price for a given region is to use statistical sampling techniques. However, this is likely to require a large and well-organized field staff, especially if the data is to be collected on a regular basis (i.e. monthly or quarterly).

A more efficient way of collecting farm prices is to interview farmers and/or traders at rural "assembly markets" which often serve as collection points for farmers' produce. Since prices at this level of the market often already reflect some transportation costs, they may not give a true picture of what price the majority of farmers are receiving. Still, these markets are at key points in the marketing chain and therefore prices from them can be of keen interest to traders and farmers.

Another practical alternative for acquiring prices at the producer level is to interview various market participants or knowledgeable observers at the major market towns. For example, by requesting traders, transporters, processors, farmers and others to give estimates of prices farmers are receiving in a given geographic region, a reasonably indicative price range can usually be obtained.

Wholesale prices at the larger, price determining markets are perhaps the best indicator of overall market conditions for a given commodity. Wholesale prices represent "real" prices at specific, important market (as opposed to average farm prices over a large region). Therefore, focusing on wholesale prices from key markets in a sense maximizes information with a minimum of data. Farmers and traders usually have good estimates of transport and handling costs and therefore can calculate a "fair" price in their location based on knowledge of current prices in nearby market towns.

Retail prices are important since it is the consumer who ultimately drives the market. However, market transparency, while seldom "perfectly clear" is usually higher at the retail level than at other levels of the market due to price labeling and other forms of advertising. Retailers are often located in close proximity to one another, thereby easily allowing price comparisons. For these reasons, and because the goal is to primarily assist the weakest members of the marketing chain (ie. farmers) retail prices are normally not a major focus of market information services. This is not to imply that retail prices should be ignored. However, system faces constraints on coverage, and particularly in the volume of information which can be effectively disseminated.

"International prices" can mean prices at key border markets which are directly influenced by prices in neighboring countries. Such markets are often of particular interest as they can serve as indications of commodity flows between the countries for both legal and illegal trade. Prices of goods in key markets in within neighboring countries or within the region are also of interest for gauging trade flows. Comparisons of competitors' prices are obviously of interest to various parties. For many commodities, information on such "regional prices" is often not readily available.

Information is readily available for major internationally widely traded agricultural commodities, especially for those traded at established commodity exchanges. Private specialized commodity news agencies are one means of acquiring up-to-date markets reports. However, various commodity brokerage firms, trading companies, trade associations, international organizations as well as individual governments can also provide detailed market reports.

### **Product Qualities**

Accurate descriptions of the product being reported on by the market news system is of critical importance for the information to be "meaningful".

The central skill required for making price information meaningful is the ability to relate a given price to a qualitative evaluation of the product. In the absence of nationally applied standards and grades for agricultural products, [market reporters] must be trained to develop (in tandem with other government agencies and private groups) and utilize commonly agreed-upon criteria for the evaluation of products. Without such criteria, the usefulness of price data would be analogous to reporting the price of sweaters...without regards for size, material or design. In short, price data is only useful when it is linked to specific quality criteria in a systematic manner. The training of market reporters to capture this price-quality relationship is one of the central features of the training program. (Servicio Nacional de Informacion de Mercados).

Typically, a market information system can not be expected to implement on its own a national system of product grades and standards. Therefore it should attempt to adopt the quality standards already used in the markets, ie. the "commonly agreed upon criteria" from the above quote.

## **Reliability of Information**

It is essential that the system pay careful attention to the reliability of the information it is collecting and disseminating since "inaccurate information can be worse than no information". Problems of accuracy of price data can stem from poorly designed or poorly followed collection procedures which can result from the following:

- 1) inattention to the price/quality relationships just described;
- 2) improper definition of the level of the market (eg. what are actually retail prices are reported as wholesale prices);
- 3) reported prices misrepresent the bulk of actual transactions either because the market reporter was deliberately misled by his sources or the sample of the trade being reported was too small; and
- 4) errors in recording, transmitting and tabulating the data.

The information system must have built in quality control mechanisms. At the field level this involves careful attention to designing procedures such that prices obtained are "representative" of the market. Preferably, the market reporter should observe actual transactions, but since this is not always feasible, he or she must establish a number of reliable contacts among market participants and others. It is important to cross check the information with both buyers, sellers and others knowledge about the markets. At both the field and headquarters levels, comparisons with historic or recent price trends are useful. Comparisons can also be made with prices at different levels of the market as well as in different market locations. The computer programs used the system also should incorporate data editing as well as graphics for analyzing price the price data. Still, there is no real substitute for well trained staff who are regularly visited by supervisors.

## **DATA PROCESSING AND ANALYSIS**

The performance requirements for software for a "typical" system in a developing country is well summarized as follows:

The ideal package would have complete capabilities in a number of different areas: data entry and verification; code and file management; data analysis including time series, regression and correlation tools; sophisticated reporting capabilities including automatic generation of complex tables and graphics; and a programming capability to automate frequently repeated procedures. Most importantly, the ideal package would have to be relatively easy to learn because few skilled data analysts are available. (Alexander and Diarra).

