Handbook for Defining and Setting up a Food Security Information and Early Warning System (FSIEWS)

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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FOREWORD

"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

This definition of food security was drawn up at the World Food Summit (Rome, November 1996). It appears at the beginning of the Plan of Action outlining the steps to be taken, developed and approved by the representatives of 186 countries, to progress as quickly as possible towards the elimination of hunger in the world.

The Summit also recognized the urgent need to improve the information available to governments, their international partners and all the actors in civil society within each country, to guide their action against food insecurity, and to make it as effective as possible. To this end, the international programme, ***FIVIMS (Food Insecurity and Vulnerability Information and Mapping Systems****), was undertaken in 1997 to improve, both at a global level and within each country, the mobilization and utilization of information needed to make decisions regarding food security for all.*

FAO has long been engaged in promoting information systems for food security. Since the 1970s it has accumulated valuable experience as a result of its own work and that of other multi- or bi-lateral technical assistance governmental and non-governmental organizations in the field of food security. Above all, it has benefited from vital lessons learned from its work in the field, consisting of supporting and participating in setting up, improving and reinforcing national information systems, the results and functioning of which comprise the backbone of food security monitoring.

In many countries, the creation, improvement and integration of information systems contributing to the monitoring of food security have been carried out within the framework of a method that has been developed, enhanced and rationalized over the years.

The aim of this handbook is to describe the FSIEWS (Food Security and Early Warning Information System) method for the benefit of the community of governmental and non-governmental actors engaged in the fight against hunger. This contribution to the FIVIMS programme is addressed to national technical managers, central and decentralized, as well as to their technical assistance co-workers. It aims to provide them with a procedure to follow and an array of useful instruments for the different stages.

As with any handbook, this one takes stock of the lessons of an experience that is being added to all the time; it will require further additions and corrections, thanks to the indispensable contributions of those who, in widely varying conditions, countries and regions, are actually carrying out the work of establishing and using instruments for bringing about food security.
Rooted as it is in the practicalities of the field, this book has an important contribution to make to the ability of governments to know who, where and why people are affected or threatened by food insecurity--a prerequisite of any action to remedy such a situation.

Jacques Vercueil Director ESA, FAO, Rome, July 2000.

Acknowledgements

This handbook is the result of a joint effort both as regards its methodological conception and its final form. Special thanks go to all those who are mentioned in the appendix for their active collaboration in the writing of this book. It would nevertheless be unfair to overlook the many different professionals who participated in the setting up of FSIEWS in their countries, whose work and constant search for solutions suited to the local situations enabled us to progressively adapt the theoretical concepts and have a clear and realistic global view of food security monitoring. This handbook was written at FAO but the hundreds of professionals of different nationalities (mainly in the sectors of agriculture, stock farming, fisheries, economics and development sociology, health and nutrition) who have worked on this analysis should consider this book as theirs.

CONTENTS

ABBREVIATIONS AND ACRONYMS

Abbreviation/ Acronym	Description
APM	Agricultural Production Monitoring
CCD	Cloud Cover Density
CFS	Committee on World Food Security
CILSS	Permanent Interstate Committee on Drought Control in the Sahel
CSO	Civil Society Organization
FAO	Food and Agriculture Organization of the United Nations
FEWS	Famine Early Warning System (EU)
FIVIMS	Food Insecurity and Vulnerability Information Mapping System
FNSS	Food and Nutrition Surveillance System
FSIEWS	Food Security Information and Early Warning System
GIEWS	Global Information and Early Warning System on Food and Agriculture
GIS	Geographic Information System
GNP	Gross National Product
GTZ	German Agency for Technical Cooperation
HCR	High Commission for Refugees
HDI	Human Development Index (UNDP)
ICN	International Conference on Nutrition (Rome 92 FAO/WHO)
IFAD	International Fund for Agricultural Development (UN)
KIMS	Key Indicator Mapping System (FIVIMS)
LFSC	Local Food Security Committee
MCW	Maternal and Child Welfare
MVG	Monitoring Vulnerable groups
MIS	Market Information System
MWG	Multidisciplinary Working Group
NDVI	Normalized Difference Vegetation Index
NFSC	National Food Security Committee
NFSS	National Food Security Stocks
NGO	Non-governmental Organization
NOAA	National Oceanic and Atmospheric Administration
PFSC	Provincial Food Security Committee
RESAL	European Union Food Security Network
SADC	South African Development Community
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VAM	Vulnerability Assessment Mapping (WFP)
WFP	World Food Programme (UN)
WFS	World Food Summit (Rome, Nov. 96)
WHO	World Health Organization (UN)

PART ONE

PRINCIPLES AND CONCEPTS

1. INTRODUCTION

This chapter gives a brief account of the historic evolution and current context of food security information systems, technical aspects of the FSIEWS methodology contained in this handbook, including its specific advantages, structure, mechanisms and didactic approach. Finally it gives a definition of food security that is widely accepted today throughout the world.

The handbook is divided into three main parts. The first part defines the main aspects of the FSIEWS method (definitions, description of national and international contexts, aims of the system, etc.). The second part, by far the longest, describes the different stages in setting up a FSIEWS, the constraints encountered and the possible solutions. The third part attempts to place the system in a wider more flexible and lasting context, and to identify how its role may evolve over time in a global food security context.

This handbook is aimed at *middle managers in developing countries* since they are the ones who actually implement the FSIEWS and keep them running smoothly, whether as part of a statistics monitoring system in one of the food security sectors, as one of the many other actors in food security (in the public, voluntary or private sector), or as providers or recipients of information. Their commitment is key to the long-term success of a FSIEWS. An enabling national policy, supported when necessary by external technical assistance, are the two other important aspects, also closely linked to the work of the professionals to whom this book is addressed.

The text of the handbook is a distillation of a number of technical papers produced by national and international experts and technicians. It was given its final form at FAO after thorough technical revision by the appropriate services and all the participants.

1.1 Historic Background to Food Security Information Systems

- **Until the 19th century, population fluctuations were linked to three main factors (war, famine, epidemics)** often correlated with fluctuations in food production. Commercial and industrial development gradually modified this tendency in industrialized countries, as people became less dependent on subsistence farming. *Until then, population monitoring gave an idea (ex-post) of food insecurity.*

- Until the beginning of the 20th century, subsistence farming remained the principal source of food in countries that were not very industrialized. **The successive waves of colonization and decolonization** of the poorest countries were based on policies of food self-sufficiency in order to preserve political independence. *The food monitoring systems of the time were based mainly on knowledge of basic agricultural production.*

- **The major food crises in the seventies showed the importance of world public opinion** and the need to inform the public at large of food crises. *Nutritional monitoring of young children was developed at this time as the basis for gathering information on, and providing assistance to, the most needy*.

- In 1974, at the **World Food Conference** in Rome, about one hundred countries adopted the "Universal declaration to eliminate hunger and malnutrition". At this time, analyses of the causes of hunger abounded and the modern idea of "food security" was developed with the

creation in 1975 of the World Food Security Committee (FSC). Although governments were urged to introduce "national food policies" the results were poor. *Emphasis was placed on trying to balance the supply and demand of staple foods. Food-supply monitoring systems were gradually developed in this period.*

- **Public marketing offices** (for cereals in particular) were given powers to supervise these supplies in many countries and efforts were made to create national or regional food security stocks (particularly in dry areas) to be used in the event of food crises. *In this setting, information regarding production, national supplies, stocks and imports could, in theory, be controlled by the same national body.*

- Statistics systems and national accounts have recorded **ever-increasing demands for information especially in planning and economic monitoring.** The statistics systems have tended to be highly compartmentalized (whether a ministry or separate national body), and geared to their own internal requirements. The information they supply has not therefore been very useful for monitoring food security (unreliable statistics that take a long time to be published, and areas covered often incompatible, making it difficult to compare data gathered from different systems*). Some development partners have therefore preferred to establish, in particular in sub-Saharan Africa, parallel information systems that they finance and supervise, and that provide them in good time with the information they need to target their food security aid and assistance*.

- **Structural adjustment and privatization** subsequently radically changed the economies of developing countries and their trajectories, which had major repercussions on food security. Donors decided to combine their economic aid with targeted interventionist policies in order to avoid major food or social crises. It became apparent *that the problems of access to staple foods (poverty) would have to be examined more closely and that specific information was needed in order to organize social aid.*

- The diminishing world grain surplus and a few negative experiences of large-scale distribution led the international community to reduce aid and question the use of food aid, which when unsuitable or mismanaged can have a negative effect on food security. *The existing information systems were then mainly redirected at better targeting and monitoring the distribution of aid.*

  The development and **use of satellite images** offered a way to estimate the vegetation in each country, especially for rainfed crops*. This made information on global production available to the major donors.*

- **The globalization of trade is now linked to the fast pace of modern communication** (Internet, fax, satellite telephone, etc.) and management (computers) systems. It is now much easier to manage databases, forecast and disseminate results. Food security monitoring and forecasting systems have become, at least in theory, easy to manage in national contexts, and donors are in favour of training managers to use these modern tools and media.

- **The speed at which developing countries undergo urbanization** also has an effect on food security data in that it becomes essential to monitor food security and vulnerable groups at urban as well as rural levels.

- Parallel to the development of faster information channels, it has become necessary to introduce **decentralized decision-making** and widen the area of concerted action to include the various actors in food security (public, private, civil society). *Food security information*

systems have gradually become centres for the exchange of information at all levels throughout the country.

- The need to reduce the number of undernourished people has pointed up the need for decentralization and concerted action among all the different actors in food security. This requirement was clearly noted by all the participants at the **World Food Summit** in November 1996 when government representatives decided to do everything in their power to reduce by half the number of undernourished people (estimated at 800 million at the time) by the year 2015. *Since then, efforts have been made to complete information system databases by developing concrete indicators for monitoring the undernourished.*

- Policy makers need accurate up-to-date information on the incidence, nature and causes of chronic food insecurity and vulnerability in order to be able to formulate and implement policies and programmes to achieve the objectives of the World Food Summit. It was therefore decided to launch a "**FIVIMS initiative**[1]", the secretariat of which is based at FAO. The aim of the FIVIMS is to improve information on food-insecure and vulnerable people at national and international levels. The approach described in this handbook contributes to this aim.

1.2 Advantages of the FSIEWS Approach

The advantages of this methodology are as follows:

- it is in keeping with the globalization of information;

- it is integrated into the monitoring framework of the World Food Summit;

- it capitalizes on twenty years of worldwide experience by international specialists, national managers and development partners in the development of a simple instrument, suited to changing contexts, able to give an objective view of the evolving food security situation in a country and provide a simple means of analysing this evolution;

- it can supply the major global information networks (GIEWS, RESAL, FEWS, VAM, etc.) with the information they need; in particular, it enables international organizations to monitor the changing numbers and characteristics of undernourished groups more closely, and to target aid and international assistance regarding food security more accurately;

- it is involved in the major humanitarian initiatives coordinated by the United Nations: the fight against poverty and inequality, better governance, disaster limitation, etc.;

- it has a fundamental role to play in the gradual move away from direct funding for the national information systems set up by donors in the 1980s to meet their information needs regarding humanitarian intervention;

- above all, it enables both national and regional officers to take direct action regarding their food security and to meet the demand expressed by government representatives, as well as CSOs and the private sector.

[1] Food Insecurity and Vulnerability Information and Mapping System.

1.3 Technical Aspects of the Methodology

Although the FSIEWS methodology was not developed by specialists it is the fruit of many years' work in the field by national and international teams. This handbook is a distillation of their experience and sets out the essential stages in defining and setting up a national system (specific to each country) for monitoring food security and early warning, the characteristics of which are as follows:

- **it relies on existing structures** (does not create additional institutions) that meet the individual requirements of their partners, ensuring its seamless integration with national institutions;

- **information** from the different food security areas can be **cross-analysed** thus ensuring "value added" information, useful in both the quantitative and qualitative evaluation of the current status of food insecurity, but also essential in forecasting, and therefore, preventing crises;

- it involves **all the actors in food security** (governments, civil society organizations, private sector, associations etc.) **in the implementation process, and therefore works through national consensus**;

- it ensures that cross analysis of the information systems is carried out at **various levels by groups of different actors** (national, provincial scale etc.), using qualitative data to adjust quantitative data and combining a statistical approach with a social one;

- it distinguishes between the information and the decision, creating a clear distinction between the strictly information-management organs (FSIEWS, which should remain a technical information gathering and processing system) and the decision-making organs (that are answerable to higher authorities for their choices and their implementation);

- it is **financially attractive,** being low cost, which ensures its long-term future since each country and even each province can have a management style adapted to its needs;

- it generally requires outside technical support during the planning phase and the set-up phase (during which time it should, however, be functioning properly), which is generally eliminated in the **medium term**;

- a key feature of the system is that it is wholly **created, set up and managed by national teams**.

1.4 Definition of Food Security

In order to define and set up a monitoring system, a detailed analysis of food security in the country, including any specific problems, must be carried out.

- The following definition of food security was adopted unanimously at the World Food Summit (October 1996): **"*Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*."** (Plan of Action, paragraph 1)

This definition is in keeping with the three classic aspects of food security: **availability** of staple foods, **stability** of supplies and **access** for all to these supplies; but it also contains the idea of adapted food, what is known as the **"biological utilization"** of food.

2. THE CONCEPT OF FORECASTING AND STEERING

Forecasting is the foundation of all warning systems. It must be applied to **the four areas** of food security (availability, stability, access, biological utilization), giving decision-makers **enough time to react** to the warning, but with a **high enough degree of reliability** (as a general rule the more long-term the forecasts the less reliable they are) to avoid false alarms. All forecasts have a probability rating (calculable or not), which gives a good idea of their reliability.

In the four food security areas, forecasting techniques are generally based on information gained from monitoring the situation and on diagnostics using:

- trend analyses (are prices going to continue rising in the coming months?);
- indirect indicators (the sale of heifers in a market used by nomadic herders is generally an indirect indicator that the food security status of their families is going to get worse; meteorological data helps to estimate future cereals production from rainfed crops);
- multiple indicators (the combination of falling commercial stocks and transport difficulties, poor road conditions at the beginning of the wet season in the Sahelian climate, is a weak indicator of rising short-term consumer prices);
- warning signals (all early warning systems should have "warning signals", i.e. indicators, usually combined, that set off the alarm. These signals serve, much as warning lights in planes and cars, to warn off impending danger).

Forecasts are sometimes carried out by the organizations in charge of monitoring information (those responsible for monitoring markets often analyse price trends), but are just as often carried out by other bodies (meteorological services, often under the ministry of transport, can be responsible to carry out agrometeorological forecasting), or by a specific body gathering information on food security and early warning. The relevant body should enter the results of the forecasts (indicators, warning signals, etc.) in a food security control panel that is constantly updated and to which decision-makers have constant access. The aim of the control panel, including warning signals, is to steer food security efforts and supply the various media aimed at decision-makers at all levels (bulletins, radio programmes, updates, fax, etc.).

The purpose of the **control panel** is similar to a dashboard in a vehicle in that it presents different kinds of information that can be analysed in order to anticipate events in each of the monitoring and forecasting areas. For example, the pilot of an airplane can assess the risk of crashing by taking in at a glance the petrol gauge close to zero, the warning signal showing the engine temperature is too high, and the spirit level showing the plane is at too steep an angle. Similarly, national authorities will be concerned about a sudden rise in grain prices in the markets, the closure of certain roads because of flooding, an increase in the death rate, and a warning signal set off by large population movements. Even though the data may be fairly imprecise, the combination of these elements is much more important than knowledge (even precise knowledge) of one or other of these elements. *Forecasts and decisions are often made on the basis of an accumulation of (sometimes biased) indices*. The use of indices (even imperfect ones) helps to draw attention to situations that need to be examined more closely. In a car when one of the red lights on the dashboard goes on, you stop, open the bonnet and, if necessary, carry out the repairs.

Availability of staple foods. The foods that should be monitored are the staple foods required by the poorest populations (see Part Two, Chapter I). For rainfed crops, the harvest forecasts are based on agrometeorological data, on estimates of the areas sown and by using agronomic parameters for the region and crops in question. Different methods of varying sophistication are

used to calculate them. Forecasts for root or tuber crops in humid zones are calculated by estimating, often approximately, areas and yields; while animal production forecasts use other parameters (changes in the condition of grazing land, number of animals recorded at certain water holes, etc.). Import and export forecasts are reliable when importers (public or private) agree to submit their import-export schedules in countries where the customs system is strictly controlled (some island countries for example). Nevertheless, in the majority of developing countries forecasts are based on estimates regularly supplied by specialists and are fairly approximate. In countries where imports and exports have to be authorized by administrations in advance, the most reliable estimates regarding the movements of staple foodstuffs can therefore be obtained from the relevant services.

Stability of supplies. Forecasts in this area are usually based on the analysis of market trends, taking into account the socio-economic and political situation (price trends as well as changes in quantities available in markets, stocks, inter-regional transfers, etc.). In the commercial area, as was mentioned above, forecasting is often very difficult and can be fairly unreliable.

Access for all to supplies. Access is linked to the constraints of relative poverty (financial means/price of staple foods) and to physical access to these products (see below for a more detailed analysis). Monitoring indicators for poverty and retail prices are useful for medium- to long-term trend analyses but are generally not suitable for short-term forecasts and "best-guess estimates". As for nutritional forecasting (see below), sets of indirect indicators suitable for short-term forecasts of the evolution of poverty and physical access to food are generally used. Sociologists identify and monitor the strategies used by vulnerable individuals or groups in situations of short-term foreseeable crises (stockpiling of produce, selling essential equipment, seeking work away from the household, etc.). The sets of indicators that have a bearing on the short-term forecasts of poverty often overlap with nutritional ones (access and biological utilization) since sudden increased poverty almost automatically leads to a deterioration in the nutritional status of the affected group or family. The younger members of poor families tend to migrate to the towns as soon as they anticipate loss of earnings. Indeed, apparently inexplicable migratory phenomena are probably an indication of short-term problems. Moreover, a good market for used essential equipment, sold by vulnerable families, is an indication that families are in serious financial difficulty and are converting their last resources into much needed cash. Certain religious practices are also symptomatic. In order to establish a type of indicator or set of indicators, a socio-economic study of individual behaviour patterns must first be carried out in homogeneous areas and the vulnerable groups and individuals be studied (see Part 2, Chapter 1).

Biological utilization of foods. Health or anthropometric indicators are status indicators; they do not indicate changes in the nutritional status of populations and, most importantly, the most vulnerable groups. They provide information on the past nutritional levels of a population, sometimes current nutritional levels, but never future ones. Therefore indirect socio-economic indicators (or sets of indicators) are generally used to measure individuals' own perceptions of future nutritional problems. The analysis of coping strategies used by vulnerable individuals or groups in food crisis situations generally gives good indirect indicators for forecasting nutritional problems. Adults know only too well what their wasting or stunting of their children means and can foresee the consequences.

3. EXISTING FOOD SECURITY MONITORING SYSTEMS

3.1 Description of Existing Systems

Most of the existing food-security monitoring systems are organized around the following four main pillars:

- agricultural production monitoring **(APM),** normally combined with monitoring the products of livestock farming;
- the market information system **(MIS)** that usually monitors domestic trade and sometimes international trade (import/export);
- the social monitoring of the most vulnerable populations or monitoring of vulnerable groups (**MVG**) that focuses on monitoring poverty;
- food and nutritional surveillance systems (also called food and nutrition monitoring) (**FNSS**), which generally, depending on the situation, monitors the health and nutritional status of populations.

These four pillars have specific aims and set up their own means and organization. They are generally country-wide and linked to the statistics services of each of the ministries concerned.

The creation of a Food Security Information and Early Warning System (FSIEWS) by the national bodies responsible for supplying food security information should not overlook any of these aspects but take them all into account in setting up a global system. Thus the monitoring of food *availability* (production + imports - exports - losses) should be supported by monitoring information on both production (MAP) and foreign trade supplied by the Market Information System; the monitoring of the *stability* of supplies uses data mainly from the Market Information System (MIS), as well as data on the status of infrastructure and stocks; the monitoring of *access* to these supplies should take into account mainly social indicators (poverty, unemployment, migrations etc.); and the monitoring of *biological utilization* should use data acquired from health and nutritional monitoring.

3.1.1 Agricultural Production Monitoring (APM)

The monitoring of agricultural production often focuses on cereal crops, and sometimes includes a section on animal production and/or grazing. It is usually established by the statistics services of the ministry of agriculture, which relies on regular studies in the field, in theory, carried out by the provincial administrative staff. The data is usually published annually in standard statistics publications.

Most of the crop monitoring and forecasting methods are developed around the water balance calculated during the growing season and take into account the phenological development of the plant. The agrometeorological approach has produced good results in semi-arid countries where

the water deficit is the main factor limiting crop productivity. This approach gives less satisfying results[2] in regions (even semi-arid ones) where:

- agricultural production (food crops) is very heterogeneous;
- there are other major limiting factors (excess water, low sunlight, and incidence of crop pests and diseases).

The monitoring of animal production can use data from the veterinary services (vaccinations, abattoir figures), fiscal services (taxes), zootechnical surveys (where they exist) or monitor grazing land (mainly in nomadic areas).

Tools

The monitoring of rainfed crops is based on the following principal techniques:

- climatic and meteorological analyses;
- the use of crop simulation models or crop specific water balance models;
- satellite image processing (supplied mainly by NOAA[3] and Meteosat[4]);
- agricultural field studies (for harvest forecasting).

Generally speaking, these tools can be used for qualitative evaluations of crop status (development, stage in the cycle, etc.), which can become quantitative depending on the availability of additional information (agronomic data, statistics on yields, historical series, etc.) and providing the information is validated. In addition, some institutions carry out essential field work to calibrate the analytical models used (see the methods used below). This work is indispensable for the proper functioning of simulation models and for testing in different conditions. NOAA satellite images can also prove useful at regional or even national level but, given the average size of farms and their patchy distribution over the territory, the calibration of NDVI[5] values is a long process that takes several years to verify. The processing of Meteosat images is easier, but even in this case careful testing is necessary.

Institutions

From an institutional point of view, the agricultural-production and harvest-forecast monitoring systems are usually established in two stages:

- establishment of an operational monitoring structure;
- gradual fine-tuning of the system as it becomes a forecasting system.

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[2] Gommes R., 1997: Prévisions agro-météorologiques des rendements: quelques moyens et méthodes utilisées par la FAO dans un contexte de sécurité alimentaire.

[3] The NOAA satellite produces digital images from which a Normalised Difference Vegetation Index is obtained. This satellite index is largely correlated with the volume of living vegetation. In arid and semi-arid conditions the state of crops and the surrounding vegetation are closely linked.

[4] The Meteosat satellite produces digital images which reveal the Cold Cloud Duration - T< -40°C (see details in Part Two, Section Three, Chapter I).

[5] Normalised Difference Vegetation Index. See note on the NOAA satellite below.

The systems are usually situated within the ministry of agriculture and the national meteorological services. In the first case, production is estimated on the basis of data recorded by district agents (phenological monitoring) and agricultural sampling surveys. In the second case, meteorological data is used and agrometeorological analyses of varying sophistication are developed. In addition, plant protection services often play a major role in monitoring the phytosanitary status of crops, and insect and locust attacks. In principle, all the services (agricultural, meteorological, dissemination, plant protection, livestock farming, water, etc.) provide, in their particular areas, information that is also included in their own analyses during the season. What is often lacking is a systematic analysis and synthesis of the information (past, present and future), procedures and methodologies used so that all the users may have access to a transparent and objective reference base.

This multi-institutional and multi-disciplinary system ensures that a progressively more sharply focused methodology is used to gather information. Using this approach it is possible to predict what areas risk poor food crops and introduce more finely-tuned surveillance techniques, that may also include sample surveys of the affected populations.

3.1.2 Market Information System (MIS)

A Market Information System (MIS[6]) is *a service, usually operated by the public sector, which involves the collection on a regular basis of information on prices and, in some cases, quantities of widely traded agricultural products from rural assembly markets, wholesale and retail markets, as appropriate, and dissemination of this information on a timely and regular basis through various media to farmers, traders, government officials, policy-makers and others, including consumers*.

The system gathers, processes and disseminates information on commodity trading. The information should include monitoring data on market prices and available quantities of certain commodities (not solely agricultural and food), variations in stocks (public and private) and how goods are transported. In general, MIS also monitor imports and exports. It should be noted that the MIS play a crucial role in the dissemination of information to public and private operatives. This role has often reduced the MIS to only monitoring market prices, since the demand from traders has been very high in this area. The monitoring of available volumes, which is more difficult to implement, has often been neglected.

Tools

A Marketing Information System must carry out the following steps:

- **data collection**. The data-collectors supply information on the *variety* of commodities examined, their *weight*, and their *price*. The price varies according to the time of day, what day it is, the level of bargaining and other factors. The surveys should contain information on the quantity sold, and whether the price is retail or wholesale. The identity of the data-collector can also have an influence on the prices given by the trader (in particular if the seller thinks the collector is from the tax office);

- **transmission and processing of data**. Formerly, information was transmitted exclusively by the national radio station. More modern communications are used today (telephone, fax, modem and electronic mail);

[6] FAO definition (see "Market Information Services - Theory and Practice").

- **dissemination of prices and sometimes available quantities and qualities.** The daily dissemination of information should be the rule. Unfortunately most countries do not have the means to do this even at regional level. Among the major means of dissemination are local-language radio, notice boards (around the markets, regularly updated and easy to read) and newspapers.

Institutions

Market Information Systems are usually attached to the statistics services of government ministries (trade, agriculture etc., according to the country). In some countries, a National Institute of Statistics, usually attached to the planning ministry, is in charge of the MIS. In others, the individual ministries (for example, the ministry of agriculture for food and agricultural products, including agricultural inputs) may be directly responsible for gathering and processing data in their respective domains.

Those in charge of collecting data at food markets (quantities, prices, how the market works, origin of products, etc.) may be agents attached to different ministries (trade, agriculture or internal affairs), or to the private sector (chambers of commerce) or non-governmental organizations (NGOs). They usually work at provincial level where the data is collected, processed and passed to a central unit. Training of field staff is also (theoretically) carried out at this level. The "data-collectors" or "researchers", as they are often called, are sometimes assigned exclusively to the MIS. If they belong to a general statistics unit, they may have other surveys or administrative tasks to carry out; if they belong to the ministry of agriculture they may be involved in the dissemination of information or other activities.

3.1.3 Monitoring Vulnerable Groups (MVG)

In June 1999, the World Committee on Food Security (CFS) endorsed the three classes of vulnerability (or at risk of food insecurity) established by the FIVIMS[7] working group. The three types of food insecurity[8] are:

- **chronic food insecurity**. Affects individuals or groups of people who consume or have regularly been consuming somewhat less than the minimum needed over a long period;

- **cyclic food insecurity**. Affects small farmers who have enough to eat in the immediate post-harvest period but not enough to carry them through to the next harvest;

- **transitory food insecurity**. Affects urban dwellers dependent on highly unstable markets and agricultural producers exposed to high incidence of natural disasters.

The **poverty** except when defined as the minimum needed to ensure biological survival, is generally regarded as a relative situation in monitoring systems and should only be considered as such.

[7] Food Insecurity and Vulnerability Information and Mapping System. (Part Three, Chapter V).
[8] FAO document CFS:99/2.

Tools

An understanding of the changing vulnerability situation and what action should be taken to improve the well-being of the most deprived populations can be gained from the relevant and precise information provided by the regular collection of certain socio-economic or other indicators. This can be carried out in parallel with measurements proper of the health and nutritional status of the population. By monitoring the factors that influence situations of deprivation, a given level of poverty can be revealed. So the same income in two different families or two different countries, taking into consideration their customs, may or may not indicate poverty.

Food intake (quantity and quality), income, employment, access to resources (land, credit, etc.) and to basic services (health, education, etc.) are the most commonly used indirect indicators of poverty after a tentative evaluation in quantitative or monetary terms.

Currently, apart from certain partial or combined indicators that have been used in large data collections (income, human development index-HDI, schooling rate, health cover, etc.) there are more case studies than usable series in the databases.

Institutions

The majority of developing countries do not have regular and appropriate monitoring of poverty for either marginal or vulnerable groups.

NGOs and national social services (sometimes the ministry of social affairs) may have data, collected and processed with varying regularity, regarding some areas of countries. The main purpose of this data is to monitor communities and enable populations, but it can also be very useful in monitoring vulnerable groups and in estimating local changes in food security at the level of provincial committees[9].

International organizations (such as FAO) involved in developing the FIVIMS[10] initiative, created in the monitoring framework of the World Food Summit[11], are now endeavouring to analyse local methods of monitoring vulnerable groups in an attempt to develop a classification system that can be used to observe changes in these groups at global level.

3.1.4 Food and Nutrition Surveillance System (FNSS)

The nutritional status of an individual and/or a population depends on all the factors that have an effect on the food/health relationship. Food and nutrition surveillance systems keep track of the nutritional status of populations and their consumption of food in order to facilitate decision making in this area. FNSS was first adopted in developing countries in 1976. The methods and aims have evolved considerably since then, and in particular since the nineties. Several countries, notably in sub-Saharan Africa, have set up FNSS to monitor and measure the impact of structural adjustment policies on vulnerable strata of the population.

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9 See Part Two, Chapter IV, Section 4 on the institutional organization of FSIEWS.

10 Food Insecurity and Vulnerability Information and Mapping System (See Part Three for more detailed information).

11 The World Food Summit (October 1996) declared it a priority aim for all countries to reduce by half the number of undernourished people by 2015.

Instruments

Nutritionists have traditionally targeted children, but interest is increasingly being focused on the nutritional status of other age groups (adolescents, adults, the elderly) using indicators based on the body-mass index[12]. Budget consumption surveys give a good overview of the food and nutritional situation, but they are carried out every ten years at the most. In addition to these fairly centralized approaches, local monitoring of vulnerable groups is being developed as a routine part of the activities of governmental institutions or NGOs working at community level.

In general, the data for monitoring health and nutrition comes from five major sources[13]:

- administrative services. In most cases they collect quantitative data, but sometimes they also collect qualitative information, and it is becoming more common for the data to be presented in a computerized format;

- random sample surveys. Such surveys can add supplementary information to existing surveys set up for a different purpose, by adding a section on food and nutrition monitoring. The multiple indicator surveys carried out by UNICEF in several developing countries often have a food element. "Household consumption" surveys also contain a "nutrition" element so that socio-economic and agricultural data can be compared with anthropometric data on children and adults. These surveys should be repeated at regular intervals;

- specific studies and research on health and well-being. They are valuable sources of information in many countries but they are often under-used;

- community monitoring systems. These are sometimes part of larger programmes or development projects. The data is usually collected and processed several times a year by health officials;

- international data-bases. FAO's assessments of the food situation and WHO's Global Database on Child Growth are also used. They are based on the statistics resources of countries, the information usually being recalculated and processed as composite indicators. International databases have the advantage of being regularly updated. Also countries that do not have a more specific system can keep track of general food trends in a global context.

Institutions

Food and nutrition surveillance systems are usually centralized and based in the country's capital. Monitoring is carried out by those in charge of health and nutrition (often the ministry of health) who may have decentralized offices (health centres at provincial, departmental, local or community level). The collection of basic data is the responsibility of public health officials who rely on anthropometric indicators (weight/age, height/age, height/weight ratios). Primary-school teachers are also sometimes involved in monitoring the health and nutritional state of children.

3.1.5 Other existing monitoring systems that may be used in food security

Information from other sources is sometimes used in monitoring food security:

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[12] Ratio of weight (kg)/height (m) squared (W/H^2).

[13] National surveys are a major source of information. However, they are not strictly speaking monitoring systems given the irregularity with which they are carried out (often once every ten years). They nevertheless provide essential information about vulnerable groups at a given time and allow comparison of estimated monitoring data with statistical data obtained from these surveys, etc.

- monitoring the food aid and assistance available from national cereal services (if needed), WFP or food-aid donors;

- demographic monitoring (including population shifts) and income monitoring (i.e. monitoring poverty) often carried out by national institutes of statistics;

- monitoring specific food security activities (set up by associations, NGOs, or the ministry of social affairs, for example);

- monitoring other elements such as environmental factors are of crucial importance in some countries.

Food security may or may not be among the overt aims pursued by those in charge of each of these systems. They often limit their aims to finding a balance between the supply and demand for some food products seen as being of prime importance. The cereal balance is an example of this approach. Others, who see economic development as a priority, focus on a "social" approach to food security, trying to correct food security problems that arise as a result of economic growth, without however integrating this dimension into their global planning. The latter therefore usually limit their food security monitoring to monitoring nutrition and vulnerable groups, preferring isolated actions targeting particular sections of the population.

Others again, particularly in areas of dryland cultivation, prefer a productive approach. They consider the monitoring of basic food crops and the corresponding harvest forecasts the principal source of information on food security in the population; for them, this information is a sufficient basis for decision making. It is also clear that chambers of commerce will be more concerned about information regarding the markets (price, quantities, stocks) than gaining knowledge of vulnerable groups, which is by definition difficult to deal with. This more profit-oriented approach is, however, quite close and complementary to the search for a balanced supply and demand.

3.2 Constraints of the Systems

The principal constraints encountered by current food security information systems in developing countries fall into two categories:

- constraints associated with poor organization of the system; and

- those related to a lack of clear objectives.

There are also functional constraints (found in many systems in developing countries), which must be taken into account in the organization of a FSIEWS:

3.2.1 Poor organization

The main criticisms are as follows:

- *poor definition of the staple food products to be monitored.* Some systems monitor imported products, or the most widely-traded products in markets, without carrying out a preliminary analysis of the staple products actually consumed by the different population groups and, in particular, by the most vulnerable groups (dietary minimum);

- *a system focused on cereals*. Cereals are the easiest foodstuffs to monitor (annual crops have a regulated market, and they can be easily stored for a long time). Moreover, they are often the main source of official supplies in times of crisis;

- *poor data analysis*. Some systems simply accumulate all the available data on agricultural production, marketing and food consumption, neither selecting nor analysing it, and without defining exactly what food security is or should be;

- *little or no account taken of unofficial exports*, and often even imports. In many countries where customs regulations are not properly enforced it is tempting to overlook or under-estimate this data when calculating availability;

- *the four areas of food security (availability, stability, access and biological utilization) are considered as completely separate monitoring areas* (crops, markets, poverty and nutrition) with their individual aims managed separately. This approach has two major disadvantages: it is difficult to monitor data in categories that do not clearly fall into one of these areas (imports, exports, stocks, social monitoring, etc.); and where the indicators are composite and complex it creates monitoring problems;

- *systems organized completely independently of national structures* and that attempt to solve on their own most of the problems associated with the gathering and processing of data. In spite of the high cost of these systems and their short-lived nature, this approach is still at times adopted by donors who want to have full control of food security information and impose their own criteria without becoming involved in the particular problems of national institutions.

3.2.2 Lack of clearly defined aims

The following defects may also occur:

- *too centralized and focussing solely on the needs of decision makers, governments and/or donors* (who often fund the activity) paying little attention to the needs of civil society (with the exception of the MIS for traders);

- *some regions are so involved with drought problems* they practically ignore the risks of food crises arising from other natural disasters (flooding), other causes (social instability, economic crisis, epidemics, etc.), or the more usual "complex" disasters due to a mixture of natural, social and economic factors;

- *concentrating mainly on statistics monitoring*, the importance of forecasts is overlooked. Indeed, many systems have very limited "control panels", often nothing more than cereal harvest forecasts, which are technically well supervised and easy to use in this form.

3.2.3 Functional constraints

The main functional constraints can be summarized as follows:

- lack of training and skills at national services level, making it difficult to use any instruments apart from surveys and field measurements;

- not enough resources to expand survey activities, carry out harvest assessments in the field, apply and validate methods for estimating harvests;

- poor transfer of methodologies and the more sophisticated data-analysis instruments from support institutions;
- poor quality of available data;
- problems in sending monitoring data from local administrative offices to the central offices of services;
- discontinuity in the application of methodologies, collection procedures and data analysis;
- high degree of mobility among staff in national services, which reduces the efficiency of training activities.

3.3 Recent Changes in the Socio-Economic Context

Rapid urbanization and the steady integration of developing countries into the world economy are the two main factors in the evolution of food security and early warning information systems.

This situation is responsible for the following changes:

- decrease in direct state intervention, but growing need to monitor and control the evolution of the situation;
- increased trade in all kinds of products;
- increased rural migration;
- tendency for agricultural systems to favour cash crops to the detriment of food crops;
- changes in demographic, food, social (individualism), and economic (monetarization) customs and habits combined with increased social exclusion (vulnerability often has a tendency to become structural).

4. CRISIS MANAGEMENT

The Food Security Information and Early Warning System can also be an instrument of choice in managing food crises although its main aim is to assist in the prevention of crises and avoid disastrous repercussions on food security in the short, medium and long-term.

When it works well, such a monitoring system can make a valuable contribution to managing food crises. This contribution can be broken down as follows*:*

- *raise the alarm* when there is a risk of a local or general food crisis, giving information on the nature of the crisis (type of disaster), possible impact (extent and type), the areas and people that will be affected;
- *define the action* which, if undertaken in good time, will reduce the negative impact of a disaster;
- *steer relief and emergency aid* towards the groups that need it, identifying correctly the vulnerable groups and the change in their situation;

- *manage food security stocks more efficiently*. Some countries, particularly in arid zones, keep food security stocks (often cereals) for rapid distribution in the event of disasters or food emergencies. They are managed by the State or donors (or jointly managed). They cannot be used to stabilize stocks[14] and in crisis situations their utilization is governed by precise rules regarding the rotation of stocks and the use of the food products themselves. A food security information system can include the necessary data for better management of these functions;

- *identify efficient supply methods*. Good knowledge of markets (international, national and local) is helpful in deciding how to organize food supplies for distribution (imported food aid, local purchase, triangular transactions);

- *define efficient ways of distributing food aid and assistance* (free distribution, subsidized sale, food-for-work etc.) and of helping to manage and monitor distribution. Decentralized monitoring services[15] should be responsible for monitoring the distribution of food aid and ensuring aid is not diverted for political or private ends.

5. THE FRAMEWORK OF A FSIEWS

The approach advocated in this handbook is designed to help national authorities to define and implement a Food Security Information and Early Warning System (FSIEWS), perfectly adapted to the constraints of each country. In practice, a FSIEWS relies on existing monitoring systems for information on the *availability* of staple products, the *stability* of supplies, *access* for all to these supplies and the *biological utilization* of food (defined as the relation between health and nutrition). In the following pages the outline of a theoretical FSIEWS is presented. The stages in setting up such a system are described in the second part of this handbook.

Experience has shown that, in order to function properly and be used correctly, a FSIEWS has to have the following attributes:

- be coordinated and supervised at national level, in close association with all the actors involved in the system, and closely linked to policy-makers in this area. The decision-makers are generally grouped together in a multi-disciplinary national committee that has been called National Food Security Committee (NFSC) here;

- decentralized levels that have information, analysis and decision-making functions, called Provincial Food Security Committees (PFSC) in this handbook;

- a central secretariat attached to the NFSC that runs the FSIEWS at central level.

