Achieving Food and Nutrition Security

Actions to Meet the Global Challenge

A Training Course Reader

On behalf of
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Klaus Klennert (Editor)

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3rd Edition

Foreword

'Halving hunger by 2015' has been defined as part of the first Millennium Development Goal. However, statistics paint a very gloomy picture about actually being able to achieve this Millennium Development Goal. Although the prevalence of undernourishment has fallen for many years, the 2007/2008 food price crisis has led to a significant increase in hunger in the world. Recent FAO estimates indicate that more than one billion people worldwide are chronically or acutely malnourished in 2009. Though the situation in Asia has improved mainly due to the achievements in China, this region still shows the highest rate of malnutrition. Hardly any improvements can be reported from Sub-Saharan Africa where the number of undernourished people has even increased significantly.

Hunger and the consequences of hunger cause the death of approximately 40 million people each year, around 13 million of them children. Moreover, more than 40% of the world's population suffer from micronutrient deficiencies, also called the "Hidden hunger": roughly 2 billion people, especially women, are affected by iron deficiency and about 1.6 billion people live in regions where iodine deficiency is endemic. Approximately 230 million children worldwide suffer from vitamin A deficiency.

Due to the worldwide media coverage of conflicts, crises and catastrophes most people believe these are the main causes of hunger and malnutrition. In fact, 90 % of the world's hungry people suffer from chronic Food and Nutrition Insecurity as a result of structural deficits within their own countries and not because of an acute food shortage due to man made or natural calamities. In particular the poor suffer from chronic Food and Nutrition Insecurity, which prevents them from realising their physical and intellectual potential. This, in turn, hampers the economic development of whole regions.

Therefore, if the Millennium Development Goal is to be achieved by 2015, international and national efforts to improve Food and Nutrition Security have to increase considerably. On one hand, priority has to be given again to agriculture and rural development within the framework of poverty eradication which emphasises and supports the special roles women have in securing and producing food. In Africa, Asia and Latin America, between 60 to 80% of staple food needs are met by women's efforts alone. On the other hand, the impact of development efforts on the nutritional status of the target groups has to be observed carefully. Improvements in education, health and equality especially for women contribute enormously to a better use and utilisation of food.

Programmes and projects all over the world, funded by all major donors, aim at contributing to the achievement of the Millennium Development Goals. Many of them define Food and Nutrition Security as a major focus. But the complexity of this task at macro, meso and micro level is tremendous.

Therefore, professionals working in this field need sound knowledge of the political, economic, social and cultural environment in which they work as well as skills to assess and analyse the situation of the food insecure groups quickly and accurately to be able to choose measures that mitigate Food Insecurity and improve Food Security in the short and long term. With this publication we hope to support professionals and their organisations to enhance their capacity in the field of Food and Nutrition Security.

The first edition of this publication was based on the totally revised and updated background papers to the training workshop on "Food and Nutrition Security – Assessment Instruments and

Intervention Strategies". The training workshop as well as this comprehensive supplement are the fruit of collaboration between InWEnt Capacity Building International, Germany, GTZ – Deutsche Gesellschaft für Technische Zusammenarbeit and Welthungerhilfe. Because this reader might be of help for all people working in this field, we are presenting it to the interested international community in this way, and look forward to comments and reactions.

Due to the high demand and the need to update hunger and malnutrition figures, a reprint was necessary. Therefore, we are pleased to present to you the third edition, which includes some additions and corrections taking into account different valuable comments and recent developments.

In appreciation of the efforts of all those who have made this publication possible, we hope it may contribute to a sustainable impact on the Food and Nutrition Security of the poor.

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Introduction

In April 2000, the first training course on „Food and Nutrition Security in the context of poverty alleviation and disaster and crisis mitigation and response“ took place, jointly developed by InWEnt, GTZ and Welthungerhilfe. Slightly changed courses, based on the same main concept, followed in 2001 and 2002 with “Programmes Addressing Acute and Chronic Malnutrition”, and “Food and Nutrition Security – Assessment Instruments and Strategies” (since 2003).

These training courses were an answer to the demands expressed by practitioners from governmental as well as non-governmental organizations working in the field of Food and Nutrition Security or related programmes. Food and Nutrition Security projects set in at local, regional or national level to improve either availability or access to food or addressing nutritional objectives – or all of the three. Persons who work in this type of projects seldom have the opportunity to develop their competencies in all of the different levels and dimensions of Food and Nutrition Security which are needed to achieve the expected results. Although these professionals are generally well versed in one or two disciplines or have gained practical experience, they are often confronted with the immediate need to know more about many other aspects of the subject. To support this process, a two weeks training course was designed to provide professionals with *“a holistic understanding of the complex nature of Food Security and Nutrition, categories of causes, different levels of actors and the variety of intervention to tackle either acute or chronic food insecurity in urban and rural areas”*. Participants look at the issues from the perspective of other disciplines, learn about the framework conditions, and gain better understanding of the various instruments at hand for analysing and combating hunger and malnutrition. In addition, it gives participants an opportunity to exchange experiences on instruments that are applied in their project and elsewhere.

As professionals seldom can spare more than two weeks for training, the course was developed accordingly. In the span of ten days, only an overview of the various instruments and action possibilities can be provided. Therefore, additional background material has been developed to support participants’ learning during and after the course. A reader like the one presented here covers the concept, frame, indicators and instruments of assessment and interventions more thoroughly. It gives an overview on the current Food and Nutrition situation worldwide, and tackles the various dimensions and levels, thus describing the holistic approach. At the same time, specific instruments and methods for nutrition interventions are addressed and their interlinkages worked out. Five authors were identified to write the first set of ten background papers: Rainer Gross, Herwig Hahn, Sylvia Kauffmann, Manfred Metz, and Ulrike Rötten. These papers have been prepared in 1999/2000 and were available for the training courses in 2000 until May 2004. For courses on the same topic in Peru, Afghanistan, Mozambique and countries from Kaukasus and Central Asia, these papers have also been translated into Spanish, Dari, Portuguese and Russian language, the later thanks to the courtesy of the Food and Agriculture Organization of the United Nations, which, in turn, used a modified version of the training course for its projects on “Intensified Monitoring of Food Security in Five CIS Low-Income-Food-Deficit Countries”.

During the past years, the political discussion around “Food and Nutrition Security” has extended to Food and Nutrition Security in the context of disasters and crisis, HIV/AIDS and its influence on Food Security, Food Security – Poverty and the MDG’s, the “Right to Food” as well as to other topics. These discussions influenced the training course in terms of content, which resulted in some methodological changes, too.

Therefore, in 2004, the background papers were completely revised by the facilitators of the training course and subject matter specialists in the field of nutrition, economics and planning, Georg Bokeloh, Maria Gerster-Bentaya and Lioba Weingärtner. A new structure was developed, additional topics were added, figures were updated and the current discussions on HIV/AIDS, Gender, Right to Food, Poverty, MDG's etc. were introduced or became a more prominent role. The new set of eight papers went through a peer reading process done by Claudia Trentmann and Hans Schöneberger, both subject matter specialists in Food and Nutrition Security. An update, especially of Paper II was finalised by Lioba Weingärtner in November 2009.

Paper I presents an overview of the complexity of Food and Nutrition Security: definition, approach, dimensions and levels, instruments and strategies, but also importance for addressing the issue.

Paper II introduces to the state of the art of the Food and Nutrition situation worldwide and according regions, giving special reference to protein-energy malnutrition as well as vitamin and mineral deficiencies.

Paper III describes first the indicators that can be used to analyse the Food and nutrition situation looking at the various dimensions (availability, access, use/utilisation and stability) from the macro perspective and describes instruments and methods to get the necessary information, including the various Early Warning and Mapping Systems.

Paper IV follows the same structure for the meso and micro (household) level.

Paper V illustrates how to plan and design the process of assessment and analysis of the Food and Nutrition situation and elaborates on the selection of indicators.

Paper VI describes interventions to improve the food and nutrition situation at macro level, looking specifically at the various policy instruments of a country and their impact on Food and Nutrition Security.

Paper VII presents actions to improve availability and access to food as well as its use and utilisation at meso and micro level, following the various dimensions of Food and Nutrition Security. In its last part the paper describes examples of international programmes and approaches.

Paper VIII refers on current planning tools and gives hints on how to develop and plan intervention strategies. The paper gives also information on where to start in which situation and gives criteria for selection. It draws attention on the continuum of "relief", "rehabilitation" and "development" and on appropriate actions and programmes to move from relief situations to development cooperation.

All papers include detailed references and web pages of relevant organisations working in the field of Food and Nutrition Security. Furthermore, annexes highlight selected features of some papers. In the end, an index helps to search quickly for selected topics.