Flexibility is another very important consideration, particularly as the information system grows or changes. There is no single software package which is well suited to all these areas, even among the "integrated" packages. Therefore, a number of market information systems in developing countries (and even in the US.) have employed a combination of standard database, spreadsheets and word processing packages, such as dBase, Paradox, Quatro, Lotus and WordPerfect. The Statistical Package for the Social Sciences (SPSS) is currently used in a number of countries, and has particular strength in time series analysis, generation of complex tables, and graphics presentations.

Various degrees of programming within the selected packages can be employed. A simple information system may initially require only very limited programming. There is a definite trade off between the extent of programming and the degree of the user-friendliness. For example, a program can be written which is fully menu driven and allows data entry (including checks and editing), analysis and reports by a person with very limited computer skills. However, such a system may require substantial programming.

Finding a highly skilled programmer to remain with, or at least be readily available to, the market information system can be a challenge. As the information system evolves, the programmer will likely need to be called upon to modify the system. At minimum, the initial programmer should leave behind careful program documentation so that another person can make future modifications.

Finally, there have recently been several commercially developed software packages designed specifically for agricultural market information systems.

## **DISSEMINATION**

Information gathered and processed by the market news service can be distributed in a number of ways and with varying frequencies in accordance with the type of users targeted. It is critical that the means of dissemination are designed not only to reach the targeted user groups, but also to present the information in such a way as to be easily understood and useful. This is a complex task especially in a country such as Morocco with a relatively large percentage of the population illiterate and with several languages.

Among the different forms of dissemination, more or less in order of general usefulness for a developing country, are: radio reports, bulletin boards and flyers, newspaper reports, a weekly (or better yet monthly) mailed bulletin, and telephone answering machines, and electronic media linked to computers..

Radio reports can be of great benefit to all potential users, but probably mostly so to farmers, who may not have easy access to newspapers or who may be illiterate. The radio report may be presented in formats which conform to the radio station needs. Broadcasts of market news can be presented in a number of ways. For example, price quotations can be read or a more detailed market commentary can be given including interviews with market participants. In some countries, market reports have even been inter-twined with segments of music.

Bulletin boards within the market or other meeting places can be highly effective especially for informing prices for different locations around the country. A simple one-page flyer should also be made available in the markets, and will allow the reporters to interchange more information with his contacts in the markets. The flyers can also be distributed to other institutions involved in or interested in agriculture such as local government, cooperatives, trade associations, etc. These institutions can serve as a network to reaching potential users and can be especially in providing "word of mouth" information which otherwise may not be readily accessible to the illiterate portion of the population. By using word of mouth, the problem of translation into a number of local languages can be partially solved since the person giving the report is often able to speak more than one language.

More detailed bulletins, either weekly, bi-weekly, or monthly are relatively less important to producers, merchants and processors, who may not have time or inclination to read lengthily reports. However the bulletins are likely to be of interest to institutional users, and are useful for disseminating summaries of information from various secondary sources outside of the market news service. For example, summaries of reports on international markets, as well as reports on recent local weather conditions from the Methodology Department can often be easily included.

Even though extremely few farmers, who are the major target group, have access to television broadcasts, this is another means of reaching other target groups. It is perhaps note worthy that the Market Information System of Mali gives weekly nationally broadcast television reports.

Automatic telephone answering machines are often used by market information services to provide pre-recorded updates on market conditions while obviously of limited use in countries where the majority of the targeted users do not have ready access to telephones, this is a very inexpensive, efficient means for dissemination, and should not be ruled out.

Electronic information transfers are widely used in market information systems in the developed countries and will obviously become increasingly important in developing countries in the near future as telecommunication systems improved.

In many developing countries, the area of market information is a striking example of how the technology of communications and data processing have far outpaced the human institutions required for allow the information systems be fully functional.

Finally, the importance of the dissemination aspects of an MIS is well stated in the following:

Many times significant resources are devoted to developing elaborate information collection systems with no provision for disseminating this information to producers and market intermediaries. An informal system is generally set up to disseminate the information among government agencies so that the information can be utilized in policy making. However, no attempt is made to disseminate to users in the marketing system down to the grass roots level. **Under these circumstances, a market information system will not assist orderly marketing** -(Schermerhorn, Emphasis added).

## CONCLUDING COMMENTS

Experiences with establishing market information systems in developing countries have met with mixed results, largely due to difficulties stemming from institutional weaknesses within the government agencies where the systems have been located. For that reason, this report has placed special attention on institutional issues and on designing the systems with the users clearly in mind.

On a more positive note, with many countries moving towards liberalization of agricultural markets and seeking ways to diversify agricultural exports, the value of market information is receiving greater recognition. The recent experiences of successful implementation of market information systems in a number of Latin American countries (eg. Mexico and Ecuador), Asia (Indonesia and Philippines) and in the very difficult conditions in the Sahel, provide not only optimism, but possible role models for close scrutiny.

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