As can be seen from the following outlines, a FSIEWS should ideally be situated within the secretariat of the National Food Security Committee, be relayed by the Provincial Committees and possess two computerized monitoring instruments: a database containing information from existing databases in the area of food security, and a control panel resulting from the cross analysis of data, and forecasts of short- or long-term changes in food security, according to complex indirect indicators or estimates. (For further details on the institutional organization of a FSIEWS, see Part Two, Chapter IV, Section 4, Institutional Organization.)

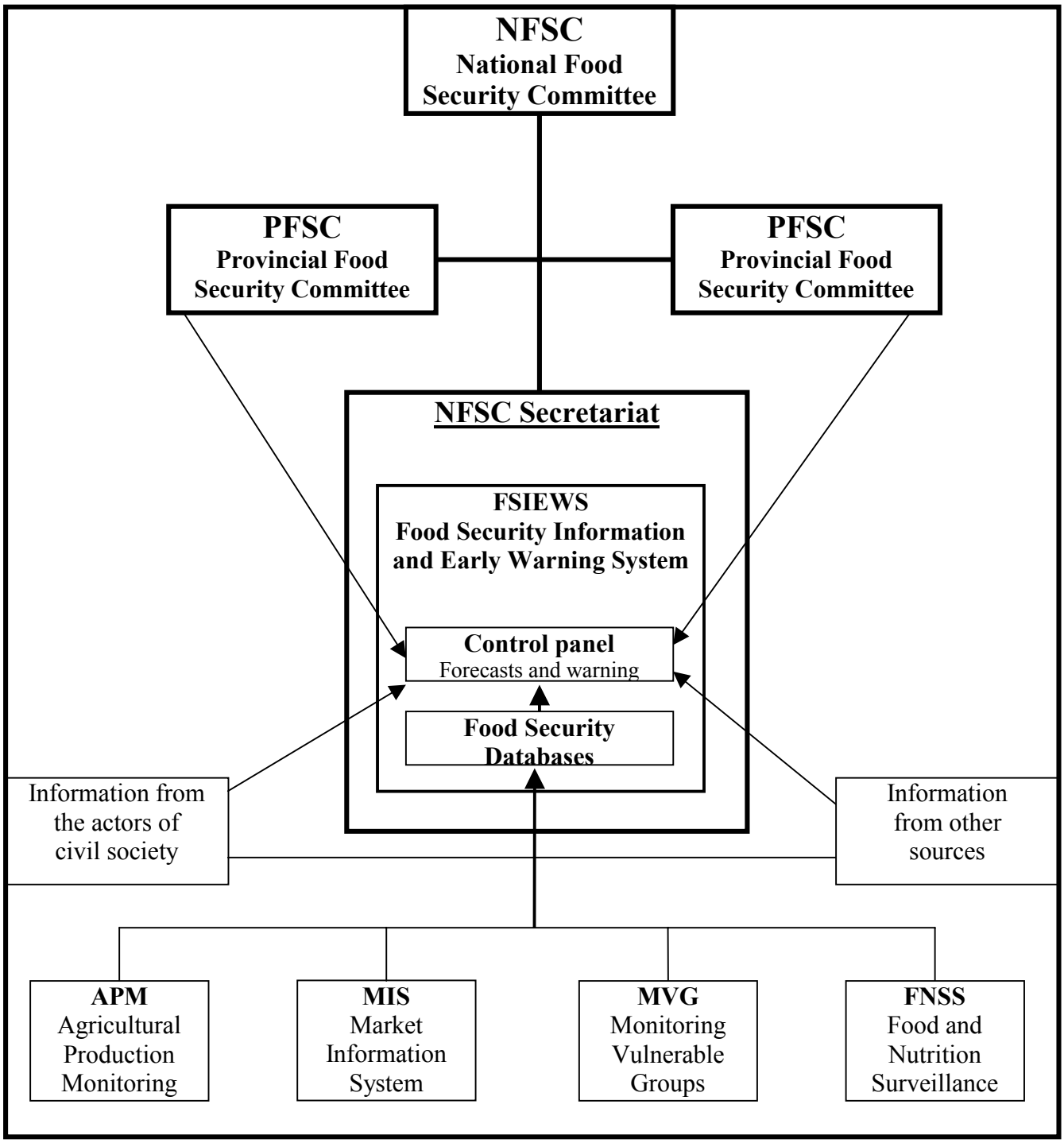
The aim of such a system is two-fold: in the short-term it serves as a steering instrument for food security and is therefore an instrument of choice in preventing food crises. In the medium and

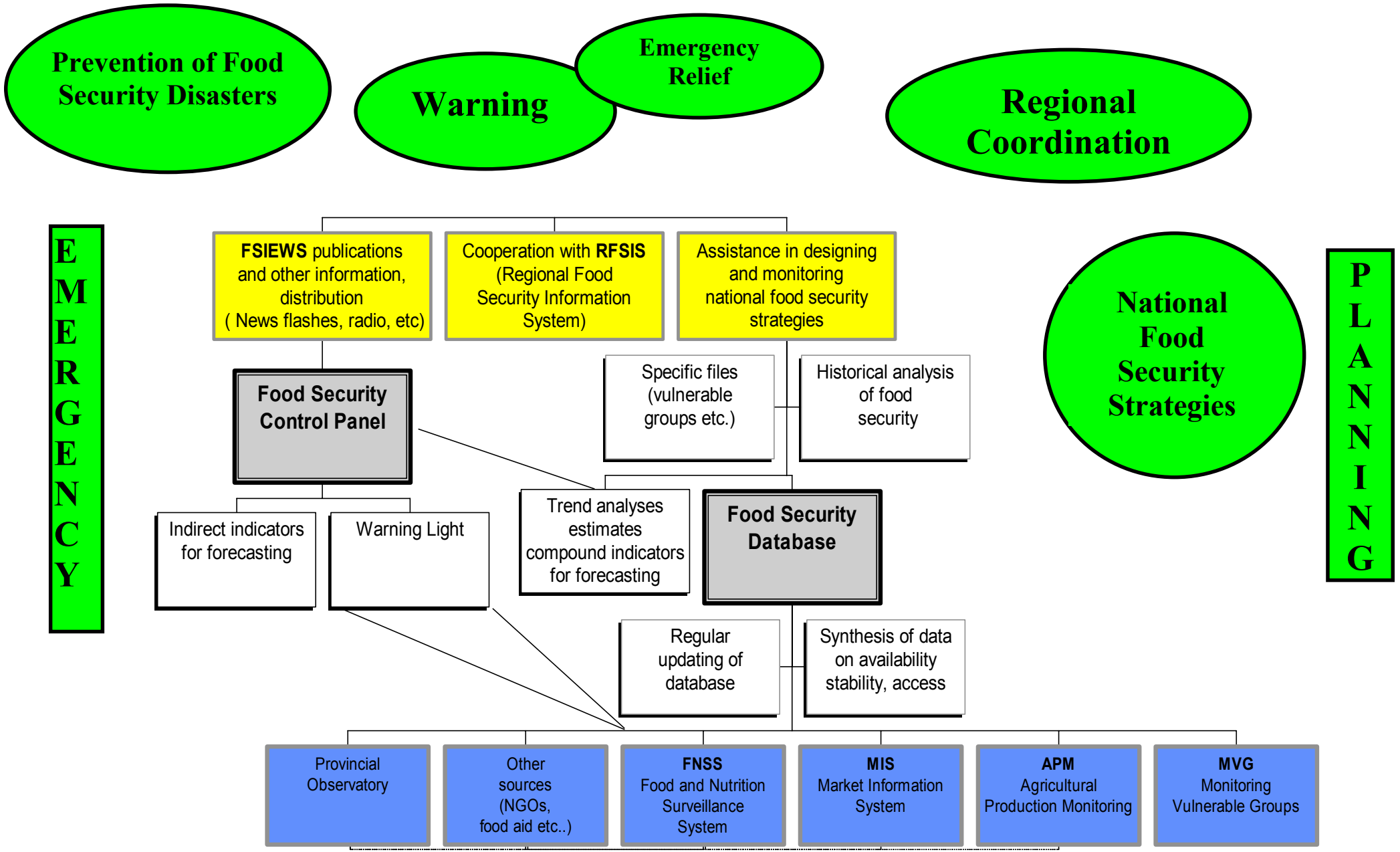
[14] The quantities are in any case too small to have an impact on prices.
[15] Often called regional observatories or regional monitoring stations.

long-term it should be an indispensable step in any programming and planning activity, providing planners with the data and analyses necessary for an understanding of food security.

It is, above all, an organ that enables cooperation to be established and food security activities to be proposed for entire populations, but in particular for the most vulnerable groups.

The Theoretical Organization of a FSIEWS





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Theoretical Organization of a FSIEWS: Flow of information

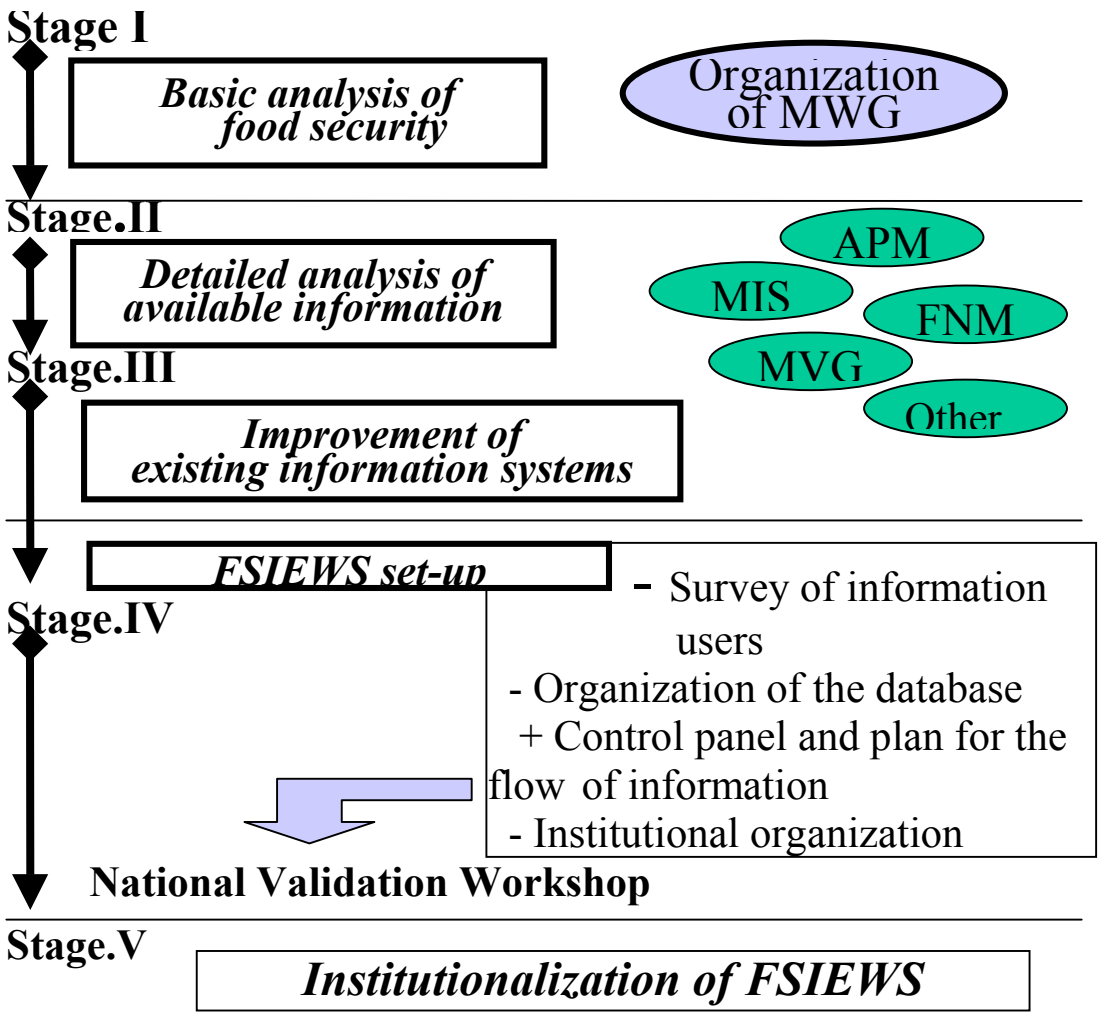
PART TWO

STAGES IN DEFINING AND SETTING UP A FSIEWS

Overview

To ensure that the work of setting up a sustainable Food Security and Early Warning Information System proceeds steadily but surely, each of the stages described in this second part of the handbook must be completed in order. The time needed to complete any one stage will vary from one country to another depending on the availability of existing studies, the suitability of existing statistics, past experience of decentralization, the level of intersectoral integration, the technical expertise of national managerial staff, etc. It is, however, imperative that none of these stages be omitted as this will affect the sustainability and validity of the final result.

The various stages in setting up a FSIEWS are set out below: each stage is covered in its own chapter in the second part of the handbook.



CHAPTER I

STAGE ONE: BASIC STUDY OF FOOD SECURITY

The first stage deals with the basic study of food security. This analysis is necessary as each country has its own specific constraints and actors that must be taken into account. It serves to define precisely for each country or each region:

- **the basic energy requirements**. Sets criteria that are used to check whether individuals, families, regional groups or the whole population have enough food to cover their basic needs;

- **vulnerable groups**. Food security monitoring must include specific monitoring of individuals or groups at high risk of food insecurity, as they are the most exposed groups in the event of a crisis. This data also enables authorities to be better prepared and to take timely action;

- **the risks and constraints of food insecurity**. Familiarity with the risks and constraints helps to anticipate how a given group will be affected by a worsening situation, how to gear policies to reduce the risks or their consequences, and to tackle the constraints;

- **analysis of staple food channels and knowledge of the principal actors**. Provides information on the economic and decision-making aspects of the food system that determines the quantities and prices of foodstuffs made available to people. Once again the aim is two-fold: to gain a better interpretation of events and to know where and how to act (in the short, medium or long-term);

- the basic study, as indeed all aspects of setting up the system, should be carried out *in the most participatory manner possible*. For this reason the preliminary study of the main elements (defining the food minimum, vulnerable groups, the risks of food insecurity and specific constraints, analysis of staple food channels and knowledge of the main actors) should be gradually but steadily developed by the **Multidisciplinary Working Groups (MWG)**. The formation of these groups, described in this chapter and mentioned in more detail later with regard to the institutionalization of the system, occurs gradually and in a participatory manner throughout the set-up phase;

- **the summary** of these basic analyses (last point in this chapter) should be presented in a form that is clear and easily understandable to everyone. It is one of the instruments proposed to all the actors in the system during the final workshop. In all the countries where FSIEWS have been set up, the summarizing of information in table format has proved very effective.

1. ESTABLISHING THE BASIC ENERGY REQUIREMENTS

Some knowledge of the minimum food requirements of the population is indispensable in order **to decide what products should be monitored in the context of a FSIEWS** (availability of these products, stability of supplies, access for all to these products and biological utilization). A list of the quantities of staple food products traditionally consumed by the population to meet their energy and nutritional requirements is therefore compiled for each homogeneous dietary region. The list encompasses three important concepts: basic energy requirements, the food shopping basket, and the diet of each population group:

The basic (physiological) energy requirements of a population (whether country-wide or a homogeneous group within a country) generally varies between 2000 and 2350 Kcal/day/person, depending on the age, sex, structure and average weight and health status of the population, as

well as the level of physical activity. These estimates are based on a population in a well-nourished condition (account being taken of work and free time activities). Proteins should make up between 10 and 12 percent of energy intake while the recommended energy amount of fats is between 15 and 30 percent.

- *The minimum food shopping basket* is a list of quantities of the main food that should be available and corresponds to the traditional dietary model: mainly starchy foods (cereals, roots, tubers and fruits), foods of animal origin (meat, fish, milk, etc.) oil and oilseed produce. These products must meet energy and micronutrient requirements.

- The grouping *of basic diets by homogeneous area* is often based on areas of homogeneous agricultural production or climatic areas, but diet is also linked to the social, cultural and religious history of each population group.

- In taking dietary habits into consideration, account must be taken of possible changes in supply sources and income, as well as human adaptation to new constraints in nature.

It should be noted that the World Food Summit[16] emphasized not only access to a dietary minimum for all, but access to *good quality food* ("sufficient, safe and nutritious") [17]. The safety of foodstuffs is a fundamental characteristic of their quality. By "the safety of food" is meant the absence, or acceptable safe levels, of contaminants, impurities, natural toxins or any other substance that could be excessively or chronically damaging to health. The quality of a food is a complex characteristic that determines its value or acceptability to the consumer. Besides safety, the attributes of quality include: nutritional value, organoleptic characteristics such as appearance, colour, texture, taste; and functional properties. Monitoring food safety is a government responsibility, but monitoring quality is a task that can be carried out by a FSIEWS.

In determining the dietary minimum for each more or less homogeneous population group, it is also essential that a concrete and objective analytical approach is adopted: i.e. analysis should not be based solely on market information (food products consumed by the most deprived sections of the population do not necessarily follow the rules of the market), or the number of products limited to those that are easy to monitor (cereals for example). Products of animal origin (milk, cheese, eggs, honey, fish, etc.), and some of plant origin (dates, roots and tubers, etc.) are often largely under-estimated in the minimum food requirement, either because they are obtained by harvesting wild resources (including fishing and hunting) and therefore often available in negligible quantities, or because it may be difficult to estimate production (dates, roots, etc.), or for both reasons.

It should not be forgotten that the whole monitoring system is based on the calculation of the dietary minimum, and that it should therefore be calculated as precisely as possible with the participation of all the actors in the food systems, if possible at a decentralized level (of production, marketing, health and social affairs).

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[16] Rome, October 1996. It established the following definition of food security: "*Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.*"

[17] See also the World Food Security Committee document: FAO CFS: 99/3 "The Importance of Food Quality and Safety for Developing Countries".

2. IDENTIFYING VULNERABLE GROUPS

Some groups or individuals are particularly prone to chronic, seasonal or accidental exposure to food insecurity having no access to the dietary minimum. It is therefore necessary to identify as precisely as possible who these vulnerable groups are (areas, groups, households, individuals) and to estimate their number, location and how they deal with food insecurity. The information on vulnerable areas, vulnerable groups, vulnerable households and vulnerable individuals must be clearly distinguished.

- *Vulnerable areas:* a vulnerable area is usually a production (or supply) area with a high probability of major variations in production (or supply) and a large number of families or individuals vulnerable to these variations. An area subject to natural disasters (droughts, floods, cyclones, etc.), as well as any areas with fragile ecosystems, come into this category, but a town or urban area can also be vulnerable (Calcutta, for example).

- *Vulnerable groups*: a vulnerable group is any homogeneous population whose physical or financial access to food is precarious or sporadic (structural or economic vulnerability). New immigrants that settle around towns, transhumant herders with less than a given number of animals, and agricultural workers in areas without irrigation are all examples of vulnerable groups. Vulnerable groups can be classified according to a typology of the causes.

- *Vulnerable households:* This term is used to designate family groups, often isolated, that have a particular kind of vulnerability. Families where the head of the family is a woman, or handicapped, large families, those with diseases, such as tuberculosis or AIDS, are examples of vulnerable families.

- *Vulnerable individuals:* These are individuals whose vulnerability depends on their age or status: children under five, pregnant or breast-feeding mothers, the ill, the handicapped, the elderly, etc.

In order to detect vulnerable groups in a national or regional population, the methods adopted by each homogeneous group to obtain staple food must be analysed, their vulnerability being dependent on these methods. The coping strategies adopted by these groups when the risk of food insecurity arises must also be analysed at this stage. The information obtained can then be used to determine the indirect indicators for forecasting the risk of malnutrition (see Chapter 3).

3. THE RISKS OF FOOD INSECURITY AND SPECIFIC CONSTRAINTS

In order to guarantee food security over time, the *structural risks of food insecurity must be clarified* (urban poverty, areas lacking water, etc.), as must the *economic risks* (drought, floods, over-production, devaluation, etc.) and their *probability*.

The principal constraints to guaranteeing a dietary minimum to everyone at all times should also be clarified: geo-climatic constraints leading to total or partial isolation (in time and space), other constraints of a social, economic, political or religious nature.

In this area particular attention must be paid to phenomena having a direct impact on individual diets: for example, rural exodus and urbanization that leads to *changes in dietary habits*, or the health problems that affect *the assimilation of food*.

For some groups of people, the nature of their vulnerability will vary according to the type of food insecurity[18]. There are three types of food insecurity[19]:

- *chronic food insecurity:* affects people who consume or have regularly consumed quantities somewhat lower than the necessary minimum for a considerable period of time;
- *cyclic food insecurity*: occurs in seasonal lean periods;
- *transitory food insecurity*: affects people whose food intake deteriorates at times to the point that their health and well-being are affected.

What do the terms undernourished, food insecurity, vulnerability and nutritional status mean? [20]

As defined by the World Food Summit, the term ***undernourished*** *is applied to people whose level of food consumption is consistently insufficient in terms of calories consumed in relation to their requirements.* ***Food insecurity*** *is applied to a situation in which people do not have access to sufficient quantities of healthy nutritious food and therefore do not take in sufficient food for growth, normal development, and for a healthy active life. Food insecurity may be chronic or transitory. When it is chronic it is known as* ***undernourishment****.*

Vulnerability *refers to the group of factors that places people in a situation where they are at risk of food insecurity, including factors that undermine people's capacity to deal with the situation.* ***Nutritional status*** *refers to the physiological status of people based on food intake and health and hygiene conditions.*

There is a growing tendency to look at food security in the broader context of "minimum well-being" including basic health and education (but often also the physical security of goods and people), since the absence of one of these minimum needs automatically has repercussions on the others. The ideas of "sustainable human development", "poverty threshold" etc. are similarly manifestations of the search for a "minimum well-being for all".

It should be noted that people's own perceptions of this minimum varies from one region to another according to the human environment, the level of development, religion, history, etc.

The minimum well-being is similar to what is now called "*livelihood security*", which is a much broader concept than food security. Indeed, satisfying food requirements cannot be considered the only need of human beings. Moreover, it depends on how important other fundamental needs are and on its priority in the decision-making system: household decisions regarding its food security always take into consideration the other competing needs (health, education, free time for example), as well as choosing between immediate consumption and deferred consumption, keeping in mind how the choice will affect future consumption. The prioritizing of these different aims, as well as the preference given to the present or the future, can vary during a food crisis.

Human beings have cultural and spiritual needs, live in communities and try to flourish. Food requirements fall into the category of physiological needs, just like the need for protection against the elements (clothes and housing), against physical insecurity, and the need for rest and sleep etc. Food security is therefore necessary for a minimum level of well-being, although it does not on its

[18] As mentioned above in section 2.

[19] Quoted from FAO document CFS: 99/2 "Assessment of the World Food Security Situation".

[20] Quoted from the CFS 1999, FAO CFS: 99/2 " Assessment of the World Food Security Situation".

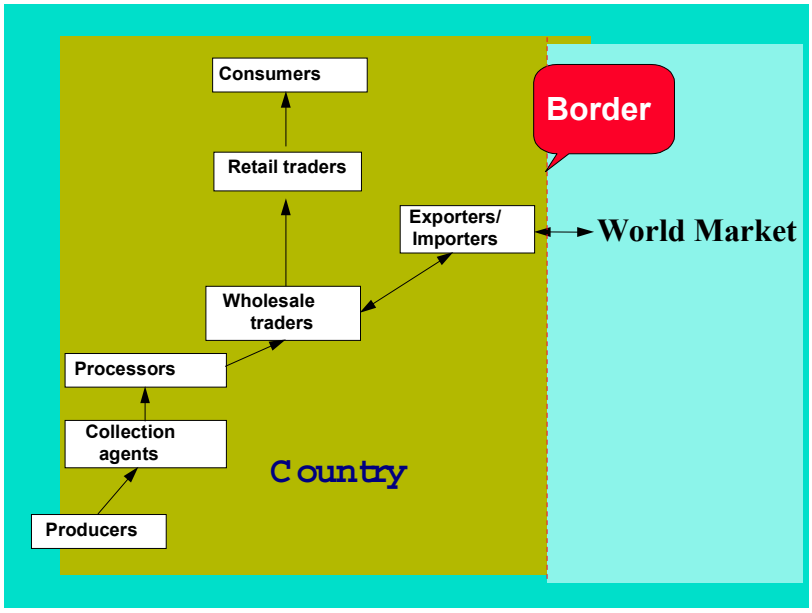
own guarantee this minimum, since other needs, cultural ones for example, may be more pressing at a given moment. Indeed some groups choose to put up with famine in order to protect their assets and preserve their cultural and social heritage.

Although the minimum well-being would seem to be becoming a global objective, it is difficult to transform this minimum into operational indicators that would make regular monitoring possible. The minimum well-being is often interpreted by a series of indicators representing the health and education minimum, assuming a situation of food security and a minimum level of income to avoid poverty. Theoretical studies of how to faithfully translate the concept of minimum well-being into operational indicators are still needed. Too often economists take minimum income indicators as a guarantee of minimum well-being.

4. ANALYSIS OF THE COMMODITY CHAIN FOR STAPLE FOODS AND KNOWLEDGE OF THE PRINCIPAL ACTORS

The Commodity Chain Approach

This approach allows the flow of food products in the economy from producers to consumers to be analysed. The analysis of a **commodity chain** reveals the relationships between the different actors and should bring to light any constraints that could explain its lack of efficiency.



This table serves as an example. It gives a very general outline and should be adapted to each commodity chain.

It should, in particular, help to explain low producer prices (which hinder availability), high consumer prices (which limits the access of the most under-privileged), and poor marketing, which could lead to unstable supplies amplifying problems of seasonal shortfalls and remoteness.

The first step in analysing a commodity chain is to **identify** the products derived from a primary product (in the case of the cassava commodity chain, for example, *gari*, tapioca, dried cassava chips, cassava flour, etc. could be identified). A list is then drawn up of the **owners** of these products at each stage of the chain (different types of peasant farmers, collectors, processors, wholesalers, etc.) and of those who provide essential services, such as haulage contractors. Imports and exports of staple food products (including food aid) should be included in this analysis as they are part of the country's available food supplies.

The objectives and strategies adopted, the specific constraints and the information requirements (market prices and conditions, the technology available, etc.) of each of these **actors** should be identified.

The **technical** role of each of these agents in the commodity chain should also be analysed and the information needed to monitor the flow of products through the commodity chain established: the technical conversion ratio (extraction rate), the loss rate, the quantity and quality of the products, etc.

How **prices** change as products move through the commodity chain should also be observed. The financial situation of the actors in the chain (income, expenditures) can also be analysed to get an idea of their profits or losses.

To gain a better understanding of the functioning of the commodity chain it is also worth examining **trade** between the actors in the chain as well as the market structure (are they competitive comprising many buyers and sellers? Or is there a monopolistic tendency, which could explain large profits and steep price increases.).

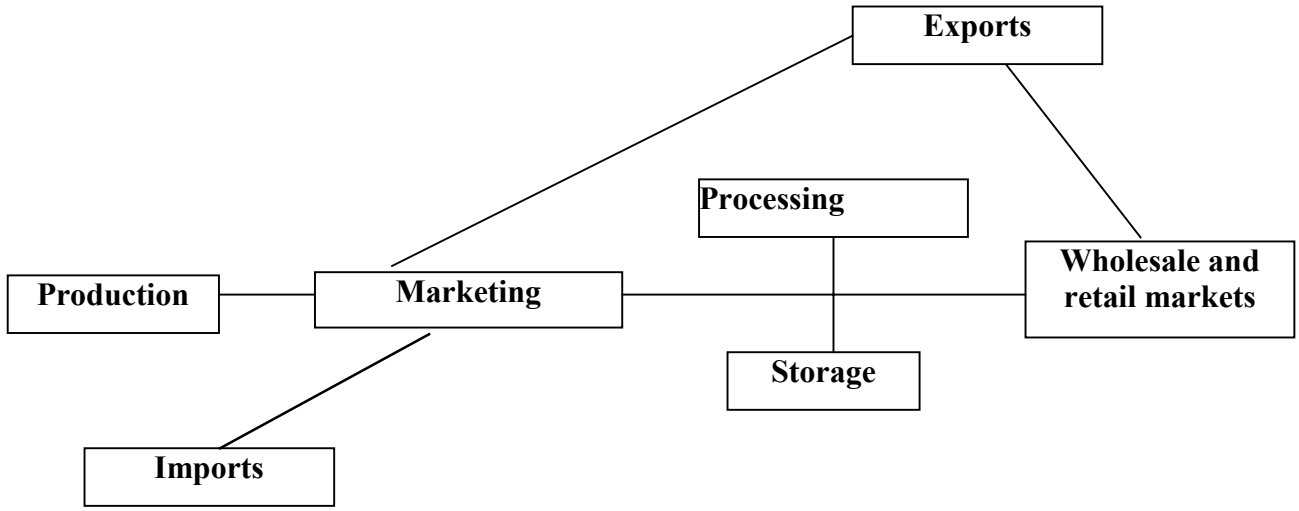
In the case of a FSIEWS, we are mainly interested in analysing *commodity chains for staple food products* (as defined in Section 1 of this chapter). Once this initial work is completed, data for each commodity chain can be compiled and the results passed to the multidisciplinary working groups (see the next section) to analyse the available data.

Brief Outline of a Commodity Chain

All the information assembled during the analysis can lead to a better understanding of decision-making among the actors in the commodity chain and to identify the various constraints they experience or create.

It should be noted that some institutions can play an important role in its *overall* functioning and in decisions taken regarding policies that may affect it. This is particularly the case of coordinating bodies for the commodity chain (which may or may not be set up by a government body), of various pressure groups (organizations of agricultural producers, traders, processors, etc.) or inter-professional organizations.

The diagram below gives another view of a commodity chain



Analysis of food security policy is also necessary. This is achieved by becoming familiar with the main decision-makers in all the areas that have a direct influence on food security or the resolution of related problem: *availability of food* (production, foreign trade); *stability of supplies* (transport, prices, market management), *access to these supplies* (employment, income, food aid, the eradication of poverty); *biological utilization of foods* (nutrition, health).

Limitations of the Commodity Chain Approach

The main limitation of this approach is a tendency to overlook the larger economic setting in which the commodity chain is situated. The decisions taken by various actors in the commodity chain are not based solely on factors within the chain, quite the opposite. At farm level, the production of a particular staple food is part of a very complex crop system. For example, in an area with the right rainfall for cotton[21] (>700 mm) the arguments for or against maize crops (staple food production) and cotton (cash crop) can overlap considerably. The same interaction occurs with agriculture/livestock farming. This kind of consideration can also be applied to actors in other commodity chains.

Finally, experience shows that as a country develops, and in particular when its market starts expanding, *the production function, so heavily favoured by the commodity chain approach, tends to become overshadowed by the marketing and distribution function*. It is the latter that often dictates conditions to the other actors in the commodity chain modifying the flow of these products at the convenience of the main marketing agents.

5. THE BASIC STUDY: CREATION OF MULTIDISCIPLINARY WORKING GROUPS (MWG) AND PROVINCIAL COMMITTEES (PFSC)

The relevance of the analysis of food security monitoring is closely linked to the quality of the databases used. Control of the four main aspects (production, marketing, nutritional monitoring and monitoring of vulnerable groups) should be achieved through combined quantitative and qualitative information, stimulating the coordinated participation of the partners in order to ensure the viability of the system, and information that is sufficiently accurate and detailed[22].

Only if there is cooperation among the services concerned and between government bodies and civil society, will the monitoring system be able to generate ever more reliable information and analyses. There must be cooperation at national level by means of the **Multidisciplinary Working Groups** (MWGs) that bring together the different information providers and users in each sector. In general, there are at least three MWGs, one for production, one for marketing and one for vulnerable groups, this last group including both social monitoring and health and nutrition monitoring.

The creation of MWGs is always difficult at the beginning. As participatory an approach as possible should always be adopted. For example, a national workshop can be organized to present the FSIEWS methodology. Representatives of the ministries concerned, NGOs, associations and the private sector interested in food security can be invited and each one asked in which MWG they would like to participate. This initial group, whose first task will be to draw up an inventory of the available information in its area, will gradually co-opt other members, and it will be necessary at a later stage to adapt the group's composition and way of working until it reaches a balanced range of ministerial representatives, NGOs and the private sector; specializations; ages

[21] Refers to the "Sudanian zone" of West Africa.

[22] As regards both the parameters and the basic geographic units.

and responsibilities of the participants, etc. When the composition and way of functioning of each MWG has been unanimously accepted it can be written up in an official document.

It should be clear to all from the beginning that as coordinating structures the MWGs are indispensable to the functioning of a FSIEWS. *They must adapt and evolve* in keeping with the deployment or functioning of the database and control panel, the technical resources of the Information System, the frequency of bulletins and other information updates to be prepared, etc. *The MWGs should function as specialized technical committees* in the principal food security areas, and have a central role in the FSIEWS, since they not only decide which indicators to monitor but are also involved in the processing of data and the preparation of articles for publication (see the example of an MWG in Mauritania on the next page).

On the other hand there should also be collaboration at provincial level (and at other local levels). The **Provincial Food Security Committees**[23] comprise representatives of the different food security bodies at local level. These national and local coordinating instruments should be *representative of the sectors or regions for which they are responsible, and include representatives of national bodies, civil society* and the private sector. They should represent a net improvement in support services for rural settings as a whole and in food security for all. In addition, the information that is exchanged should have a better balance of simplicity, clarity and flexibility, have good quality statistics, and enable the ongoing refinement of the approach and its methodology.

The Provincial Food Security Committees (PFSC) are usually organized at a later date, in the set-up phase of a FSIEWS, when the preliminary studies have been carried out. Nevertheless, if there are already decentralized food security organizations in the country (that may, for example, have been created to monitor food aid or set up at the instigation of NGO associations), they must be integrated into the analysis and proposal process right from the very first stage.

[23] See Part Two, Chapter IV, Section Four, Institutional Organization, and Chapter V, Steps to the Institutionalization of a FSIEWS.

The table below shows the composition and tasks of an MWG of the FSIEWS in Mauritania, which, although responsible for agricultural production, also monitors food products of animal origin.

MWG
Monitoring agricultural production

LEAD MANAGER: Crops Adviser (MDRE)

Members:

A representative of the Food Security Department
A representative of the National Statistics Office
A representative of the Office of Research, Training and Extension (MDRE)
A representative of the Office of Agricultural and Pastoral Resources (MDRE)
A representative of SONADER
A representative of the Office of Planning and the Environment (MDRE)
A representative of the Rural Radio Station
A representative of the Mauritanian Information Agency
A representative of FAEM
A representative of DATAR/MINPT

Observers:

A representative from FAO
A representative from FEWS
A representative from WFP

The role of the MWG is to coordinate all the information regarding the monitoring of the agricultural year in order to:

- ensure continuous monitoring of changes as the crop season unfolds, based on indicators permitting assessment of the national and regional situation and in particular early forecasts of harvests;
- ensure reliable information on the evolution of the situation at different levels, particularly that of the moughataas, regarding the different types of crops as well as the status of livestock and grazing;
- propose, after analysis, all the appropriate measures to help policy makers, in particular the Food Planning Committee (FPC) through the Consultative Group (CG), to implement the necessary action in order to improve monitoring of the crop year, and through this to improve food security;
- propose setting in motion the early warning process in cooperation with the Consultative Group of the Food Planning Committee, should serious problems be identified in the course of the crop year, or any other event that could affect a good harvest;
- publish all the data collected and analysed, using various media (bulletins, news flashes, newspapers, radio) to reach a large section of the population.

Secr.:S/P Informations rurales/DRAP/MDRE

6. SYNTHESIS OF THE BASIC STUDY

The synthesis of the basic study should be presented in summary form in a simple table with the following minimum information:

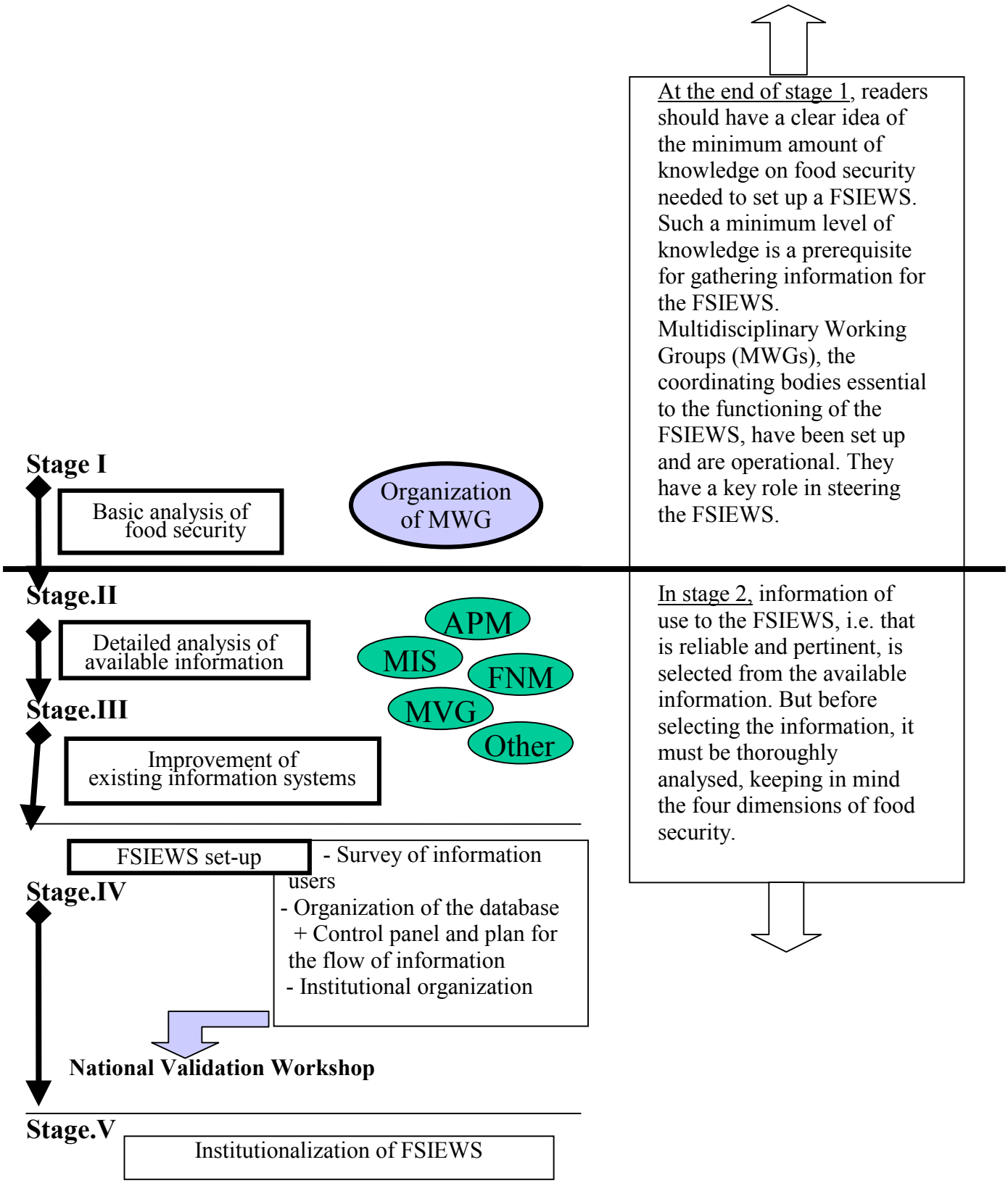
- definition of homogeneous zones;
- lists of foods that make up the dietary minimum of populations;
- detailed list of vulnerable groups;
- the frequent risks that can cause their food insecurity;
- regular risks that can cause food insecurity.