Table of contents

List of boxes, figures and tables

Paper I

Paper II

Paper III

Paper IV

Paper V

Paper VI

Paper VII

Paper VIII

Abbreviations

ACC/SCN	Administrative Committee on Coordination / Standing Committee on Nutrition (of the UN)
AIDS	Acquired immune deficiency syndrome
ARI	Acute respiratory diseases
BCG	Bacille Calmette Guerin – current vaccine for tuberculosis
BFHI	Baby Friendly Hospital Initiative
BMVEL	Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (Federal Ministry of Consumer Protection, Food and Agriculture)
BMI	Body mass index
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development)
CCA	Common Country Assessment
CFS	Committee on World Food Security
CIS	Commonwealth of Independent States
CMP	Crisis Management Plan
CMR	Child mortality rate
DAC	Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD)
DD	Diarrheal diseases
DES	Daily energy supply
DHS	Demographic and Health Survey
DPT	Diphtheria-pertussis-tetanus
EPI	Expanded Program on Immunisation
EWS	Early Warning System
FAO	Food and Agriculture Organization of the United Nations
FBS	Food Balance Sheet
FEWS	Famine Early Warning System
FfW	Food for Work
FIVIMS	Food Insecurity and Vulnerability Information and Mapping Systems
FNS	Food and Nutrition Security
FSF	Food Security Funds
FSR	Food Security Reserves

GDP	Gross Domestic Product
GIEWS	Global Information and Early Warning System
GNI	Gross National Income
GNP	Gross National Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HES	Household Expenditure Survey
HIV	Human immuno-deficiency virus
IAWG	Inter-agency Working Group
ICCIDD	International Council for Control of Iodine Deficiency Disorders
ICN	International Conference on Nutrition
IDA	Iron deficiency anaemia
IDD	Iodine Deficiency Disorders
IDNDR	International Decade for Natural Disaster Reduction (early warning systems)
IFAD	International Fund for Agricultural Development (World Bank)
IFPRI	International Food Policy Research Institute
IFSP	Integrated Food Security Program
IMCI	Integrated Management of Childhood Illnesses
IMR	Infant mortality rate
IUGR	Intrauterine growth retardation
LBW	Low birth weight
LIFDC	Low Income Food Deficit Country
LSMS	Living Standard Measurement Survey
MCH	Mother and Child Health
MDG	Millennium Development Goals
MDG	Millennium Development Goals
MI	Micronutrient Initiative
MICS	Multiple Cluster Indicator Survey
MIS	Market Information System
MSF	Médecines sans Frontières
MUAC	Mid-upper arm circumference
NCHS	National Center for Health Statistics

NGO	Non Governmental Organization
PCM	Project Cycle Management
PEM	Protein-Energy-Malnutrition
PHC	Primary Health Care
PPP	Purchasing Power Parity
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper
RAN	Rapid Assessment of Nutrition
RFLS	Rapid Food and Livelihood Security Assessments
RFR	Total Fertility Rate
RRA	Rapid Rural Appraisal
SAF	Standard Analytical Framework – in relation to VAM
SFP	Supplementary Feeding Program
SUA	Supply Utilisation Accounts
TFP	Therapeutic Feeding Program
TGR	Total goitre rate
UIE	Urinary iodine excretion
UN ACC/SCN	United Nations Administrative Committee on Coordination / Sub-Committee on Nutrition
UN SCN	United Nations Standing Committee on Nutrition (former UN ACC/SCN)
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAD	Vitamin A deficiency
VAM	Vulnerability Assessment Mapping
WFP	World Food Programme
WFS	World Food Summit
WHO	World Health Organization
WTO	World Trade Organization
ZOPP	Ziel-Orientierte Projekt Planung (Objective-oriented project planning)

Paper I

The Concept of Food and Nutrition Security[1]

Lioba Weingärtner

1 This paper is a revision and update using elements of the following papers: Gross, R. et al., 2000: The four dimensions of food and nutrition security: definitions and concepts; Hahn, H., 2000: Conceptual Framework of Food and Nutrition Security; and Rötten, U., 2000: Food and Nutrition Security: Problems and Perspectives.

Table of Contents

1 Background

Food security, an important element of poverty reduction, is one of the priority foci of German development cooperation with partner countries in Africa, Asia and Latin America/Caribbean.

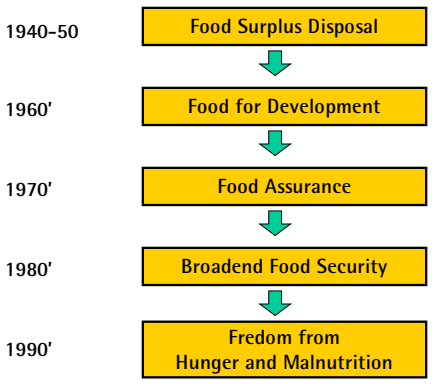
Food and Nutrition Security (FNS) has evolved significantly during the last decades in theory and practice. This overview provides some basic information about the current understanding on FNS. It serves as a reference point for exchanging experiences among all stakeholders involved in programmes and projects, which foster policy and strategy development. It introduces the concepts of FNS and briefly illustrates operational instruments and processes.

This overview is not a discussion of conceptual approaches, but a tool to bridge theory and practice and to stimulate discussions and innovations. It summarizes the holistic understanding of FNS. Many of the aspects and issues presented in this overview paper are elaborated in more detail in the papers II through VIII.

2 The evolution of Food and Nutrition Security concerns

Global FNS has a history of more than 50 year, and has evolved through a sequence of definitions and paradigms (Figure 1). After the historic Hot Spring Conference of Food and Agriculture in 1943, in which the concept of a "secure, adequate and suitable supply of food for everyone" was accepted internationally, bilateral agencies from donor countries such as the USA or Canada were created in the 1950s and started to dispose of their agricultural surplus commodities overseas.

Figure 1: The evolution of Food and Nutrition Security concerns



In the 1960s, when it was acknowledged that food aid may hinder for developing self-sufficiency, the concept of food for development was introduced and institutionalized. The creation of the World Food Programme (WFP) in 1963 is one prominent example.

The food crisis of 1972/74 marked a dramatic turning point from the past era of food abundance of donor countries to highly unstable food supplies and prices on the world market. As a result, food security insurance schemes, which assured international access to physical food supplies, were developed in the 1970s.

Improved food security assurance was to be achieved through better coordination among donor organisations and agencies and food availability surveillance in recipient countries.

In the 1980s, following the success of the green revolution which helped to increase food production (food availability), it was recognized that food emergencies and even famines were not caused as much by catastrophic shortfalls in food production as by sharp declines in the purchasing power of specific social groups. Therefore, food security was broadened to include both physical

and economic access to food supply. In this decade, poverty alleviation and the role of women in development was promoted.

In the 1990s, concrete plans were defined to eradicate or at least reduce hunger and malnutrition drastically. In addition, the human right to adequate food and nutrition was internationally reaffirmed and committed national governments to a more proactive role. Finally, reduced international public support of donor agencies reduced food aid to crisis management and prevention.

In the 2000s, decreasing hunger and malnutrition has increasingly come to be seen in the context of overall development, poverty reduction and the achievement of the Millennium Development Goals (SCN 2004). These internationally accepted development targets can only be achieved, if adequate food and nutrition are ensured for all members of a society (see also chapter 6.2).

3 A holistic understanding of Food and Nutrition Security

Food security historically referred to the overall regional, national, or even global food supply and shortfalls in supply compared to requirements. But, with increased observation of insufficient food intake by certain groups (despite overall adequacy of food supply), the term has more recently been applied mostly at a community, local, household or individual level (Foster 1992). Further, the term has been broadened beyond notions of food supply to include elements of access (determined by food entitlements, Sen 1981), vulnerability (Watts and Bohle 1993), and sustainability (Chambers 1989) (see also Maxwell 1995).

However, food security is a concept that has evolved over time. The most common definitions vary around that proposed by the World Bank (1986) and were summed up by Maxwell and Frankenberger as „secure access at all times to sufficient food for a healthy life“ (1992, 8). In their exhaustive review of the literature on household food security, they list 194 different studies on the concept and definition of food security and 172 studies on indicators (Maxwell 1995). A review that updates this literature (Clay 1997) provides an additional 72 references[2]. IFPRI (1999) listed approximately 200 definitions and 450 indicators of food security. An article by Gross et al. (1998) provides a synthesis of different concepts and the models of nutrition and FNS.

According to a currently accepted definition (FAO 2000), ‘Food Security’ is achieved when it is ensured that “all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”. Food is here defined as any substance that people eat and drink to maintain life and growth. As a result, safe and clean water is an essential part of food commodities. This definition already includes aspects of nutrition but yet not sufficient.

2 Both publications are recommended to development practitioners who are interested in understanding the development of the concept of food security. Other recommended reviews of this literature are Riely et al. 1995, Chung et al., 1997, and Christiaensen and Tollens 1995.

Figure 2: Definition of Food and Nutrition Security

"Food and Nutrition Security is achieved, if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life."

The necessity to include also nutrition into food security evolved over time. The nutrition focus adds the aspects of caring practices and health services & healthy environments to this definition and concept. This aims at what is more precisely called '**Nutrition Security**', which can be defined as adequate nutritional status in terms of protein, energy, vitamins, and minerals for all household members at all times (Quisumbing 1995, 12) and thus in principle is more than food security (see also figure 5).

To underline the importance of nutrition in our holistic approach our definition combines food **and** nutrition and we use the term "**Food and Nutrition Security**" emphasizing several aspects, i.e., not only '*Availability*', '*Accessibility*', but also '*Use and Utilization*' of food (see figure 2).

A holistic understanding of Food and Nutrition Security stresses the various dimensions of the concept:

1. **categorical aspects**,

2. **time aspects**,

3. **socio-organisational aspects** and

4. **managerial aspects**.

Each is discussed below.

4 Aspects of Food and Nutrition Security

4.1 The categorical aspects

4.1.1 The conceptual framework of food and nutrition security

Figure 3 illustrates the relationship among the categorical elements within the conceptual framework of **food and nutrition security**.

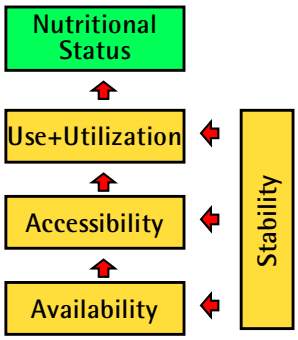
Two factors influence the framework: a physical and a temporal factor. The physical determinant is the food flow: Availability ➞ Accessibility ➞ Use and Utilization.

The **temporal determinant** of FNS refers to stability, which affects all three physical elements.