Example Results of Basic Food Security Analyses

Food Security Information and Early Warning System (FSIEWS) – CHAD[24]

Homogeneous Zones	Food Minimum	Vulnerable groups	Risks
SAHARAN ZONE **/oasis agriculture (BET)** rainfall < 150–200mm	Dates, milk, meat, millet, wheat, vegetables (tomatoes, onions, gumbo, lemons, water melon)	Chronic economic food insecurity:- Shepherds have lost a large percentage of their flocks to droughts and livestock epidemics.	Rainfall Locust infestations Epizootics
SAHELIAN ZONE **a) Transhumant mixed farming** **(Kanem, Batha Nord, Biltine)** rainfall: 150–350 mm	Millet, berbéré (recession sorghum), red and white sorghum, maize, cowpea, groundnut, sesame.	***Chronic economic food insecurity:*** - Herder-farmers who do not have a large enough area to cultivate and have not managed to replenish their herds are unable to purchase food in the market.	Rainfall Locust infestations Epizootics
b) **Lake** rainfall: 300–400 mm	Millet, maize, wheat, market garden produce, fish	- Fishermen who suffered much reduced incomes as a result of the drop in the water level of rain-fed lakes, ponds, streams, etc.	Rainfall Infestations of locusts and birds Insufficient water to recharge the lake
c) **Mixed farming** **Northern Chari Baguirmi** **Guera North.** **Batha South.** **Ouaddaï** rainfall: 350–700 mm	Millet, sorghum, berbéré, maize, groundnut, cowpea, sesame. Vegetables(garlic, onions, tomatoes, gumbo etc.)	***Frequent economic food insecurity (natural disasters in particular in the flood recession plains*** - Farmer-stock breeders with an insufficient or landlocked cultivable area - Farmers and livestock breeders fled to the towns	Rainfall Insufficient flood recession water for plains planted to berbéré Infestations of various crop pests.
SUDANIAN ZONE **a) former cotton-growing area** **South Guera,** **South Chari Baguirmi.** **North Mayo Kebi.rainfall**: 750–850 mm	Sorghum, millet, berbéré, maize, Groundnut, sesame Cassava Vegetables	***Less frequent economic food insecurity limited to bad agricultural seasons and natural disasters.*** - Farmers using unsuitable production systems - Farmers encountering tenure problems - Fishermen and stock breeders forced into other occupations	Rainfall Insufficient flood recession water Floods Uncontrolled proliferation of crop pests
b) rice-growing area **Tandjilé (Laï, Léré, Koloba, Kim, Eré)** **Mayo Kebi (Djoumane, Bongor, Bilam Oursi)** rainfall: 850–1000 mm	Sorghum, millet, berbéré, maize, rice. Groundnut, sesame Cassava, taro Vegetables	***The Chronic Food Insecurity of the under-nourished*** ***In urban areas chronic food insecurity affects:*** - elderly people with no support - the handicapped - widows and women heads of families - the unwaged and unemployed - orphans and abandoned children - households with a large number of young children - farmers and stockraisers who have sought refuge in urban centres - divorced women and single mothers - junior civil servants and others on low incomes	Insufficient flood recession water Floods Areas becoming landlocked Uncontrolled spread of crop pests
c) Salamat zone rainfall: 800–1100 mm	Berbéré, sorghum, millet, maize. Groundnut, cowpea.		Floods Uncontrolled spread of crop pests
d) cotton-growing area **Western Logone** **Eastern Logone** **Mayo Kebi sud** **Tandjilé** **Moyen Chari** rainfall: > 850 mm	Sorghum, millet, maize, rice. Groundnut, cowpea Cassava, taro Vegetables		

[24] Summary of a document presented at the national workshop in September 1998.


At the end of stage 1, readers should have a clear idea of the minimum amount of knowledge on food security needed to set up a FSIEWS. Such a minimum level of knowledge is a prerequisite for gathering information for the FSIEWS. Multidisciplinary Working Groups (MWGs), the coordinating bodies essential to the functioning of the FSIEWS, have been set up and are operational. They have a key role in steering the FSIEWS.
Stage I
Basic analysis of food security
Organization of MWG
Stage.II
Detailed analysis of available information
APM
MIS
FNM
MVG
Other
Stage.III
Improvement of existing information systems
In stage 2, information of use to the FSIEWS, i.e. that is reliable and pertinent, is selected from the available information. But before selecting the information, it must be thoroughly analysed, keeping in mind the four dimensions of food security.
FSIEWS set-up
- Survey of information users
- Organization of the database + Control panel and plan for the flow of information
- Institutional organization
Stage.IV
National Validation Workshop
Stage.V
Institutionalization of FSIEWS

CHAPTER II

STAGE TWO: DETAILED ANALYSIS OF AVAILABLE INFORMATION

During the second stage, the Multidisciplinary Working Groups (MWGs) and those in charge of the FSIEWS should analyse thoroughly the available information in all food security areas, as well as the collection, processing and information dissemination mechanisms.

1. INFORMATION ON AVAILABILITY OF FOOD

The formula for the availability of staple food products defined in the first stage is: ***Availability = production of staple products + imports-exports + available stocks - losses and uses other than for food***.

Since there is usually fairly reliable information at national level and for a given period on the availability of these products, it can be compared with people's requirements over the same period. At provincial, departmental or local levels, availability can be assessed with margins of error that vary according to the countries and zones studied. Any analysis of availability should take into account imported food aid. Of course the staple products classed as "available" may vary from one region to another, and from one population group to another (according to ethnic group, main sector of activity, age group, etc.). The staple products will be the ones identified earlier in the analysis of the dietary minimum (Part Two, Chapter I, Section 1).

The MWG monitoring agricultural production (APM) analyses this information jointly with those in charge of the FSIEWS. This work will mainly involve the agricultural statistics services, but in collecting the necessary data on losses they will have to work with the plant protection and animal health services. As they must also collect data on imports (including food aid) and exports, the MWG/APM should always collaborate with the MWG monitoring marketing (in the framework of the MIS) for the analysis of available information on foreign trade (import/export). In some countries, import and export data are the exclusive province of customs, but even in this case, it is useful if the data-collection is carried out jointly (MWG/APM and MWG /MIS).

2. INFORMATION ON STABILITY OF SUPPLIES

The stability of supplies classed as belonging to the "dietary minimum" must be analysed over time (food is supplied daily) and spatially (an over-supplied region does not necessarily compensate for an under-supplied one). The analysis of the stability of supplies therefore includes information *on prices and quantities in the markets*, the evolving *stock situation*, and the functioning of the *transport* system etc., that is, knowledge of the mechanisms through which consumers access "available supplies" everywhere and at all times. The overall import (and export) figures refer to the availability of products, but the date of entry (or exit) of products into the country can give an indication of the stability of supplies.

The MWG monitoring the marketing of staple products is therefore responsible for finding and analysing the available data on the stability of basic food supplies.

The adoption of a MIS in the FSIEWS therefore involves all aspects of marketing staple food products; it also covers transport, storage, and the processing of these products throughout the production/commodity chain, from their production (or importation) to the end consumer. It is mainly

for this reason that the analysis of commodity chains, included in the basic study of the FSIEWS (Part Two, Stage One, Section 4), must be carried out with great care.

3. INFORMATION ON CONSTRAINTS REGARDING ACCESS FOR ALL TO SUPPLIES

Analysis of access for all (to an adequate quantity and quality of supplies) demands some knowledge of the nutritional status of people and the factors that can modify it: household incomes relative to the price of foodstuffs (*financial access*), demographic problems, and also *physical access* to supplies (distance from markets, ability to access them, etc.).

Many people working in the field have also suggested that social access should be included with physical and financial access, in which case unemployment, state of health, supply of drinking water etc. would be added to the other factors.

Monitoring *access* therefore consists, above all, of ***the socio-economic monitoring of vulnerable groups***.

The members of the MWG that monitors vulnerable groups (MWG/MVG), and who are in charge of analysing the available data in this area, should therefore adopt a "social" approach (awareness of the problems of poverty, the role of women, etc.) combined, however, with a good economic approach, particularly important in monitoring poverty.

4. INFORMATION ON THE BIOLOGICAL UTILIZATION OF STAPLE FOODS

Monitoring data on ***the biological utilization of foods*** is generally data on *monitoring the nutritional status of populations*.

The nutritional monitoring MWG (MWG/FNSS) analysing the available data in this area should therefore be composed of members with expertise in health and nutrition.

Often the MWG/MVG and the MWG/FNSS are combined into one MWG so that they can jointly analyse the socio-economic data linked to access, and the nutrition and health data linked to the biological utilization of foods.

5. OTHER INFORMATION

5.1 Food Aid

Generally speaking the information from monitoring food aid deals with the three principal stages in the commodity chains of the products concerned: supplying commodities (supplying merchandise), supply management and distribution to beneficiaries.

5.1.1 Information on the origin of food aid

In addition to the origin, this aspect also takes into account the quantity, quality, price, packaging and status of each product. The following information is usually available from customs and donor services and should be classified according to source:

- imports from the international market are the largest category and they often come from countries providing food aid;

- imports from neighbouring countries or triangular purchases (involving the donor country, the recipient country and the country where purchased) are among the most interesting in that local market distortions can be contained and products can be adapted to local consumer preferences. This approach has been developed with success in the Sahel for supplying millet and sorghum;

- local purchases, financed by the government or donors, can be looked at from the marketing point of view as inter-regional transfers from surplus zones to deficit zones.

5.1.2 Information on managing food-aid stocks

A distinction must be made between public and private (belonging to international donors or food-aid administrators such as WFP) stocks of foodstuffs, and what may be considered price stabilizing stocks (virtually impossible today if markets are open and competitive). There are also "security" stocks such as the National Food Security Stock (NFSS) in arid countries, controlled by the state (sometimes by donors) and comprising specific reserves for emergency use only.

Food-aid products are often managed by a government body that also oversees the National Food Security Stocks; their management involves having information on markets, the movement of foodstuffs, the condition and movements of stocks, etc.

The World Food Programme (WFP), which also administers large food stocks, monitors a number of variables to ensure good stock control (import terms, logistic parameters for distribution within the country, number of beneficiaries, volume of stocks, number of rations available, etc.).

5.1.3 Information regarding the distribution of food aid and assistance

Food-aid management involves ensuring that foodstuffs are conveyed via free distribution or sale to target groups. To this end information on the following aspects has to be collected and processed:

- targeted groups (groups in a food-insecure situation);

- type of assistance proposed (free distribution, subsidized sale, food-for-work);

- origin of food supplies;

- the practicalities of food-aid operations, including means of transport and distribution, time scales, stock handling, etc.;

- responsibilities at the different stages of distribution.

This information should be contained in a protocol agreement drawn up between the government and the donor(s) of food aid.

5.2 Population Movements

When large numbers of people (and large distances) are involved population shifts are often a very good indication of a difficult economic and social situation and even of food insecurity or vulnerability. But such shifts are a difficult phenomenon to pin down, especially when information is needed quickly on the situation and nature of these movements:

- the national census gives fairly complete information and from this point of view is the best instrument since it covers all households and all individuals. Major migratory flows can be reconstructed by comparing current places of residence with place of birth or past places of residence (for example, one, two and/or five years ago). But, at best, this will give information on the recent past. Questions can certainly be included to measure seasonal or short-term migrations, but this information is soon out of date. Given the high cost in terms of money, time and manpower, this type of data collection is not frequently used;

- sample surveys, which are less expensive and not as cumbersome, give a more immediate view of the migratory situation. Even so, the preparation, execution and utilization of a national survey on migration still take several months. On the other hand, when dealing with a limited area, it is a more manageable instrument for measuring and explaining migration to, or from, a particular area. It is not, however, suitable for identifying sudden migratory movements (unless it is repeated at regular intervals, which is expensive and therefore rarely done);[25]

- in order to keep track of population movements that may be indicative of underlying local problems, observations must therefore be made on a day-to-day basis in the field by the people or institutions that are best placed to do so by virtue of their work (administrative authorities, health centres, schools, religious communities, etc.). If one does not attempt to measure migration flows but empirically assesses their existence, information gathering is simple and inexpensive. Getting organized to keep track of such phenomena and centralize the information at a level where it can be interpreted prior to making decisions, does, however, present some not insignificant difficulties.

6. COMPUTER SYSTEMS AND THE FLOW OF INFORMATION

The analysis of institutions that provide information on food security, and the channels through which the data flows, is carried out in stages in the specific framework of each MWG. It is one of the first tasks of the MWGs. A participatory approach must be adopted in carrying out this task, as indeed applies to the basic setting up of the FSIEWS, and the results circulated systematically among many of the actors involved in food security in order to obtain their comments before finalizing them. The available information, the frequency, format, distribution method, and the person in charge of each stage, etc, must be detailed for each food security area (and therefore each MWG).

The smooth flow of information through the collection, analysis and utilization services is indispensable over time (as up-to-date as possible) and space. It depends on:

- the cooperation of the providers (some services may be unwilling to part with their data, hoping to profit from them, or fearing criticism);

- whether providers and recipients circulate information in the same format (e.g. computer file);

- whether means of communication such as fax, telephone, radio, that facilitate communication are available;

- whether the frequency with which information is disseminated is suited to that particular kind of information.

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[25] The simple addition of questions on migration to a survey set up for a different purpose, in the hope of economizing, will not work: the survey has to be conceived specifically to study migration, which means covering all the spatial units potentially concerned.

It is important to motivate the providers allowing them to benefit from the technical expertise of the FSIEWS. Feedback from the FSIEWS to the providers can take the form of additional information, favourable comments on the information supplied, and/or on the providers themselves. The extension services that provide data on crop status may be interested in receiving information on the marketing of the products that concern them and will get satisfaction out of seeing their work published and analysed in the monthly bulletin, while their managers will get positive feedback at the meetings of the PFSCs[26] or MWGs[27]. On the other hand, at all levels, from the collection to the final publication of the data, all those involved must feel that they are part of a network that values their information and allows them to participate in a global analysis of food security.

Of course, these analyses, while indispensable at the start of the work of the FSIEWS, are not definitive and their results will have to be reviewed periodically as the structures, media, and those in charge, etc. change and evolve.

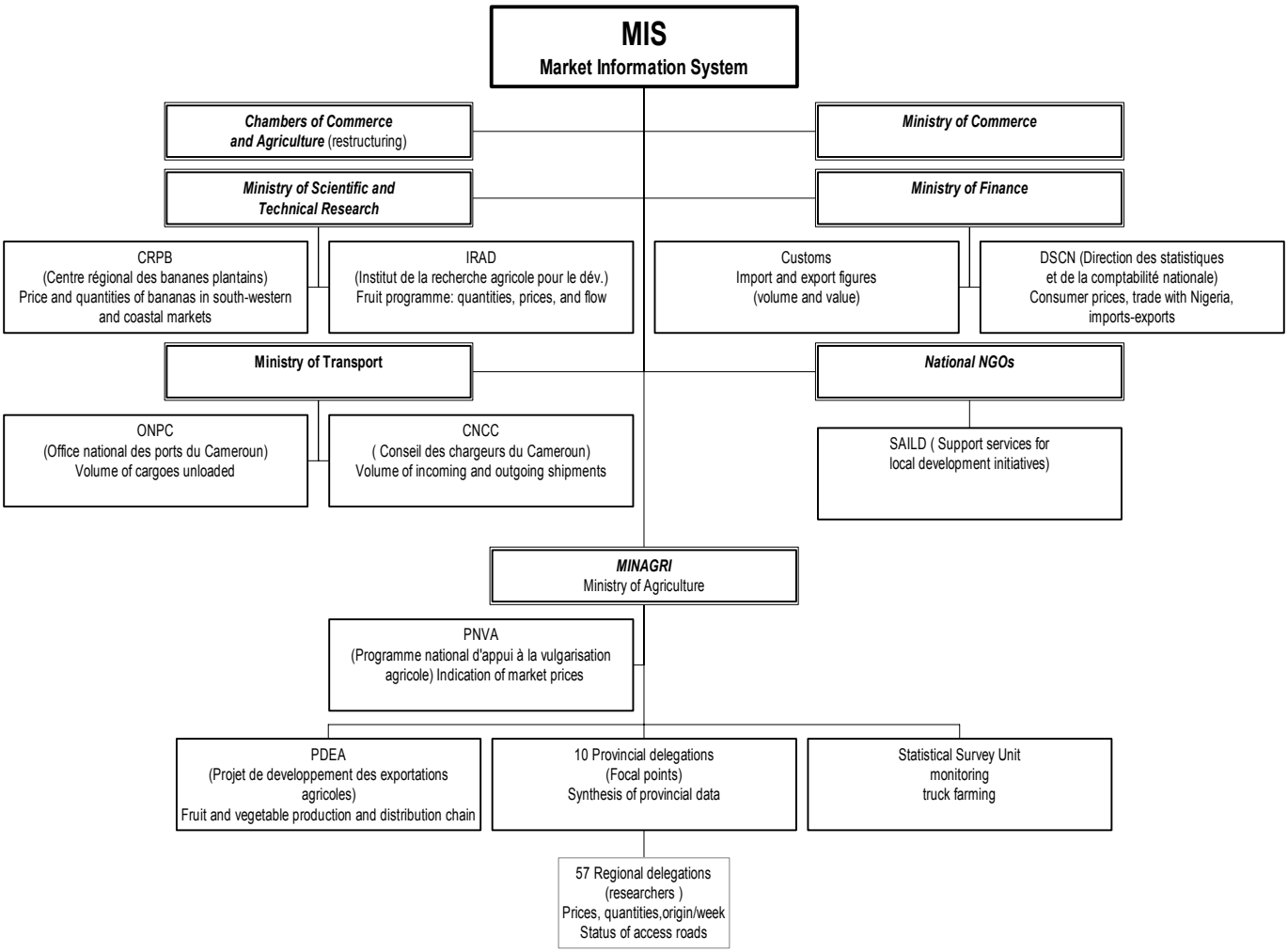
Illustrating the information channels in diagrammatic form is useful both for ease of understanding and for regular updating. Flowcharts are an important element of the participatory analytical process.

The analysis of the existing information systems can be summarized in a similar way to the table on the next page (analysis of information provider services).

At this stage, the question of how to set up a simple computer system arises and whether a network of central computers perhaps even linked to provincial delegations should be considered. Decisions regarding the need for modems, or other means of sending information (fax, radio, diskettes, satellite, etc.) also need to be discussed.

[26] See Part Two, Chapter IV, FSIEWS Set-up.
[27] Part Two, Chapter I, Section Five - Basic Study.

Analysis of the Circulation of Data for the Cameroon MIS



Example analysis of information provider services (Chad 98)

Structures	*Available Data*	*Frequency of publication*	*In what form will data be sent to the FSIEWS*	*Data Processing*			*Existing databases*	*Data processing constraints*
				Computer power	*Software*	*In charge of data handling*		
DSA	MIS cereals/livestock forecasts and agricultural production	Every crop season	Report, diskette in Dbase	486	Dbase 4/ SPSS for output tables	Technician	Yes in Dbase	Inexperienced in using SPSS and ACCESS
CNNTA	Nutrition (survey) Vulnerable groups		Report	Pentium (not used)	Need Office 97	Nobody	No	Inexperienced in using computers
DERA	MIS livestock and pastures	Monthly	Report	-	EXCEL	Technician	No	Lacking computers and software
DPVC	Data on desert locust and other pests including seed-eating birds	Every 10 days	Report	486	Excel and Word for the reports	Technician	Yes	No recycling of data by data-manager
ONC	Cereal and stock prices	Monthly	Monthly report on cereal prices	IBM 386	EXCEL	Service chief	No databases	Computer broken Need training
ONDR								
SODELAC	Production data by crop, yield, crop pests, rainfall.	Reports monthly, end of crop year, quarterly, annually	Report	Only one 486 computer for everyone	Word for the reports	Service chief	No	Lacking equipment and training
DREM	Rainfall	Every 10 days	Report, bulletin	486	Pluie, Climbase	Database manager	Yes, in climbase, pluie	Problems with the power supply
DEPA	Statistics not very reliable	No publications	-	No computer	-	-	-	-
SIM	Cereal prices	Weekly, monthly, annually	Report, bulletin	486	Paradox,	Input clerk	Databases in paradox	Lack of experience in information processing
DSEED								2
DSIS	Diarrhoea, goitre, tuberculosis, vitamin deficiencies, dysentery	Twice yearly, but provided on request	Diskette, reports	Pentium 166 Mhz	ACCESS	Input clerk	One database in ACCESS	Lack of training for the data-manager
FEWS	Rainfall Cereal prices, hydrology NDVI	Monthly	Diskette, report	Pentium 166 MHz	Yes, but not Access	Head of project	ACCESS but not familiar with it	
SAP	Early warning data	Monthly	Report	486	Yes	Input clerk	Dbase4	Lacking computer equipment and skills
SECADEV OXFAM	Area, production, price of produce, utilization of agricultural goods and gum arabic	Monthly or at the request of the FSIEWS, depending on fund	Diskettes, Periodic reports	Pentium 166 MHz	ACCESS, Publisher	Mixed farming and fishery resources manage	Lacking resources and technicians	Databases are in ACCESS Need training in Office 97
CCI/DPASA	*Food aid*		*Reports*	486	WP, Lotus	*Service chief*	*No databases*	
Word Vision	Nutritional surveys	Periodic reports	Reports	486	Excel	Nutrition manager	No databases	Difficulties creating a database
ACCRA	Stocks of cereal products, cereal prices	Monthly (no longer published due to lack of funds)	Reports	486	EXCEL	Representative	No databases	Funding No experience with databases

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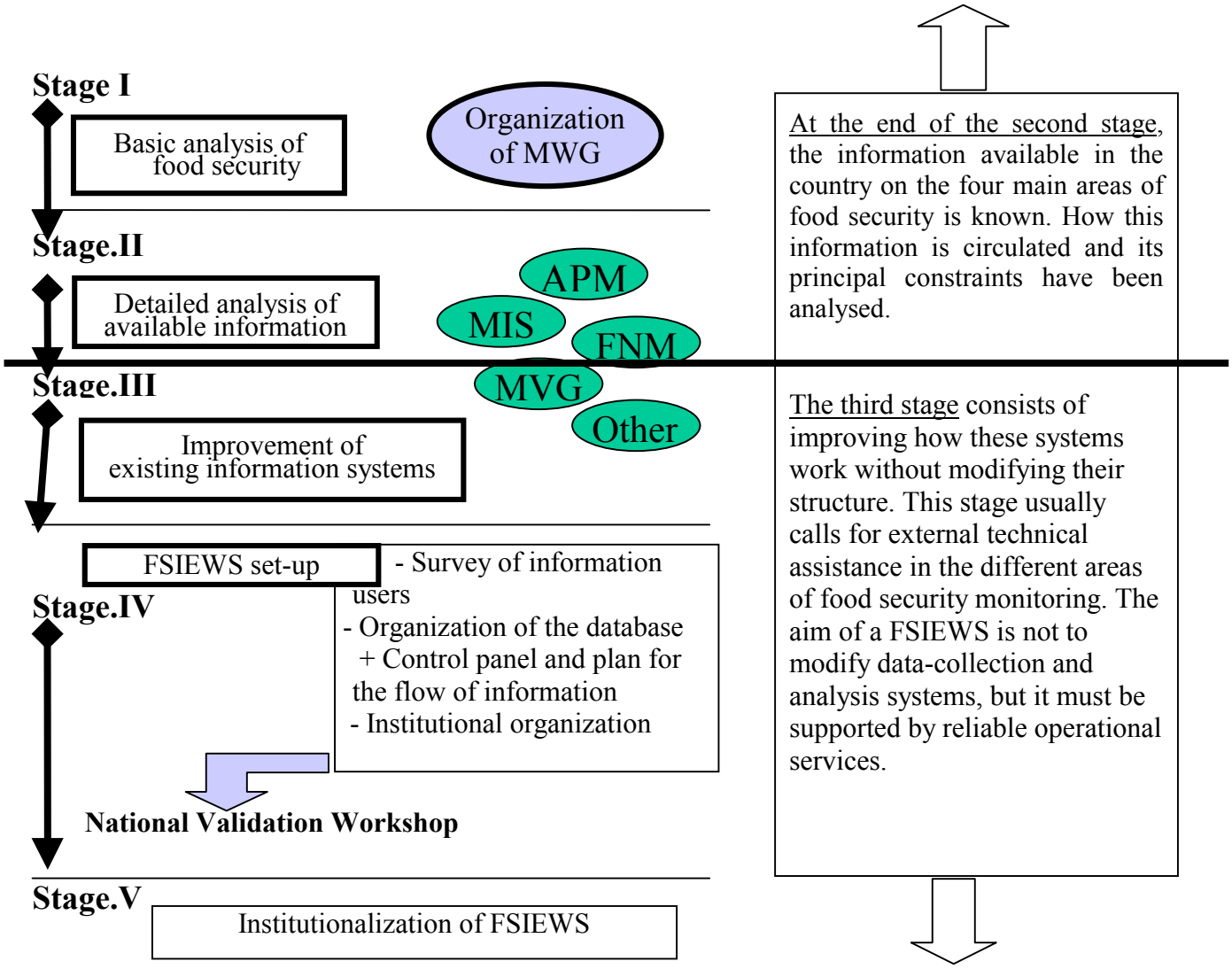
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Detailed analysis of available information
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Improvement of existing information systems
FSIEWS set-up
- Survey of information users
- Organization of the database + Control panel and plan for the flow of information
- Institutional organization
Stage.IV
National Validation Workshop
Stage.V
Institutionalization of FSIEWS
At the end of the second stage, the information available in the country on the four main areas of food security is known. How this information is circulated and its principal constraints have been analysed.
The third stage consists of improving how these systems work without modifying their structure. This stage usually calls for external technical assistance in the different areas of food security monitoring. The aim of a FSIEWS is not to modify data-collection and analysis systems, but it must be supported by reliable operational services.

CHAPTER III

STAGE THREE: HOW TO IMPROVE EXISTING INFORMATION

Each food security information system has to be methodically analysed and technical improvements proposed. Any help and improvements deemed necessary or useful must not involve changing *their structure*. Technical assistance will be provided by the members of the corresponding MWGs, whose respective national managers are influential members and often the lead managers. All members of the MWGs, and not only those in charge of the statistics systems, will be involved in the process of technically improving the collection and processing of data, in order to ensure overall cohesion in setting up the system, since each one has to understand the process and participate in it. Moreover, this broader participation of the MWG members is essential from the sustainability point of view, since there can be a rapid change-over rate among national representatives. It is therefore desirable that a large number of managerial staff be involved in this process of technical refinement.

1. AGRICULTURAL PRODUCTION MONITORING AND HARVEST FORECASTS

The various existing monitoring systems have been described briefly in Part One (Chapter III, Section 1). Agricultural production monitoring systems are to be found, at different levels of development, in all countries, but a number of them need to be improved so that they can play their part in the collection and processing of data. It should be noted that the monitoring of agricultural production should take into account all basic food products: foodstuffs, products of stock raising or fisheries. In practice, it appears that only food products are monitored, the reasons for which are a combination of convenience and commercial interests.

One of the first things to take into consideration in improving the monitoring of food production is that diversity in agro-climatic environments can lead to very different methods being adopted. While in the **semi-arid zones** agricultural production is limited to a narrow range of farming systems where the food-crop (and even animal) productivity depends essentially on the water balance, the same cannot be said of the **more humid zones** where stock farming is much less widespread and agricultural production is dependent on a far greater number of factors:

- the limiting factor is no longer rainfall but intensity of solar radiation (sunshine);
- the main crops are varied and cover a wide range of seasonal plants (maize, sorghum, groundnuts, beans, cowpea, sweet potato), annual plants (cocoyam, taro, yam) and perennial plants (cassava, banana/plantain)[28];
- yields therefore depend on the following main factors:
    - the cropping combination which is in turn dependent on biophysical resources (soil, water, varieties, etc.), inputs and socio-economic factors (technical knowledge, labour, capital, etc.);
    - weather conditions other than rainfall, in particular the combined effect of temperature and humidity;
    - the incidence of disease and insects;

[28] These crops are mentioned only as examples.

- the farmers' specific needs/priorities;[29]
- access to markets.

So the first constraint any analysis of food-production monitoring data encounters is the need to know the environmental conditions in which the food is produced.

Another element of prime importance is, of course, the availability of correct and reliable statistics (also for multiple cropping). Often the published average yields and productions are "administrative" averages calculated for a wide range of production systems and not very representative of food production. National agricultural statistics services often have to overcome technical and financial problems as best they can, and the sample analysed is very often not at all representative of all the agricultural enterprises.

1.1 Data

In monitoring food crops production, a distinction should be made between data used for the agro-ecological classifications and those used for crop monitoring during the agricultural season.

A necessary preliminary phase for all environmental conditions consists of dividing the area into agro-ecological zones according to the available resources (soil quality and fertility; temperature, rainfall, water balance and other meteorological data) and the main production systems. This classification is used to varying degrees in different countries according to the availability of information. There may be climatic classifications based on historical series of meteorological data (the most frequent being rainfall), pedological maps, maps of plant cover or grazing areas. The degree of detail in the maps is very variable but they are at times the only source of information for such studies. The classifications are not usually changed unless a new methodology offering a more precise analysis is adopted.

Example

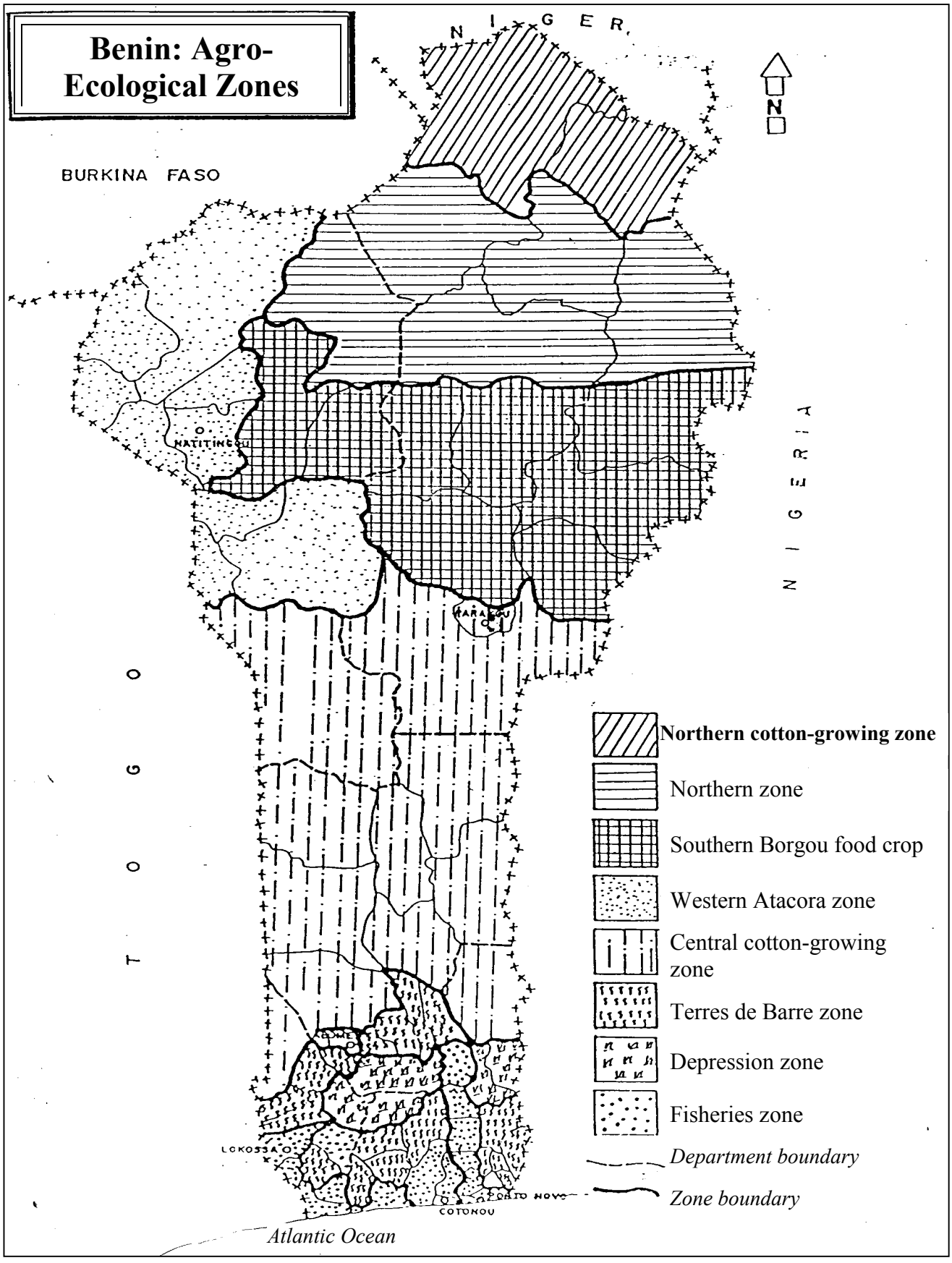
Southern Cameroon has been divided into four agro-ecological zones (AEZ) according to agro-climatic and phyto-geographic conditions, the main characteristics of which are mentioned below.

AEZ	Vegetation	Altitude	Rainfall	No. days rain/year	No. of months > 100 mm
High Plains of Adamaoua	Sudano-guinean savannah	900-1400	Monomodal 1500 mm	110-150	7
South Cameroon Plain	Mixed forest & derived savannah	500-800	Bimodal 1400-1600	125-175	7-9
Coastal low lands	Evergreen forest	0-500	Monomodal > 2000 mm	180-240	9-12
Western high plains	High savannah	750-2000	Monomodal > 1750 mm	175-220	7-9

More detailed analysis of the AEZs reveals a number of "agricultural production areas" based on specific soil and climatic conditions and the main food and perennial crop systems practised.

The map of Benin on the following page further illustrates agro-ecological zones.

[29] They determine the time to harvest and the quantities, notably for continuous harvest crops (i.e. cassava), and therefore the yield.


Benin: Agro-Ecological Zones
NIGER
N
BURKINA FASO
NIGERIA
TOGO
NATITINGOU
PARAKOU
COTONOU
PORTO NOVO
LOKOSSA
Northern cotton-growing zone
Northern zone
Southern Borgou food crop
Western Atacora zone
Central cotton-growing zone
Terres de Barre zone
Depression zone
Fisheries zone
Department boundary
Zone boundary
Atlantic Ocean

Zoning is therefore one of the fundamental preliminary elements of the agricultural production monitoring process. On the other hand, the yields of the principal crops are broadly linked to several factors that can be summarized as follows:

- the agro-ecological zone and the type of agricultural production, including specific normal climatic conditions (rainfall, temperature) and special conditions (tornado, hail, fires at the end of the dry season), combined with the average soil fertility;

- the traditional combination of crops and growing methods: varieties, planting date, mixes and respective densities of the species, fertilizer used, maintenance. The incidence of disease and pests linked to the agro-climatic conditions of the production area, to the varieties and production techniques (multiple cropping, fertilizing, protection), etc.;

- the priority given to food/cash crops produced by the household or to other activities that affect the available workforce at certain times of the year, priority being based on the expected income;

- the distribution and density of the population.

In addition, some socio-economic factors do not have a direct influence on the crop yields but on the behaviour of peasant-farmers, influencing choices in relation to available manpower, the use of fertilizer, multiple cropping methods, etc., which does have an effect on yield and production. Similarly, market access has a strong influence on the planting of vegetable crops, which are difficult to keep fresh, because of the high costs related to losses or investment to avoid such losses. This is also true of continuous cropping plants, the overall yield of which is influenced by the distribution of the harvest over time, but also by whether the produce is traded fresh or dried.

Information on monitoring the crop year is collected and/or produced by the relevant services (statistics, extension, projects etc.) through their field networks, district agents, and decentralized offices. Clearly, the main factors affecting production (and therefore the information needed to monitor production) vary according to the agro-ecological zone. While in the semi-arid zones (rainfall less than 700/800 mm per year) the water balance can give an acceptable estimate of yields for cereals (i.e. sorghum, maize, millet), it only plays a secondary role in determining the yield of main crops in the Sudanian and tropical zones. Indeed in these areas, information on the phytosanitary status of crops is more important than rainfall, an excess of which can have a harmful effect on production. Data on the phenological development of crops provided by agricultural monitoring or extension workers therefore complete the necessary data.

Towards the end of the crop year, the harvest forecasting element, essential for the FSIEWS control panel, takes into account historical statistics, the estimation of yields and cultivated land, and information on production by crop and by administrative district. Although the administrative districts may not be homogeneous areas from the point of view of the above-mentioned zoning criteria, they provide a general reference for assessing harvests since statistics are available and aid requirements are identified at this level.

The approach to monitoring the main food crops and harvest forecasts varies markedly from one country to another but in general it is based on a combination of the following methods:

1. Assessment of **cultivated areas** for each system of production.

- *Statistical sample survey.*

- *Qualitative evaluation (verbal statement) of cultivated areas, combined with the sowing success rate.*

2. Assessment of **yields** based on:

- *water balance: calculation of the actual evapotranspiration and agro-ecological zoning;*
- *utilization of biomass development indices (analysis of NDVI images) and rainfall assessment (CCD images);*
- *qualitative evaluation of yield and production of the principal species cultivated by groups of peasant-farmers;*
- *plant evaluation when measuring crop-cutting plots;*
- *more advanced simulation models or models that take into consideration all the factors affecting plant production (sunshine being the principal factor).*

3. **Average production of agricultural households** in each production area, based on quantitative (measured locally) and qualitative data.

4. **Extrapolation of production** at national and provincial levels based on (calculated) extrapolation constants.

In the box below, is a summary of all the factors mentioned and the elements necessary for their characterization.