In this context **availability** refers to the physical existence of food, be it from own production or on the markets. On national level food availability is a combination of domestic food production, commercial food imports, food aid, and domestic food stocks, as well as the underlying determinants of each of these factors. Use of the term availability is often confusing, since it can refer to food supplies available at both the household level and at a more aggregate (regional or national) level. However, the term is applied most commonly in reference to food supplies at the regional or national level (Riely et al 1995, 21).

Access is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet (Riely et al. 1995). It is dependent on the level of household resources – capital, labour, and knowledge – and on prices. Note that adequate access can be achieved without households being self-sufficient in food production. More important is the ability of households to generate sufficient income which, together with own production, can be used to meet food needs.

Figure 3: Food Security and Nutrition



Food access also is a function of the physical environment, social environment and policy environment which determine how effectively households are able to utilize their resources to meet their food security objectives. Drastic changes in these conditions, such as during periods of drought or social conflict, may seriously disrupt production strategies and threaten the food access of affected households. To the extent that these shocks often lead to the loss of productive assets such as livestock, they also have severe implications for the future productive potential of households and, therefore, their long-term food security (Riely et al. 1999, 22).

Use of food refers to the socio-economic aspect of household food security. If sufficient and nutritious food is both available and accessible the household has to make decisions concerning what food is to be purchased, prepared and consumed (demanded) and how the food is allocated within the household. In households where distribution is unequal, even if the measured aggregate access is sufficient, some individuals may suffer from food deficiency. The same is true if the composition of the consumed food is unbalanced. Another aspect is the social function that food can have in terms of community cohesion through offerings, ritual meals etc. especially in food deficit times. All these socio-economic aspects are determined by knowledge and habits. This is especially critical for feeding infants (breast feeding, weaning foods etc.).

Focusing on the individual level food security also requires taking the biological **utilization** of food into consideration. This refers to the ability of the human body to take food and convert it into either energy which is either used to undertake daily activities or is stored. Utilization requires not only an adequate diet, but also a healthy physical environment, including safe drinking water and adequate sanitary facilities (so as to avoid disease) and an understanding of proper health care, food preparation, and storage processes.

Stability or sustainability refers to the temporal dimension of nutrition security i.e. the time frame over which food security is being considered. In much of the food security literature, a distinction is made between *chronic food insecurity* – the inability to meet food needs on an ongoing basis – and *transitory food insecurity* when the inability to meet food needs is of a temporary nature (Maxwell and Frankenberger 1992). Transitory food insecurity is sometimes divided into two subcategories:

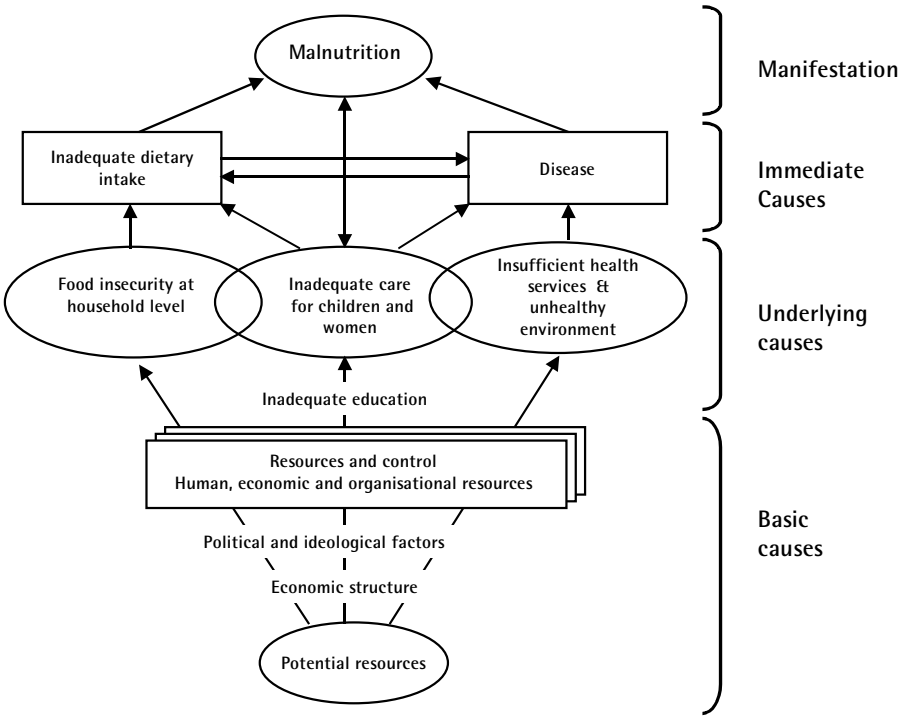
– cyclical, where there is a regular pattern to food insecurity, e.g., the 'lean season' or 'hungry season' that occurs in the period just before harvest, and

– temporary, which is the result of a short-term, exogenous shock such as droughts or floods. Also civil conflict belongs to the temporary category, although their negative impact on food security often continues over long periods of time.

4.1.2 The conceptual framework of malnutrition

Figure 4 shows the conceptual framework of malnutrition, developed by UNICEF and widely accepted at the international level. Although mainly used in the context of under-nutrition in rural areas of developing countries, it is also applicable to overnutrition in an urban context. According to this framework, malnutrition occurs as a result of a number of factors which directly and indirectly cause malnutrition.

Figure 4: Conceptual framework of malnutrition



Source: UNICEF 1991

The **immediate causes** of the nutritional status manifest themselves at the level of the individual human being. These are dietary intake and health status. These factors themselves are interdependent. **Dietary intake** must be adequate in quantity and in quality, and nutrients must be consumed in appropriate combinations for the human body to be able to absorb them (energy, protein, fat, and micronutrients). On household level the decision what food is being put on the table (demand) and who is to eat it (intra-household distribution) determines the composition of the meals for the individual. Habits (e.g. food taboos) and knowledge (e.g. preparation, processing, child feeding practices) influence the composition but also the biological utilization of the food. There are strong synergistic relationships between the **health status** and the nutritional status. A sick person is likely to lose his/her appetite, thus eating a poor diet, digest his/her food poorly and must use some of his nutrients to fight infection. A poorly nourished person has a weakened immune system and is more prone to infections. Infections increase the potential for and severity of malnutrition. In developing countries, infectious diseases, such as diarrhoeal diseases (DD), and acute respiratory infections (ARI), are the most important nutrition-related health problems.

The immediate causes of the nutritional status are, in turn, influenced by four **underlying causes** manifesting themselves at the household level. These are adequate household food security (availability and access), adequate care for mothers and children (specifically relevant in the case of child nutritional status), a proper health environment as well as access to health services. Associated with each is a set of **basic causes** for achieving them which are briefly outlined below (Smith and Haddad 1999, p 12).

The resources necessary for gaining **access to food** are food production, income for food purchases, or in-kind transfers of food (whether from other private citizens, national or foreign governments or international institutions). Whether or not enough food is available (**food availability**) is determined, aside from own household production, by the market supply which originates from the combination of domestic food stocks, commercial food imports, food aid and domestic food production.

Caring capacity, the second underlying determinant, is the provision in households and communities „of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members" (ICN 1992). Examples of caring practices are child feeding, health seeking behaviours, support and cognitive stimulation for children, and care and support for mothers during pregnancy and lactation. The adequacy of such care is determined by the caregiver's control of economic resources, autonomy in decision making, and physical and mental status. Decisive to execute control is the caretaker's status relative to other household members. A final resource for care is the caretaker's knowledge and beliefs. (for an in depth study see Smith and Haddad 1999).

The third underlying cause of the nutritional status is the availability of a functioning **health service**. They have a direct impact on morbidity and mortality and in consequence on the nutrition status. A further key issue which plays a role is the caretaker's knowledge about health and nutrition related topics (specifically child feeding practices and hygiene).

The last cause refers to the environmental conditions. They play a crucial role in influencing the nutritional status via the health situation and mainly include the availability of safe water, sanitation, and environmental safety, and shelter. Water and sanitation improvements, in association with changes in hygiene behaviour, can have significant effects on a population and its health by reducing a variety of conditions for diseases such as diarrhoea, intestinal helminthes, guinea worm, and skin diseases. These improvements in health can, in turn, lead to reduced morbidity and mortality and improved nutritional status. (see Billig et al. 1999).

Finally, the general socio-economic and political conditions of a country influence the causes of nutrition (and poverty). These include the potential resources available within the natural environment of a country or community, access to technology, and the quality of human resources. Political, economic, cultural, and social factors affect how these potential resources and used for food security, care and health services and a safe environmental (see Smith and Haddad 1999). These factors are considered basic causes that contribute to malnutrition.

This model relates the causal factors for malnutrition with different social-organisational levels. The **immediate** causes affect individuals, the **underlying** causes relate to families or households and communities, and the **basic** causes are related to the sub-national, the national and the regional level (see chapter 4.2.1).

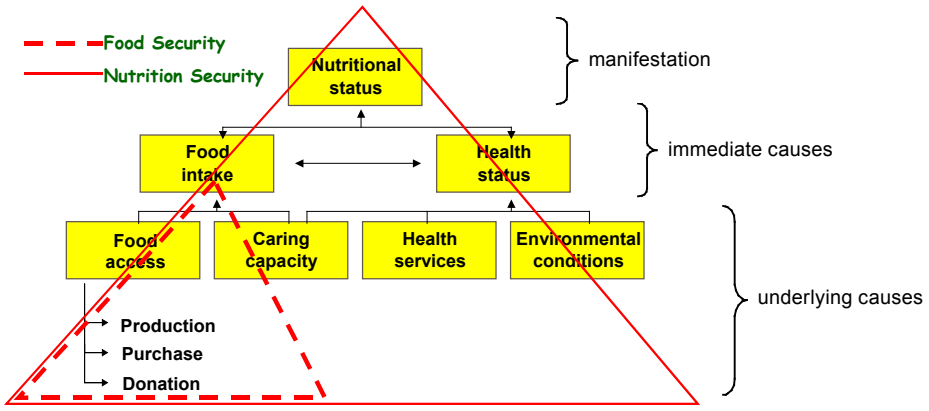
4.1.3 The conceptual framework of the nutritional status at household level

Figure 5 depicts a **simplified causal model of linking nutritional status with causal factors at household level**. In this conceptual framework, the **nutritional status** is an outcome of **food intake** and **health status**. However, the underlying causes of health – **environmental causes** and **health services** – have been depicted in different boxes due to their different natures. A reduced state of health may be due in part to tenuous access to health care, poor housing and environmental conditions, and is possibly worsened by malnutrition, which predispose individuals to diseases. The distinction between health services and environment is necessary to select appropriate intervention strategies.

The four underlying causes of food intake and health status are influenced by several determinants. In addition, each determinant has several contributing factors. For example, as shown in Figure 5, **access to food** is affected by food production, food purchase and/or food donation. This conceptual framework emphasizes the difference between '**Food Security**' and '**Nutrition Security**'. The first refers to the area of causes and effects of *food availability at household level (= access to food)*, here illustrated as the small, dotted triangle. The latter refers to the entire relationships, depict in the larger lined triangle.

Figure 5 suggests another important fact that should be taken into consideration when designing programmes, i.e., the less direct the relationship between a causal factor of malnutrition and the nutritional status, the more time is required to improve the situation.

Figure 5: Conceptual framework of the nutritional status at household level

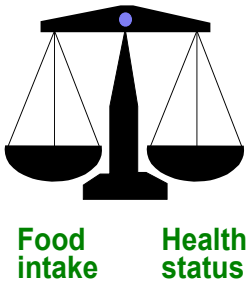


Source: Gross et al. (2000)

4.1.4 Food, health and nutrition

The two most commonly used conceptual frameworks show significant differences: (1) The food security framework emphasizes an economic approach in which food as a commodity is a central focus. (2) The nutrition security or malnutrition framework adopts a biological approach in which centres on the nutritional status of the human being.

Figure 6: Food, health and nutrition



However, common to both frameworks is the promotion of an interdisciplinary approach to ensure FNS. Both acknowledge that food alone is not sufficient to secure a sustainable satisfactory nutritional status and, therefore, aspects of health must be considered. As a result, nutrition is the function of food intake and health status (illustrated in Figure 6).

The conceptual framework of FNS (Figure 5) integrates the food security and the malnutrition framework. Although each starts from a different conceptual perspective, both arrive at similar programme design by using common instruments and processes.

4.2 The socio-organisational aspects

4.2.1 Levels of social and administrative organisation

The categorical elements of FNS, i.e., availability, access, use & utilization and stability, are relevant to all levels of social and administrative organisations (Table 1), from the individual and the household (**micro level**), to the community (sub-district, district and province) or **meso level**, and the nation and the global level (**macro level**). However, the relative importance of each determinant of malnutrition (as presented in Figure 4) changes with the level of social organisation. At higher levels of social organisation the overall political, economic and ecological conditions become more important. Given the diverse nature of the determinant factors of human nutritional status, and the different levels of society in which they interact, FNS will necessarily have to involve aspects from both the natural sciences and the social sciences. As a result, the relevance of FNS at all socio-organisational levels and the interaction between these levels stresses the importance of an interdisciplinary approach of FNS.

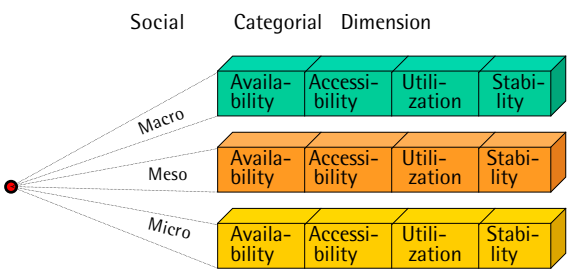
Table 1: Levels of social and administrative organisation

Macro	World	
	Region	
	Nation	
Meso	Community	Province / City
		District / Town
		Village
Micro	Household / Family	
	Individual	

4.2.2 Food and Nutrition Security at the different social/administrative levels

Figure 7 illustrates a merging of the categorical and the socio-organisational dimensions. *Availability, Accessibility, Use & Utilization* of food and the *Stability* of these three elements differ in their nature, causes and effects at the *Macro, Meso* and *Micro* level respectively. For example, food may be available in a country but not in certain disadvantaged districts or among discriminated population groups. The seasonality of food availability and utilization, for example, due to cyclic appearance of diseases, may be a rural but not an urban phenomenon.

Figure 7: Food and Nutrition Security at different levels



The same merger could also apply to the malnutrition framework with its categories: *Food, Care, Health* and *Environment*. However, these four categories affect, and are affected differently at each of the specific socio-organisational level.

4.3 The managerial aspect

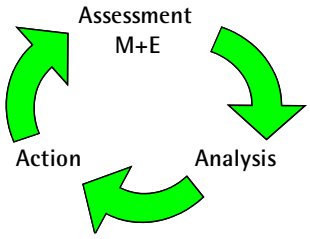
4.3.1 The project cycle management

The third dimension is the **managerial aspect** of FNS projects and programmes. As shown in Figure 8, management follows the classical project cycle, which may have different names in different organisations (UNICEF: Triple A (Assessment – Analysis – Action), GTZ/Welthungerhilfe: Project Cycle Management (PCM)). However, all development agencies agree that programme implementation follows a cyclic learning process consisting of the following steps:

Assessment ➞ Analysis ➞ Action/Intervention ➞ Monitoring & Evaluation (or Re-assessment)

The current situation and problems are identified through assessment. Feasible solutions or actions can then be elaborated based on a comprehensive analysis of causes of problems and their causal relationship. This process is essential to implement the efficient, sustainable, and acceptable actions required to improve the FNS situation of the targeted risk groups. More details are presented in BP VIII.

Figure 8: Concept of Triple A or Project Cycle Management (PCM)

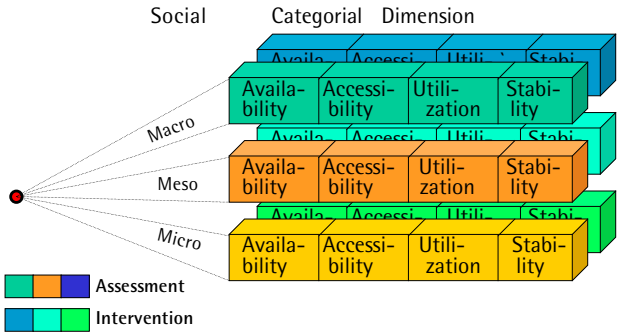


4.3.2 Assessment and intervention in Food and Nutrition Security at different social and administrative levels

Figure 9 illustrates FNS in three dimensions (categorical, socio-organisational, and managerial). It should be noted that the instruments and processes selected for assessment are specific, but also interlinked. Measures to assess the availability of food at the **macro** level are different from those used at the **meso** or **micro** levels. The same observation applies for instruments and processes selected for programme implementation with respect to food availability at the three levels. Despite these differences, **all elements are interrelated vertically and horizontally by nature, cause**

and effect. For example, inappropriate assessment of food availability may lead to the formulation of ineffective interventions that actually reduce access and utilization.

Figure 9: Assessment and intervention in Food and Nutrition Security at different social and administrative level



As indicated throughout, FNS is a complex system. Food and nutrition insecurity at different socio-organisational levels are caused by different factors and requires specific solutions. Consequently, an effective **FNS programme needs a holistic programme approach**.

4.3.3 Examples of instruments to assess Food and Nutrition Security at different social and administrative levels

During all stages of the PCM there is a need for the continuous collection of information to define targets, to select appropriate interventions, and to monitor and evaluate programme progress, process and impact. Table 2 provides selected examples of assessment instruments related to the different categories of FNS at macro, meso, and micro level.

At the **macro** level, precipitation records can predict future food production. Food balance sheets provide information on food availability at national level. The World Food Programme (WFP) developed the Vulnerability Analysis and Mapping (VAM) project to analyse the vulnerability to food insecurity of target populations. A prominent part of VAM is related to access to food. The Demographic and Health Survey (DHS), funded by USAID, provides health data for many countries to help them design their national policy. FAO has developed the Global Information Early Warning System (GIEWS) which collects data related to temporary food insecurity. Under the leadership of WHO, several health surveillance systems have been developed and implemented to monitor the epidemiology of various forms of malnutrition and of selected diseases.

At the **meso** or sub-national level, food market surveys provide data on the availability of food. Qualitative surveys, such as food focus group discussions, provide information on accessibility to food for those in greatest need. District health surveys describe health conditions that may reflect food utilization problems. For quantitative situation analysis, food and nutrition security programmes assisted by GTZ use the standardized BASELINE survey method.

Table 2: Examples of instruments to assess the Food and Nutrition Security situation at different social levels

Social Level	Availability	Accessibility	Use & Utilization	Stability
Macro	Precipitation Record Food Balance Sheet	Vulner- ability Analysis and Mapping (VAM)	Demographic and Health Surveys (DHS)	Global Information and Early Warning System (GIEWS) Health Surveillance System (WHO)
Meso	Food Market Survey	Food Focus Group Discussion	District Health Survey	Anthropometric Survey of Children
Micro	Agricultural Production Plan	Intra-household Food Frequency Questionnaire	Immunization Chart	Weighing Chart of Pregnant Women

Finally, agricultural production surveys, intra-household food frequency interviews, immunization surveys and anthropometric surveys of children under five can be used to assess the availability, accessibility, and use & utilization of food and its stability at micro level.