Factors	Characterization Elements
	- Total rainfall and distribution, in particular at the beginning and end of the season, - Average temperatures, minimum temperatures, relative humidity, - Soil type.
Typical cropping combinations and farming methods: varieties, planting dates, combination and respective density of species, fertilizer, maintenance	Production methods: - Multiple cropping (preparation of the soil) - Varieties used, production cycles - Planting and replanting times (including delays) and length of season - Inputs used, fertilizer, phytosanitary products - Maintenance (eradication of weeds) - Harvest period (periodic, continuous, final)
Incidence of pests and diseases linked to the agro-climatic conditions of the production area, the varieties and production methods (multiple cropping, fertilizer, protection), etc.	Frequency and incidence of pests and diseases (strongly linked to climatic conditions, varieties, farming practices)
Priority given to ***food/cash crops*** produced by the household or to other activities affecting the availability of the work force at certain times of the year, and priorities of producers according to expected income	- Presence and areas - Inputs and factors of production typical of these crops

CAMEROON - *AN EXAMPLE*

In the context of harvest forecasting, the mandate of the FSIEWS was limited to the principal food crops having a major impact on food security[30]. The following products were identified for south Cameroon:

- Tubers: cassava, new cocoyam/taro, yam + sweet potato, potato;
- Cereals: maize and sorghum;
- Legumes: groundnuts, beans, soya and cowpea (*Vigna unguiculata*);
- Plantain and banana.

In each agro-ecological zone a group of main food crops is examined according to the following outline:

	Adamaoua	Southern Plateau	Coastal Lowlands	High Plateaus
Main crops	Cassava Maize Sorghum Groundnut	Plantain/Banana Cassava Cocoyam/taro Groundnut Maize	Plantain/Banana Cocoyam/taro Cassava Maize	Maize Cocoyam-taro Plantain Beans/Cowpea
Secondary crops[31]	Yam Sweet potato	Yam	Yam Groundnut	Cassava Yam Sweet potato

Cassava, plantain and banana all have crop cycles of two years or more. Cassava is a continuous cropping plant while plantain/banana is a periodic cropping plant. The other tropical roots and tubers (cocoyam, taro, yam) are annual crops with more limited harvest periods, generally within a single crop season[32]*. All the other crops, including sweet potato and potato, are considered seasonal crops.*

1.2 Data Analysis

As mentioned above, the agricultural, meteorological, extension, plant protection, water, stock breeding, and other services are normally responsible for providing the data in their own fields. They may also analyse the data since they usually have good background knowledge of the history and local sociology and much experience in the field. The MWG for monitoring agricultural production (APM) is the institutional setting in which these analyses should regularly be carried out as part of the plan to exchange and make information available to all, to coordinate the work of the national services and civil society, and also to prepare bulletins and other methods of disseminating information. The APM/MWG should also be responsible for the harvest forecasts which, in the Sahel, for example, should be effected twice yearly: in November (provisional) and in March (final) for annual crops in the north. The agro-hydro-meteorological tables compiled every ten days are also useful to the APM/MWG.

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30 Forecasts for other crops could be carried out at a later date if required.

31 Once the system is established, the introduction of a "secondary" crop does not involve any further costs.

32 Although aroid plants may be treated as perennial crops in some production systems, it should be noted that the return of the rains stimulates growth in many of the young tubers which therefore become unsuitable for consumption/marketing.

The **principal analytical methods** are summarized below.

- *Climatological analysis*

In climatological analysis, the meteorological conditions of the current year are assessed with the aid of historical series of data. Even when applied in difficult conditions (lack of data, few stations, etc.), the simulation models can project the effects of meteorological conditions on the crop cycles. They can, moreover, be useful in developing "scenarios" for determining yield variability ranges for the current year, with an acceptable degree of probability.

- *Water balance analysis[33] (simplified)*

As is the case in most forecasting methods, the approach recommended by FAO is based on the water balance[34]. Using a series of parameters, the total water requirement is calculated as well as the water deficit or surplus in relation to rainfall and the real evapotranspiration (Etr). The estimated Etr for each year is calibrated using regression analysis and the yields provided by agricultural statistics.

This simplified approach based on rainfall, permits crop yields (of cereals in particular) in semi-arid areas to be estimated. However, the following modifications have been introduced to bring about a steady improvement in the system's performance:

- measured potential evapotranspiration values, or additional agro-meteorological variables, such as sunshine or excess rainfall lost through run-off;
- specific values of the water-retaining capacity of soils, and crop factors for the different species;
- actual sowing dates;
- calibration using local values of non-climatic detrimental factors;
- regular yearly calibration of agro-ecological zones;
- additional variables, as necessary.

This approach has already been tried experimentally in a number of meteorological services using various programmes. However, many problems were encountered relating to lack of skill in calibrating and refining the regression method for the different crops, taking into account the soil situation and production areas.

Forecasting Harvests

Production is calculated by multiplying the area sown by the estimated yield. The first step, therefore, is to estimate the yields. How reliable the estimate is depends on the care with which the calibration phase is carried out and the experience of the personnel in charge of the analyses. Models sometimes give yield results in the form of indices that have to be transformed into more understandable information (kg per hectare) using historical yield data published by national statistics services for each crop and administrative unit. The reliability of statistical data is of vital importance in that it directly affects the estimation of yields. Reliability, in turn, depends on the

[33] see "early agrometeorological crop yield forecasting" in FAO Plant production and protection paper N°73
[34] Can be calculated using FAOINDEX software.

number of farms sampled and how representative they are (usually too limited) and on how carefully staff in charge of measurements and surveys in the field carry out their work.

Moreover, for the purposes of forecasting production, the areas sown or planted have to be estimated. This (often inaccurate) information is usually obtained by field agents from the local services of the Ministry of Agriculture, by extrapolating from the whole administrative district. The identification of "proxy" indicators of the area sown is still used in studies and research in several institutes and countries.

- *Analysis of satellite images*

Satellite images are widely used in semi-arid areas. They are usually produced through the sensors installed on-board of NOAA[35] and Meteosat[36] satellites. Professional staff must be trained to analyse these images and in the use of the appropriate hardware and software equipment. The integration of satellite images into the overall analysis depends on the following technical options:

- integration of agronomic (sowing date, plant development, etc.), meteorological (mainly rainfall) and remote-sensing observations so that estimated yields by station can be interpolated by means of NDVI images[37];

- spatial analysis carried out on the basis of good correlation at local level between data in the field and certain satellite indices (for example precipitation recorded at meteorological stations and CCD[38]).

Several institutions have developed methodologies for monitoring the agricultural year in semi-arid areas (in particular the FAO-Agromet Group, the Agrhymet Centre in Niamey, the CSE in Dakar, the JRC of the European Community[39]). The products most frequently used in monitoring crops are the NDVI (with the option of a time profile for the zones concerned) and the estimated rainfall derived from Meteosat-CCD. Due to lack of resources and information for managerial staff, this work is not usually carried out by national services.

1.3 Constraints

The methodologies described here can typically be applied to zones between the semi-arid and sub-humid regions of Africa, but the analytical principles are also applicable to other tropical regions of Africa, Asia and Latin America. The technical and functional constraints of these regions can be summarized as follows:

- high degree of variability in agro-ecological conditions linked to the variability of climatic and phyto-geographic conditions. The climatic types are extremely varied with a lot of

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35 The NOAA satellite produces digital images by means of which the Normalized Difference Vegetation Index (NDVI) can be obtained. This index is broadly correlated with the volume of living vegetation. In arid and semi-arid conditions the state of crops and the surrounding vegetation are closely linked.

36 Meteosat produces digital images that measure the Cold Cloud Duration (CCD - T< -40°C), but this level is then calibrated in keeping with the existing statistical relationship between CCD values and recorded rainfall.

37 See note on the NOAA satellite.

38 See note above on the Meteosat satellite.

39 Apart from the specific products of the institutions mentioned, there has been rapid growth in commercial tools and software for processing satellite images. Several options are available according to the level of expertise of personnel and according to the type of processing to be done. IDRISI, IDA, Addapix, IGT and WinDISP are just some of the programmes. ERDAS is a more advanced programme.

overlapping, while the meteorological stations network is not adequate to obtain detailed or frequent data;

- great diversity of agricultural production systems, dietary habits[40], possibilities/opportunities to access markets;

- high degree of interannual variation regarding cultivated areas in the context of slash and burn types of shifting cultivation according to the biophysical environment and above all the socio-economic environment of agricultural households;

- great difficulty in getting measurements for multiple cropping, including combinations of seasonal, annual and perennial crops, and the great variety of intra-annual divisions of continuous and periodic harvests, that make it impossible to effect a reliable extrapolation of production, which demands at least two, if not three data-collections in the course of the season;

- difficulty accounting for the impact of food gathered in the wild[41] on agricultural production systems, especially in forested regions;

- little attention paid in the past to food security in some regions generally thought of as "easily meeting their food requirements", on the basis of a superficial assessment of "average" ecological conditions;

- lack of resources to carry out provisional and final evaluation surveys, and to apply and validate harvest assessment methods;

- poor quality of the available data; discontinuity in applying the methodologies and procedures for collecting and analysing data.

1.4 Improving Existing Systems and Monitoring Production

1.4.1 At organizational level

- Facilitate the continuity of activities, especially during the agricultural season. This requires coordination and intersectoral cooperation at all levels, which is a cornerstone of the efficiency and viability of agricultural production monitoring (APM).

- Set up APM in the following incremental stages:

    - identify information that is actually available and the institutions concerned;
    - organize the flow of information from the field to the monitoring system, through the institutions and bodies concerned (coordination);
    - collect and store useful data in a way that it can be easily accessed;
    - develop procedures and protocols for monitoring and analysis so that the monitoring system can evolve into a forecasting system.

- Reinforce the meteorological, agronomic (extension and research) or phytosanitary dimensions of the work of the MWGs, according to requirements.

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[40] These apply mainly to populations in the different zones.

[41] In Chad, the extent of cultivated areas in "afub owondo" (in the southern region of Haut-Nyong) is inversely proportional to the "abundance" of wild mangoes (I. gabonensis), which are a substitute crop for groundnuts.

1.4.2 At the technical level

- The various techniques mentioned for monitoring food production and forecasting harvests must be used in an integrated way, since none of them are able on their own to give a reliable estimate of how the agricultural year is progressing. Such integration becomes more important as the APM becomes a key part of the decision-making process. This applies to the "economic" analysis, but also to the "structural" analyses, classification, and zoning, etc. based on the historic data.

- The limits and features of the identified production areas should be gradually refined with the cooperation of agricultural services, agricultural research and other partners involved, depending on the country, and on the basis of relevant routine surveys carried out by the local survey and statistics offices.

- Regarding agricultural production, the state of constant change produced by the reactions of peasant farmers to specific conditions, does, as a rule, give rise to the diversification and extensification of systems of agricultural production. In some cases, however, there is also an intensification, mainly in the areas of greatest demographic pressure. Such intensification tends to improve the local systems, notably by using low external input strategies and integrated methods of production and protection.

- In addition to the regular agro-hydro-meteorological reports (every ten days), which would benefit from presenting essential information in map form, the MWG monitoring food crops and crop forecasts should also contribute significantly to:

    - reporting on the situation half-way through the crop season (after plants are established and before flowering);
    - constantly updating the harvest forecasts for the main food crops, at least from the flowering stage on;
    - analysing agricultural production in depth and in an integrated fashion at the end of the season.

1.4.3 Monitoring animal production and fishery products

As mentioned above, the figures regarding food consumption per inhabitant and the total availability of food often do not take into account food stuffs of animal origin, fish, meat or other livestock products. These elements are sometimes integrated into the definition of basic diets and in the monitoring of vulnerable groups, although in most cases the agricultural production monitoring systems only consider food crops (and often only cereal crops). It is therefore a good idea to make sure that all the products mentioned in the list of staple foods (see the first stage) are included in the agricultural production monitoring system, i.e. for both the collection and analysis of data.

While the monitoring of food crops is often restricted, especially in dry zones, to monitoring the cropping season in order to predict the harvest, the monitoring of animal production (livestock, milk, eggs, chicken, fish, etc.) is more complex because production is continuous and more scattered.

Monitoring the availability of fish is possible when catches are recorded by national authorities (such as the Fisheries Authority) and when aquaculture production, which is quite large in some areas, is known.

Monitoring foodstuff production of animal origin often uses indirect indicators: monitoring grazing, veterinary activities (vaccinations, official slaughtering), and milk production by means of marketing information, etc. The most difficult aspect remains domestic self-sufficiency of these products: indeed it was often thought that nomadic herders in the semi-arid areas suffered chronic hunger as they lived mainly on milk and meat from their own stock (sometimes also dates, which are not monitored either) for much of the year. A few countries have carried out surveys, some of which were country-wide, to estimate animal production, both in sheds and free ranging. Veterinary services that monitor animal production have access to the estimates drawn from these surveys.

Monitoring fish and animal production is an essential part of monitoring agricultural production and the APM/MWG must use every means to set up a database, even if only approximate, for this purpose. This work can only be achieved through regular cooperation with the national and local people in charge of fish or animal production.

As was mentioned in Part 1, Chapter 2, it is possible to predict major variations in animal production using indirect indicators. Indirect indicators must nevertheless be compared with the most accurate data available on animal production and derived products (milk or egg products, for example) in each province.

Populations whose diet depends to a large extent on harvesting wild resources are often (wrongly) considered to be under-nourished, because there is no information on the quantities of products consumed. Even an approximate estimate of food gathered is nevertheless essential for monitoring agricultural production.

2. MARKET INFORMATION SYSTEMS, STOCKS AND MARKETING[42]

FAO has conducted an evaluation of Market Information Systems (MIS) in all FAO member countries on this subject. It revealed that although a large number of countries do have some sort of MIS, the services they offer cannot be considered to provide farmers and traders with commercially useful information. The MIS suffer from inadequate data-gathering, the incompetence of government officials, and general lack of resources. Often set up by donors, they become unsustainable after the donors' departure. There is a tendency when creating an MIS to plan such cumbersome structures that they prove difficult to manage.

In creating an MIS, the first consideration should be its **commercial usefulness** and viability. A detailed list should be drawn up of the needs of those involved in the marketing system and the MIS **tailored to the available resources**, only expanding it when additional funds have been acquired on a long-term basis[43].

An MIS should be "**transparent**", providing everyone with a clear picture of the principal trends in markets and prices, in addition to other useful supplementary information on marketing and stocks. Not that information per se can halt price fluctuations or lead to perfect transparency: those involved in marketing will always have to take decisions based on data that is incomplete.

The golden rule is to start with an MIS of **modest dimensions** that can be expanded later as resources become available. Based on an analysis of the marketing system, it may be appropriate at the outset to have an MIS that only provides the ruling prices in the bigger markets, and to

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[42] The text of this section is based on *Market Information Services: Theory and Practice*, FAO 1998.

[43] A detailed description of how to collect and utilize information in order to forecast cereal market trends was proposed in a handbook presented at an SADC seminar: it is the product of two FAO projects carried out in the field (Helder & Nyhoff, 1994).

extend it later to cover prices in other wholesale markets and assembly markets. Where donors are involved, perspectives can become skewed and an MIS is likely to be proposed that is too big in relation to the country's capacity to maintain such a system. Beneficiaries find it difficult to refuse offers of aid and tend to focus on the immediate gains, ignoring the question of what will happen in the future, especially if a gradual approach is adopted.

2.1 The Institutional Structure of an MIS

First of all the country's capacity to operate an MIS should be examined from both a technical and financial point of view. The institutional organization needs to be closely examined and the potential for private-sector involvement looked into.

There are a number of possible satisfactory institutional settings for MIS that will vary from one country to another.

- It is possible to rely on *the statistics services* that already have a network of trained data-collectors. Nevertheless, it is well-known that there can be considerable delays among some government agencies in publishing information, while the MIS has to disseminate market information frequently.

- *Agricultural ministries* also usually have a network of officers throughout the country, but such staff may not have any training in collecting information nor be particularly motivated to do it. When the management of MIS is entrusted to agricultural ministries, it often happens that other ministries who produce the same statistics (ministry of trade, for example) often continue to collect price information, which duplicates costs. The ministries concerned should therefore come to some agreement to avoid this issue.

- In theory, making the users pay something for the information they need could ensure the economic viability of an MIS. However, it is not feasible to charge small farmers. For this reason most MIS are run as *free public services.*

- *Private MIS* are a possibility. They work best when they can use already available information without having to collect it. In Beijing, the information gathered by public services on wholesale markets is then disseminated by the private sector.

- An *autonomous semi-governmental organization* is another option. The advantages of this type of organization are that it can retain its revenue which is an incentive to seek commercial support. It is in theory free of restrictive public-service employment regulations.

- *Parastatal financing of MIS* is an alternative, the work of data collection and dissemination being carried out by the private sector.

2.2 Data

The first step is to carry out an in-depth analysis of the marketing system in order **to assess the information requirements of each actor in the system** (farmers, traders, commission agents, exporters, retailers, consumers, administrators, etc.). Such an analysis provides information on:

- the products and varieties to be considered as well as the weights and measures to be used;

- the frequency with which farmers and traders would like information and the means of disseminating it;

- the resources available to potential users of the MIS to receive information;

- the farmers' capacity to put the information to good use, and the need to provide for a specific dissemination system.

Detailed information on marketing channels for products is also necessary:

- how products get from farm to market and from one market to another;

- the function of each intermediary;

- how prices are established at each link in the chain and qualities and quantities of products traded;

- the weights and measures used.

Monitoring markets

In **selecting data for monitoring markets** the following principal constraints should be taken into consideration:

- the choice of products (and varieties of each product) to monitor is very important. Only products of commercial interest should be included in an MIS, but sometimes it is necessary to introduce different varieties of the same product. The costs rise according to the number of products, and the usefulness of monitoring a very large number of products is questionable, both for commercial and food security purposes;

- the weights and measures used can be confusing. It is therefore important to standardize. The most practical solution is to monitor the normal packaging system [prices are per kilo, but collected by whatever the usual packaging unit is (carton, box, etc.)];

- the list of markets for which information is disseminated should be very carefully established: the basic criterion consists of choosing markets where prices for each of the basic products are established. Sometimes this involves relying on some large national markets, or on those of a country bordering a major exporting country (neighbouring countries of Nigeria, for example). Border markets can be very important in determining domestic prices;

- the quality of the produce is another essential point. The MIS should be used to monitor products of fair average quality. To do this, data collectors need specific training in order to ensure consistency of the data collected by different agents in different markets.

Examples

The Tanzanian MIS started out collecting prices of 27 products in 45 centres, but most of them were not used. The Ghanaian MIS was based on price-collecting in more than 100 markets but the Agricultural Ministry had to discontinue it due to lack of resources and training for agents in the field, although the MIS still has close to 100 full-time staff.

When the MIS has a large number of markets to cover, it runs into the problem of how to manage such large amounts of information. There are not enough resources to pay for salaries, train data-collection agents and maintain the system.

The storage of products

A good MIS should have precise knowledge of the storage systems throughout the commodity chain and to what extent they are utilized. All stocks (family stocks on the farm, village stocks of cereals, the various commercial stocks, national security stocks etc.) should be analysed and a system of assessing their value and contents be established. In addition, the loss-rate of stored products has to be estimated for each type of storage.

Imports and exports

The MIS needs precise agreements with customs services, ports, and official import and export authorization services for staple food products in order to assess the general status of national supplies and potential short- or medium-term changes in the situation. In some countries, estimates of the flow of food products (including animal products) may be obtained at provincial level from administrative controls carried out for the purpose of applying transport taxes.

The implementation of an MIS should also fulfil the following conditions:

- the markets to be monitored, the list of products, the weights and measures used, the evaluation of product quality all have to be determined accurately in the framework of a **participatory discussion process** with representatives of all the actors involved in marketing the principal food products;

- **the survey forms should be filled in accurately**, checked and the data-collectors given appropriate training;

- the **data-collectors** employed by the MIS should have **a fixed timetable** to follow, for example, when to collect the prices in a given market, when to input data on the computer and deliver it to the radio station to be broadcast;

- **supervisors** should ensure that timetables are adhered to strictly. They should also listen to broadcasts to make sure they are going out as they should, and be familiar with all MIS publications.

Example of a working MIS

A private MIS in South Africa

Agritel is a privately run information service providing information on wholesale markets and eleven major abattoirs in South Africa. The markets are computerized and all transactions (price and volume) are recorded. Agritel receives information daily that it then processes and presents in a more user-friendly format. The service covers both price and volume data for all commodities, varieties, categories, sizes and packages.

Agritel has about 400 users who pay a monthly fee of between US$28 and US$38 depending on the number of services and markets on which the user requires information. Users include producers, packers, caterers, butchers, wholesalers, market agents and the markets themselves. They can also access the national electronic transmission network (Beltel), either through a terminal hired from Beltel or through the use of a PC and modem. The telephone call to Beltel is free.

The service offered by Beltel is menu-driven and easy to use. It provides the following information on the current and previous day's trading for each market:

- *the highest price and volume traded at this price;*
- *the weighted average price for the day;*
- *the lowest price and volume traded at this price;*
- *the volume traded between the average price and the highest price of the day, and the weighted average price of these transactions;*
- *the volume traded between the average price and the lowest price of the day;*
- *the volume on offer at the beginning of the day;*
- *the total quantity sold during the day;*
- *the volume unsold and carried forward to the next day.*

In addition to trading information for the day, users can consult historical information using a graphics package supplied free of charge by Agritel to its major customers. This information shows trends from the start of the service. Agritel allows market information to be used to its full potential.

2.3 Data Analysis and Dissemination of Information

The data processing should be kept **simple**. A close eye should be kept on computer experts who often tend to design systems that only they can understand. The designs should be flexible enough to provide for future expansion of the MIS but they should avoid being complex at all cost. Users have to be able to use the system easily on a daily basis, and be able to solve any problems that may arise.

The **time** factor needs to be given careful consideration in the system's design since daily, weekly and monthly reports are required and **meaningful** comparisons made between the different time periods and markets.

Data security is a major problem. The programmes and databases should be protected and regular checks carried out to make sure they have not been cancelled or accidentally changed. Files can be blocked and passwords used to prevent unauthorized access. But it is difficult to protect information since it is constantly being moved from one sheet to another, or from cell to cell. It is equally difficult to set up automatic checks on the data at the moment when it is being entered.

The media used to disseminate information should be relevant to MIS users. Considerable care should be taken over how the information is presented, and as much use as possible made of graphics. Long lists of prices read out on the radio can make for poor listening: lists should

therefore be limited to the most important products, that is, those subject to the greatest price fluctuations. Fuller information can be published in the newspapers. Radio broadcasts should be interspersed with some commentary on market conditions and opportunities, although this lengthens the programme and increases the costs. Finally, and perhaps obviously, prices have to be broadcast in the languages spoken by the people using the MIS.

When an **MIS begins radio broadcasting**, one or two introductory broadcasts should be devoted to describing the service and providing farmers with the information necessary to be able to understand the prices broadcast. These broadcasts should be repeated periodically. In recent years FAO has developed training materials designed to give extension workers a good background in marketing matters.

Example of an MIS in Zambia

Initially, prices and demand in markets was disseminated in three ways (weekly radio broadcasts, weekly market bulletins and price boards) which all suffered various setbacks. When another section of the ministry did not pay its bills, the radio station refused to broadcast any further information; an increase of 400 % in postal charges put an end to the weekly distribution of bulletins; while price boards were not favoured by farmers. These problems were eventually resolved: information is once again broadcast on the radio and published twice a week in a national newspaper, while the bulletin is now distributed thanks to sponsorship from a local bank. Future sustainability will depend on attracting and retaining such sponsorship.

The MIS managers have realized that simply publishing prices is not sufficient. Farmers have to be able to interpret the data and find out about potential market outlets. For this reason, the ministry (assisted by FAO) is launching a new provincial bulletin supplying farmers with information on which traders are buying and where, and trying to improve on-farm storage, which is becoming increasingly important, now that farmers no longer have outlets for their crops immediately after the harvest

- **AGRIMARKET**

The **FAO-AgriMarket** software was developed by FAO to help governments establish agricultural market price lists, called Market Information Systems (MIS), and to improve the operation of existing systems. AgriMarket reduces the time and effort needed to manage large quantities of data and increases the accuracy of such work. The programme permits more information to be transmitted faster to all those involved and should thus help to increase market transparency. It can also be utilized for information regarding prices and quantities of agricultural inputs.

AgriMarket was developed using the database management system "**MS ACCESS**". It is a simple-to-use menu-driven package. It can monitor up to 891 products in 90 different markets, and the data can be input daily or weekly. The data checking functions enable users to establish price brackets for each product in each market, excluding prices outside these ranges. Conversion from local measurement units into standard units is incorporated into the programme, which saves time and eliminates calculation errors. Reports can be produced daily, weekly, monthly or quarterly, in a variety of ways, enabling users to obtain information on all or some of the markets or products for varying periods.

AgriMarket also has **utilities** for managing databases, enabling smooth manipulation of disks and files, and data transfer. Database management functions have been included to protect and restore files, index databases or store them. Its data import and export functions make it easy to transfer data between AgriMarket and other databases, spread sheets or graphics programmes. Data can thus be transferred to other programmes for more advanced analysis or to prepare graphs. Moreover, data already stored in computerized market information systems can be imported to AgriMarket without loss of information. The programme also has a simple built-in mailing system that can keep track of all those to whom market information is regularly sent, and create address labels.

Security functions have been built into the programme in order to discourage unauthorized access to the databases and to prevent unsuspecting users from executing potentially damaging commands. The overall programme is protected by passwords, the highest level of access being reserved for the system manager, who allows other users to access the system. The management functions permit users to change their password to obtain a summary of the system's status.

A very useful feature of the programme is the **"tutorial" mode**, which enables users to access the databases without affecting the real data contained in them. Training sessions can therefore be carried out alongside its use in normal mode and the processing of real data.

A user's guide accompanies the software. It deals principally with setting up a computer information system using AgriMarket in a typical marketing office. The guide gives a step-by-step explanation of how to code data and prepare the screen layouts before going on to explain how to actually use the programme. The case-study approach is effective, new users learning in tutorial mode can use the data contained in the guide for practice.

- **Other MIS data management and processing systems**

If AgriMarket is not used as an information management tool, then a commercial relational database management package (such as MS Access or Paradox) should be used. Direct access to data can be fairly rigidly controlled and data-entry routines can be built in to include error checking features. Reports can also be organized to extract any necessary set of data automatically (any series of products, markets or time periods) with minimum manipulation of the database. Databases do, nevertheless, take more time to set up initially and require more highly trained staff than does a simple spread sheet.

In summary, data processing should follow the principle that the simplest solution is often the best. Allowing computer experts to design systems that they alone can understand is to be avoided at all costs. Moreover, the design should allow for possible future expansion of the MIS, but avoiding complexity as the users have to be able to use it with ease and solve any problems that arise.

2.4 Principal Constraints of an MIS

The principal constraints that impede the smooth running of an MIS are the following:

- **Information costs**

    - Local operating budgets are too low and poorly paid employees whose travel expenses to markets are not always paid may tend at times to invent information to avoid doing their rounds.

- The training of data-collectors leaves much to be desired and refresher courses are often non-existent, which may explain errors in recording data or in filling in the records.
- The aims of the MIS may not be clear to all employees and approximate data or errors, especially of analysis, may ensue.

- **Duplication of activities**

Sometimes there is duplication of activities among the services that collect prices nationally and then disseminate them through the various bulletins. This can cause some confusion, particularly when there is no consistency between the data sets. In Cambodia in early 1996, the prices of agricultural products were collected by the ministry of agriculture, the ministry of trade, the statistics service in charge of the retail price index and by a local radio station (the only one to provide the farmers and traders with a useful service).

- **Political and other interference**

  - It is well known that traders are unwilling to divulge information (fear of tax inspection or price speculation);
  - National or local government authorities may also have a reason to manipulate data on supplies and prices: public or private interests linked to import authorizations, requests for food aid, the risk of civil unrest, etc.

- **Forecasting difficulties**

  - Import and export forecasts are difficult to make, infrequent and not reliable. They are sometimes put out by customs services or services that issue import authorizations to traders.
  - Forecasts of market supplies or price changes are often estimated by extrapolating from historical analyses (if the country possesses such information) and taking into consideration the constraints of the current year. Forecasts of harvests, imports, and sometimes traders' plans are used here.

- **Computer problems**

  - The need for on-going, or at least regular, training
  - Computers often need an air-conditioned environment
  - Maintenance of equipment
  - Difficult to ensure that all staff are competent in computer and software use; not enough training and/or once trained they are often transferred to other posts at short notice.
  - Finally there is the choice of software, often imposed by donors funding support projects for the MIS who want to use their own packages, which are often impossible to update after the departure of the technical assistants.

3. VULNERABLE GROUPS MONITORING SYSTEM

According to the FIVIMS[44] definition, victims of food insecurity *are people whose food consumption falls below the minimum energy requirement*, as well as those with the physical symptoms of energy and nutritional deficiencies resulting from an unbalanced or inadequate diet, or from a physiological incapacity to efficiently utilize food because of infection or disease. Groups that are vulnerable to such food insecurity, as mentioned in Part II, Chapter 1, must therefore be identified and monitored carefully.

At institutional level, the MWG monitoring vulnerable groups generally relies on public and private authorities (including NGOs etc) that deal with social problems. But in order to be fully operational it has to work closely with the MWG monitoring nutrition (see next chapter). Indeed in some countries the FSIEWS have chosen, in the interests of efficiency, to have a single FNSS/MVG-MWG that monitors both vulnerable groups and nutrition. In the interests of clarity, however, the two MWGs are described separately here.

3.1 Defining Vulnerable Groups, or at Risk to Food Insecurity

The main groups vulnerable to food insecurity can be identified on the basis of the information contained in the synthesis of the basic study for a FSIEWS (Part Two, Chapter I, Section 6), assisted, above all, by a highly (and if possible decentralized) participatory discussion process focussing on this problem and aiming at the gradual definition of these groups. Each representative of an MWG brings to the table one aspect of the situation, depending on the individual experience of food security (production, revenues, health, etc.). No single representative has all the information. Similarly, national social services and NGOs often have different information on the distribution of vulnerable groups, in that the former are centrally based while the latter's expertise relates to the field, just as an economist's perspectives and data will be different from a sociologist's or a technician's.

The table that serves as an example for the participatory synthesis is essential for reaching consensus. Using the table as reference, the MWG monitoring vulnerable groups should collect further information on these groups, particularly in the following areas:

- geographic area;
- age and sex group;
- socio-economic group (urban or rural environment);
- type of subsistence system;
- strategies for coping with food insecurity.

Such an approach, although less common and more difficult to adopt (qualitative methodology, participatory approach), should prove useful for identifying socio-cultural and religious groups and the specific characteristics of their diet.

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[44] Food Insecurity and Vulnerability Information and Mapping Systems. FAO document CFS:98/5. See further information in Part Three, Chapter V.

3.2 Data

Data on vulnerable groups is essentially obtained by monitoring vulnerability, that is, the **causes of food insecurity:** those reflecting the quantities and quality of food available to households, and physical and economic access to foods. The indicators comprise data on household resources, budgets, consumption, etc. These kinds of variables are often dynamic and difficult to measure.

Monitoring population groups involves monitoring several aspects:

- **economic and social conditions of the population** itself (income, migration, eating habits, family structure, etc.). This area includes, in particular, monitoring poverty, which is the principal constraint to economic access to food;

- the specific problems of **physical access** to food: distance (from markets, for example), types of produce locally available (supply unsuitable for the demand), cost of urban transport to alternative markets, etc.;

- **coping strategies** adopted by marginalized groups faced with a serious risk of food insecurity. This kind of monitoring is essential for predicting food crises at household level.

3.2.1 Monitoring poverty

Per capita GDP is a general indicator (usually annual) which allows some comparison between countries. It has its limitations, since it ignores the distribution of income within the population, and therefore the extent and degree of poverty, as well as all the other causes of deprivation.

More complex indicators are generally used by the United Nations, such as the HDI[45] (human development index) that takes account of income, education and health.

It is not easy to choose poverty indicators, since the data has to be easy to collect, relevant and reliable. Often total *revenues* (including domestic self-sufficiency), total *expenses*, and the value of *food consumed* by households over a given period are used. In general, a minimum total income, below which a household is considered to be in a situation of poverty, is defined. This minimum may be calculated for a region or a village. The same thing applies to total expenses. To calculate the food consumption of a household, the minimum value of a food ration is established, in keeping with the local eating habits, and covering the minimum daily energy requirements of an individual (see Part Two, Chapter I, Section 1, the basic energy requirements). All people whose consumption falls below this minimum level are considered to be under-nourished. Clearly when the data relates to a carefully targeted local population, it is easier to take local factors into account and this reference is therefore more acceptable as a poverty threshold indicator. As each indicator has its own advantages and disadvantages, several indicators are often combined (into a set of indicators), each one marking an aspect of vulnerability. Therefore, if several indicators are in agreement for a given household, there can be no doubt about their poverty.

Nowadays, another dimension of the complex problem of poverty is also taken into account. Studies have effectively demonstrated that, for the same level of economic or social indicators, some families will find a way out of poverty while others get caught up in a downward spiral. This phenomenon can perhaps be explained by the capacity of the former to draw strength from the family or community around them thus rendering their situation more bearable. In other words they have **"solidarity assets"** that they can draw on, while the others, although characterized by similar economic and social indicators, deprived of such assets are perceived as poorer still and

[45] See the annual reports of the UNDP for further details.

suffer the distress of exclusion. The idea of *"social capital*" has been proposed by various schools of thought and attempts are currently being made to translate this phenomenon, essentially qualitative in nature, into measurable indicators.

At this stage, and apart from certain partial or combined indicators that have been the subject of large data collections (income, HDI, schooling rate, health cover, etc.) there are more case studies than useable series in the databases. Nevertheless, the large number of examples already gives some countries enough information to work on. Further work can be carried out in the FSIEWS to translate these complex dimensions into useable information.

Some of the indicators for the economic and social monitoring of the most vulnerable groups are also essential for the work of the MWG monitoring nutrition, and, as mentioned above, both MWGs (FNSS and MVG) must agree on how to monitor these variables. This is mainly a question of data regarding:

- consumption of the main food groups;
- household food expenses;
- domestic self-sufficiency;
- number of meals per day;
- the expected duration of household food supplies, particularly for self-sufficiency consumption households.

In this area, the indicators that best seem to reflect the household's energy consumption, in both urban and rural settings, are those for total per capita expenditure or resources, the household dependency ratio, and the number of staple foods used etc.

3.2.2 Monitoring physical access to supplies

Monitoring the specific problems groups have in **physically accessing** food is tied, as was seen above, to criteria such as:

- distance from food distribution sites (such as markets);
- the types of products available in nearby markets in terms of consumer priorities in the neighbourhood (available supplies unsuitable for needs);
- urban transport costs to go and shop in a better stocked store or one with supplies better suited to requirements;
- people with special physical access problems, such as the handicapped or people who have to take their children with them when they do their shopping, etc.;
- etc.

The MWG should therefore take time to examine these criteria for each specific vulnerable group and decide, for each criterion, what data to monitor, usually long-term (annual data may suffice for some indicators). It is often interesting to regularly check for variations in the data when certain conditions appear in the economic or social sector, such as the privatization of transport, changes in the country's social policy, etc.

3.2.3 Monitoring coping strategies

Familiarity with the coping strategies adopted by families is essential and should be integrated into the basic food security analysis[46]. Monitoring these strategies gives an insight into how families perceive their own food insecurity. When faced with the risk of not having enough food in the future, they adopt one of these strategies. The indirect indicators that can be derived from these strategies are often more qualitative than quantitative, but they give a fairly clear idea of a foreseeable change in the situation. This, however, requires thorough knowledge of the "vulnerable" groups and what they see as the greatest risks for their families[47].

The sequence and nature of coping strategies differ quite a lot from one group to another, depending on the subsistence systems, and within a given subsistence system according to the socio-economic profile, ethnic origin, religion, etc. (see the example of Nigeria below). In countries that regularly face food crises, people adopt complex coping strategies of their own, which can sometimes make the job of forecasting and preventing crises more difficult. Moreover, no two food crises are the same: the underlying causes, the sequence of events, and the conditions in a household facing a crisis are always different. A good understanding of the vulnerabilities of the local subsistence farming systems is therefore fundamental in determining the indicators for monitoring vulnerable groups.

Example: Analysis of coping strategies

Time sequence of vulnerable rural household responses to a food crisis in Nigeria

Coping strategies in the event of a food crisis in chronological order:

- *Adjustment of food and animal production*
- *Change in diet*
- *Use of famine foods*
- *Borrow cereals from neighbours*
- *Work for others*
- *Sell small animals*
- *Borrow money or cereals*
- *Sell production equipment*
- *Mortgage cultivable land*
- *Sell cultivable land*
- *Migration*
- *etc.*

The indicators, direct or indirect, corresponding to these strategies should be identified by the MWG/MVG from the data already available in the existing statistics systems or from other institutions, NGOs or projects.

Monitoring the signs of this behaviour (single indirect indicators or sets of indirect indicators) can give good warning of a probable food crisis. Although they are not usually very expensive to monitor, these indicators do need to be carefully analysed beforehand if they are to be properly adapted to the target populations. They must be developed in cooperation with all the actors working in risk areas since they often function more as "warning signals" than as regular monitoring data. It should also be noted that these indirect indicators should be modified as

[46] Part Two, Chapter I.
[47] Part Two, Chapter I.

populations adapt their strategies, and indeed as the ways and means of monitoring evolves, regarding both knowledge of data and ways of measuring the phenomena or transmitting data. The members of the MWG must therefore regularly examine the relevance of the indicators for each group concerned and adapt them as necessary.

3.3 Monitoring Vulnerability during Food Crises

When a food crisis occurs, various kinds of *information* are *required* at each step, depending on the stage it has reached, who needs information (NGOs, food aid organizations, governments, consumer associations, MCWs, traders etc.) and the decision level concerned. The MVG/MWG should be ready to provide the necessary information from its own database. Food crises are mainly due to failure to access food for various reasons. Depending on their dietary and social customs, their degree of monetarization, etc., households react very differently. A good understanding of the strategies of each of the groups most at risk is very important for decision-makers when crises arise. These can be used both as indicators of the severity of the crisis, and to target aid, favouring, for example, assistance to the most badly affected groups in keeping with their own coping strategies.

4. FOOD AND NUTRITION SURVEILLANCE SYSTEM

People who suffer from malnutrition are those whose food consumption is unsuitable and/or inadequate, or whose biological utilization of nutrients is impeded by a poor state of health, or a combination of both. This corresponds to the "access" and "biological utilization" aspects of food security. Food consumption at household level is a function of available food and how it is distributed within the family itself. Moreover, an unfavourable health environment and poor socio-economic conditions prevent the most deprived households from making optimal use of available food, and are the cause of high levels of infection. Food availability at household level[48] is a necessary condition but not sufficient to prevent malnutrition. It is acknowledged that socio-cultural factors play a key role in the utilization of available foodstuffs. The most notable socio-cultural factors (religious, ethnic, etc.) are: different kinds of diet, feeding practices for children (in particular, when they are being weaned), food distribution within the family as well as strategies for coping with food insecurity, etc.