4.3.4 Most common Food and Nutrition Security indicators at different social and administrative levels

Table 3 shows examples of the most commonly used FNS indicators at different social levels according to the matrix found in Table 1. National food availability depends on supply and demand. Therefore, data on the production of different food commodities, fertility rate and the trends in internal population should be reviewed to determine the national situation of food availability. Food prices and per capita food consumption are indicators for national food accessibility. The rates of stunting, wasting and underweight in children, low Body Mass Index (BMI) in adults, and low birth weight (see BP II and IV) are FNS impact indicators that designate the extent to which food is adequately being used and utilized and converted into a satisfactory national nutrition situation. Fluctuations in food prices and regional shortages of food availability or accessibility are sensitive indicators for national food and nutrition instability.

At the meso level delayed harvest time and reduced staple food production are indications of reduced food availability. Food prices are sensitive indicators for accessibility. Types of sewage disposal and diarrheal diseases (DD) rates provide information on the effectiveness of food utilization. The comparison between pre and post harvest food availability and accessibility as well as chronic energy deficiency of women (low BMI) indicate temporal food and nutrition insecurity.

The lack of stored food and the consumption of wild foods are indicators for reduced food availability at household level. A reduced number of meals per day and increased rate of under- or unemployment may indicate low food accessibility. Appearance of wasting, goitre or anaemia among household members are outcome indicators of reduced food utilization at micro level. Finally, changes in pre-harvest food consumption practices and migration may be sensitive indicators for temporal food insecurity.

Table 3: Examples of most common FNS indicators at different social and administrative levels

Social Level	Availability	Accessibility	Use & Utilization	Stability
Macro	Food production fertility rate population flows	Food price wages per capita food consumption	Stunting rate wasting rate LBW rate	Food price fluctuation regional gaps
Meso	Harvesting time staple food production	Market and retail food prices	Latrine coverage DD rate	Pre-/post harvest food women's BMI
Micro	Food storage consumption of wild foods	Meal frequency food frequency employment	Weight-for-age goitre anemia	Pre-harvest food practices migration

4.3.5 Examples of intervention instruments of Food and Nutrition Security at different social and administrative levels

Using the systematic approach outlined above, Table 4 shows some examples of interventions in the four categories of FNS at different socio-organisational levels.

For example, in addition to a sound agricultural policy that boosts agricultural production, family planning programmes may be important to insure long-term food availability. Food stamp programmes can increase food accessibility for the most vulnerable groups. National safe motherhood programmes can reduce fetal malnutrition and thus increase the utilization of food by small children. The formulation of a saving and loan policy, within the national banking system, can assist small enterprises and help to reduce seasonal food insecurity (macro level). Small-scale irrigation projects, school feeding programmes, measles immunization campaigns, or the creation of community planning organisations are instruments to achieve food security at the meso level. Finally, some examples of FNS interventions at the micro level are increasing the area of agricultural production through the use of fertilizer, breast-feeding counselling for young mothers, and the construction of latrines and food stores.

Table 4: Examples of implementation tools in Food and Nutrition Security programmes at different social levels

Social Level	Availability	Accessibility	Utilization	Stability
Macro	Agriculture and trade policies Family Planning Programme	Price policy Food Stamps Programme	Safe Motherhood Programme	Saving and Loan Policy
Meso	Small-scale Irrigation Project	School-feeding Programme	Measles Immunization Campaign	Community Planning Committees
Micro	Use of fertilizer	Breast-feeding Coaching	Latrine Construction Growth chart	Food storage

The systematic approach shown in the tables above uses the same instruments and processes for assessment and intervention if the four categorical elements of the Malnutrition Framework (*Food, Care, Health, Environment*) were inserted in the table above. Therefore, it makes little difference which framework – Malnutrition or Food and Nutrition Security – is used for the programme design of FNS projects and programmes.

For more details, please consult papers III and IV which present instruments for assessment and analysis, and papers VI and VII present instruments and strategies for improving the Food and Nutrition Security.

5 Rational for investing in Food and Nutrition Security

There are a number of good reasons why it is imperative, profitable and worthwhile investing in food and nutrition security – now!

5.1 Basic need, humanitarian task and ethical obligation

Adequate nutrition is a basic human need. Only if people can satisfy their nutritional requirements on a regular basis, and use and utilize adequate and safe food with the respective energy, protein, vitamin and mineral content, is one of the most important precondition for an active, healthy and decent life fulfilled.

Box 1: Ensuring Food and Nutrition Security is fulfilling basic needs and ethical obligations

„Hunger is one of the worst violations of human dignity. In a world of plenty, ending hunger is within our grasp. Failure to reach this goal should fill every one of us with shame. The time for making promises is over. It is time to act. It is time to do what we have long promised to do – eliminate hunger from the face of earth."

Source: Kofi Anan, Secretary General of the United Nations, at the World Food Summit: five years later in June 2002 in Rome

Prolonged lack of food and nutrients leads to various physical and mental impairments of human beings. It prevents children from growing into productive members of the society and be adults who are fully able to participate in the economic and social development of their countries. In extreme cases, it leads to premature death which could be prevented with relatively simple and inexpensive measures. Sustainable food and nutrition security is life saving for people today and beneficial for future generations. Hunger is a human catastrophe and unacceptable (Box 1) in a world which produces enough food for all (see Paper II) and which knows enough about appropriate solutions to the problem (see Papers VI–VIII).

5.2 Human rights and the Right to Food

Food insecurity and malnutrition are viewed as a violation of human rights. The International Covenant on Economic, Social and Cultural Rights adopted by the United Nations General Assembly in 1966 defined and formalized the right to food as a basic human right, which had already been mentioned in the Universal Declaration of Human Rights of the United Nations in 1948, and has been re-affirmed in 1974.

Box 2: The right to food

"Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties."

Source: United Nations 1974

However, "today, more than 800 million men, women and children are denied the most basic human right of all: the right to food."

Source: Kofi Annan, Secretary General of the United Nations

When food and nutrition security is accepted as one of the basic human rights of every individual, there can be no compromises made in ensuring the right to food (WFS 1996a). The right to food, e.g. the right of each person to be free from hunger and to have access to productive resources to feed himself is a challenge for governments and imposes obligations on states to respect, protect and fulfil food and nutrition security (Robinson 1999). A rights-based approach offers potential additional leverage to improve and speed up the current efforts to reduce the number of the hungry worldwide. In reference to this right, on one hand governments could draw up precise guidelines for their policy choices. On the other hand, civil society actors would be better enabled to articulate and state their own rights and interests and to hold their governments accountable (BMVEL 2005). If a rights-based approach were firmly anchored in law, claims could be brought against specified bodies to seek redress (McClain-Nhlapo 2004, 3).

In the past there was limited application of a rights-based approach to national and international development policies because there was no practical experience with using human rights standards and instruments as an orientation for development policies. The conceptualisation of a rights-based approach has gained momentum in recent years, as is partially reflected in the Human Development Report 2000. The application of economic, social and cultural human rights was hindered for many years because there were no precise guidelines concerning the content of the right to food and the state obligations (BMVEL 2005).

Commitment 7 of the World Food Summit Plan of Action (1996) requests the UN High Commissioner for Human Rights (WFS 1996b) "... to clarify the content of the right to adequate food and the fundamental right of everyone to be free from hunger, as stated in the International Covenant on Economic, Social and Cultural Rights and other relevant international and regional instruments, and to give particular attention to implementation and full and progressive realisation of this right as a means of achieving food security for all".

The first step toward clarification has been achieved through the adoption of the Resolution on the Right to Food by UNHCR and the adoption of the General Comment 12 on the Right to Food by the international community (Haddad 1999). For the first time, this comment provided a comprehensive and authoritative interpretation of the human right to adequate food. In 2002, in a second step, the FAO-Council established an inter-governmental working group to develop a set of Voluntary Guidelines for the progressive implementation of the Right to Food.

The Voluntary Guidelines is an international legal instrument which clarifies the content of the right to food, enumerates the state obligations to guarantee that right and provides guidance on the implementation of the right to food (FIAN 2004). These guidelines offer a unique opportunity to discuss more precisely how governments should act and how strategies to combat hunger should be organised. They could become an important additional instrument to mobilise the „missing political will".

After two years of negotiations the FAO Council adopted in November 2004 the text of the „Voluntary Guidelines to Support the Progressive Realisation of the Right to Adequate Food in the Context of National Food Security". This instrument allows for real changes by not only identifying its potential but also by making concrete use of a rights based approach in order to realize food and nutrition security (BMVEL 2005). The Declaration of the World Summit on Food Security 2009 recognises the Right to Adequate Food as the reference framework for actions to improve food security (FAO 2009).

For more information on the Human Rights Systems with special reference to the Right to Adequate Food see Kent 2005.

5.3 Economic considerations

Malnutrition among adults and children has serious consequences. These are low birth weight of babies and a perpetuation of malnutrition over generations, decreased physical and mental abilities with lower capacities for learning and working, specific and partly irreversible physical impairments, increased susceptibility to infections and increased mortality. The World Health Organisation (WHO) estimates that more than half of the annual 11 million child deaths can be attributed directly or indirectly to malnutrition.

Malnutrition is one of the most important causes of underdevelopment and poverty (see chapter 6.2). Investments in nutrition are investments in human capital. These investments support men, women, boys and girls who can only then use their growth and development potential for the development of their families and societies once such investments in nutrition have been made.

The World Bank (World Bank, McGuire 1996, Phillips and Sanghvi 1996) assumes that investments in nutritional programmes are efficient investments. Cost-benefit analyses show that – depending on the programme approach – 0.9 to 84 US$ per 1 US$ invested are gained through increased remuneration and decreased incapacity to work. This is achieved through the impact on adult labor force participation and productivity, on improved health and school performance and ultimately on economic growth investments in nutrition (FAO 2001b).

The gains from reduction of malnutrition are substantial. In Pakistan, school enrolment rates increased substantially (2 percent for boys and 10 percent for girls) when nutrition improved – measured through increased height-for-age. Nutrition education, vitamin A supplementation and breast feeding promotion are among the most cost-effective public health interventions in terms of disability adjusted life years (DALYs, a commonly used indicator for assessing health interventions) gained (World Bank 2001).

Box 3: Investing in Food and Nutrition Security pays

„We do not have the excuse that we cannot grow enough or that we do not know enough about how to eliminate hunger. The cost of inaction is prohibitive. The cost of progress is both calculable and affordable."

Source: FAO 2002, 4

According to a FAO proposal for an Anti-Hunger-Programme, public investment of US$ 24 billion a year would be enough to jump-start an accelerated campaign against hunger that could reach the target of halving hunger and malnutrition by the year 2015. These costs are very low compared to the more than US$ 300 billion that the OECD nations transferred in 2001 to support their own agriculture. The payoff of investing in food and nutrition security would be impressively high. FAO has estimated that freeing several hundred million people from hunger – as formulated in the above mentioned target – would yield at least US$ 120 billion per year in benefits as a result of longer, healthier and more productive lives (FAO 2002, 4).

6 Cross cutting issues in Food and Nutrition Security

Food and Nutrition Security is linked to a number of cross cutting issues in development of individuals and societies. These include gender, livelihoods, poverty and poverty reduction, HIV/Aids as well as conflicts, crises and natural disasters.

6.1 Food and Nutrition Security and gender

Women are the key to food and nutrition security (Quisumbing 1995, Welthungerhilfe, IFPRI and Concern 2009). They play an important role as producers of food, as managers of natural resources, in income generation and as providers of care for their families. Yet, women often continue to have limited access to land (see Box 4), education, credit, information, technology and decision making bodies.

Women are thus impaired in fulfilling their potential socio-economic roles in food and nutrition security and in ensuring care, health and hygiene for themselves and their families. This is aggravated by the fact that women themselves are often more vulnerable or more affected by hunger and malnutrition than men, especially by iron deficiency and undernourishment during pregnancy and lactation.

Box 4: Women's rights

In many developing countries, women produce most of the food consumed by their families and communities. Yet women rarely have secure tenure to the land they work. In Nepal, India and Thailand, for example, less than 10 percent of women farmers own land.

Although traditional land tenure systems rarely granted women outright ownership of land, they frequently protected their rights to work and manage enough land to provide for their families' needs. In many cases, those rights are now being eroded by changing socio-economic conditions, land shortages and tilting programmes that fail to recognize the value either of customary tenure practices or of women's contributions to agriculture.

Improving access to land for women is essential to increase both food security and sustainable production. Only through such measures can it be ensured that women possess collateral and the security to invest in land and technology.

Source: FAO 2002, 27

A number of constraints limit women's ability to improve their own and their children's nutritional status. These include, e.g., fewer employment opportunities of poor women compared to men, significantly lower wages, less access to resources and information, less involvement in decision making, lower enrolment at school and earlier drop outs. In some countries, socio-cultural norms dictate that girls marry early in adolescence and have their first child soon thereafter. In conditions of gender inequality, women and girls are more poorly nourished throughout the life cycle, show higher rates of mortality, have less access to health care, and are subject to greater household food insecurity (UN SCN 2004, 15).

Researcher (IFPRI) found that

- Agricultural productivity increases dramatically when women get the same amount of inputs men get.
- Gender differences in property rights hinder natural resource management (see Box 4).
- Increasing women's human capital is one of the most effective ways to reduce poverty.
- Increasing women's assets raises investments in education and girls' health.
- Women's education and status within the household contribute more than 50 percent to the reduction of child malnutrition.
- Females in South Asia consistently fare worse than males on a number of health fronts, while girls in Sub-Saharan Africa do better than boys. The difference is linked to the relative value placed on boys and girls in these two regions.
- Good care practices can mitigate the effects both of poverty and low maternal schooling on children's nutrition.
- Women are at a disadvantage when food and nutrients are distributed within a household.

A number of studies have shown that improvements in household welfare depend not only on the level of household income, but also on who earns that income. Women, relative to men, tend to spend their income over-proportionately on food for their families. Women's incomes are more strongly associated with improvements in the health and nutritional status of their children than men's incomes (Quisumbing et al. 1995).

Empirical results leave no doubt that a higher status of women has a significant, positive effect on children's nutritional status in South Asia, Sub-Saharan Africa, and Latin America and the Caribbean. They further confirm that women's status impacts child nutrition because women with higher status have better nutritional status themselves, are better cared for, and provide higher quality care to their children. Raising women's status today is a powerful force for improving the health, longevity, mental and physical capacity, and productivity of the next generation of young adults (Smith et al. 2003).

Measures to improve food and nutrition security have to take into consideration the gender specific differences, roles, tasks and interests of men, women, girls and boys in the food and nutrition system. They also have to explicitly address women and girls on order to close existing gender gaps and thus allow women to fulfil their potential in generating food and nutrition security.

6.2 Food and Nutrition Security and poverty

Food and nutrition insecurity and poverty are closely interlinked in a vicious cycle. Hunger perpetrates poverty, since it prevents people from realizing their potential and making contributions to the progress of their societies. Hunger makes people more vulnerable to diseases. It leaves them weak and lethargic, reducing their ability to work and provide for their dependents. The same devastating cycle is repeated form generation to generation and this will continue to be so until we take effective action to break it. Reducing malnutrition is a cornerstone in reducing poverty.

Food insecurity and malnutrition – an outcome of poverty

A further key factor in FNS affecting all underlying causes is **poverty**. A person is considered to live in (absolute) poverty when he/she is unable to satisfy his or her basic needs – for example, food, health, water, shelter, primary education and community participation – adequately (Frank-

enberger 1996). The effects of poverty on child malnutrition are pervasive. Poor households and individuals are unable to achieve food security, have inadequate resources for care and are not able to utilize (or contribute to the creation of) resources for health on a sustainable basis.

Considering food insecurity and malnutrition to be a symptom or outcome of poverty and underdevelopment suggests that the availability of and access to food interact with the health and sanitation environment, and human behaviour and knowledge in giving rise to inadequate nutritional outcomes.

Food insecurity and malnutrition – a cause of poverty

Taking the view that nutritional well-being is a pre-condition for development one can argue that lack of productivity is partly a result of malnutrition. The nutritional well-being of the poor is thus not merely an outcome of development, but a pre-condition for it. The linkages between the two are both of a direct, short term nature, and of an indirect, long term one, whereby the latter also closely relates to population growth (von Braun 1999, Leisinger 1999).

Improved adult nutrition leads to higher physical productivity and higher national economic growth rates (WFS 1996a; von Braun et al 1998). Undernutrition has severe consequences in the economic and social development of people and countries. It is calculated that at least 50% of diseases are caused by malnutrition and more than one percent of the economic growth of the world economy is reduced due to malnutrition. Vice versa, undernutrition results in substantial productivity losses through, e.g., reduced physical and mental capacity, and high morbidity. Malnutrition also has effects on future generations. Undernourished pregnant women are at high risk of giving birth to children with low birth weight (Kracht and Schulz 1999; Martorell and Scrimshaw 1995; Pollitt 1995; ICN 1992).

The efforts of food-insecure households to acquire food may also have important implications for the environment and the use of natural resources. Malnourished people often live in ecologically vulnerable areas, and tend to use land-exploiting agricultural practices in their need for higher food production. This in turn undermines their livelihoods and those of future generations (WFS 1996a).

Nutrition and population growth stand in a complex, long-term relationship. Improved nutrition leads among other factors to economic development. And there is a strong relationship between economic development and the demographic transition from a high birth rate and low life expectancy to longer life expectancy and later lower birth rates (WFS 1996a).

It is increasingly being recognized that food security and nutrition are foundations for development. Nutritional status of children is used as one of the key indicators for poverty reduction in the framework of the Millennium Development Goals (MDGs). This reflects the insight that policies, programmes and processes to improve nutrition outcomes have a role to play in poverty reduction and global development. Food security and nutrition contribute to the attainment of more than one MDGs (see box 5). A food security and nutrition perspective can strengthen key development mechanisms such as poverty reduction strategies, health sector reform, improved governance, human rights and trade liberalization (SCN 2004, iii).

Box 5: Food and Nutrition Insecurity endanger the attainment of the MDGs

Goal 1: Eradicate extreme poverty and hunger
Food insecurity and malnutrition erode human capital, reduce resilience to shocks and reduce productivity (impaired physical and mental capacity).

Goal 2: Achieve universal primary education
Malnutrition reduces mental capacity. Malnourished children are less likely to enroll in school, ore are more likely to enroll later. Hunger and malnutrition reduces school performance.

Goal 3: Promote gender equality and empower women
Food secure and better nourished girls are more likely to stay in school and, subsequently, have more control over future choices.

Goal 4: Reduce child mortality
Malnutrition is directly or indirectly associated with more than 50% of child mortality. Malnutrition is the main contributor to the burden of disease in the developing world.

Goal 5: Improve maternal health
Maternal health is compromised by an anti-female bias in allocations of food, health and care. Food insecurity and malnutrition are associated with most major risk factors for maternal mortality.

Goal 6: Combat HIV/AIDS, malaria, and other diseases
Food insecurity spurs coping mechanisms, such as migratory labor and/or prostitution which increases the spread of HIV/Aids. Malnutrition hastens the onset of Aids among HIV-positive. Malnutrition weakens resistance to infections and reduces chances of survival for those who have malaria.