The FNSS have been created mainly for long-term monitoring of food consumption, to check that it is satisfactory, and, should this not be the case, set up programmes to improve the situation. Such programmes may be directly concerned with nutrition (nutritional education, distribution of food supplements in MCWs), or indirectly (prevention of childhood diseases, vaccination programmes). Malnutrition is by definition a dynamic phenomenon, not static. The FNSS should therefore be as flexible as possible in order to "adjust" the monitoring indicators according to the specific context and rapid changes in the food systems. The speed with which urbanization occurs in developing countries brings about changes in consumption patterns and the distribution of food within the family. This specific context is decisive in the choice of FNSS indicators.

[48] A clear distinction should be made between food availability at household level, a concept used mainly by nutritionists to mean the quantity of each type of food available over a period of time in a household, and the idea of "availability" in the concept of global food security (as used in the FSIEWS), which is defined as the sum of foodstuffs produced in the country, minus losses, plus imports, less exports, from which intermediate consumption is also generally deducted.

4.1 The Institutional Framework and Setting Up an FNSS

Since much of the data for an FNSS relates to health and nutrition, it is often based at the Health Ministry, which gives it access to the decentralized structures of this ministry (MCW[49], primary health care staff, etc.) to collect primary data, and statistics services for processing them, and so to obtain health data easily. Some countries, however, have institutes of nutrition, separate from the health ministry, but sometimes attached to the ministry of social affairs or with an autonomous semi-governmental status. Whatever its status, it is always closely linked to health structures, on one hand because data on health and nutrition are often put together, especially in the case of children, and on the other, because doctors and other health workers play an important role in the nutritional education and monitoring of groups.

To set up an FNSS, first of all, a common conceptual basis for existing malnutrition problems and their causes must be worked out in a participatory context involving all the different interested bodies (preferably within the FNSS/MWG). This basis can then be discussed and accepted by all the FNSS participants at all levels. The level can then be set at which the national authorities will act on the causes to modify and/or improve the nutritional situation (and/or food insecurity) through policy decisions, technical intervention and targeted programmes.

The stages in setting up Food and Nutrition Surveillance Systems (FNSS) are as follows:

- obtain accurate information on the social and nutritional situation;
- clarify the actions that can be taken in these areas;
- determine the types of information needed to take decisions;
- select lists of indicators;
- analyse sources;
- coordinate data-entry and processing systems;
- decide on methods for disseminating information.

A system that has been tried and tested in a number of countries is bottom-up monitoring. It relies on specialized teams from non-governmental organizations working in various regions in a country (but using a common methodology so that results can be compared) and on a central system of continuous quality control of data.

The following table illustrates the time sequence of the components of an FNSS in Ethiopia, the aim of which was to obtain information on:

- the evolution and prevalence of indicators of the anthropometric status of children between 6 and 59 months;
- the distribution of malnutrition according to region and socio-economic group, defined in such a way as to facilitate the formulation of intervention policies; and
- the causes of malnutrition according to population group in order to plan the action to be taken.

[49] Maternal and Child Welfare.

Table of the different operational stages of an FNSS in Ethiopia

	Year 1	Year 2	Year 3	Year 4	Year 5
a)Principal section: field	X	-	-	X	-
b) Basic study	X	-	-	X	-
c) Detailed analysis	-	X	X	-	X
Targeted sections	-	X	X	-	X
d) Rapid assessments in rural settings	-	X	X	-	X
In-depth surveys	---------- according to requirements ----------				

a. Description of the geographic and socio-economic distribution of malnutrition
b. Causality analysis using more sophisticated tabulations and statistical models
c. The aim is to examine in more depth the specific problems identified in the principal section. These sections may concern vulnerable regions or socio-economic groups or even specific aspects (e.g. infant feeding practices)
d. Similar to targeted sections but using simpler qualitative survey methods

However, such a method has to guarantee the consistency of the methods used, so that reliable comparisons of the various surveys can be made.

4.2 Data

To obtain a preliminary framework, all the available information on nutritional problems (extent, geographic and socio-economic distribution, periodicity, as well as the underlying socio-economic factors) must be analysed. Some of this work can be used in the basic studies of the FSIEWS (Part II, Chapter 1) and can be gone into further by the FNSS/MWG together with the MVG/MWG.

National health services usually know what **the main deficiencies (chronic or acute) in energy, proteins, and micronutrients** are. Malnutrition does not affect all the people in a population to the same degree, or for the same reasons. The most frequent malnutrition problems are to do with protein-energy malnutrition, and deficiencies in micronutrients (mainly vitamin A, iron, and iodine). It also has to be decided if these problems are acute or chronic, as this will influence, among other things, which monitoring indicators (anthropometric in particular) should be used. In the case of acute protein-energy malnutrition, indicators that can monitor changes in people's weight in relation to size are recommended.

Problems have also been noted regarding the ***biological utilization of foods*** as a result of cooking methods, ways of consuming food, how it is distributed within the family, and the state of a person's health. These problems depend to a large extent on the socio-cultural environment (dietary habits and taboos), and sanitation (drinking water and state of sanitary installations).

To organize a database for an FNSS, staff have to know what **data is already collected regularly** on nutritional status, and adapt it as necessary[50]. This nutritional monitoring work should already have been completed if there is an FNSS in the country: if not, an FNSS/MWG should carry out this task as a priority.

The data regarding malnutrition at household level is generally divided into two categories: causal indicators and status indicators.

[50] See above, Part Two, Chapter II, Section Four.

- *Causal indicators* reflect the degree of vulnerability to food insecurity. Two main categories can be identified:

    - indicators reflecting quantities and varieties of food available in households;
    - indicators reflecting access to food, often linked to poverty and the coping strategies of households, which the MWGs monitoring vulnerable groups should have (see information on MWGs above).

- *Status indicators* use anthropometric measures to assess the growth of children and so evaluate their nutritional status (weight-age, height-age, weight-height, low birth weight), as well as morbidity and mortality rates. The data changes fairly slowly and has the advantage of reflecting, with a single measurement (static opposed to dynamic), the past dietary conditions of a population. For this very reason, they cannot take into account short-term changes in nutritional status, nor can they be used directly as a forecasting and warning indicator although the weight loss of young children is sometimes used as a warning indicator and even as a monitoring indicator in times of famine.

- *Prevention and warning indicators* should be simple, quickly obtained, flexible, and inexpensive to collect. They should, above all, be reliable, that is, reflect the changing nutritional situation of the people studied. Any clear deterioration in nutritional status can be monitored by purely quantitative indicators, such as the weight/height indicator or the MUAC[51] indicator, which are easy to implement.

[51] MUAC= middle upper arm circumference.

Example: FNSS Indicators according to development level

Area	Indicators	Level C = Central	I = Intermediate	P = Peripheral
Demographic and health statistics	Size of households	C		
	Household dependency ratio	C		
	Percentage of low birth-weight breast-fed babies <2500g	C		
	Infant, child and maternal mortality rates			
	Morbidity and mortality rate due to the principal infectious diseases	C	I	P
	Availability and access to health services (%)	C	I	P
	Vaccination rates (BCG, DCT, oral polio vaccine and measles) among infants under 1 year			
Water and environmental health	Availability and access to drinking water (%)	C		P
	Availability and access to adequate sanitary installations (%)	C		P
Nutritional status	Weight-age, height-age and weight-height ratio <-2 sd in children under 5 years	C	I	P
		C	I	P
	Low height-age ratio in school-age children	C		P
	Percentage of body mass indices below 18.5 kg/cm^2 in adults	C		P
	Principal deficiencies in micronutrients (iron, iodine and vitamin A)	C		P
Food consumption[52]	Quantities of the main groups of foods consumed	C		P
	Level of food expenditure by households and self-produced food consumption	C		P
	Total expenditure of households per person and number of meals per day			P
				P
	Number of months of household food stocks (depends on food production systems)			
	Number of principal foods			
Processing and food practices	Feeding-practices, breast-feeding			P
	Health and hygiene practices			P
	Food distribution within households			P

Source: Article by Haddad L. and Kennedy E. (1994) -Food Policy, vol. 19 (3) 329-343

The indicators generally used in Food and Nutrition Surveillance Systems are contained in Table above. The final list of indicators for an FNSS system depends on the specific situation of the country and should be established using a participatory approach involving communities and managers at all levels. These indicators take into consideration the principal foods consumed by households, region, dependency rate and size of households, habitat, morbidity, the vaccination rate, the weaning age, availability of and access to drinking water, and status of sanitary installations. The indicators used should be clearly itemized and presented in a table form for swifter and easier interpretation.

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[52] Food consumption in economic terms should be monitored by the MVG/MWG

A more reliable monitoring system can be established in areas vulnerable to food insecurity through the combination of different **information sources** (often called "information providers" in this handbook). For example, it is sometimes useful to combine administrative information (schools, dispensaries) with data from random group samplings among the most vulnerable households. The first source provides a basic time series on nutritional status, while the second is more sensitive to changes in nutritional status, and in particular to the weight-height indicator (emaciation) and the clinical signs of nutritional deficiency. Such surveys of households are not necessary when causal indicators have already raised the alarm for a given area.

In Bangladesh, the nutritional status of children is monitored regularly (every two months, more often during periods of distress) alongside surveillance of the normal health indicators and socio-economic monitoring. This monitoring method, which is carried out at established sites in regions at risk, has proved a valid tool for the forecasting, assessment and coordination of responses to food crises caused by natural disasters[53].

4.3 Data Processing

The data can be analysed and presented in different ways, in addition to showing the results in table form. The measurement of the rate of change among sensitive indicators can be combined with severity thresholds and so function as an early warning system. In a more complex early warning system in Ethiopia, a drop in the average weight-height ratio (less than 90 per cent that of the reference population) is the warning signal to set in motion the measures to be taken to avert a crisis (tables 3 and 4). Nutritional surveys are also often used to justify or reject aid and nutritional assistance measures. Nevertheless, the **threshold values** are specific to each country or each homogeneous zone and its prevalent nutritional problems. There is often disagreement over thresholds and they should be studied in more detail. Recent work on data in Ethiopia revealed that children mortality starts rising long before the "average weight-height" ratio reaches the threshold of 90 per cent of the reference population, and therefore action should be taken before the threshold is reached. Data on the nutritional status of young children is not enough on its own and should be completed with the addition of other indicators such as the nutritional status of adults and the sanitary situation of the population.

TABLE 3. Criteria to establish the nutritional status of a population - Ethiopian early warning system

Proportion of population with a weight/height ratio more than 90% of the average ratio (%)	Proportion of population with a weight/height ratio less than 90% of the average ratio (%)	Status
> 95	< 5	Good
94-90	6-10	Satisfactory
89-80	11-20	Poor
< 80	> 20	Serious

TABLE 4. Results of nutritional monitoring in Menzna Gishe

	Proportion of population whose weight-height ratio exceeds 90 per cent of the average ratio (%)
December 1992	94,5
February 1993	94,5
April 1993	93,7
June 1993	92,8

[53] Bloem M. et al. (1995) Food and Nutrition Bulletin 16(2):131-138.

The media used to disseminate FNSS information and how often it is disseminated is very important. In general, a combination of strategies is recommended (newspapers, video, social mobilization, education and training). In most cases, information appears as periodic bulletins, reports and maps illustrating the geographic distribution of malnutrition in the country. In recent years, there has been a lot of interest in maps, mainly for their usefulness as a didactic tool. More advanced Geographic Information Systems[54] (GIS) are currently being examined, but their application in the field of malnutrition is complicated by the particular problems encountered in nutrition and because health officers do not have sufficient training in data processing. Health and malnutrition are dynamic continuous phenomena that do not fit easily into rigid classifications.

4.4 FNSS in Crisis Management

In the **prevention** of food crises, FNSS can be useful in analysing the causes of decreased food consumption or increased malnutrition, and therefore facilitate the setting up of a mechanism or intervention aimed at preventing the occurrence of these problems or lessening their effects on the population.

The use of causal indicators as warning tools is controversial. The use of nutritional indicators in forecasting has also received much criticism. They do, in effect, only reveal an existing nutritional problem. In spite of their poor forecasting powers, such indicators can nonetheless be used in emergency situations to coordinate and **assess relief efforts,** and to allocate food aid to the most vulnerable groups. In Ethiopia, for example, the nutritional monitoring of children is achieved through random sample surveys restricted to regions where risks have been highlighted by other indicators (agricultural performance, size of herds, etc.). Nutrition data is therefore used to corroborate and fine-tune forecasts.

The usefulness of nutritional data in **relief and rehabilitation operations** is less controversial than its involvement in early warning and forecasting. Such information can be used to select beneficiaries and estimate the size of the affected population. Not only can priorities then be established among the affected areas but also the type of relief and its required duration. Finally, information on nutritional status is used above all to assess the impact of relief in rehabilitation programmes.

In emergency situations, the relative mortality risk among age groups varies in the same place according to circumstances and the period. Some results show that although infant and child mortality rates may be higher, children over five years and adults are sometimes more seriously affected than the younger children usually monitored. It therefore often becomes necessary to extend nutritional monitoring to all population groups, using anthropometric methods in order to define more precisely how much pressure the population is under. Nomadic populations are another example: when there are severe droughts, these people feed their children to the detriment of the adults. In the case of the children, anthropometry will not reveal the true nature of the crisis. To obtain the nutritional status of the other age groups, random sample surveys including a nutritional element should be adopted. For the anthropometric status of adults, the simplest and most reliable measurement is the Body Mass Index [BMI = weight (kg)/height² (m)].

For *prevention and warning*, the nutritional indicators must be simple (to avoid errors and to make sure that all the actors involved at all levels of the system can understand them), quickly obtained, adaptable or flexible (as the situations being monitored are dynamic) and involve low costs. Finally, and most importantly, these indicators, whether they are direct or indirect, complex or simple, must be reliable: that is, they should reflect the changing nutritional situation of the groups studied.

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[54] Part Two, Section 5, Chapter Five: Mapping and Other Software.

5. MONITORING DIRECT FOOD AID AND ASSISTANCE

5.1 Monitoring Aid

Food aid contributes to food security: at household level in the very short-term, through the free distribution or subsidized sale of staple foods in times of crisis; in the longer term, it can bring about an increase in food production, or create production workshops or small industries through food-for-work programmes. It can also encourage schooling (school canteens), training, or improvements in the health of the poorest (hospital meals, for example).

In order to monitor food aid and food assistance, three kinds of information regarding the commodity chain must be identified:

- data that will help decision-making **regarding the allocation of food aid**, in particular:
    - estimation of food aid requirements;
    - targeting needy groups;
    - allocation of the appropriate type of aid;
- data linked to **the food-aid operation,** that is, imports or local purchases of produce to be distributed to the beneficiaries;
- data that will permit the **impact of food aid operations** on the nutritional status of vulnerable groups to be assessed.

A specific database on food aid often amounts to **historic monitoring** of the distributed **aid**, distribution criteria, and products distributed. In theory, data relating to the management of food aid and assistance along the commodity chain, imports or local purchases for distribution to beneficiaries, should be integrated into the MIS. Unfortunately, donors or the government, or both, do not tend to favour transparency where information and its management is concerned, since such information represents power in a country on the verge of a food crisis. Imports should be integrated into the monitoring of all staple food imports, their transport and storage should be known, and distribution criteria decided by the National Food Security Committee (NFSC) (or its equivalent) in all transparency. Distribution of food aid should be monitored by the Provincial Committees (PFSCs) according to the decisions taken by the NFSC.

So far, no precise study has been undertaken of the principal steps to improve the monitoring of food-aid operations, in particular, the selection of key indicators. In some countries, **an MWG has been set up specifically for food aid and assistance and a specific database created for monitoring this data** (as occurs in Chad). Nevertheless, the establishment of such an MWG and database within the FSIEWS, presupposes that those holding information specific to this commodity chain (donors, WFP and other international agencies, national authorities, private carriers and NGOs chosen to distribute aid etc.) will supply, in good time and without manipulation, accurate information to the MWG. The MWG should then check the information and put it into the FSIEWS database.

The members of the NFSC secretariat (including FSIEWS managers and the lead managers of the MWGs) can easily **assess the impact of food-aid operations on the food security of target groups** if there is a good database for monitoring aid. It is, however, the case that food aid and assistance can have serious repercussions on production, marketing and consumption, which

affect the poorest most. The NFSC and the Provincial Committees should, from time to time, carry out targeted studies of the medium-term effects, in particular the negative ones. It is clear that "triangular" aid, that is, depending on regional (or local) purchases of staple foods, does not distort markets to the same extent, although national agencies or donors tend, for convenience or financial interests, to favour imported aid, often supplied by donor countries.

The development of participatory approaches and the setting up of constructive dialogue with needy populations would, as well as strengthening the links between the various food aid and assistance monitoring systems (WFP's VAM, FEWS, UNICEF's monitoring system, etc.), clearly improve monitoring in this very sensitive field.

5.2 Setting Up a Monitoring System in Emergency Situations

It is very difficult to obtain information on the food security of populations in an emergency situation. In particular, in the case of "complex"[55] emergencies, which are on the increase, institutional capacities and available expertise are lacking. Often considerable amounts of basic information are missing, although there is an urgent need for information. This information is essential in order to be able to assess:

- the impact of the disaster on the food security of the population (availability and stability of supplies, access, but the health/nutrition relationship is also very important in emergency situations);
- the population groups most in need;
- the immediate relief requirements of these groups;
- the resources needed in the short-term to enable these people to strengthen their survival mechanisms and to reduce as quickly as possible their dependency on food aid (often called "rehabilitation").

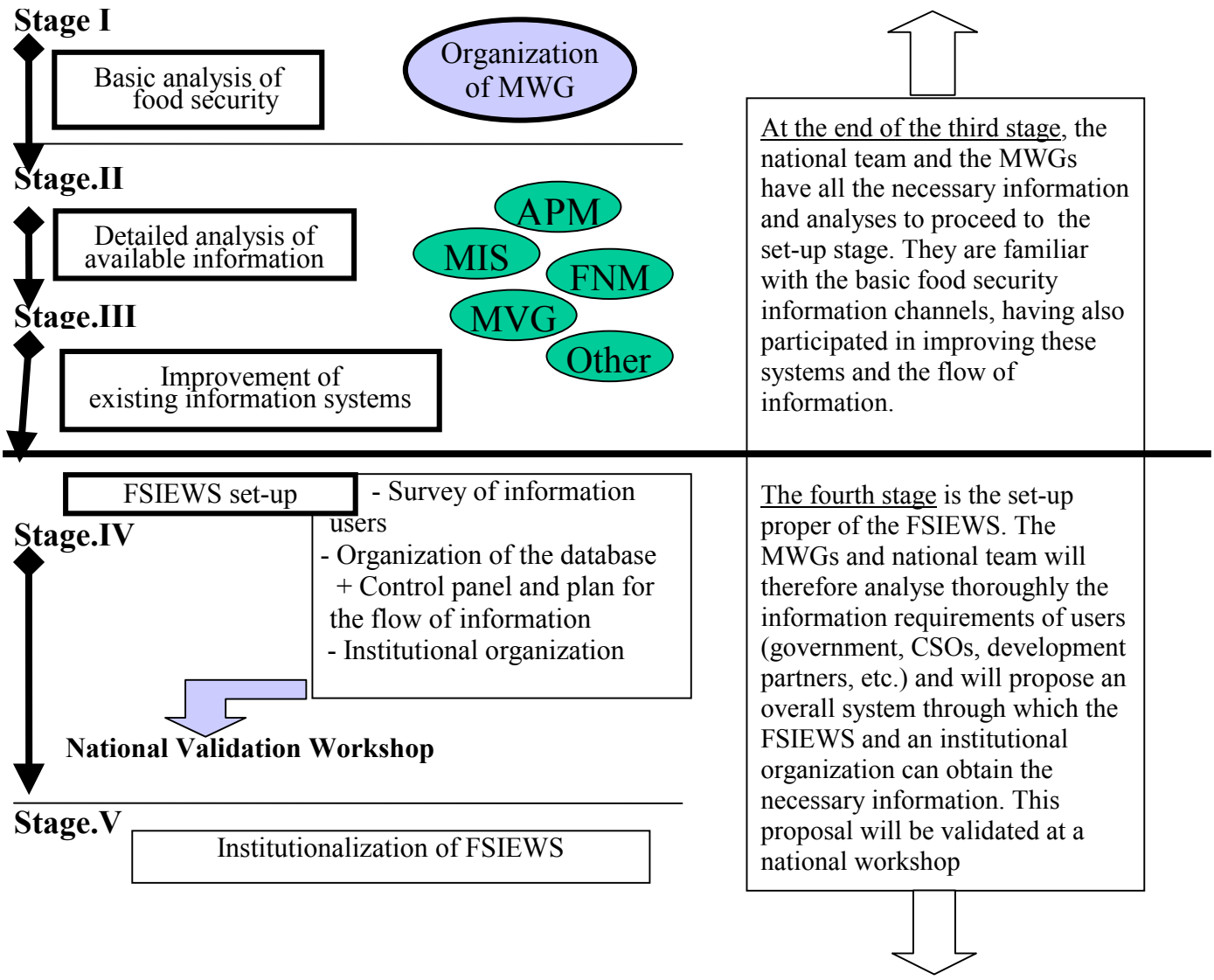
This information should be supplied to decision-makers (mainly the international community and governments) as quickly as possible. There is, as yet, no clear "model" for a FSIEWS in an emergency situation. A review of the situation is currently being carried out to see what lessons can be drawn from recent experiences. *Some simple concrete characteristics of a FSIEWS in an emergency situation* can, nonetheless, be outlined.

- It should be designed so that it can coordinate the various initiatives in the domain of food security information (based on what already exists).
- It should basically rely on those who work in the field (structures and human resources) without creating a management structure that would be cumbersome for the government.
- It should supply rapid analyses of the production and marketing situation of staple foods, as well as the nutritional status of the most affected groups. Such analyses may be carried out by using rapid survey methods. The indicators for monitoring the emergency situation will be obtained from these analyses called "sentinel-monitoring". They have to be simple, that is, come from information that is easy to collect and process.

[55] Accepted definition: A complex emergency can be defined as a disaster with serious humanitarian consequences in a country, region or society where central authority is considerably reduced by an internal or external conflict and which demands the joint intervention of various agencies or ogranizations.

- The principal product of a FSIEWS in emergency situations is a regular report of the results of monitoring these indicators and their meaning, as well as the results of surveys to monitor agricultural seasons, sanitation, and emergency food-aid data.

Information obtained in these conditions may lack accuracy and a scientific approach.


Stage I
Basic analysis of food security
Organization of MWG
Stage.II
Detailed analysis of available information
APM
MIS
FNM
MVG
Other
Stage.III
Improvement of existing information systems
At the end of the third stage, the national team and the MWGs have all the necessary information and analyses to proceed to the set-up stage. They are familiar with the basic food security information channels, having also participated in improving these systems and the flow of information.
FSIEWS set-up
- Survey of information users
- Organization of the database + Control panel and plan for the flow of information
- Institutional organization
Stage.IV
National Validation Workshop
The fourth stage is the set-up proper of the FSIEWS. The MWGs and national team will therefore analyse thoroughly the information requirements of users (government, CSOs, development partners, etc.) and will propose an overall system through which the FSIEWS and an institutional organization can obtain the necessary information. This proposal will be validated at a national workshop
Stage.V
Institutionalization of FSIEWS

CHAPTER IV

STAGE FOUR: SETTING UP THE FOOD SECURITY INFORMATION AND EARLY WARNING SYSTEM

In the fourth stage, all the available data and analyses are deployed and a suitable system for the country proposed in the framework of a highly participatory process. First of all, a survey of the users (often also called "recipients" or "customers") of food security information is carried out. From the results of the survey, what is "available" (in terms of data) can be compared with what is "useful", and an optimal and sustainable system set up. This gradual deployment should involve the working groups and the national FSIEWS team who will then be able to propose the optimal and sustainable system they have developed together at a national workshop.

1. SURVEY OF FOOD SECURITY INFORMATION USERS

There is a multiplicity of useful information on the four food security monitoring components (availability, stability, access, biological utilization), but it is not always available in the services that oversee its collection (the "information providers"), either in the form of raw data, or (even less likely) in a more refined form. Moreover, some of this data may seem superfluous to policy makers and other food security information users (often also called "recipients"). The survey of potential users helps to clarify precise individual requirements, in respect of both how the information is prepared for use, its periodicity and medium. Once the requirements are known FSIEWS staff can select the data to be collected, define the database, the control panel, the method for circulating information, the information products and the media for publishing and disseminating information.

1.1 Implementation of the User Survey

1.1.1 Preparation of the questionnaires

A *participatory approach* is recommended for the preparation of the questionnaires, since this guarantees a constructive dialogue with users, who are key to the system's sustainability, right from the establishment of the FSIEWS. It is a good idea to develop a partially-guided questionnaire comprising closed and open questions, since it offers a good compromise between the need for precise answers and the need to complete the survey in a short space of time.

The content of the questionnaire depends on the status of the FSIEWS when the survey is carried out. Are there any constraints regarding the dissemination of information? What are the problems of the users? The assistance or collaboration that can be expected at a later date from each member can also be clarified. A questionnaire of about ten questions, spread over between one and three pages (50 to 80 variables) gives a reasonable length of interview.

Example of the first part of a questionnaire drawn up for the National Early Warning System (SNAR) in Cameroon

RECIPIENT IDENTIFICATION
ORGANIZATION:/_____/___/___/___/
CATEGORY:/_____/___/
ZONE:/_____/___/___/
Interview team: /_____/___/___/
Date of survey: _____/___/___/___/___/___/__/
Date of entry_____/___/___/___/___/___/___/

Q1 Question N° 1: Are you familiar with any FSIEWS publications? _____/___/
Q2 Question N°2: Do you receive information from FSIEWS? _____/___/
Q3 Question N°3: if YES, in what form or medium ?
Q3a Monthly bulletin /_____/____/ **Q3b Ad hoc reports /**_____/___/
Q3c Radio broadcast /_____/____/ **Q3d Electronic media /**_____/____/
Q4 Question N°4 Regarding the information you receive,
Q4a is it regular? _____/___/
Q4b does it meet your needs?_____/___/
Q5 Question N° 5: What are your current sources of information on food security?
Q5aPublication1/----------/____/ **Q5a1 Body/**----------/____
Q5b Publication2/----------/____/ **Q5b1 Body /**----------/___
Q5c Publication3/----------/____/ **Q5c1 Body /**----------/___/
Q5d Publication4 /----------/____/ **Q5d1 Body /**----------/____

1.1.2 The survey sample

The survey sample is drawn from the list of recipients of information disseminated by the FSIEWS, where it already exists, or from a list drawn up by the MWG. In general, the representatives of organizations involved in food security at all levels should be surveyed: representatives of governments, NGOs, development partners, traders, associations of producers and consumers, etc. This list should then be compared with the list of subscribers to the bulletin (if there is one), target groups for information broadcasts on the radio and television, information provider services and all the regular recipients of information in all its forms. They are then regrouped into homogeneous categories according to their role in food security: consumers, producers, market operators, decision-makers, the media, donors, etc.

1.1.3 Organization of the survey

A preliminary letter should be sent out to all recipients describing the aims and expected results, and giving the schedule for the survey. Two options for replying to the questionnaire can be offered (by post, or by personal interview). The interview teams, with two researchers to a team, should carry out the survey according to the rules set down (optimal duration of one hour per interviewee, four interviews per day). The duration of the survey will therefore vary according to the number of teams used and the size of the sample. A half-day session is sufficient to train the survey teams. Training should focus on describing the aims of the questionnaires, ways of filling them in, scoring them, and checking the completed questionnaires. The researchers should preferably belong to the MWGs and the national team. Since the questionnaires are short and carefully targeted, it is a good idea if members of the national team participate in this survey as they can make sure the work is carried out properly and supply the team with results that it will certainly be able to use.

1.1.4 Processing, analysis

Depending on the size of the sample, the surveys may be collated manually or by computer. SPSSPC software, used in processing social data, has been used in some countries, but simple database software can also be used.

The main steps in computerized collation of the survey results are as follows:

- the questions and variables must be clearly coded to facilitate the researchers' work of entering and processing the data (qualitative answers are simpler to analyse if a numerical code is used);

- researchers should be provided with a description of the codes used to guide them and so that they can detect any errors;

- files should be checked and classifications reorganized or split when a first perusal of results shows answers that are too sparsely or too densely scattered;

- the control status should be edited so that the number of replies can be analysed according to the size of the sample and their logic checked;

- further analysis of results depending on additional requirements

Computer processing of results has the advantage of being faster. It means that the data can be used for other purposes with a precision that is difficult to obtain with manual processing.

1.2 Results of the User Survey

The results of surveys of recipients carried out in some countries between 1996 and 1998 shared the following characteristics:

- each food security component's **information requirements are much simpler and more limited than was at first thought;**

- the accuracy of the media and the regularity with which they disseminate information varies according to the type of data. The demand for marketing information is in printed and broadcast form, issued more frequently than information on food availability, which favours monthly, quarterly and annual publications;

- suggestions made by recipients in the surveys to improve the flow of information and institutional structures were in fact very pertinent.

The table below gives a summary of the results of the surveys carried out among users in three West African countries with very different political, economic and social structures.

Information gathered from surveys carried out among users of food security information in three countries in Africa

Country	Target groups	No. of staff	Information Priorities			Preferred media
			Availability	Stability	Access	
Senegal	*Six groups targeted* -policy-makers - Development partners -the business community -NGOs -Farmers' organizations -Consumers	60	- Production levels (plant, animal, fisheries) -Availability of agricultural inputs (seed, fertilizer, pesticides, agricultural equipment -Surplus and deficit areas	-Prices -Supplies -Imports -Exports -Storage /conservation -Commercial legislation -Processing methods for agricultural produce	-Nutritional status of children -Micronutrient deficiencies -Food deficit areas -Dietary habits	-Radio -Printed material (bulletins, information leaflets in local and official languages) -Television -Electronic media (fax, e-mail) -Workshops, meetings -Agricultural fairs
Chad	*Six groups targeted* - Policy-makers - Development partners -The business community -NGOs -Farmers' organizations -Consumers	60	- Production levels (plant, animal, fisheries) -Agrometeorology -Harvest forecasts -Harvest damage by crop pests (locusts etc.) - Surplus and deficit areas	-Prices -Distribution channels -Stocks -Imports /exports -Processing methods for agricultural produce -Storage/conser-vation	-Dietary habits and customs -Coping or survival strategies - Health/nutritional status -Road conditions - Numbers and population vulnerable groups - Purchasing power	-Printed material (weekly bulletin) -Radio -Electronic media (fax, e-mail) -Meetings
Came-roon	*Eight groups targeted* -Policy-makers -Technical services -Producers -The business community -NGOs - Media people -Development partners -Consumers	244	- Production levels (plant, animal, fisheries) -Agricultural inputs -Farming methods	- Prices - Stocks - Imports/exports - Flow of food products - Processing methods, storage	- Identification of risk areas - Numbers and characteristics of the population - Causes of insecurity - Food and nutritional requirements - Access to areas	-Printed material (monthly, weekly bulletins) Radio/ Television -Electronic media (fax, e-mail)

2. SUGGESTED INDICATORS FOR THE DATABASES AND CONTROL PANEL

As mentioned above, the FSIEWS databases rely on the four "feeder" databases of the MWGs, to which are added databases containing more general information (population, employment, general economy, etc.). The MWGs are responsible for regularly updating their databases. The control panel is a forecasting tool. It therefore contains indirect indicators, trend analysis data, warning signals, etc. The central control panel is the responsibility of the secretariat, but it should always be set up and maintained in close collaboration with the lead managers of each MWG. It is generally desirable to set up a database and sometimes also a control panel at provincial level (see section 4 below). The circulation of information among the various structures is dealt with below in section 3.

2.1 The Tendency to Cram in too Much Information

There is a natural tendency to fill the databases of the food security information system with all the data officially collected by the information providers of the four food security monitoring components (production, marketing, vulnerable groups, nutrition) and then to integrate the specific indicators into the control panel. A number of difficulties are involved in such an approach since the data is not always regularly available from the collection services, and the information system can neither invent not estimate it. Moreover, this "information bulimia" gives rise to enormous unmanageable databases and useless duplication of the work of the provider services. In this context it is often better to leave well enough alone: quality is often inversely proportional to quantity.

By the same token, the control panel (on the basis of which forecasts are made) is not in a position to meet the needs of the users of this information, since in this case it is only an analysis (however compelling) of all the existing data. On the contrary, a better way to proceed is to first decide what is to be put in the control panel, taking into account the needs actually expressed by the users, and as a result adapt the volume and content of the database, which is necessary for developing and regularly updating the control panel.

2.2 Development of the Database and Control Panel on the Basis of the User Survey

The database and control panel should be established not on the basis of the mass of available information, but according to the users' needs as expressed in the survey.

The database and control panel should be based on clear criteria, defined by the results of the user (recipient or client) survey:

- the basic analysis of the national food security situation (see Stage one);
- some knowledge of vulnerable groups (the knowledge base can always be expanded later);
- the information available in the four specific areas of food security (availability, stability, access and biological utilization);
- the information needs of users;
- the preferred media for disseminating information;
- publications.

However, the FSIEWS should not by any means replace the providers of primary data, with whom specific agreements will be drawn up at a later date to guarantee a regular supply of information. The FSIEWS is an instrument for the synthesis, analysis and dissemination of carefully selected information. It is neither a data-collection system nor a sectoral analysis system.

The contents of the database and control panel, thus designed, will respond precisely to the information requirements of decision-makers at all levels, and will be protected from becoming unmanageably large. They will be updated more regularly, processed more efficiently, costs will be lower and the system more sustainable.

2.3 Practicalities of Setting Up the Database and Control Panel

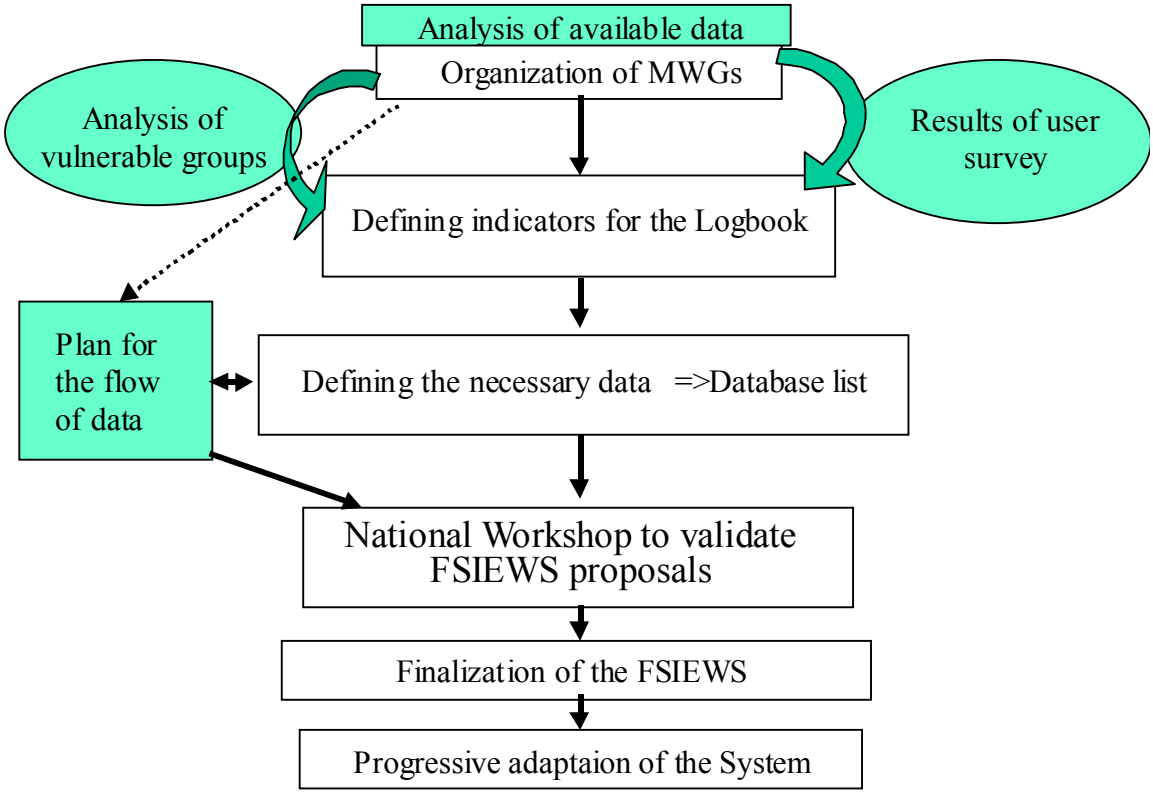
The set-up phase of the database and control panel involves the following steps:

- organization of the multidisciplinary working groups (MWG);
- determine, in each group and according to the results of the user survey, the forecasting indicators and warning signals that should be used in the control panel;
- determine the basic information needed to establish the control panel and examine the existing data (earlier studies carried out by the MWGs[56]) for other information that could be used or that is missing;
- negotiate with providers to get them to put into their statistics systems, according to their own areas of technical responsibility, the data the FSIEWS needs but does not have;
- add information, which could be useful at a later date in the medium-term monitoring of food security, to the database proposal;
- discuss with the working groups how to harmonize proposals for the database and control panel of the FSIEWS. Their conclusions will be circulated in the form of clear tables to all interested parties; they will then be revised and presented at the national workshop;
- hold a national workshop to validate the FSIEWS proposals. Proposals for the control panel, indicators, warning signals, as well as the data-flow plan and the findings of the MWG, are validated by the national workshop attended by all the principal actors of food security and early warning mechanisms at national and provincial levels (including those belonging to the public, private and voluntary sectors);
- start entering the available data series in the FSIEWS database and control panel. The lead managers of the MWGs are not only responsible for supplying the data, they are also directly involved in the practicalities. They therefore need specific training in data processing; the management of the databases should be shared among FSIEWS managers and the lead managers of the MWGs and their deputies;
- data-entry and updating of the database by the MWG lead managers in their respective food security sectors and regular analysis of the results by a national team of FSIEWS managers and MWG lead managers;

[56] See Part Two, Chapter II.

- management of the database by the FSIEWS coordinating unit (the database managers to be chosen from among FSIEWS managers) and assisted by technical staff from the main information provider services. They should receive more advanced training in computing and database management.

It is very difficult, and, above all, not in the didactic grain, to propose *ideal lists* (of direct or indirect indicators, warning signals or other type of information) for setting up the food security database and control panel in a given country. Staple foods, national constraints (analysed in Stage 1), the available information in the country (Stages 2 and 3), and recipients' needs vary considerably from one country to another. Only through a highly participatory discussion process can an acceptable compromise be reached between the ideal control panel (including all useful information) and the obstacles to obtaining this information regularly and within an acceptable period of time. The diagram below provides reminders for setting up the database and control panel. It highlights the repetitive nature of the process, and indeed of the establishment of the entire FSIEWS. The database and the control panel should be proposed, discussed, approved, established, monitored, but above all, regularly reviewed and adapted.