Goal 7: Ensure environmental sustainability
Food insecurity leads to unsustainable use of forest lands and resources.

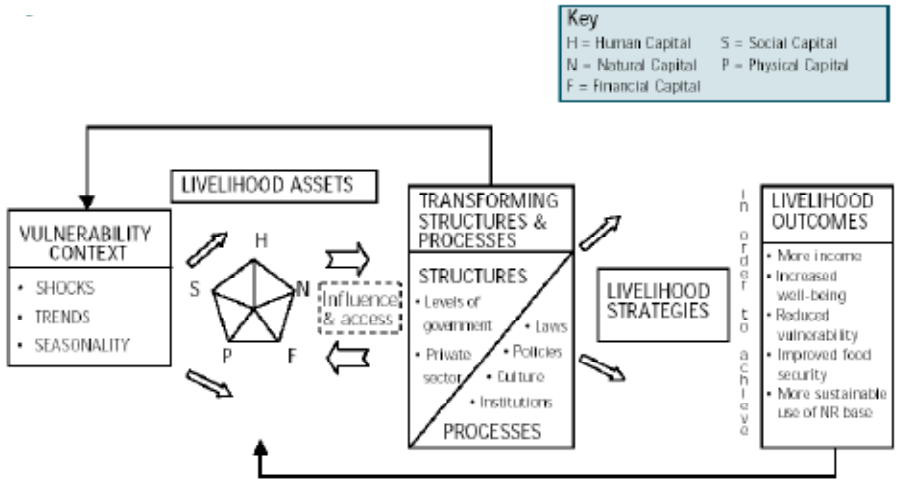
Source: UN SCN 2004, iii and FAO 2002, 11

6.3 Food and Nutrition Security and sustainable livelihoods

DFID's framework presents the main factors that affect people's livelihoods, and typical relationships between these (see figure 10 below). It is centred on people and provides in both planning new development activities and assessing the contribution to livelihood sustainability made by existing activities / actions. The framework not only serves as checklist of important issues and sketches out the way these link to each other. It also draws attention to core influences and processes and emphasises the multiple interactions between the various factors which affect livelihoods (DFID 1999).

One major outcome of strategies adopted by people is "improved food security", as a result of *Transforming Structures and Processes* using livelihood assets. Assets are the ingredients for the transformation process, e.g. (availability of) food items as natural capital, health status that influences the physical capital, nutritional knowledge as human capital, receiving food in case of needs from neighbours as social capital, etc. The asset endowments are constantly changing as assets are both destroyed and created as a result of the trends, shocks and seasonality of the *Vulnerability Context*. At the same time *Structures & Processes*, e.g. government, laws, policies, peace, conflicts, influence highly the *Vulnerability Context*, and *Livelihood Outcomes* influence the assets.

Figure 10: Sustainable Livelihoods Framework



Source: DFID 1999

6.4 Food and Nutrition Security and Health, in particular HIV/Aids

According to recent estimates (UNAIDS 2003), about 40 million men, women, boys and girls live with HIV/Aids. 25 million people have died of the disease since the HIV/Aids epidemic began. Every year about 5 million people are newly infected. 95 percent of the 12,000 people, who are newly infected every day, live in low and middle income countries, almost 2000 are children under the age of 15 years.

The disease is primarily infecting the most productive part of the population, i.e., people aged 15 to 49 years. About 50 percent of them are women and 50 percent are between 15 and 24 of age. Trend analysis shows that the largest number of affected people lives in Africa, which also shows the highest prevalence rates (up to almost 40% in Botswana and Swaziland). However, the prevalence (percentage of infected people) is steady. The highest incidence (number of new cases in a year) of HIV/Aids is observed in countries of Eastern Europe and Central Asia as well as in China. The epidemic is growing in these regions.

The links between FNS and HIV/Aids work in two directions. On one hand, the HIV/Aids epidemic has massive impact on food insecurity and malnutrition of the infected people and their affected families and communities. The destructive power of HIV/Aids on food security and malnutrition is well known. On the other hand, food insecurity and malnutrition affect the outset and impact of HIV/Aids.

Food insecurity and HIV/Aids

As a lethal disease HIV/Aids is different from most other food security shocks which are of limited duration and magnitude. Individuals and households suffer the permanent loss of productive labour so that HIV/Aids has significant impact on the availability of and access to food. Food reserves are depleted, income and savings are diverted and assets depleted to meet food, health care and funeral costs. Agricultural workers, key decision makers and highly skilled professionals are lost. An increasing number of households are forced to seek support from the broader community whose coping mechanisms and self-help capacities are in danger of being

overstretched. A downward spiral in the welfare of households and communities starts as soon as the first adult falls sick.

UNAIDS estimates that 42 million children will be orphans in Sub-Saharan Africa in 2010. This group is particularly vulnerable to food insecurity and malnutrition.

Box 6: HIV/Aids orphans

"Orphaning is a series of events, with the death of the parent the culminating one. We are ending up with millions of children who are unloved, unsocialized, and uneducated."
Alan Whiteside, University of Natal, South Africa

Existing social capital and long-standing social institutions are threatened. Governments that traditionally spend little of their public resources on health, education, safety nets and other social services are challenged to meet the demand for appropriate sustainable response to the epidemic. In addition, those professionals who are supposed to provide such services are dying prematurely and their competencies cannot be replaced quickly.

Conversely, food insecurity can also increase the risk of HIV/Aids at individual and household level, if, e.g., fatal coping strategies – such as prostitution and migration – seem to be the only way out of food insecurity for the hungry people.

Malnutrition and HIV/Aids

Individual nutritional status may influence a person's risk of infection. The already existing vicious cycle between malnutrition and infectious diseases, which affects many people in developing countries, is intensified through HIV. In addition, adequate nutrition is important because it may retard the progression from HIV to Aids-related diseases.

HIV also increases the body's nutritional needs. The risk of malnutrition increases significantly during the course of the infection. Recent WHO recommendations (WHO 2003) suggest that an adult's energy requirements increase by 10–30 percent, and a child experiencing weight loss needs 100 percent more energy. Data are insufficient to support an increase in protein requirements due to HIV/Aids. Similar findings are relevant for micronutrient requirements. Some micronutrient supplements may even produce adverse outcomes in HIV-infected populations. However, it is imperative to ensure intake of protein, vitamins and minerals at recommended levels (FAO/WHO 2002).

Antiretroviral drugs used for the treatment of HIV/Aids can interact with food and nutrients. They often have to be taken with food to mitigate side effects. Side effects, such as nausea, vomiting, diarrhea and loss of appetite impact on the use and utilization of food and the adherence to drug regimes.

The mother-to-child transmission of HIV/Aids through breastfeeding, which is estimated to be 10–20 percent, is of special concern. Avoidance of breastfeeding is only recommended if replacement feeding is acceptable, feasible, affordable, sustainable and safe – conditions which often are not met in resource poor settings in developing countries. If one or more of these conditions cannot be fulfilled, exclusive breastfeeding is recommended for the first months of life (SCN 2004, 22).

Urgent action needed

HIV/Aids represents an enormous humanitarian and development challenge. However, experience in several countries, e.g., Uganda and Thailand, shows that this challenge can be met and that the epidemic can be stemmed. High levels of political commitment and effective strategies of prevention, care, treatment and mitigation are needed. Important elements are strong advocacy, dynamic leadership and political commitment at all levels, participatory programmes that simultaneously address the food, health and care issues associated with HIV/Aids as well as mainstreaming of HIV/Aids considerations in agricultural and development policies and programmes (FAO 2001a).

6.5 Food and Nutrition Security in the context of conflicts, crises and natural disasters

Hunger and conflict often occur together. Conflict is one of the most common causes of acute food insecurity. More than half of the countries where undernourishment is most prevalent experience conflict. Conversely, food insecurity may lead to or exacerbate conflict, particularly when compounded by other shocks and stresses. The interface between food insecurity and conflict has critical implications for food security and conflict prevention programmes alike (FAO 2002, 22). Conflict resolution and peacekeeping activities must be seen as vital tools in fighting hunger (FAO 2000, iv).

Natural disasters, mainly drought, but also floods, are the main cause of food emergencies. Many of the affected countries have been plagued by severe food shortages over several years, a decade or longer. E.g., drought has contributed to several famines in Africa with millions of people affected over the past 30 years (FAO 2003, 12).

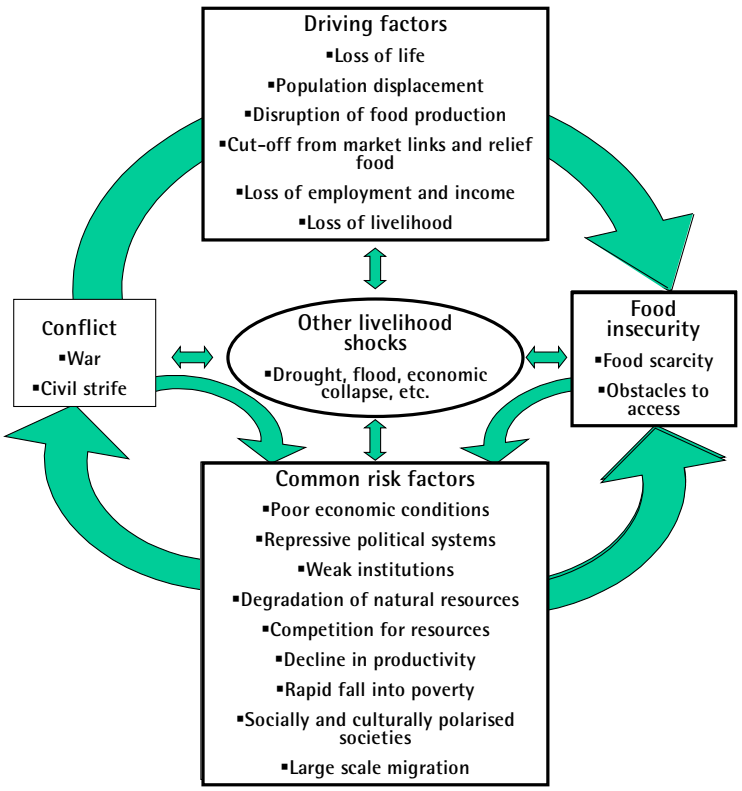
Human suffering, hunger and malnutrition achieve much attention in the context of conflicts, crises and natural disasters due to the media interest which they often attract. However, it is worth noting that hunger and starvation in this context are only the tip of the iceberg, and represent only about 10 percent of the hungry and malnourished people in the world. The great majority of the affected people suffer from chronic forms of hunger and malnutrition – more or less unnoticed and without media and often donor interest.