An example of a database and control panel set-up plan for the FSIEWS in Chad is illustrated on the next page. The national team chose to present separately the indicators for the availability of staple foods, stability of supplies, access and biological utilization. This has the advantage of clearly defining each food security area, and by the same token of not overlooking anything important. It also leaves each MWG completely responsible for setting up and monitoring the feeder databases. It should however be noted that this particular set-up only applies to Chad.

FSIEWS in Chad:
Information Breakdown for setting up the database, control panel, and warning signals (availability section)

Warning signals	Monitoring /forecasting	Indicators	Necessary information	Service providers	Media
Water stress for 10-15 days depending on time of year and crops Replanting percentage Proportion of areas (villages, cantons, etc.) not planted by the latest date Yields 25% below the norm. Large-scale locust invasions (X insects per m2 at a given crop development stage). Large invasions of birds in colonies of x specimens. Rampant disease in one or more crops, X hectares affected, damage estimated as a percentage. Grazing status Level of water sources Epidemics among herds Surface water levels at the end of the wet season in relation to rainfall in a normal year Drop (%) in floodwater levels of watersheds	Cereal production (millet, sorghum, berbéré, maize, rice, wheat) Production of legumes and oil-seed crops Tubers (cassava, taro) Horticulture and fruit growing production Livestock production Fisheries production	- Produce - Area sown per crop - Crop yields - Crop monitoring - General condition of fields - Principal agricultural activities - Crop development stages - Physiological stress - Crop predators and pests: types of predator/pest/stages - Density of infestations per surface unit; area infested, crops infested and development stages; extent of damage. - Herds: Numbers Average weight Breeding parameters Health/disease/vaccination status. Grazing Biomass (NDVI) Areas Fisheries production Area of surface waters etc. Annual rainfall	- Rainfall (dekad) - Climatology - Hydrology - Plant production surveys - Phenology of the main crops - Phytosanitary status of crops and grazing - Survey of herds - Health status of herds - Development of grazing - Availability of fodder and other animal feed - Survey of fishery production - Hydrology of watersheds with fisheries potential	Water resources and meteorology (DREM: Direction des ressources en eaux et de la météorologie) DSA, ONDR, SODELAC Extension, ONDR, SODELAC, projects Plant protection and packaging (DPVC: Direction de la protection des végétaux et de conditionnement) and extension services Extension Stock breeding and animal resources (DERA: Direction de l'élevage et des ressources animales) Fisheries and aquaculture (DPA: Direction de la pêche et de l'aquaculture) DREM	Information sheet (every 10 days) Monthly bulletin Monthly reports from the DPV Monthly extension report Ad hoc reports Radio messages Fortnightly and monthly reports Monthly reports Study reports

3. A PLAN FOR THE FLOW OF DATA AND ITS MANAGEMENT

3.1 Information Flowchart

3.1.1 Development

Analysis of the information priorities revealed by the user survey (beginning of this chapter) can also be used to draw up a plan for the flow of data.

The plan should cover:

- the necessary indicators and data, as defined in the database and control panel (see previous section);

- the information provider services and their contacts with the MWGs (it is always preferable for the principal providers of the FSIEWS to be active members of the relevant MWG), (see Section 2, Stage five on forming MWGs);

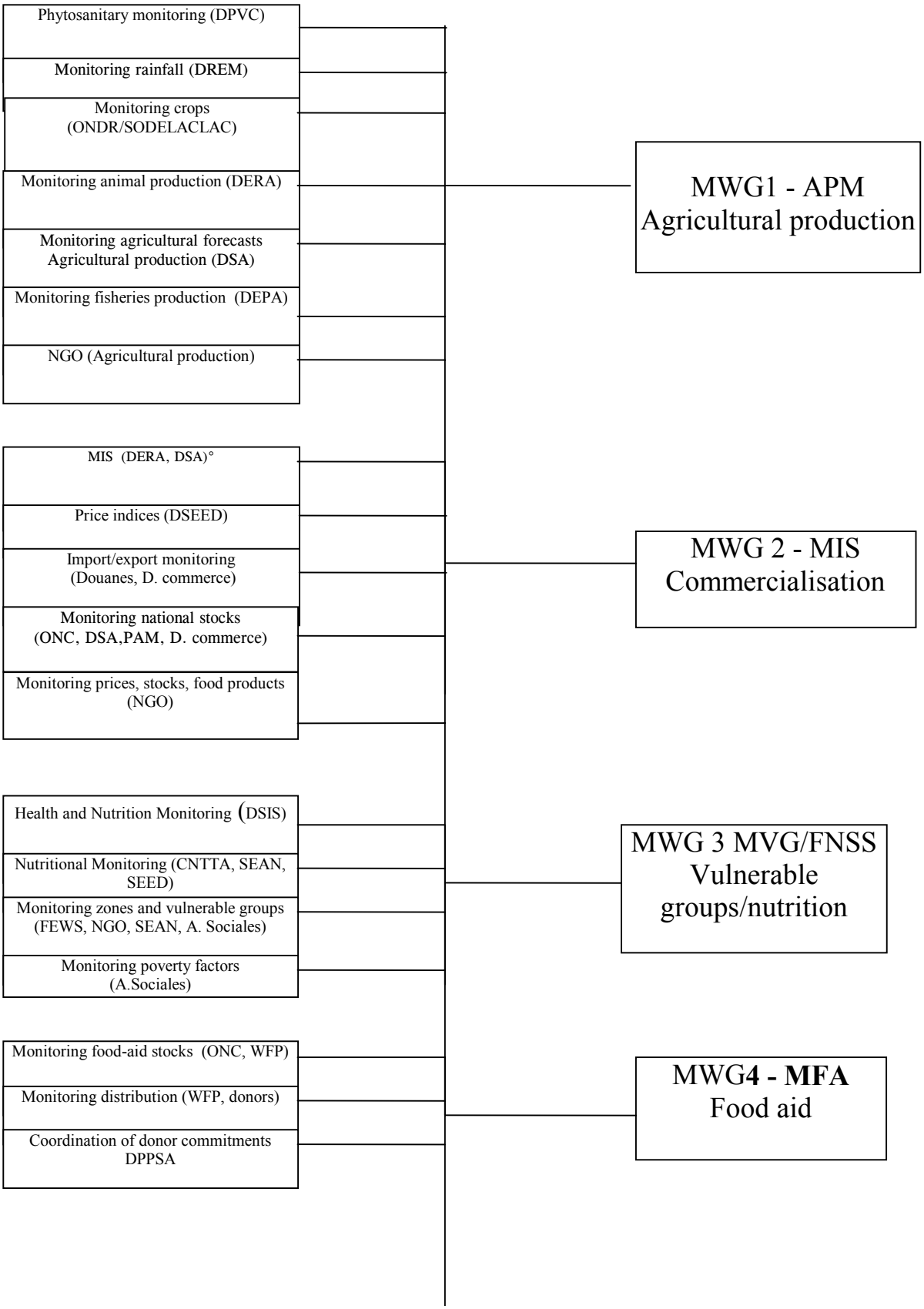
- the frequency with which the data is supplied, the media used (radio or newspaper bulletins, etc.), and how it is transmitted (fax, photocopy, telephone, radio, etc.) to the MWG.

This should be established by the FSIEWS team working closely with representatives of the four MWGs and other information provider services (not members of a MWG).

The feasibility of this plan should be carefully evaluated while it is being developed. It is not just a question of establishing the most reliable methods of transmitting information to the FSIEWS: bottlenecks have to be clearly identified at each stage (no paper, roads flooded, recurrent power cuts, all of which can impede the flow of information through the system, and may require some adaptation to local conditions). Careful examination of these constraints should reveal whether it is necessary to give some methodological (or other) support to selected information services or provincial food security committees to enable them to transmit reliable data to the FSIEWS in good time. Many problems can be resolved with little cost by installing fax machines (providing there is a telephone network, of course).

This type of support will sometimes have to be governed by cooperative agreements (often called “agreement protocols”). Whatever the situation, the concerted effort involved in planning the flow of information should be sustained in the future, both to adapt to the FSIEWS’ constantly changing information requirements, and to ensure its continued functioning and sustainability.

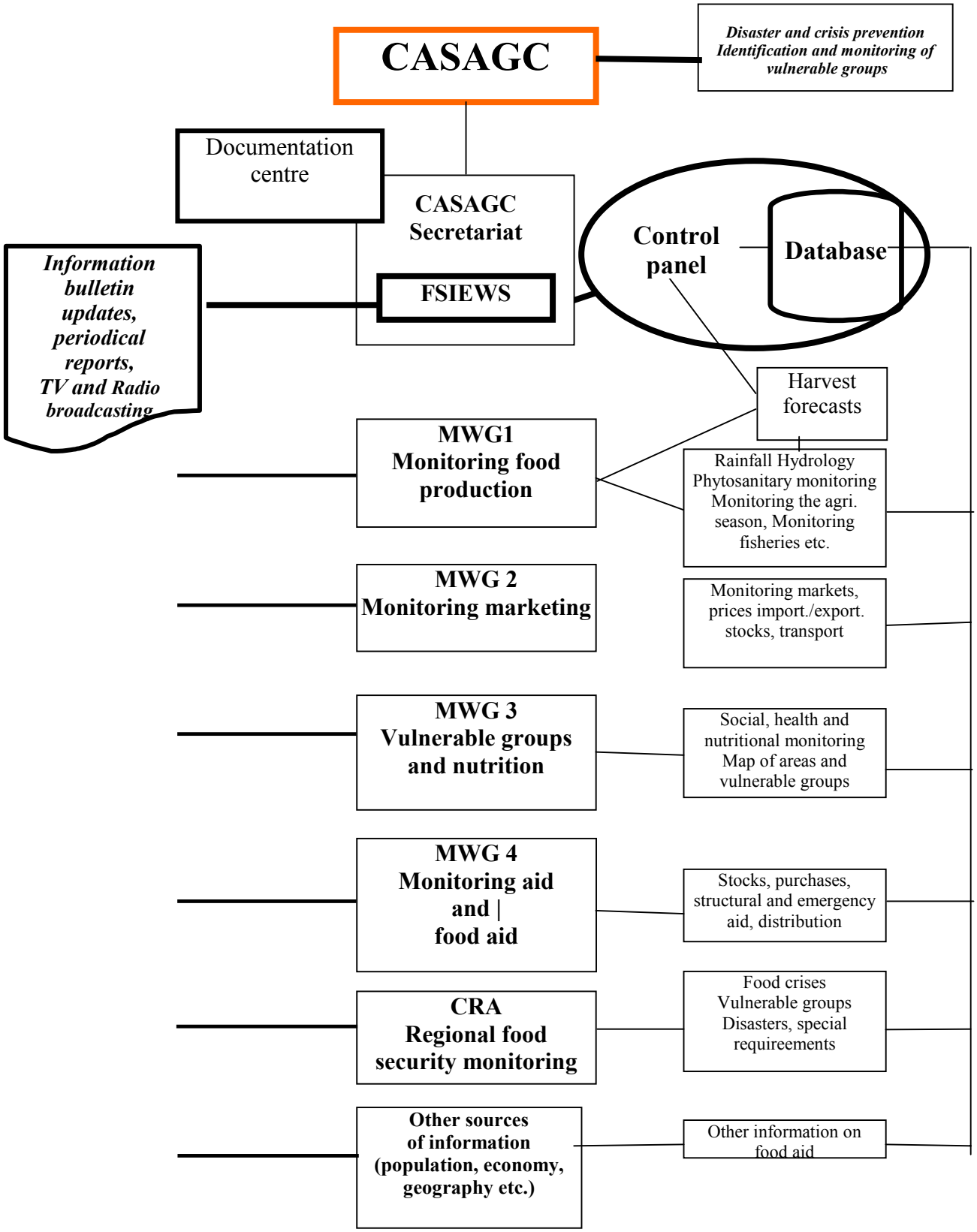
Plan of the flow of information between information providers and MWGs
(Using Chad as an example)



Note: In Chad the FNSS and MVG MWGs were created when the FSIEWS was set up.

Plan of the flow of information between Regional Action Committees (CRA), MWGs and the FSIEWS (Using Chad as an example)

Note: *The CASAGC is a decision-making authority involving government and donors that manages food crises. It functions as a national food security committee (NFSC).The CRA are decentralized multidisciplinary food security bodies roughly corresponding to the provincial committees (PFSC) mentioned in this book.*



3.1.2 Correction and implementation

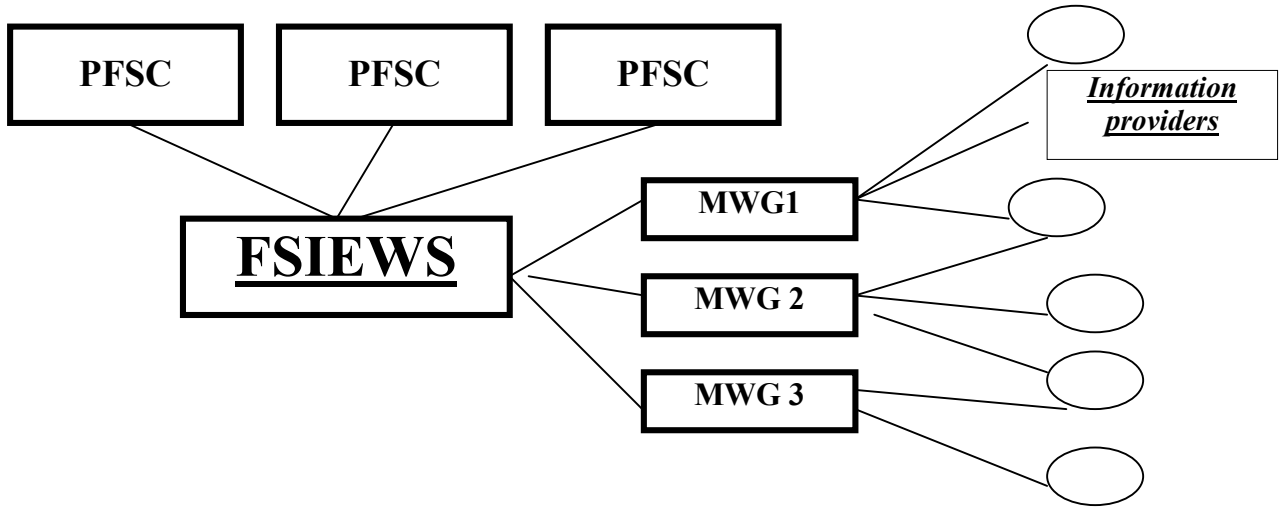
The application of the information flow plan can, as mentioned above, encounter problems caused by:

- either *poor coordination and collaboration* with the information services;
- or *lack of resources to run certain key public services*, a situation at times made worse by structural adjustment measures or other budget restrictions;
- and sometimes also *poor organization* in getting *information* from local and regional levels to the provider services or directly to the FSIEWS.

In some cases the information provider services (public, private or voluntary) may make payment for services a condition of their cooperation (a practice that is current in other projects, and even within institutions). It is essential that this problem is looked into and carefully dealt with by the National Food Security Committee.

A good information flow plan for a FSIEWS should be based on:

- mechanisms of coordination and collaboration between the FSIEWS and the cooperating bodies founded on reliable agreements and positive feedback;
- diversified sources of information (public services, plus private and voluntary providers);
- the clearly expressed interest of the information providers in the work of the FSIEWS, in terms of their participation as providers and in their role of recipients of information processed by the FSIEWS. A regular flow of information to the FSIEWS can only be guaranteed if the providers are directly interested, for whatever reason, in the final product;
- a good working relationship between the Provincial Food Security Committees (PFSC), information providers at national level (national statistics services, NGOs, projects, etc. who have to coordinate with the MWGs) and the FSIEWS, underpinned by a good flow of information and mutual interest in the results.



3.2 Data Management and Computers

All the information received by the MWGs and the Provincial Committees (PFSC) should be accompanied by the minutes of the meetings of the two bodies responsible for collating the data. The minutes and a copy of the data should be filed by the FSIEWS documentation clerk. The data should also be put into the database and analysed for the control panel. Clearly the information has to be submitted to the FSIEWS in a format that it can use. Where Provincial Food Security Committees, MWGs and the FSIEWS are connected in a computer network or by modem, the format for the data-files can be agreed on so that they can be used directly in the format in which they arrive. Nevertheless, it often happens in developing countries that information sources are not uniformly equipped and the data may arrive in a number of formats (as mentioned in Section 2 above). Therefore standard data-collection forms have to be prepared in collaboration with the providers, which can be sent by fax, mail and modem or dictated via radio. While such forms may have to be adapted for every region or MWG, they should be easy to fill in and use.

Example of a data-collection sheet for the FSIEWS database in the Sahel

Collection date: _____
Crop description: _____ Crop code: _____

Year	Prefecture Code	Area (ha)	Yield (kg/ha)	Gross production (t)	Source

Type of crop:

0: Other **1: Pennisetum** **2: Sorghum**
3: Maize **4: Wheat** **5:Wheat**
6: Berberé (recession sorghum) **7: Peanuts** **8: Groundnut**
9 Cowpea **10: Fonio** **11: Sesame**
12 Cassava **13: Yam**

3.2.1 Setting up computers and software

It is essential to have powerful computers, **usually connected in a network**, equipped with a simple range of good software including as a minimum:

- a spreadsheet programme (such as Excel, Lotus, etc.), mainly for the control panel;
- a database programme (Access, Paradox, etc.), mainly for the databases;
- word-processing software (Word, Word Perfect, etc.);
- simple page layout software (such as Publisher, Pagemaker) mainly for creating bulletins;
- drawing and presentation software (such as Powerpoint) mainly for training and publicity;

- mapping software (Atlas GIS, Mapinfo or the FIVIMS[57] programme, KIMS, available from FAO);

- a good anti-virus utility regularly updated (McAfee, Norton, etc.).

The computers must also have a good storage and back-up system, such as Iomega or Java ZIP (either on the hard drive or an external drive), or some other way of saving information, either on the network or CD-Rom.

The first step consists of developing a conceptual data model as a preliminary to creating the file structures.

To organize and structure the database a fixed number of files covering the different food security areas has to be created and the master items developed. There are two types of files: archive files (that are regularly updated) and reference files (coding list).

A user-friendly interface should be prepared by computer experts to facilitate access to the database so that users only need click on a screen button to perform a task. The first screen gives all the fields for managing the database (input masks, requests, file searches and print-out). This method allows users to quickly become familiar with the data-management systems installed and also makes checking tasks performed by unskilled users simpler.

The following example is a very approximate list of files for monitoring national situations; it includes a special documentation file:

- General information
  List of prefectures, sub-prefectures and cantons
  Transport infrastructure
  Status of roads
  GDP
  GNP
  Economic indicators
  Macro-economy
  Rainfall and PET monitoring
  etc.

- Population
  Population, resident
  Population, by occupation
  Population, by gender
  Population, by age

- Plant production
  Locust eradication: areas infested and treated
  Crop development stage
  Price paid to cereal crop growers
  Agricultural production
  Tuber production
  Horticulture and fruit growing

[57] See Part Two, Chapter V, Section 5.2.

- Animal production
  - *Animal health (vaccinated animals)*
  - *Breeding inputs*
  - *Herds slaughtered*
  - *Milk production*
  - *Changes in size of herd*
  - *Changes in animal production*

- Other production that may affect food security
  - *Coastal fishing*
  - *Main cash products having an indirect influence on food security*
  - *National fisheries production*
  - *List of fish varieties*
  - *Fish production by sector and by species*

- Marketing
  - *Imports of foodstuffs*
  - *Exports of foodstuffs*
  - *Food aid*
  - *List of donor countries*
  - *National trade in staple foods*
  - *Food stocks*
  - *Price of food products*
  - *Price of meat and milk*
  - *National trade in livestock: supply and sales*
  - *Price of animals on the hoof*

- Environment
  - *Rainfall*
  - *List of stations*
  - *Status of grazing*
  - *Hydrology (level of rivers and lakes)*
  - *Forests*
  - *Water supply*

- Areas and vulnerable groups
  - *Food consumption*
  - *Harvesting wild food*
  - *Number of meals per day*
  - *Urban and rural poverty*

- Nutrition and primary health care
  - *Malnutrition*
  - *Nutritional status (deficiency)*
  - *Statistics on diseases (children from 0 to 5 years)*
  - *Health monitoring*

- Employment
  - *Average income by occupation*
  - *List of occupations*
  - *Unemployment rate*
  - *etc.*

- FSIEWS Documentation
  List of FSIEWS documents and documents available from other services
  Users (of documentation)
  Minutes of NFSC meetings
  Monthly records of Provincial Committees
  Bulletins etc.

The list is far from being complete. The practice in some countries of keeping data on the marketing of staples (both domestic and foreign) in the same file as production data is not very appropriate. The former information generally comes from the MIS, customs, the ministry of trade and the ministry of internal affairs, while the origin, periodicity and utilization of agricultural data is totally different.

A user's guide to the database should be prepared describing the relations between files, procedures for updating, adding, and modifying data, and data output. The guide should also describe all the procedures for managing data at the level of the Provincial Committees, the MWGs, and the FSIEWS.

3.2.2 Implementation

If recommendations are followed and the computer programmes used by the FSIEWS are simple and easy to use, there should be no need for a full-time computer expert to see to its maintenance. Indeed it would be a serious error of judgement to take such a step, in that staff at the National Committee (including the FSIEWS team) would have no incentive to learn for themselves how the system is structured and works. When the systems are launched ***the assistance of a computer expert should be strictly limited to training staff at national level*** (how to use software and manage the system). The system can only function properly if the greatest possible number of managers is able to use it. It is, of course, necessary to arrange regular training/refresher courses and take out maintenance contracts for the computer equipment, peripherals and software, with the suppliers of the equipment.

Any inefficiencies brought to light[58] in the analysis of information providers and that impede data-processing in these services should be addressed by developing ***a training programme for data-management staff*** (in particular data managers, lead managers of the MWGs and FSIEWS management) to ensure that information flows smoothly. The problems of services still using out-of-date equipment or manual processing should also be addressed.

The training should aim to:

- harmonize processing methods;
- provide managers with processing tools;
- give them a basic grounding in the system;
- facilitate the exchange of data between services.

The organization and timetable of regular meetings should be decided jointly by the FSIEWS team and the MWG lead managers. The data-collection sheets for updating the databases, the form of which will gradually be modified, will be examined during these meetings. The role of each in the publications/broadcasts (bulletins, radio broadcasts, etc.) will also be discussed.

Example of collated information

List of information provider services and type of data supplied to the FSIEWS in Mauritania
Summary of documents prepared for FSIEWS 96

Information provider services	Resources people	Data supplied	Processing software	FSIEWS Files
Agrometeorological Division	Mbodj Cheikh	Data on rainfall, grazing, yields, estimated sowing dates	Climbase, DHC Also have MSOFFICE	PLUVIO PATURA RENDE
Agricultural and Livestock Statistics Division	Nagi O/ Sabar	Annual agricultural survey	Processing done by the project	DIERI WALO BASFO
Plant Resources Improvement Service	Sidi M. O/Ndioubnane M. Abdellahi O/Babah	Data on damage	No processing Do not have MSOFFICE	DEGAT
ONS	Saadna O/ Baheida Diop Moussa	Consumer indices with cereal prices curve for Nouakchott	EXCEL	INDICE POPULA
CSA	M. Mahmoud/Isselmou	Cereal prices in Wilayas	Processing done by rural information project (do not have MSOFFICE)	PRIXCERE
Port autonome de Nouakchott	Diery Gueye	Imports (Rice, wheat, flour)	Do not have MSOFFICE	PORT
Planning unit/MDRE	Abderrahim O/ Zein	Irrigation	Do not have MSOFFICE	IRRIGUE
Health and Social Affairs Ministry	Corera Choibou	Statistics on diseases	Do not use MSOFFICE	STATMAL
Mauritanian Red Crescent	Diallo	Nutritional situation	Do not use MSOFFICE	NUTRITIO
SONADER	Ismail Ould Ahmed	Irrigated crops	Do not use MSOFFICE	IRRIGUE
FEWS	SY Hamady Samba	Vulnerable groups and zones	Have MSOFFICE	CARTE INDICATE

4. PROPOSED INSTITUTIONAL ORGANIZATION FOR MONITORING FOOD SECURITY AND MANAGING EMERGENCIES

4.1 The National Food Security Committee

As mentioned at the end of Part One (section 5), the functioning of a FSIEWS depends on having direct contact with national *food security decision-makers*. In countries where there is serious chronic food insecurity, an interministerial committee will often coordinate food security activities. Donors, NGOs and other representatives of civil society, plus those involved in national food security, may participate in it as full members or as observers. The committee, which has been called ***National Food Security Committee*** in this handbook, but may be designated differently (food planning committee, national production committee, etc.), usually meets at regular intervals two or three times a year, during periods of high risk. It may also meet, at the request of the chairman (often the agriculture minister, or may even be the prime minister, as in Niger), to try to solve current food crises, but its main purpose is to assess the risks of future crises and propose ways of avoiding disasters. These committees usually include among their members senior representatives from: *agriculture and livestock* (for food production), *customs* (for imports and exports), *trade* (monitoring markets, infrastructure, transport, prices, supplies, etc.) *social affairs* (monitoring poverty and vulnerable groups), and *health* (health and nutrition monitoring). Representatives from *planning, domestic affairs* or *education* may also participate but this varies from country to country. They all have decision-making roles in the food security

[58] See Part Three.

context and they are all providers and recipients of information. In addition, representatives of donor countries, who play a key role in food security, NGOs and civil society often participate in these committees.

The NFSC should be governed by specific statutes providing for a small number of compulsory meetings and extraordinary meetings convened at the request of the chairman or its members.

4.2 The Secretariat of the National Food Security Committee

4.2.1 The role of the secretariat

The secretariat should be a small service of three or four managers with a background that is complementary or additional (may include economics, sociology, agronomy, statistics); they should all have a good level of computer knowledge and be assisted by two members of staff for secretarial and documentation duties. The secretariat should naturally carry out all the normal routine work of such an office:

- organize committee meetings;
- keep files and records;
- prepare the minutes of meetings;
- prepare technical notes at the Committee's request.

It should also be responsible for:

- coordinating the FSIEWS;
- the general documentation on this subject (see point 4.2.3 below);
- coordinating the MWGs;
- preparing bulletins and other methods of disseminating information;
- etc.

The NFSC secretariat is usually the focal point of the FSIEWS in the country.

4.2.2 The role of the FSIEWS in the NFSC secretariat

The staff of the secretariat and the FSIEWS should be able to carry out the same tasks, although some members will have their own special fields. They should therefore *all* have received suitable training to enable them to: use and update the database and control panel; organize and keep the minutes of committee meetings; be familiar with and manage the records; prepare a bulletin or radio broadcast, etc. This flexible staff situation, which does not preclude staff members having individual specialized roles in the service, is essential to ensure a good overlap of skills (each staff member should have a clear understanding of the others' work and plan his/her own accordingly) and to cover for staff who are absent. It is essential in such a small group that the various functions can be carried out smoothly without compartmentalization.

4.2.3 Documentation

A documentation unit is indispensable and should be managed, if possible, by someone with training in this field. Documentation includes:

- NFSC records;
- copies of key documents in the four food security areas in the country;
- regularly updated files on national officials, contacts, and studies in areas of interest to the FSIEWS;
- copies of documents regarding similar experiences in other countries;
- a library of reference documents on methodologies;
- publications.

4.3 Decentralized Food Security Structures (Provincial Food Security Committees)

As we saw above (first steps in setting up a FSIEWS), regular contact with those in charge of collecting and processing data in the field and at provincial or local level, is essential. The raw data is organized at regional level by extension, health, education, and market monitoring workers. They are the mainstay of primary information since they gather it in the field; they are also the only ones who can say whether the information is true or has been "manipulated".

A decentralized (provincial) food security committee (such as the CRA in Chad, or the provincial monitoring stations in other countries) should be set up both to promote the work of the field managers and improve the flow and control of data in the long-term. The committees should cover most of the fields of specialization to be found at central level and include representatives of major NGOs in the region, associations of traders, carriers, consumers, etc. Such a committee may be coordinated by the provincial administrative officer (which is often the case and seems to give the best results), or function independently.

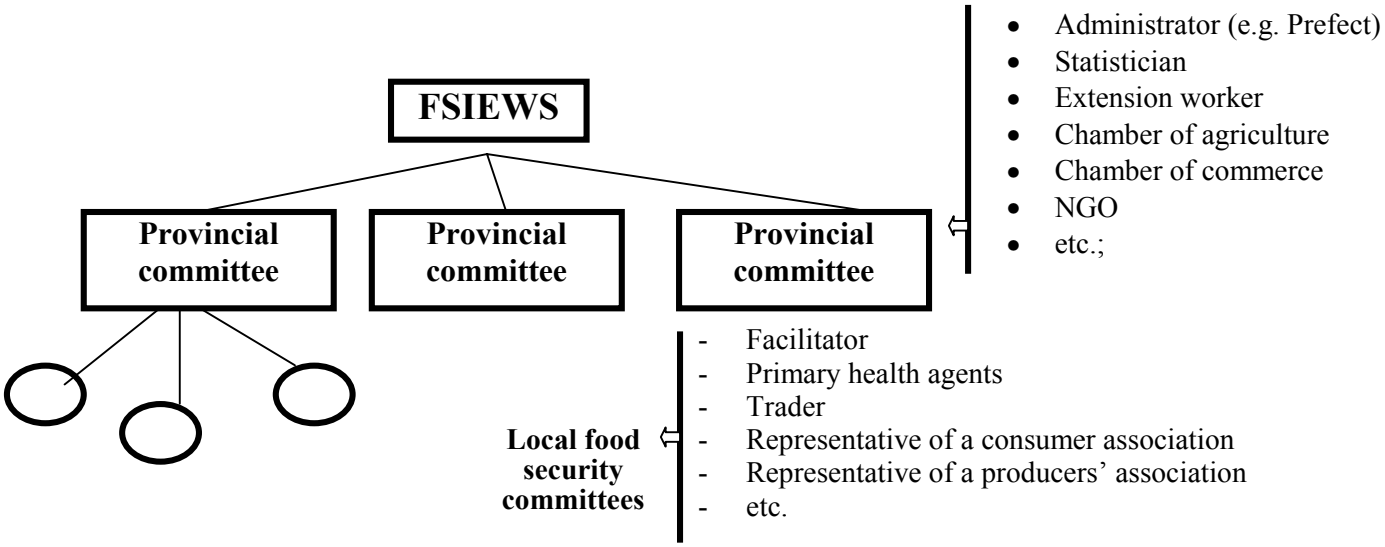
The responsibilities of the Provincial Food Security Committees are to:

- regularly fill in the food security monitoring sheets and send them to the FSIEWS;
- analyse local changes in food security and advise the NFSC, through its secretariat, at the first signs of a crisis;
- monitor the distribution of food aid in the area;
- write articles on food security for the local press and the FSIEWS bulletin;
- keep a provincial database on the changing food security situation;
- etc.

4.3.1 Decentralized multidisciplinary organization

Depending on the population density, communication systems, and number of field managers, it may be necessary to organize several levels of local coordination among food security workers. For example, local committees could be set up in cantons or other small administrative units that have a market, and a provincial committee at prefecture or district level. Whatever system is chosen, it should comprise permanent members, those regularly involved in food security in the area covered, and represent all sectors. The information should be checked for consistency at provincial level before being collated and transmitted to the FSIEWS.

A system of the type illustrated below could be envisaged:



Clearly the proposed organization and the setting up of provincial and local committees presupposes the effective participation of all those involved in the system, who (and this is a key aspect) are both providers and recipients of information.

In due course a legal document should be drawn up (or other legislative method used) to regulate these decentralized committees (their composition, responsibilities, meetings, and the means at their disposal) and provide them with permanent statutes.

One of the main functions of such decentralized structures is to monitor food insecure groups. While there may be some overlap between other local data and national data (although still enabling the FSIEWS to better analyse such data), information on vulnerable groups is mainly local in origin.

4.3.2 Formal relations between decentralized structures and the FSIEWS

The first formal relationship is based on the data-collection sheet the decentralized offices have to send every month (or with whatever regularity has been established) to the FSIEWS. The sheets, the form and content of which may change over time, are collated by the FSIEWS team, working closely with the focal points in the provinces. At regional level, FSIEWS focal points are often the chairpersons of the Provincial Committees although they may also be another member chosen by the Committee.

The data sheet may change as the system is gradually adapted and develops; it may also vary from one season to another (in keeping with the crop season or regularly occurring crisis points, for example) and from one province to another.

Decentralized structures should ideally be *linked by modem* to the FSIEWS. But obviously in areas where there is neither electricity nor telephone, communications can be maintained by radio or by sending roneoed documents with the pilot of an airplane, or by any other means adapted to the situation.

If there is a telephone (with a satellite connection for example*) fax transmission* is simple and cheap.

4.3.3 The need for local structures

As was mentioned above, it can be a good idea to create Local Food Security Committees. It is necessary if the region is very big, the areas within it very different from each other, or if the local managers simply prefer this more decentralized form. In this case, its governing rules will have to be worked out and the local committees allocated their own resources.

5. VALIDATION OF INDICATORS AND THE TYPE AND FORMAT OF INFORMATION TO BE DISTRIBUTED TO USERS (ORGANIZING THE NATIONAL WORKSHOP)

The FSIEWS team prepares the tables of indicators for the database and the control panel with the active participation of the lead managers of the MWGs, the focal points, the provincial committees, and ensures the involvement of development partners (donors, NGOs, etc.). The tables and concrete proposals for setting up the FSIEWS should be discussed openly and validated at a national workshop. The workshop should be held in a place that is easily accessible by everyone, last for at least three days, and should be an event instilled with a sense of occasion to make it a truly inclusive event, an important element in the national debate. Naturally the press and other media should play an active part in the proceedings.

The main aims of the workshop should be to:

- secure consensus within a forum uniting all the parties concerned with information on food security and early warning;
- validate the implementation of a food security and early warning information system and ensure that it is operational;
- boost the planning and coordinating capacity of the NFSC;
- validate proposals for setting up the database, control panel and warning signals of the FSIEWS;
- validate effective ways of transmitting information in order to sustain regular and reliable monitoring of the food and nutrition situation;
- validate an operational institutional framework for the FSIEWS in connection with the work of the secretariat of the NFSC and the provincial committees;
- develop concrete proposals to guarantee the sustainability of the food security information system.

5.1 Participants

The maximum number of participants in the workshop has to be established, the active participation of everyone assured in advance, and the debates organized in such a way as to provide all the participants with constant stimulation. Therefore those who have been invited to take an active role in the workshop should also be known well in advance (see list below for guidance).

The following should be invited to take an active role in the workshop:

- all the central and regional public services involved in the prevention of food insecurity;
- the main regional authorities, such as prefects or district administrators;
- development partners;
- non-governmental organizations;
- members of the business community;
- producer associations;
- consumer associations.

5.1.1 Central administration

The principal ministries having an active role in food security should be represented at decision-making level:

- ministries responsible for agriculture, animal husbandry, fisheries (to represent national food production);
- the environment ministry;
- ministry responsible for customs (often the ministry of domestic affairs) with regard to import-export of staple foods;
- ministry of trade;
- ministry in charge of national statistics (often the planning ministry);
- ministry responsible for social affairs and the eradication of poverty;
- ministry of health;
- ministry responsible for maintaining relations with donors (often the ministry of cooperation or planning).

5.1.2 Local administration

The local administrative authorities, directly or indirectly responsible for food security, who should be invited to participate in the workshop are principally:

- government representatives at provincial level (governors, prefects, etc.);
- the focal points of the provincial food security committees;
- other members of provincial or local committees depending on their individual circumstances and the costs involved.

5.1.3 NGOs and the voluntary sector

If there are one or more NGO coordinating associations, they should certainly be involved in the organization of the workshop. A number of representatives of national and international NGOs should, in any case, be invited to participate; they should be highly representative of the activities carried out in this field. In particular, representatives of NGOs working in the following fields should be invited:

- food aid and assistance;
- rural development among poor farmers;
- aid to associations and cooperatives involved in production and consumption;
- social assistance for the most deprived;
- health and nutrition.

Efforts should also be made to invite associations of producers, consumers, small traders, carriers, etc.

5.1.4 The main donors and technical agencies

Representatives of the main development partners should preferably be involved in the whole process of defining and setting up a FSIEWS. Their technical collaborators should ideally take an active part in the MWGs, which ensures that they are well placed in the system to observe and provide assistance (financial or technical) when required. The main partners should of course be represented at the decision-making level of the national workshop.

One of these representatives could be chosen to represent the donor community and be asked to make a speech at the opening or closing ceremony to present the donor's interest in this process.

Representatives of technical agencies (United Nations, development agencies, international banks, etc.) should also be invited to participate in the opening or closing ceremonies and in the discussions.

5.1.5 Private sector

Representation of the private sector involved in food security in the country is essential. If there is a chamber of agriculture and commerce, members will be invited to participate actively in the workshop. Should there be no such organization, representatives from the following areas should nevertheless be invited:

- carriers of foodstuffs;
- importers and exporters of foodstuffs;
- traders;
- managers of wholesale and retail markets;
- managers of food processing companies;
- etc.

5.2 Document Preparation

All the documents should be clearly presented at the opening of the workshop. If possible, the technical documents should be sent out in advance with the invitation. They can be put in a folder or envelope with the name of the workshop on the cover. It is also a good idea to include some paper and a ballpoint pen for participants to take notes.

5.2.1 Workshop organization documents

There are three types of documents:

- programme and agenda for the workshop (including coffee, meal breaks, etc.);
- list of participants;
- list of documents distributed.

5.2.2 Technical documents

The principal technical documents to be distributed are:

- NFSC frame of reference (regulations, functions, organization, etc.);
- summary documents or outlines of studies on existing information prepared by the MWGs;
- summary table of basic studies on vulnerable groups;
- summary table of indicators for the database and control panel;
- outline of the flow of information through the proposed FSIEWS;
- proposed information sheets that the provincial committees should send regularly to the FSIEWS;
- example of an information bulletin on food security that the FSIEWS could produce (if possible publish a 0 edition of the bulletin, as a concrete example);
- etc.

All these documents should be **short, to the point, easy to read and understandable to all**.

5.2.3 Worksheets

The main worksheets are:

- worksheets prepared by the MWGs indicating the constraints encountered in setting up the FSIEWS in each sector of food security. Each MWG should present concise results of their analysis of available information (preferably in table form), the obstacles to the circulation of information in each sector (one sheet), the members, the organization and the principal tasks of each MWG (an outline is sufficient);

- worksheets for the working groups presenting concisely for each group: the topics to be studied, the functioning of the group, the questions to be dealt with and discussion times, and how their results are to be presented;

- workshop evaluation sheets. They should be ready in advance and include questions on the content of the workshop, the organization of the plenary and parallel sessions, and evaluations of the results obtained. It is important that the evaluation sheets are brief and easy to fill in so that participants can do it quickly at the end of the discussions;

- worksheets for making proposals or raising questions, which any of the participants may do, regarding the organization of the discussions or on a precise technical subject. It can be a good idea to distribute to the participants simple forms that they can use to bring suggestions or questions to the attention of the organizers in the course of the workshop. If this option is adopted, provision must also be made to have a clearly marked box where participants can place these forms. The forms should also be gone through every day, summarized if necessary, and answered during the first hour of the following day's business.

5.3 Organizing the Discussions

5.3.1 Press campaign

A press campaign announcing the workshop should be launched in advance so that by the time participants have received their invitation they already know about the event. The press releases prepared in advance should be clear and concise; they should give the aims of the workshop, the list of participants, and highlight key figures and events.

5.3.2 Documents to be sent out

The preparation and sending out of technical and organizational documents should preferably be a participatory activity. All those who so desire, should be given the time to read, analyse and add supplementary information in their areas of interest in advance of the workshop. Some documents may, however, be distributed at the last minute with the worksheets. The number of copies made should far exceed the number of participants.

5.3.4 Choice of venue

A large number of participants can be expected at such a workshop (often between 50 and 100). A large airy, well-lit, possibly air-conditioned conference room is therefore required. Also needed are another large room for the secretariat, a reception area (in the entrance hall), and three or four smaller rooms for group work. Overhead and video projectors, screens and white-boards should also be available.

There must be a ***full-time secretariat*** to provide services such as typing up minutes of meetings and working groups, answering the telephone, collating the various documents, etc.

5.3.5 Organization and expenses of the workshop

The workshop's budget should cover:

- hiring of rooms and equipment;
- the travel expenses of participants coming from other countries;
- light but balanced meals and snacks (coffee, sandwiches, soft drinks, etc.) should be provided mainly so that participants can keep within the conference area and do not have to wander off in search of food and drink;
- the costs of the opening and closing ceremonies (may include drinks at the opening and lunch at the closing ceremony);
- the costs of preparing and reproducing the documents;
- the secretariat;
- additional costs (telephone, paper, felt-tip pens, etc.).

5.3.6 Organization and monitoring of sessions

Participants usually nominate a chairperson for the workshop as a whole, and additional chairpersons for each session, who in turn appoint a session secretary (to take the minutes) and a rapporteur if necessary.

The workshop should start with an opening ceremony, the formalities of which will depend on the customs of the country. This is followed by the plenary sessions where the documents and the food security context are presented (one or one-and-a-half days) and continue with the working groups, the subjects and participants of which should be established in the plenaries. Each working group appoints its own chairperson, secretary and rapporteur.

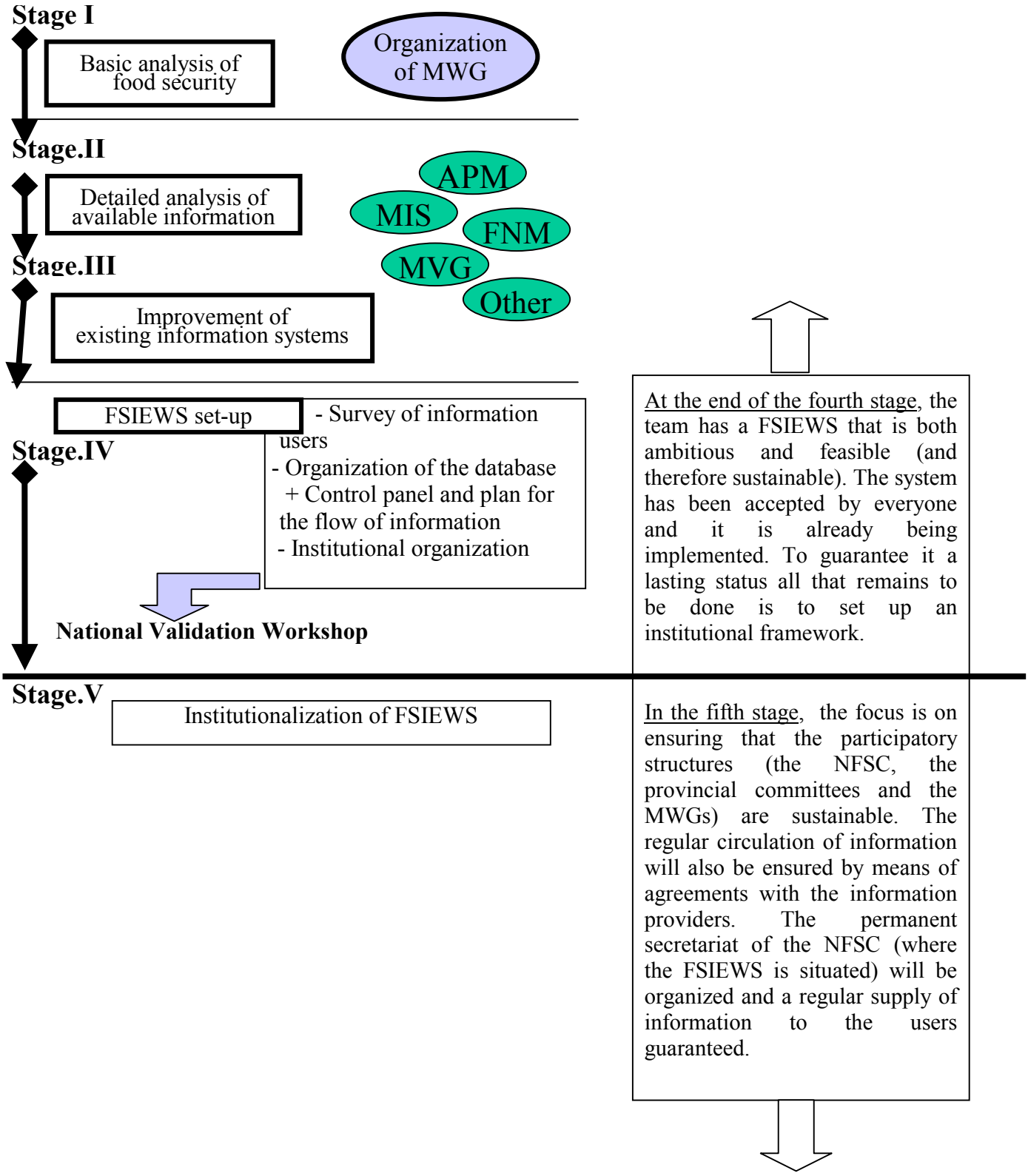
As already mentioned, the minutes of the plenary or working-group sessions should be handed in to the secretariat at the end of each stage by the rapporteurs, typed up immediately, copied and distributed to all the participants at the following session.

5.3.7 Final approval of minutes

The final copy of the minutes should be available, at least in summary form, at the closing session for participants to approve. Should it then have to be amended by the national team, it should nevertheless be distributed as quickly as possible to maintain interest levels among participants and impress on them the speed and efficiency of the organization.

5.3.8 Post-workshop press campaign

The results of the workshop should be given national coverage highlighting the aspect of a nationwide concerted effort for food security. Therefore the press, radio and television must all be there to point up the importance of the workshop and the decisions taken.


Stage I
Basic analysis of food security
Organization of MWG
Stage.II
Detailed analysis of available information
APM
MIS
FNM
MVG
Other
Stage.III
Improvement of existing information systems
FSIEWS set-up
- Survey of information users
- Organization of the database + Control panel and plan for the flow of information
- Institutional organization
Stage.IV
National Validation Workshop
At the end of the fourth stage, the team has a FSIEWS that is both ambitious and feasible (and therefore sustainable). The system has been accepted by everyone and it is already being implemented. To guarantee it a lasting status all that remains to be done is to set up an institutional framework.
Stage.V
Institutionalization of FSIEWS
In the fifth stage, the focus is on ensuring that the participatory structures (the NFSC, the provincial committees and the MWGs) are sustainable. The regular circulation of information will also be ensured by means of agreements with the information providers. The permanent secretariat of the NFSC (where the FSIEWS is situated) will be organized and a regular supply of information to the users guaranteed.

CHAPTER V

STAGE FIVE: STEPS TO THE INSTITUTIONALIZATION OF A FSIEWS

The institutionalization of the system takes place in two main phases:

- first, the institutionalization of coordinating groups and committees at all levels (NFSC, MWG, etc.);

- followed by the sustainable adaptation of the NFSC secretariat (where the FSIEWS is situated), including staff training, the long-term functioning of the database and control panel, and the sustained flow of information, publications, etc.

The second phase deals with "running in" the system to a stage where it is operating smoothly and is sustainable.

Based on the experience of existing FSIEWS, the duration of each stage can be estimated albeit approximately:

- **basic analysis and analysis of available information (first and second stages):** between one and twelve months, depending on whether studies have already been done and data is easily available;

- **improvement of existing information:** between six and twenty-four months, depending on training and equipment available at all levels;

- **implementation of the FSIEWS:** between six and twelve months, depending on time needed for the survey and specific problems of coordination at both national and decentralized levels. The length of time also depends on the human and financial resources available for training and providing everyone with information, and for organizing joint workshops, both at national and provincial levels;

- **institutionalization of the FSIEWS:** wide variation in time needed, it depends on local administrative and political constraints.

It is not necessary, however, to wait four years before the FSIEWS is operational. It should be providing some services from year one (services such as the bulletin, very brief initially, should become ever more comprehensive, as indeed will the database, etc.)

1. ORGANIZATION OF THE NATIONAL AND PROVINCIAL FOOD SECURITY COMMITTEES

As was mentioned above (Part Two, Chapter IV, Section 4), the FSIEWS should be attached to a National Food Security Committee (NFSC), integrating, at decision-making levels, representatives of the main technical organizations responsible for the national availability of food, the stability of supplies, access for all to these supplies and the biological utilization of these foods. The system also requires a decentralized form of the national committee, called in this handbook Provincial Food Security Committees (PFSC).

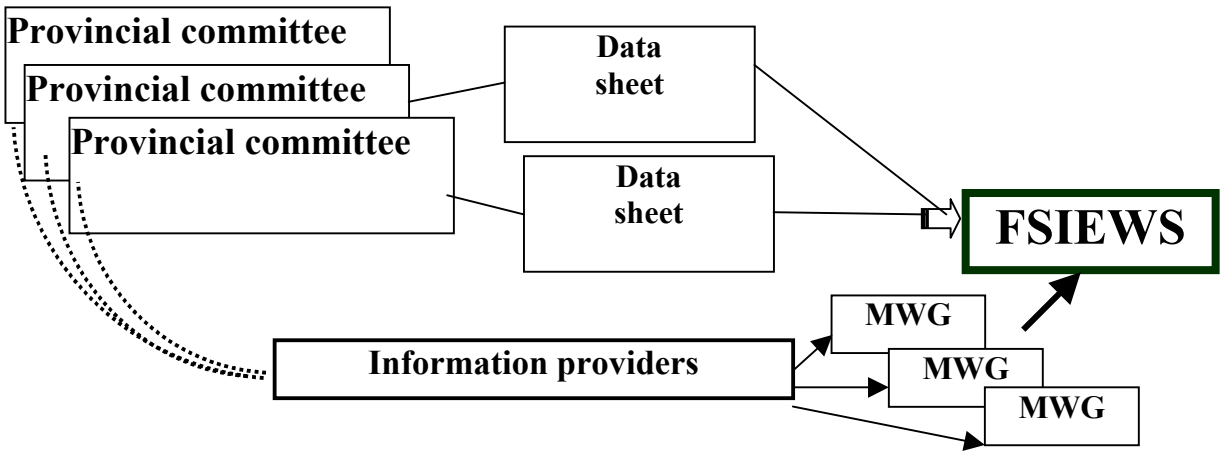
Some countries have adopted different food security information systems, distinct from the government and generally not linked to a national committee. These information systems have mainly been organized by donors, who also supervise them. They are wholly or partially sustained by direct funding. Such structures would appear to be unreliable in the long-term, since they are very often out of all proportion to the country's resources and are, moreover, neither integrated into the national structures nor linked to a National Assembly or other food security decision-making body. Therefore they can only function insofar as the donor pays the costs and supervises their activities and results.

1.1 The NFSC and the FSIEWS

There should be a two-way relationship between the FSIEWS and the NFSC. The FSIEWS first of all assists the NFSC in its decision-making role, providing it with the information to enable it to make decisions. It may then promote the NFSC at national level in *its role as a national disseminator* of food security information. In the other direction, the NFSC (which counts a number of ministers and other policy-makers among its members) helps the FSIEWS to obtain in good time the necessary information from the providers who would otherwise delay in providing them with it, and puts pressure on the FSIEWS to produce the data and analyses in good time while maintaining the required quality. The NFSC facilitates the work of the FSIEWS (by anticipating bottlenecks) but it also exerts pressure on it (by forcing it to play its early-warning role).

1.2 Provincial Committees and the FSIEWS

The FSIEWS' relations with the provincial committees are of a different order. *Provincial committees are both providers and recipients of information*. They supply both quantitative data, which is checked against data provided by government organizations and by the MWGs, and qualitative data (assessment of changes in the situation of vulnerable groups, likelihood of a crisis arising), which cannot be considered statistical data, but rather are indirect indicators of the changing situation. Provincial committees are also the only group in the system to transmit regular data on monitoring food aid in the field. In this respect, they therefore have a special relationship with the FSIEWS. For its part, the FSIEWS promotes the role of provincial committees in coordinating and monitoring food security activities and gives them a voice within the NFSC.



As the FSIEWS and provincial committees are set up, there should be no doubt at all that if *the system* is to be sustainable, it *must be able to evolve*. The composition of the national and provincial committees should be reviewed as circumstances change. For example, when disasters occur representatives from the army, the police, the fire brigade and civil defence should be integrated into the committees as they often play a major role in such circumstances.

The data sheets of the provincial committees should of course be constantly adapted, both to improve their accuracy, in terms of a better local approach to problems, and to vary their technical content as food criteria, social or economic problems, population shifts, etc. change and evolve.

2. ORGANIZATION OF MULTIDISCIPLINARY WORKING GROUPS MONITORING FOOD SECURITY

The need to organize multidisciplinary working groups in each key area of food security has already been discussed in Part Two, Chapter I, Section 1.5. The original functions of the MWGs, forming the institutional basis on which to define and set up a FSIEWS, should evolve as the system is run in. *Routine should be avoided at all costs* in these structures: interest levels among participants have to be maintained and the tendency to hand over tasks to lower grades, who may be asked to substitute for their superiors at MWG meetings, avoided.

To avoid these risks each MWG should develop its own stimulating environment by taking on more responsibilities in preparing articles for the press and other media, and making sure there is enough happening at technical and staff levels to keep members interested. Therefore active participation in the MWG should be emphasized:

- the FSIEWS should make sure members of the MWGs have the necessary training (in data processing, data management, journalism, etc.). It should also give them a *high profile* (in newspapers, interviews, etc.) *within the system*, and access to all the available data;

- the NFSC also has a role in promoting MWG members: national decision-makers should support and promote their own management, and verify their place in the system. Donor members should also give the necessary support to the system's information providers.

Right from the first stages in setting up the system, each and every person should know what his/her place in the system is, and how the system might evolve in line with changing national food security problems and national institutional changes.

3. ESTABLISHING AGREEMENT PROTOCOLS WITH INFORMATION PROVIDERS

It should not normally be necessary to impose a formal structure on the exchange of information and the flow of data, but experience shows that where personal contacts are essential in obtaining information in the set-up period, more formal agreement protocols are often needed in the long-term.

- such protocols should state clearly the type of data to be transmitted, the required degree of accuracy, when, how often, and how it is to be sent (fax, modem, diskette, etc.), what software is to be used, etc.;

- the service or groups of people sending the information should also be entered;

- the protocols should also indicate the information the FSIEWS, in turn, supplies the provider with: regular bulletins, access to the FSIEWS database, opportunity to publish articles in the bulletin, etc.

If the information providers work under the auspices of a ministry, a project or an NGO represented in the NFSC, it may be useful and effective to have the document initialled by the minister, or person in charge of the NFSC member organization.

The advantages of making these protocols legally binding should be seriously discussed in each country planning to set up a FSIEWS. It should not, however, be forgotten that the contents of the database and the FSIEWS management system are destined to evolve over time as they will have to constantly adapt to the changing economic situation and *consequently the protocols will also have to be periodically amended*.

4. GRADUAL DEPLOYMENT OF THE DATABASE AND CONTROL PANEL

The first steps to implementing the database and control panel should be based on the list of indicators and management methods approved during the national validation workshop. The bulletin, which is the organ of communication between the FSIEWS, information providers and recipients (or "customers", who may also be providers as described above), should include an article explaining the system status to everyone. Such an article, perhaps called "FSIEWS News", should give information on the work of the system as a whole: NFSC meetings, the work of the MWGs, staff training courses, news from regional monitoring stations, etc. It should also update readers on the latest changes or adaptations to the system.

Any proposed changes to the list of indicators, and other information regarding the database or control panel should be discussed by the relevant MWG. Once the need for change has been agreed, its effect on the provincial committees' data sheets, periodicity of the data, and agreement protocols, etc. has to be clarified. A technical note explaining the pros and cons of the change should be submitted to the NFSC for a decision. The NFSC, acting as a board of directors for the FSIEWS, has the final say on any changes. The approved changes should be implemented so that new information can be gathered with whatever regularity has been decided on, but also so that historic data on this information can, if possible, be compiled. A note in the bulletin will explain this change to everyone.

It may also be necessary to alter the composition of the MWGs, to change some agreement protocols, modify the appearance and frequency of publication of the bulletin, set up a specific press campaign or a special training course. In these cases, too, the NFSC secretariat, jointly with the lead managers of the relevant MWG, should write a brief explanatory note that is then submitted for approval to the NFSC.

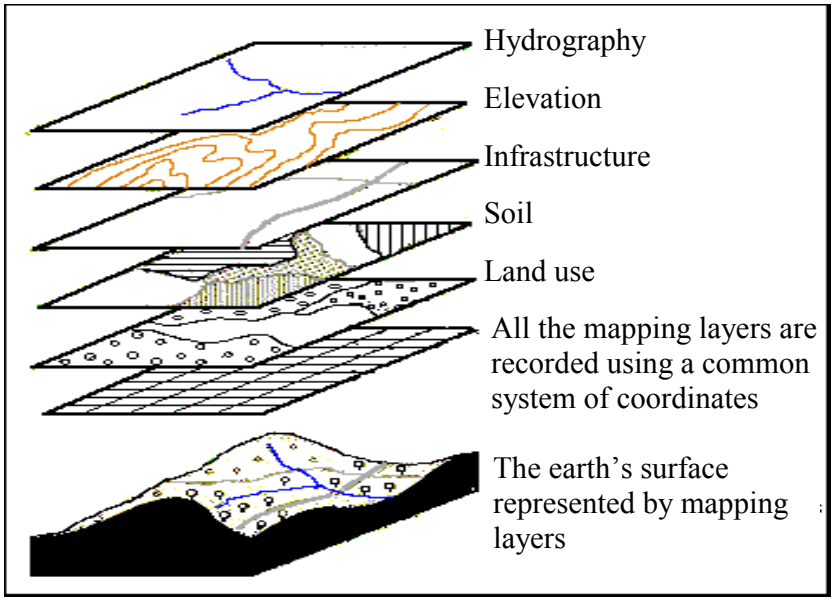
As mentioned above, all modifications to the system (and since it has been designed to evolve, there will be modifications) should be carefully analysed, the final decision resting with the NFSC. The implementation of the changes will be the responsibility of the NFSC secretariat, working closely with all the other components of the system (provincial committees, MWGs, etc.).

5. MAPPING AND OTHER SOFTWARE

5.1 Geographic Information Systems (GIS)

Geographic Information Systems (GIS) are advanced software tools for storing, analysing and publishing data. They can integrate spatial/geographic data with related non-geographic information stored in databases. The geographic data is generally organized in "layers", each one representing different physical characteristics (topography, roads, etc.), socio-economic characteristics (demography, income, etc.), agricultural characteristics, etc. of a given geographic area. One of its features is that several layers can be superimposed and new information gained by means of cross analysis. Of course the quality of the output generated by the GIS depends on the quality of the initial data supplied and the analytical skills of whoever is using it.

GIS have become very popular in recent years, having proved their worth in managing, analysing and illustrating a wealth of information about a country. Nevertheless their application in services in developing countries is still limited by lack of technical resources and suitable training. On the other hand. The use of GIS must be underpinned by information that is consistent and reliable if the spatial visualization of the data is to bring additional advantages to decision-making.



Example of a land use analysis, taken from "Utilization of Geographic Information Systems in Sustainable Development" (GIS section on the FAO Internet site: www.fao.org).)

To make efficient use of a GIS in the framework of a FSIEWS, it is necessary to:

- adopt the FSIEWS databases, which are of good quality and regularly updated;
- have the right equipment for the services concerned at both central and decentralized levels (in particular fairly powerful computer equipment), including spare parts and accessories. Simple to use but advanced software is also necessary;
- provide on-going training for staff taking into account specific local constraints. For example, if power cuts are a problem, management should be trained to use mechanical equipment, while if there is a high turnover of staff, many more people will have to be trained, etc.;

- establish a geographic basis for analysing the country, such as "the smallest administrative unit", homogeneous agro-ecological zones, or other divisions. Socio-economic, health and nutrition parameters, the degree of vulnerability and coping strategies, etc. can be provided for these areas.

5.2 Suitable Mapping Software

FIVIMS is a global information system on vulnerability and food security[59] that *stresses the need to map food insecurity and vulnerability* to gain a better understanding of how these situations evolve and a better analysis of the different factors involved. It was set up in response to requests by participants at the World Food Summit (November 1996) for concrete action (therefore well documented) to be taken to reduce the number of undernourished by half by 2015. FIVIMS therefore focuses on the need to map the changes in this area.

FAO, in cooperation with the other members involved (IFAD, UNICEF, HCR, GTZ, UNDP, USAID, etc.), was therefore asked to develop simple mechanisms for effective mapping and, above all, comparison at a global level. The GIEWS[60] already has an efficient software system, and is currently developing a system of on-line maps to be made available on the Internet.

FAO's World Agricultural Information Centre (WAICENT) has developed a Key Indicator Mapping System (KIMS) the aim of which is to share mapping information for key indicators and related data. Designed with the needs of the national and international partners of FIVIMS in mind, KIMS is a presentation and mapping tool for the main indicators of food insecurity and vulnerability. Its simple copy and paste options allow maps, spreadsheets, diagrams and meta-data to be widely used and disseminated, as well as allowing comparison of food security and vulnerability indicators and other data concerning food security[61].

VAM and GIEWS also have specific software with which FSIEWS software should be compatible to avoid duplication of data.

6. ORGANIZATION OF THE NATIONAL FOOD SECURITY COMMITTEE PERMANENT SECRETARIAT

As mentioned above (Part Two, Chapter IV, Section 4.1), the main roles of the NFSC secretariat are the following:

- to organize NFSC meetings, run the secretariat and keep the minutes of meetings;
- to coordinate all the activities of the FSIEWS (maintenance of database and control panel, analysis of results, preparation of bulletins, etc.);
- provide the MWGs with secretarial services;
- provide managers (NFSC, MWG, regional monitoring stations, etc.) with training and information;
- run the documentation centre on food security;

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[59] See details in Part Three, Section Four.
[60] See Part Three, Section Four.
[61] See details on the FIVIMS web site: www.fivims.net

- implement all the decisions of the NFSC;

- etc.

The secretariat of the NFSC should act as the executive organ of the NFSC. Although the number of managers in the secretariat is very small (two or three people), they can call on their counterparts at national (MWGs) and regional (regional committees or monitoring stations) levels.

As the FSIEWS gradually evolves, the precise role of the NFSC secretariat and its relations with the different participants in the system should become clearer. The long-term risk, already mentioned above, is that the NFSC secretariat (and therefore the FSIEWS, which is a component of it) may shift away from its primary responsibilities, either because its members see themselves as "information managers" (forgetting that they are just a cog in a system that includes information providers and the NFSC) or because one of the administrative bodies (or a donor) takes control. The essential point to remember is that information is the key to future development. There will always be some, driven by personal, political or other ambitions, who will exert whatever pressure they can either from within or outside the secretariat to control it.

As an interdisciplinary committee for the exchange of information and decision-making, the NFSC should direct, supervise and support its secretariat attentively: without such vigilance the system risks becoming a tinderbox.

7. BULLETINS, RADIO OR TELEVISION BROADCASTS, UPDATES, ETC.

In an age when information is omnipresent, when processing and disseminating techniques are ever more numerous but also increasingly simple to use, information and communication activities relating to food security should make maximum use of such resources to produce a message that is clear and useful to its audience. It should not be forgotten that more traditional means of communication (notice boards, rural radio, public meetings, etc.) are still valid and useful ways of informing traditional societies. The "market place" can often be an ideal site for exchanging information, something that politicians have long understood.

Current projects in developing countries make use of four main dissemination methods:

- the *monthly bulletin* is usually a brief low-cost document (4-8 pages) containing information on the current status of food security and forecasts. There will also be a few more descriptive articles on FSIEWS activities, giving the readership a good overview of how the system functions and evolves. Information on the current food security situation is usually written by MWG staff, while the forecasts are taken from the control panel and written by the NFSC secretariat. In the FSIEWS which have e-mail, the bulletins can also be sent out to some customers in this form;

- the *information updates*, which are very short (one page) and sent to a limited number (often only the members of the NFSC), can also be sent by fax or e-mail. They are generally used for urgent information such as food crisis prevention;

- *radio broadcasts* (often rural radio) and sometimes television broadcasts, are used mainly in monitoring market information since this information can be crucial for traders and producers. Unfortunately, radio and television broadcasting is expensive and has to be carefully prepared,

the texts have to very clear (leaving no room for misunderstandings), very short, and broadcast at times convenient to the target audience;

- *inserts in the local press* (in national or local languages) are often very useful; they reach many more readers than the more specialized monthly bulletin and often highly targeted radio broadcasts.

There are however many other methods used by the FSIEWS:

- posting information in local languages on notice boards, with clear illustrations understandable to everyone and preferably a minimum of text, is an important method of local dissemination;

- email and Internet sites can also be used for targeted customers;

- FIVIMS[62] has plans to publish on the Internet[63] vulnerability maps that can then be edited by the respective countries. How the FSIEWS decide to adapt and use this information will obviously vary from one country to another. However, this excellent idea should become reality sooner than expected. The various FSIEWS will have a direct link to the site;

- the GIEWS[64] already has an Internet site[65] where early warning information on various countries is available;

- large amounts of information can also be sent by fax. Where there is an extensive countrywide telephone network, provincial committees already use fax or modem links to send information to the FSIEWS, which, in turn, sends back information duly collated or transmits internal administrative information to the provincial committees.

In order to find a way through this maze of possibilities, the NFSC secretariat should ask the following questions:

- What are the most appropriate dissemination tools and why?

- Should the mass media be used?

- What audience/readership can be reached through each of these tools?

- What is the best format?

- The best language?

- How should modern and traditional media be combined in order to reach as many customers as possible? etc.

It should be noted that although these questions will have been asked and provisionally resolved at the national workshop to approve the FSIEWS, they should be raised regularly by the NFSC secretariat as part of the on-going adaptation of the system so that it can more closely respond to requirements and available options.

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[62] See Part Three, Section Four.
[63] http://www.fivims.net/DEFAULT.htm
[64] See Part Three, Section Five.
[65] http://www.fao.org/WAICENT/faoinfo/economic/giews/english/giewse.htm

8. REGULAR SUPERVISION AND IMPROVEMENT OF THE FSIEWS BY THE NATIONAL FOOD SECURITY COMMITTEE

The NFSC really does have to be in charge of the FSIEWS, and the FSIEWS, albeit playing a fundamental role, is an instrument of the NFSC. This principle cannot be repeated too often.

Therefore at regular intervals (e.g. twice a year) the NFSC should review the work of the FSIEWS and examine the following points:

- changes in the system during this period (new indicators, new protocols, staff changes, etc.);
- problems encountered in this period and the solutions applied;
- need for the system to evolve (methodological, managerial, technical, human, etc. changes) and discussion of the proposed solutions (including costs and time-scale for applying them) to make the system run more smoothly;
- etc.

At the end of the review, a clear summary of the decisions taken by the NFSC should be prepared and instructions accordingly given to the FSIEWS.

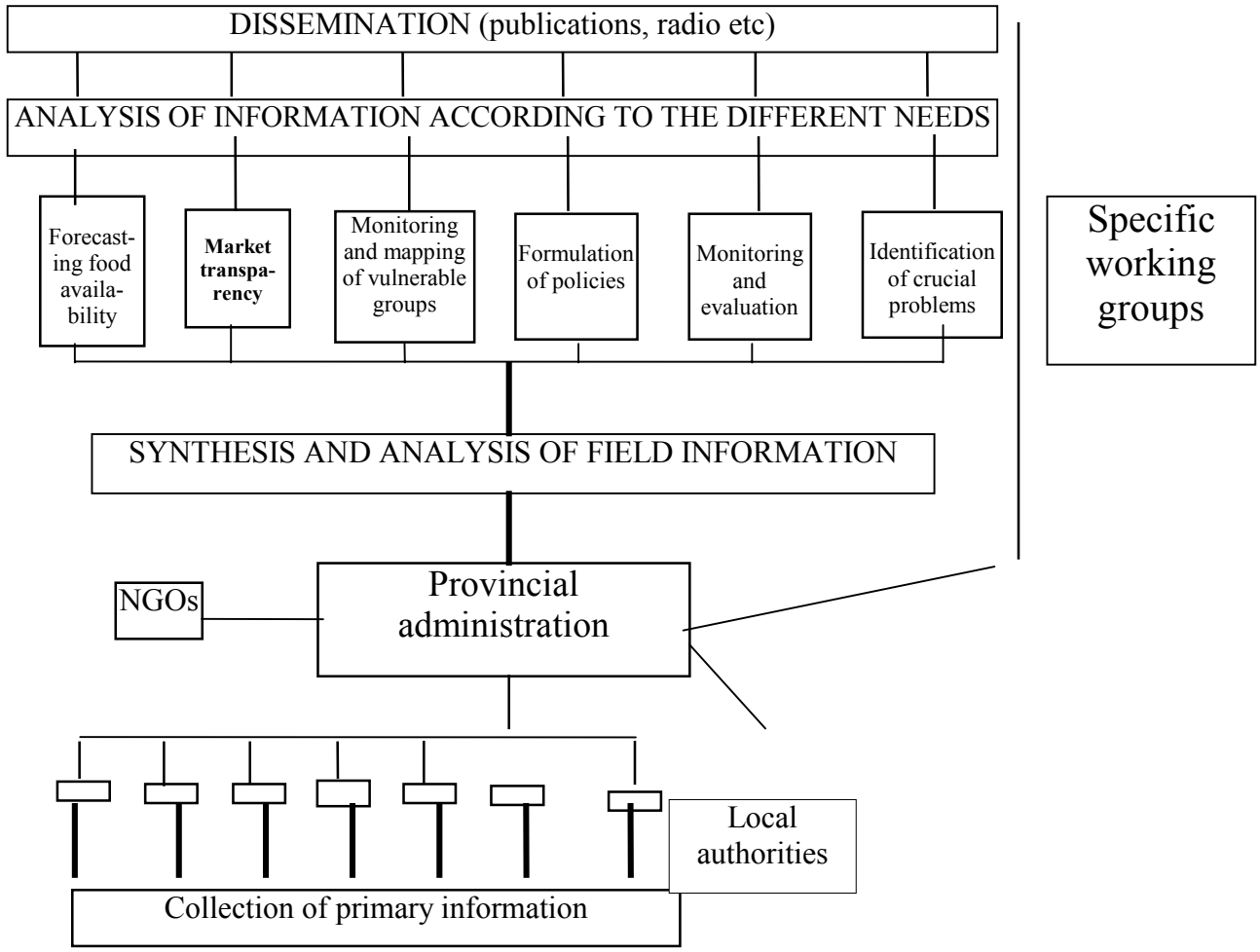
What should be avoided at all costs is that the FSIEWS receive orders from, or come under the influence of, bodies or people outside the NFSC. But, as mentioned above, the FSIEWS has to remain an executive instrument of the NFSC and should not act on its own initiative without having first discussed its plans with the NFSC and received its approval. No single member of the NFSC should be able to exert an influence on the information system. Complete transparency of the information used and processed by the FSIEWS is the only way to guarantee an efficient and sustainable system.

9. ADAPTING THE FSIEWS TO SPECIFIC NATIONAL CONTEXTS (EXAMPLE OF MOZAMBIQUE)

Mozambique is an interesting example of the rapid evolution of a poor country coming out of a crisis situation and moving towards a situation of sustainable development. The national authorities had to develop a food security information system to deal with this particular situation. The aims of the system should gradually progress from *targeting emergency aid* to supporting the marketing of food products and developing *a new food security policy in a market development framework*.

In spite of the change in the general aim, *predicting food crises* is still a priority area, especially given the frequency with which natural disasters occur in this country (floods, droughts, etc.). Unfortunately, the quantity and quality of available information in the different food security areas is poor. At provincial and national levels, in the public, private and voluntary sectors, there is, however, keen interest in setting up a network of information systems on food security and nutrition. FAO and the Commission of the European Community have therefore helped the country to set up the network of information systems presented below.

FLOW OF FOOD SECURITY INFORMATION ACCORDING TO THE DIFFERENT AIMS



What is immediately apparent from the diagram is that much of the data analysis in Mozambique is done at provincial level (while in the standard FSIEWS system the work is shared between the provincial committees and the MWGs). On the other hand, the working groups do not focus exclusively on food security and development policy.

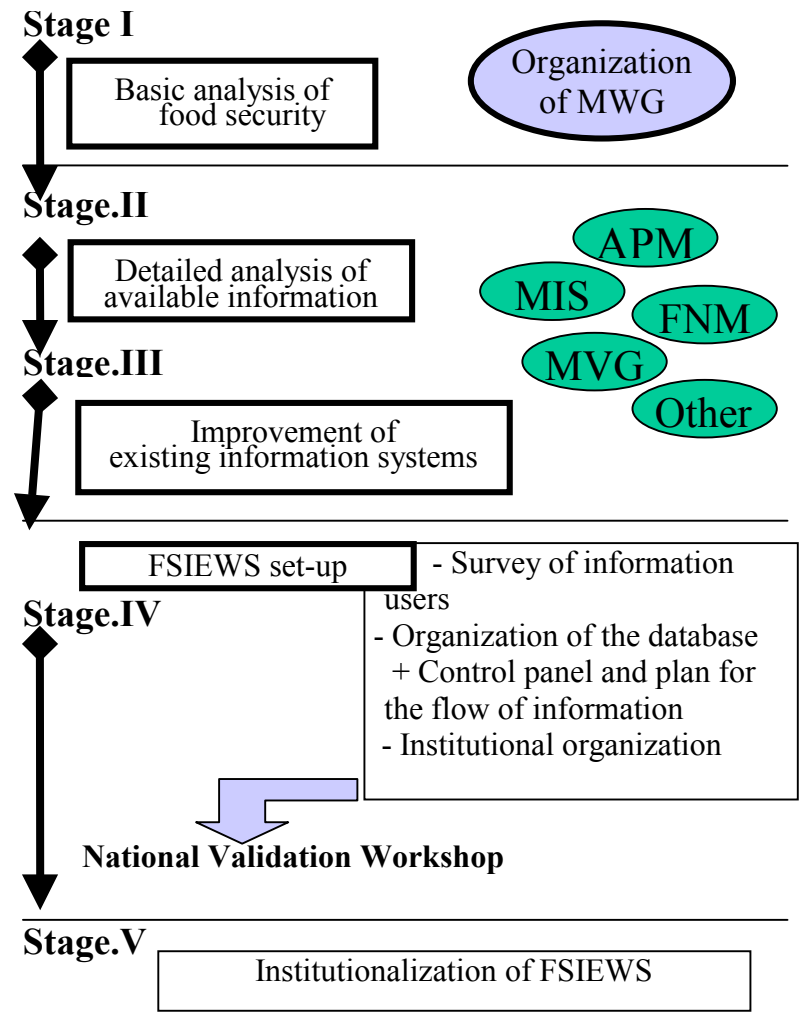
The reasons underpinning the organization of such a system are as follows:

- *it is difficult for Mozambique in its current situation to create an integrated food security monitoring system,* as each institution involved in the main food security areas wants to maintain its independence. Nevertheless, the need to work more closely and exchange information is being expressed more and more often, particularly in working groups with specific information requirements. Therefore there is neither a central FSIEWS unit (however small) nor a control panel. But there is a national committee on food security and nutrition uniting representatives of all the sectors concerned with food security;

- Mozambique's system can be described as *an information network involving various institutions, the results of which can be used for different purposes*. The six sub-groups each pursue their own particular aims (forecasting availability, the smooth functioning of markets or trade, monitoring vulnerable groups, policy and constraints analyses) and are organized into multidisciplinary working groups, coordinated (with the agreement of everyone) by a national institution, a lead agency (similar to the MWG of the FSIEWS). For example, the working

group monitoring vulnerable groups comprises representatives of government and civil society, while the working group on the efficient operation of markets is made up of representatives of the Ministry of Trade and Agriculture, which works closely with other marketing organizations;

- in Mozambique a large number of private institutions collect and process food security information (harvest forecasts, monitoring markets, etc.) for their own purposes. Efforts have been made to gradually integrate them into the six working groups that are being set up in stages, both to have better global utilization of the data and to avoid duplication and encourage better utilization of the financial resources available for collecting, processing and disseminating the data.



At the end of the fifth stage, the food security and early warning system has been adapted to the economic, social and political constraints of the country, while the coordinating structures have been given an institutional form.

All that remains to be done is to ensure the long-term functioning and sustainability of the system, which will be consolidated mainly through the proper functioning of the coordinating bodies and constant adaptation at all levels. This will be dealt with in part three.

PART THREE

SUSTAINABILITY: THE LONG-TERM VIEW

The sustainability of the FSIEWS thus created can only be guaranteed if:

- the classic information systems (production, market, nutrition, etc.) retain their own aims and resources, and continue to develop their own collection, analysis and dissemination of information;

- the FSIEWS unit is as small as possible (three or four experts in food security data processing, equipped with the right computers and software should suffice);

- the national food security committee (including ministers, donors and key representatives of civil society) functions properly and meets whenever its chairperson considers it necessary;

- provincial committees are established at the highest possible level of the provincial administration, in particular to ensure fast and efficient problem solving. They should also act as relay points for the data from the different agencies, as well as being prime users of information summaries of all kinds, particularly FSIEWS information;

- the FSIEWS unit is situated at a high enough administrative level to guarantee both unrestricted access to the necessary monitoring data and the sustainability of the system. It is recommended that the unit be integrated into the NFSC secretariat;

- the FSIEWS sets up and maintains a database for monitoring food security, and the control panel as a forecasting and early warning (warning signal) instrument. The list of indicators for the control panel and warning signals is approved by the National Committee (and the provincial committees). This list should change according to the situation and available information.

1. REGULAR UPDATING AND EVOLUTION OF THE SYSTEM

One of the principal uses of the available information in the database is to provide planners at all levels with an inter-sectoral historic analysis of national food security, highlighting the constraints and strong points. Clearly the ministries concerned (mainly agriculture, trade, health and social affairs, planning and economics) have much more detailed historic analyses of their sectors than the FSIEWS database, but its specific focus on food security, and its inter-sectoral structure, make it particularly attractive to planners. Moreover, its detailed information on vulnerable groups and individuals helps planners to target their actions to the most deprived. The frequency and care with which the database is updated is one of the keys to a successful FSIEWS. The regular use that planners at all levels (local, provincial, national, etc.) make of the database is a reflection of how successful it is.

A regularly updated database should also be useful in preparing analytical publications on the impact of different sectoral policies concerning food security. It is probably not the role of the FSIEWS (which should remain exclusively an information system) to carry out such analyses: these should be left to researchers, but it should be adapted to meet such needs and even suggest them.

Some key factors are:

- include in the MWGs all the bodies involved in food security, each one with its own special area of interest. The composition and work of the MWGs should evolve, as should the system as a whole;

- keep up to date with all the information collected or processed in the country;

- discuss the need for any changes to be made to the flow of information and any new protocols for transmitting data with the services directly concerned and with the NFSC. Agreement should also be reached on any improvements to bulletins, changes in their content, form, and the speed with which information is published;

- negotiate any additional work to be done (adjustments to data collection or processing, for example) with the information provider services directly concerned, in terms of staff potential, available equipment, and, above all, mutual benefit;

- avoid all duplication of work and make sure the responsibilities of each local institution are quite clear. In this context, the FSIEWS should, for example, work together with the national body in charge of coordinating statistics (often the Planning Ministry) to avoid loss of focus in data collection and processing, and ensure the methodologies used are compatible. In this way information will circulate faster and more efficiently;

- start small and gradually improve the system as required, rather than attempt from the start to apply supposedly advanced complex procedures, which local staff have little or no hope of mastering. For example, one of the first steps should be to install simple input masks for the database programmes on the computers of the provincial focal points to facilitate uniform decentralized encoding and rapid data collection. Focal points can then be trained gradually to modify the input masks to suit their own requirements and to process the provincial data themselves;

- a Geographic Information System for processing data should help to gradually increase the analytical possibilities and facilitate the preparation of bulletins, regarding both information in the database (monitoring the situation) and the control panel (forecasts);

- finally, it is essential that the FSIEWS collaborate with all the international or other organizations that would like to have information on food security. By definition, the FSIEWS must work closely with FEWS (USA), RESAL (EU), VAM (WFP), GIEWS/FAO (see Section 6), FIVIMS, (see Section 5 below) which was set up within the monitoring framework of the World Food Summit, and the ACC[66] thematic groups. If the FIVIMS focal point is situated in the NFSC secretariat and therefore with the FSIEWS, as recommended by FAO, it should serve to channel information through all the systems at national level. In addition, in the context of the overall evolution of the market system, the FSIEWS should also work closely with the chambers of commerce and agriculture and the NGO coordinators.

[66] The ACC network on rural development and food security brings together the main development partners in coordinated action at country level. For further details on this network see the internet site: http://www.accnetwork.net

To respond to the growing need for information, taking into account new constraints, the following must be ensured:

- All data collection should be justified by one or more specific targeted uses. It is the use that is made of the information that guarantees funding.
- All duplication in the collection or processing of data should be scrupulously avoided; regular coordination among information providers, and between providers and users, is indispensable (if difficult at times).
- The results of data processing should be quickly made available to as many people as possible in a form that everyone can understand. Extension services, civil society and many others may be interested in receiving information in a summary or collated form provided it is adapted to the user.
- The only way an early warning can be identified is by estimating the change in a situation. The forecasting component should therefore be developed for each of the classic monitoring systems (harvest forecast, evolution of markets and households vulnerable to food crises), but in particular for the system that analyses the food security situation (forecasting global food insecurity trends).

2. EVALUATION OF THE SYSTEM

Provision may have to be made for regular "public" evaluations of the FSIEWS. *National workshops on food security monitoring* may also be planned every two years with the participation of all the actors in the public, private and voluntary sectors, similar to the national workshop to validate the FSIEWS. The workshops should be organized by the NFSC secretariat with the approval and support of the NFSC.

Such a workshop is quite difficult to organize, as it can easily become a pretext for political discussion or manoeuvrings among the various participants. For this reason it has to be carefully organized, controlled and the focus constantly brought back to the technical problems of running the FSIEWS as a monitoring instrument.

Periodic assessment can also take the form of *another survey of the recipients of FSIEWS information*. The questions should be aimed at revealing the level of satisfaction among recipients, perceptions of problems encountered, suggestions for improvements (in particular for the control panel indicators). However, such a survey will not give a global view of the FSIEWS situation. It should also be accompanied by an assessment of the internal functioning (analysis of the flow of information, appropriate use of technical and human resources, etc.), which may be carried out by one or more independent consultants.

Another way of periodically evaluating the system is *to use the regular bulletin as a discussion forum*, setting up a dialogue between the paper and its readership. As the NFSC secretariat is responsible for the bulletin, it could be tempted to use this forum for its own ends – propaganda or self-congratulation, giving the questions and articles a definite slant, selecting the replies or comments received. This needs to be guarded against.

The NFSC may also ask *a firm or independent consultants nominated by the Committee to carry out regular technical assessments*. The choice of firm or independent consultants, as indeed their instructions (and method of payment) are also susceptible to manipulation by the members of the NFSC. In order to avoid any such criticism, the NFSC can choose to have this periodic evaluation carried out by an independent international organization (FAO).

3. NATIONAL FSIEWS IN A REGIONAL (INTERSTATE) CONTEXT

The CILSS, the SADC and the IGAD, which have all set up interstate food security monitoring systems, provide some interesting examples in this context. "Subregional FSIEWS" can be beneficial in zones subject to regular drought that are fairly homogeneous in respect of the food production and diets of their populations. They may be called regional food security information systems (RFSIS), or be otherwise named.

Such a system has three main areas of responsibility:

- a synthesis of information from the national FSIEWS;
- a database of interstate information (regional commerce, population movements, regional supplies, triangular aid, etc.);
- a discussion forum on a common food security policy for decision-makers of states in the zone.

3.1 Synthesis of National FSIEWS Information

It is a good idea for the regional organization to receive regularly and in good time copies of food security databases from each country so that it can prepare a regional overview of changing data on availability, stability and access, and distribute such summary information to all the member countries and other interested parties (donors for example). Obviously such a database will only be interesting if the information reaches the regional organization quickly and in a standardized format so that the data in the various databases can be combined. For example, a good synthesis of national production data should enable the regional organization to inform the countries in the region of available surpluses and specific needs.

A regional organization can also assist some of the countries in the region to establish their databases, if necessary.

3.2 Databases for Interstate Information

Some of the information needed to monitor food security is of a purely regional nature and therefore requires a regional organization to take charge of collection, analysis and dissemination.

This kind of information is linked to:

- migration (structural, temporary or other);
- refugee camps;
- regional trade (livestock, food, etc.);
- regional transport systems;

- customs problems;
- phytosanitary controls;
- the harmonization of taxation policies on staple foods;
- migrations of birds and locusts;
- regional epidemics etc.

An RFSIS could also channel food aid from triangular transactions, where the donor buys staple foods in one country to donate to another.

3.3 A Common Food-Security Policy Forum for Decision-Makers in the Region

The CILSS[67] is a good example of food security cooperation among the drought afflicted countries of the Sahel. This concerted effort is both technical and policy-based; it is a forum not only for governments in the area but also other development partners (NGOs, private associations, etc. in the region and foreign donors).

The principal constraint to the smooth running of this cooperative effort is the political will of governments in the area to collaborate.

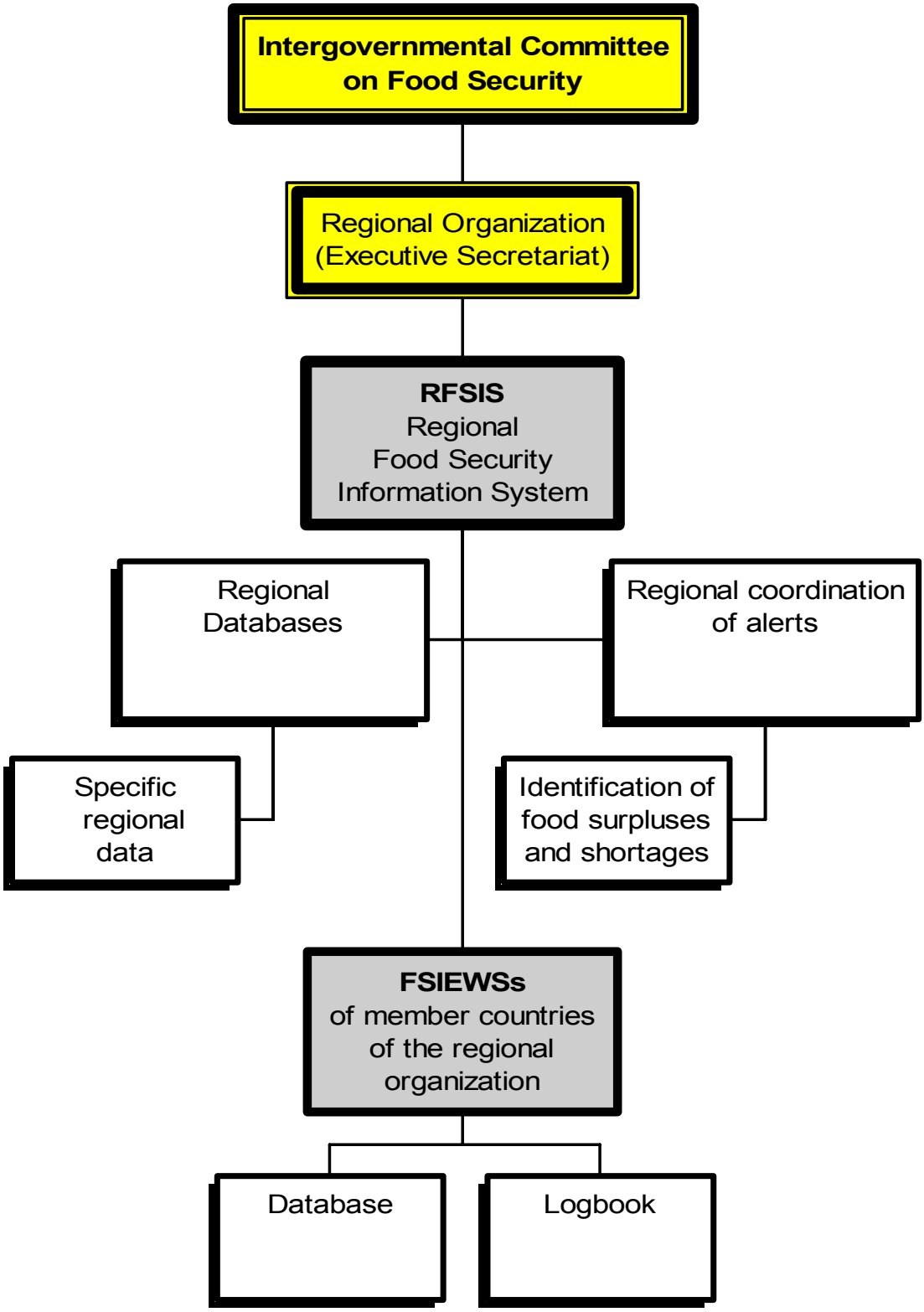
In the SADC[68] region, the member states finance a regional early warning and food security unit that produces regional reports and gives technical support to the member states. The unit is also a discussion forum, and in this role it organizes annual seminars for examining new initiatives and analysing monitoring and forecasting techniques.

The Prevention of food crises

It is difficult to predict how the food security situation will change at regional level, except perhaps as regards major natural disasters such as cyclones, tsunamis, etc.

It is also difficult to establish a control panel for regional forecasting. At best, a synthesis of the information contained in the national control panels can be carried out. A regional organization is, however, responsible for organizing interstate cooperation in the case of specific alerts affecting several countries and also for preparing appeals for international assistance. On the other hand, good knowledge of the migrations of birds and locusts should enable a regional organization to coordinate efforts to combat crop pests and organize action to prevent animal or human epidemics.

[67] Permanent Interstate Committee on Drought Control in the Sahel.
[68] South African Development Community.



Proposal for the regional coordination of food security information and early warning systems

4. DEVELOPMENT OF MULTIMEDIA RESOURCES

The current development situation is characterized by *a reduction in public aid, the massive spread of information exchange systems* (fax, Internet, etc.), and the globalization of computers, combined with an array of ever more powerful, simple and inexpensive programmes.

Multimedia seems to affect every aspect of the mass media today (advertising, television, radio, reviews, newspapers, books, films, cassettes, CD-ROMs, Internet, etc.). The different media use information that is not always properly controlled and analysed before being transmitted to a large number of "customers" or "recipients", who are not always able to distinguish between reliable and unreliable information.

Nor should the exponential development of *mobile telephones*, now linked by satellite, be overlooked. A large number of traders and transporters already use mobile telephones for "their business"; the cost of calls is dropping all the time, fierce competition leading to spectacular reductions. The exchange of information between the regional committees and the FSIEWS, and between the various FSIEWS, may soon be possible via fax (or e-mail) and a mobile phone.

In spite of improved techniques for circulating and processing information, the costs of collecting and analysing information is still very high (staff, travel, training) and national statistics systems often do not have the resources.

5. THE ROLE OF THE FSIEWS IN THE FIVIMS INITIATIVE

At the World Food Summit, in November 1996, FAO undertook to act as a catalyst in developing food insecurity and vulnerability information and mapping systems (FIVIMS). Their proposed role was to provide data at a disaggregated level on regions and populations at risk or undernourished. On a global scale, the aim of the FIVIMS is to monitor under-nourishment so that individual states are better able to formulate and apply policies aimed at reducing by half the number of people undernourished by 2015 and promote food security for all[69].

A large number of activities can be carried out in the framework of the FIVIMS initiative at national and international levels to improve information and achieve the aims of the World Food Summit. To this end FAO has taken steps to:

- launch a technical inter-agency mechanism to coordinate all the initiatives linked to the FIVIMS;
- analyse the causes of vulnerability and create a database on vulnerable groups (as identified at national level);
- analyse the methods and indicators used to evaluate and monitor food insecurity and vulnerability;
- organize the designation of FIVIMS national focal points;
- carry out specific case studies;

[69] 2015 is the date set by the World Food Summit by which the number of under-nourished people should be halved.

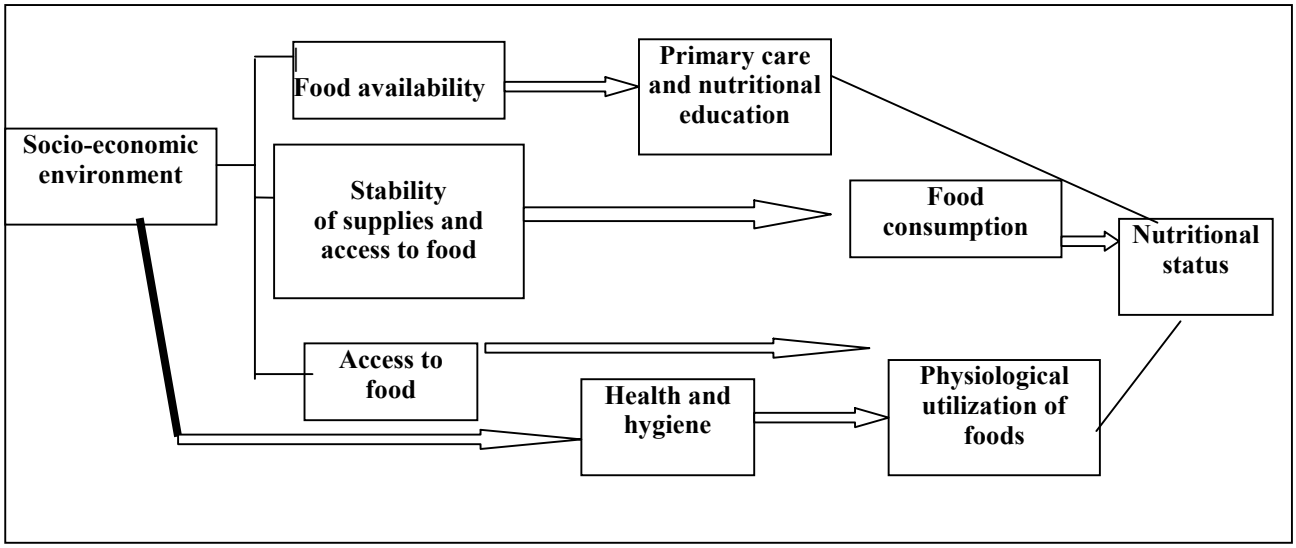
- set up a global mapping system for monitoring indicators of vulnerability to food insecurity.

Commitments made at the Summit regarding the establishment of a food insecurity and vulnerability information mapping system (FIVIMS)

Commitment Two, para. 20 a): *states that "governments, in partnership with all actors of civil society, as appropriate will: develop and periodically update, where necessary, a national food insecurity and vulnerability information and mapping system, indicating areas and populations, including at local level, affected by or at-risk of hunger and malnutrition, and elements contributing to food insecurity, making maximum use of existing data and other information systems in order to avoid duplication of efforts;"*

Commitment Seven, para. 59 b): *states that, "To this end, governments, in cooperation among themselves and with international institutions, using information on food insecurity and vulnerability, including mapping, will, as appropriate: encourage relevant agencies within the UN system to initiate, inter alia within the framework of the ACC, consultations on the further elaboration and definition of a food security and vulnerability information and mapping system to be developed in a coordinated manner; member countries and their institutions and other organizations, as appropriate, should be included in the development, operation and use of the system ..."*

The theoretical framework of vulnerability analysis within the FIVIMS initiative is defined in the table below:



In this framework we find once again the four aspects of food security: availability of staple foods, stability of supplies (to which is added the stability of access), access for all to supplies of staple foods, and biological utilization (called physiological utilization here).

In countries where there is already a FSIEWS (or equivalent system), a natural choice for the national focal point of the FSIEWS would be one of the managers of the NFSC secretariat, often even the FSIEWS coordinator.

5.1 Activities and aims of the FSIEWS at Global Level

The following measures have already been taken or are under way:

- identification of international databases of interest to FIVIMs, and specification of data that should be made available to the global FIVIMS;
- drafting of an agreement for sharing data among the organizations of the UN system and other international institutions participating in the global FIVIMS;
- agreement on a common classification system and on quality standards concerning information and data to be put into the global FIVIMS;
- agreement on uniform ways of presenting the information so that selected data for the global FIVIMS can be shared and exchanged;
- development of a user-friendly system (including mapping capacities) for the dissemination of global FIVIMS data on the web and on CD-ROM.

For further information on the stage of development of the global FIVIMS, see the web site for this inter-agency programme: http://www.fivims.net/

5.2 The FIVIMS Initiative at National Level

At national level, the FIVIMS consists of a network of information systems that collect and analyse data relating to the measurement and monitoring of food insecurity and vulnerability. The FSIEWS can be seen as a national FIVIMS but it is neither necessary nor useful to change its title[70].

A national FIVIMS is a system or network of systems that gathers, analyses and disseminates information on people who are victims of, or are exposed to, the risks of food insecurity. It aims to find out who they are, where they are and the underlying causes of the food insecure or vulnerable situation. The aim of national FIVIMS is to enable managers and representatives of civil society to have more reliable and up-to-date data on the problems of food security in their countries at all levels, and to facilitate the evaluation of policies and programmes aimed at improving the situation[71]. The national systems are also called on to provide information to enable the international community to monitor and guide their progress towards the global objectives established during the World Food Summit.

A FSIEWS can therefore be an essential instrument for a national FIVIMS. The FIVIMS guidelines place particular emphasis on the fact that while national information systems (FSIEWS or other approaches) are playing their part in the eradication of food insecurity and malnutrition there is no need to rename them. Nevertheless, they recommend that these national organizations be designated as FIVIMS focal points in the context of the commitments of the World Food Summit.

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[70] For further information on the specific functions of a national FIVIMS see FAO document CFS: 98/5 available on the Internet at the FAO site: http://www.fao.org/docrep/meeting/W8500e..htm

[71] See Guidelines for FIVIMS: Background and Principles, 24th Session of the FSC, Rome, 2-5 June 1998.

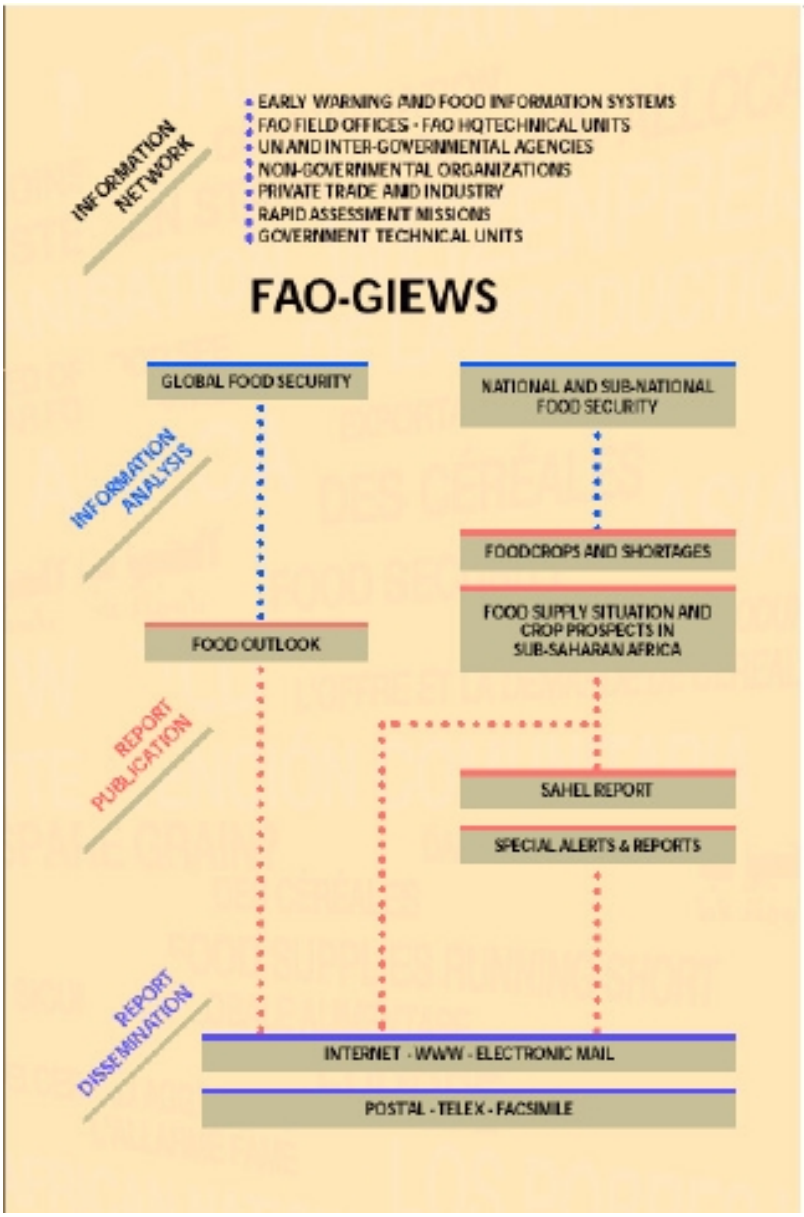
6. INTERACTION WITH THE GIEWS

The Global Information and Early Warning System (GIEWS) of FAO was created in 1975, following the World Food Conference. The aim of the GIEWS is to provide international decision-makers and analysts with the most up-to-date information possible on all aspects of the supply and demand for food and alert them to the risk of imminent food crises so that appropriate action can be taken. It publishes regular bulletins on production, consumption and food markets worldwide; it also publishes detailed reports on regional and national situations.

In carrying out this work, the GIEWS relies in particular on information provided by national data-collection systems. It has therefore established a close working relationship with all the FSIEWS and other local systems and regularly receives their publications by fax or e-mail. It can, moreover, liaise with these bodies to organize missions to assess harvests and the food situation, to collect more up-to-date or more detailed information, especially at harvest time or when there is a food crisis. These missions are often also jointly led by FAO and WFP. In the Sahel, joint FAO/CILSS[72]/government missions are organized every year in October in all CILSS member countries. The figures for the harvest forecasts can therefore be estimated jointly and then presented at a series of regional or international meetings with donors.

Conversely, the GIEWS supplies countries with national information regarding the situation in neighbouring countries, at regional and international levels. All these publications can be accessed on the Internet[73]. There is also a mailing list for subscribers to receive information by e-mail[74]. In addition, the GIEWS has developed country databases of statistics, maps, cultural events and satellite images[75].

[72] Permanent Interstate Committee on Drought Control in the Sahel.
[73] http://www.fao.org/giews/english/giewse.htm
[74] http://www.fao.org/giews/english/listserv.htm
[75] http://www.fao.org/giews/afrbase.ht



A large amount of additional information may now be accessed on-line using a new interface called GeoWeb, which has a search facility.

To facilitate consultation of the various indicators and the work of cross analysis carried out by its geographic experts, the GIEWS has developed a work station (GeoFile) with the support of the European Union, that will be made available to countries to improve their national systems. This computer tool, which has already been installed in Africa and in the SADC, will soon be available at the Centre Agrhymet of CILSS. There are also plans to organize training courses on the use and maintenance of the workstation that is to be decentralized in other parts of the country.

APPENDIX I

LIST OF CONTRIBUTORS TO THE HANDBOOK

Name	Title/Expertise	Nationality (country of origin)	Organization	Contribution
Argenti, Olivio	Marketing Expert	Italy	FAO/AGSM	Agrimarket
Bedouin, Rachel	Food Safety Expert	France	FAO/ESAF	Emergency aid
Ben Ali, Moussa	Information Manager	Chad	FSIEWS/CHD	Information management
Bernardi, Michele	Agrometeorological Expert	Italy	FAO/SDRN	Prod. monitoring and forecasting
Bonnal, Jean	Poverty Expert	France	FAO/SDAR	Monitoring poverty
Chevassus, Simon	Nutrition Expert	France	FAO/ESNA	Monitoring vulnerable groups
Coullet, Geneviève	Food Security Expert	France	FAO/ESAF	Coordination
Di Chiara, Carlo	Food Security Expert	Italy	SAP Niger	Harvest monitoring/forecasting
Dia, D.	National Expert	Mauritania	FSIEWS/MAU	Data management
Gaviria, Lydda	Communications Expert	Colombia	FAO/SDRE	Communication systems
Gommes, René	Agrometeorological Expert	Switzerland	FAO/SDRN	Prod. monitoring and forecasting
Huddleston, Barbara	Head of Service, ESAF	United States	FAO/ESAF	Suggestions
Jost, Stéphane	GIEWS Expert	France	FAO/ESCG	Forecasting emergency sits.
Keita, Naman	Statistics Expert	Mali	FAO/ESSS	Agricultural statistics
Lompo, Luc	Food Security Consultant	Burkina Faso	FAO/Chad	FSIEWS Implementation
Lopriore, Cristina	Nutrition Researcher	Italy	INN Rome	Nutritional monitoring
Maetz, Materne	Economics Expert	France	FAO/TCAS	Systems analysis
Marcoux, Alain,	Demography Expert	France	FAO/SDWP	Population monitoring
M'Balla, M.	National Expert	Cameroon	FSIEWS/CMR	General editing
Napon, Drissa	Food Security Expert	Burkina Faso	FAO/RAF	General editing
Novoa-Barrero Jaime	Marketing Expert	Colombia	FAO/AGSM	Monitoring marketing
Shepherd, Andrew	Marketing Expert	United Kingdom	FAO/AGSM	MIS
Smulders, Marc	Food Security Expert	Canada	FAO/SADC	Special systems
Tollens, Eric	Lecturer	Belgium	Univ. Louvain	General editing
Vercueil, Jacques	Director, ESA	France	FAO/ESAD	General revision
Zehraoui, Mohamed	Food Security Expert	Algeria	FAO/Mauritania	General editing

APPENDIX II

DOCUMENTATION

General documentation on food security and information systems

Publisher	Author	Title	Year
FAO SDRE	L.V. Crowder, W.I. Lindley, W.Truelove, J.P.Ilboudo, R.Del Castillo	Knowledge and Information for Food Security in Africa: from Traditional Media to Internet	1998
FAO/ Univ.of Guelph	D. Richarson & L. Pisley	The First Mile of Connectivity- Advancing Telecommunications for Rural Development Through a Participatory Communication Approach	1998
FAO/SDRE	C.Fraser, J.Villet	Communication: a Key for Human Development	1994
Food policy 19	V.J.Quinn, E.Kennedy	Food Security and Nutrition Monitoring Systems in Africa: a Review of Country Experiences and Lessons Learned	1994
FAO	FAO/TMAP 35	- Note de méthodologie générale sur l'analyse de filière: utilisation de l'analyse de filière pour l'analyse économique des politiques	1993
FAO	FAO/TMAP 36	- Analyse de filière: application à l'analyse d'une filière d'exportation	1993
FAO		World Agriculture: Toward 2010	1995
FAO/CFS	CFS/99/inf6 document	Report on Work in Progress for the Identification of Vulnerable Groups	1999
FAO/CFS	CFS/98/4 document	Report on the Development of Food Information and Vulnerability Information and Mapping Systems (FIVIMS)	1998
FAO/CFS	CFS/98/5 document	Guidelines for National Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS): Background and Principles	1998
FAO	G. Blau, m. Ezekiel, B.R.Sen	Food Aid for Development	1985
ORSTOM	in Cahier des sciences humaines N°27	La sécurité alimentaire à l'heure du néo-libéralisme	1991
FAO projet SNAR	J.Tedou, P.Backiny & A.Hakoua	Détermination des groupes à risques en matière de sécurité alimentaire, en zone urbaine, au Cameroun	1997
FAO	Doc."Participation populaire"N°9	Participation and Exclusion Risks: Remarks on a Few Examples from the Sahel	1995
University of Louvain	E.Tollens,Beerlandt, J.Serneels	Manual for a Food Security Diagnosis	1996
Solagral	Dossiers Pédagogiques	Vers un monde sans faim ? Les enjeux de la sécurité alimentaire: 14 fiches pour comprendre, anticiper, débattre.	1996
Solagral	Le Courrier de la Planète	La sécurité alimentaire à long terme	1996
FAO/WHO	WFS document	World Food Summit - Rome Declaration on World Food Security and WFS Plan of Action	1996
FAO/WHO	WFS document	World Food Summit - Synthesis of Background Documents	1996
FAO		FAO Policy and Strategy for Cooperation with NGO/CSOs	1999

Relief and Dev. Inst., London	J.Borton, J.Shoham	Mapping Vulnerability to Food Insecurity: Tentative Guidelines for WFP Country Offices,	1991
WFP	B. Flamm	Zambian V.A.M. Project. Analyses of Normal and Current Food Security Conditions	1996
WFP/Dakar		La structure de la vulnérabilité – Analyse préliminaire	1996
WFP/Lilongwe	E.Weiss, L.Moriniere	Generalized Methodology for the Targetting of Interventions	1997
WFP		VAM Analysis- Example of Three Methods Towards Geographic Targeting for Disaster Mitigation	1999
WFP		Cambodia - Poverty Mapping Exercise	1996
Club du Sahel/OECD	J.Egg, J.J. Gabas	La prévention des crises alimentaires au Sahel	1997
Club du Sahel/CILSS	Several authors	Les systèmes d'information sur la sécurité alimentaire dans le Sahel	1999
FAO/GIEWS		Guidelines for Crop and Food Supply Assessment Missions	1996
FAO/GIEWS		GIEWS publications: - Food Outlook - Foodcrops and Shortages - Food Supply Situation and Crop Prospects in Sub-Saharan Africa - Sahel Weather and Crop Situation	 5 /yr 5/ yr 3/yr 6/yr
USAID/FEWS		Monthly FEWS bulletins	

Monitoring agricultural production and harvest forecasts

Publisher	Author	Title	Year
CNR/IATA Florence (IT)	Bacci	Utilisation des modèles de production dans les stratégies agrométéorologiques pour la culture du mil	1994
FAO agrometeo paper N°12	P.Bogaert, P.Mahau & F.Beckers	The Spacialinterpolation of Agroclimatic Data. Co-kriging software and source code	1995
Envir.& quality of life series (Luxembourg)	J.F Dallemand, P.Vossen editors	Agrometerological Models: Theory and Applications in MARS Project - CEC JRC & Phare, EUR 16008	1995
CESIA & CNR/IATA Florence (It)	C di Chiara, M.Montanelli, M.Daouda, M.Labo	Manuel de suivi de la campagne agricole et alerte précoce au Niger	1995
Geo-EAS 121 Las vegas	E. Englund, A Sparks	Geostatistical Environment Assessment Software	1991
FAO/UE		Yield Forecasting, Proceedings of a Meeting Organised in October 94 in Villefranche-sur- mer	1995
FAO.AGLS	M.Smith	Revision of FAO Methodologies for Crop Water Requirements. Report on the Expert Consultation in Rome (May 90)	1991
FAO agrometeo. paper N° 13		Coordination and Harmonisation of Databases and Software for Agroclimatic Applications. Proc. of an Expert Consultation, FAO, Dec 93	1995
FAO agrometeo. paper N°		FAOCLIM: CD-Rom with world-wide agroclimatic data.	1995
FAO/USGS/US AID/FEWS		Manual for IDA v4.2, package for display and analysis of satellite information (manual & diskette)	1996
FAO Plant prod.& protec-tion paper N°73	M.Frere, GF Popov	Early Agrometeorological Crop Yield Forecasting	1986
FAO Agrometeo paper N° 8	R.Gommes, L.See	Agrometeorological Crop Forecasting Tools FAOMET	1993
FAO	R.Gommes	A Note on FAO Early Warning Software	1995
FAO	R.Gommes	Objectifs et cadre opérationnel et institutionnel des systèmes d'alerte precoce et de suivi de l'environnement – Suivi des cultures et prévision des récoltes- application agrométéorologiques et standardisation des logiciels in Notes de la conférence de Niamey (Nov 94)	1996
Official publications of EU	R.Gommes	The Use of Remote Sensing Techniques in Agricultural Meteorology Practice: Proceedings of the Consultation,Sept 95 (Budapest)	1996
Official publications of EU	R.Gommes, FL Snijders, J.Q. Rijks	The FAO Crop Forecasting Philosophy in National Food Security Warning Systems	1996
FAO	S.Griguolo, M.Mazzanti	Pixel by Pixel Classification for Zoning and Monitoring (doc + two diskettes)	1996
FAO-AGR remote sensing center	J.U.Hielkema, F.Snijders	Operational Use of Environmental Satellite Remote Sensing and Satellite Comunications Technology for Global Food Security and Locust Control by FAO: the ARTEMIS & DIANA Systems	1993
FAO agrometeo paper N° 4	P.Hoefdloot	Programme for Input and Analysis of Agrometeorological Data (doc + diskette)	1993
CNR-IATA & CeSIA (Italy)	G.Maracchi, L.Fibbi, M.Brindi	A Guide to Data and Software Sources for Applied Climatology	1996

FAO- SDRN	H.Pfeiffer	Volet prevision des récoltes pour le SNAR au Cameroun meridional – Rapport de mission	1997
FAO-SDRN	H.Pfeiffer	Volet suivi de la production agricole et prevision des récoltes SISAAR Tchad- Rapport de mission	1998
FAO-AGLS	D.Sims, P.Diemer; U.Woods-schra	ECOTROP the Adaptability Level of the FAO Crop Environemental Requirements Database (doc + two diskettes)	1994
FAO	F.L.Snidjers	The FAO-Artemis Programme for Operational Production and Calibration of Satellite Based Rainfall Estimates over Africa. Paper presented at the International Workshop on "rainfall estimation by satellite" Niger april 1992	1992
FAO	F.L.Snidjers	Artemis and the Outside orld.File Formats and Naming Conventions	1995
FAO-agrometeo paper N°10	H.Velthuizen, L.Verelst, P.Santacroce	Crop Production System Zones of the IGADD Subregion. (one A0 sized map and one diskette)	1995

Monitoring the marketing of staple food products and harvest forecasting

Publisher	Author/Ref.	Title	Year
FAO Agricultural Services Bulletin N°125	Andrew W.Shepherd	Market Information Services: Theory and Practice	1998
FAO Agricultural Services Bulletin N°76		Horticultural Marketing: a Resource and Training Manual for Extension Officers	1990
Agricultural Ministry of Zambia		Market Liberalization Impact Study: The Agricultural Market Information System in Zambia	1995
FAO Agri/ Services Bulletin 126	John Lynton-Evans	Strategic Grain Reserves – Guidelines for their Establishment, Management and Operation	1997
FAO AGSM Occasional Paper No. 8	Andrew W.Shepherd & Alexander Schalke	The Indonesian Horticultural Market Information Service	1995
FAO Bulletin des services agricoles N°57	B.Schubert et al	Market Information Services	1983

Monitoring nutrition and vulnerable groups

Publisher	Author	Title	Year
WHO	J.Mason, JP. Habicht, H. Tabatabai et V. Valverde	Nutritional Surveillance	1984
Food & nutrition BulletinVol 16		Special Edition "Surveillance for Action towards Better Nutrition".	1995
Food Policy vol.19, no.3	V. Quinn, E.Kennedy	Special Edition "Household Food Security and Nutrition ùonitoring: the African Experience".	1994
American Journal of Clinical Nutrition vol.65, sup. 202S	N.W. Jerome, J.A. Ricci	"Food and Nutrition Surveillance: an International Review"	1997
Eur J Clin Nutr N° 48	M.Lawrence, T.Yimer, J.K.Odea	Nutritional Status and Early Warning of Mortality in Southern Ethiopia 1988.1991	1994
FAO Food & nutrition bul. N°16		Special Edition "Surveillance for Action Towards Better Nutrition"	1995
Save the Children WPN°8	R.Lambert	Monitoring Food Security and Coping Strategies, Lessons Learned from the SADS Project, Mopti Mali	1994
IFAP (Int. Fed. of Agri. producers)		Pauvreté rurale et développement durable	1998
FAO		Dynamique de la pauvreté rurale	1987
FAO/CFS	document CFS/98/inf 8	Information Note on Estimation of the Number of Undernourished	1998
Forum for Development Studies	Nyborg I., Haug R.	Measuring Household Food Security: a Participatory Approach	1995