Food and Nutrition Security in the context of conflicts and crises

Food and nutrition security and violent conflicts are closely related and interrelated. Violent conflicts – defined as crises in the context of the German development cooperation – are not merely significant causes of poverty and food and nutrition insecurity. Hunger and underdevelopment are also increasingly recognized as important factors which contribute to conflicts and crises. This leads to the expectation that specific measures can contribute to the mitigation of violent conflicts.

Violent conflicts influence the framework conditions under which the civil society has to fulfil its basic needs. The strategies of the actors of violence and the victors of war increasingly deprive the majority of the population of their basis of living and thus increase their economic and social vulnerability. These processes impede the production of, the access to and the use and utilization of food. The relationships are described in figure 11, and the following relationships can be observed:

Figure 11: The interface between violent conflict and Food Security



Source: FAO 2002, 23.

a) Production of food

– Stopping or reducing of field work due to the security situation,
– Expropriation of land through expulsion,
– Devastation of arable land through landmines and overexploitation in the war economy,
– Destruction of productive infrastructure (irrigation systems, drinking water supply, local markets, seed banks etc.),
– Reduction of agricultural labor force through (forced) recruitments of young men and women, expulsion, injuries, mutilation, traumatization, and killing,
– Migration of laborers and specialists out of the conflict affected regions.

b) Access to food

– Limited scope for movement of the population due to the security situation and thus reduced access to local markets (for commercialization of local products and purchase of food),
– Looting of money and stocks,
– Blackmail, kidnapping, collection of 'war taxes' through armed groups,
– Letting people starve as an instrument of war.

c) Use and utilization of food

– Looting or destruction of health, education and sanitation infrastructure,
– Absence or insufficiency of extension and education services in the field of health, education and agriculture,
– Expulsion, injuries, mutilation, traumatisation and rape of the civil population leading to insufficient use and utilization of food due to stress.

Under these circumstances the majority of the population try to produce minimum amounts of food or other products for survival. This includes diversification of incomes (subsistence agriculture, petty trade, looking for a job and migration) and redistribution within solidarity networks. Sometimes people are forced to reduce their assets in order to survive, e.g., eating of seeds and overuse of natural resources, which then endanger the basis for their long term food and nutrition security. Some coping mechanisms are not negative per se, but lead to further insecurity of the population because they change the social rules. The classical example is the takeover of traditional male tasks by women.

Food and nutrition security programmes in the context of conflicts and crises need an integrated approach which takes into consideration the various structures, behaviors, and attitudes which could fuel the conflict. The objective of such programmes is the creation of a stable and just society, which can ensure constructive processes of change – a situation which is described through the term 'structural stability' (Box 7).

Box 7: Definition: Structural stability

"Structural stability embraces the interdependent and mutually reinforcing objectives of social peace, respect for the rule of law and human rights, social and economic development, supported by dynamic and representative political institutions capable of managing change and resolving disputes without resorting to violent conflict."

Source: DAC 1997

Overcoming of food and nutrition insecurity quickly in (post)conflict situations reestablishing the preconditions for a healthy and productive life are crucial contributions for creating structural stability. The elimination of the conflict related causes of food insecurity risks as well as the creation of capacity and institution building for non-violent conflict resolution are important medium term contributions to sustainable development processes.

Food and Nutrition Security in the context of natural disasters

Apart from political conflicts, natural disasters lead to acute food crises for many people in developing countries. At the same time, food and nutrition insecurity is an important factor which triggers the use of marginal lands and risk areas, and leads to further degradation of resources. This in turn leads to increased vulnerability to disasters.

Programmes to improve food and nutrition security in the context of natural disasters aim in the first place at ensuring immediate and medium term food availability and food access. At the same time, a contribution has to be made to decrease the vulnerability of populations to future events through capacity development for prevention, preparedness and rehabilitation. Such measures are important at meso level and have to be supported by adequate decisions, strategies and programmes at macro level.

The **Sphere** "Humanitarian Charter and Minimum Standards in Disaster Response" is a remarkable international initiative aimed at improving the effectiveness and accountability of humanitarian assistance based on the principles and provisions of international humanitarian, human rights and refugee law, and on the principles of the Red Cross and the NGO Code of Conduct. The Sphere sets forth a set of minimum standards for disaster assistance which should be adhered to for each of the five key sectors (water supply and sanitation, nutrition, food aid, shelter and health services) and provides key indicators to measure these standards (The Sphere Project 2004).

Box 8: Natural disasters and Food and Nutrition Security – the link

Food and Nutrition Security and vulnerability to natural disasters are closely interlinked through various direct and indirect effects.

As a consequence of floods, droughts or earthquakes, harvests and market infrastructure can be destroyed which leads to an acute reduction of food availability and access to food. If productive infrastructure is also affected this could reduce the agricultural production in the medium term, thus reducing farmers income and possibilities to ensure access to food. People in urban and rural areas depending on non-farm job opportunities are endangered through long lasting economic crises which can often be observed in the aftermath of the natural disaster.

Conversely, food and nutrition insecurity and poverty increase the vulnerability to natural disasters. Poor people are less able to make provisions for natural calamities and often are forced to settle or work in risk areas. This, in turn, may increase the probability of certain natural disasters, such as landslides and floods.

Challenges of Food and Nutrition Security in conflicts, crises and natural disasters

Food security and nutrition in situations of conflicts, crises and natural disasters must encompass three aspects:

- Managing acute emergency situations and formulate assistance in such a way that it promotes peace, recovery and rehabilitation,
- Preventing crises and natural disasters while preserving human dignity once the devastating event has taken place,
- Combating food insecurity and malnutrition as a cause and/or consequence of conflict, crises or natural disaster.

Organisations taking actions in such situations have to take into consideration the following issues (adapted from UN SCN 2002, 98):

- Apart from making resources available for immediate live saving actions, there is a need to allocate greater amounts of resources for the implementation of longer term more sustainable programmes that promote food and nutrition security and actively seek to reduce vulnerability and risk of future disasters.
- Food aid resources for saving lives should be part of a more flexible system of response to food and nutrition emergencies. In addition, more resources should be made available for non food costs required to support food and nutrition security programmes, such as health, water and sanitation activities, and to promote recovery.

– Food and nutrition interventions in conflict situations require more careful analysis of all the potential impacts (positive and negative) of delivering humanitarian assistance and should seek to maximize good and minimize harm.

– The scarcity of resources for humanitarian interventions often requires that aid is targeted to the groups considered most vulnerable. However, vulnerability is often defined using pre-existing assumptions (e.g., women, children and female headed households), which may or may not hold true within a particular context. It is imperative that vulnerability and population needs be accurately assessed, and assistance allocated accordingly. The 'Do no harm'-approach may require compromises in targeting in situations where food and nutrition insecure groups correspond to one conflict party. Under certain circumstances, interventions may do well to also target relatively better-off groups in order to support reconciliation rather than adding fuel to a conflict by excluding them.

7 Outlook

Hunger and various forms of malnutrition affect more than one billion women, men, girls and boys worldwide (see Paper II). It impairs their chances of individual, family and community development and thus the development of whole nations. Current rates of progress are insufficient to achieve the Millennium Development Goals.

The ways to assess and analyse hunger and malnutrition (see Papers III–V) and to take appropriate action (see Papers VI–VIII) are known. It is up to the governments of the industrialized and developing countries to generate the political will to grant this topic priority, and to make the necessary resources available to take action.

Box 9: Political will needed

"The problem is not so much a lack of food as a lack of political will. The vast majority of the world's hungry people live in rural areas of the developing world, far from the levers of political power and beyond the range of vision of the media and the public in developed countries. Except when war or a natural calamity briefly focuses global attention and compassion, little is said and less is done to put an end to the suffering of a 'continent of the hungry' whose 798 million people outnumber the population of either Latin America or Sub-Saharan Africa."

Countries that succeeded in reducing hunger were characterized by more rapid economic growth and specifically by more rapid growth in their agricultural sector. They also exhibited slower population growth, lower levels of HIV infection and higher ranking in the UNDP's Human Development Index. A few building blocks are identified in the foundation for improving food security – rapid economic growth, better than average growth in the agricultural sector, effective social safety nets to ensure that those who cannot produce or buy adequate food still get enough to eat, improved education – especially female education –, the status of women in the society, and functioning health services (see also BP VIII).

Source: FAO 2003, 4 and Smith 2003

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Paper II

The Food and Nutrition Security Situation in 2009[1]

Lioba Weingärtner

1 This paper is a revision and update using elements of the following papers: Gross, R. et al. (2000): The four dimensions of food and nutrition security: definitions and concepts. April 2000, Hahn, H. (2000): Conceptual Framework of Food and Nutrition Security. April 2000, Rötten, U. (2000): Food and Nutrition Security: Problems and Perspectives. April 2000 and Weingärtner, L. (2005): The Food and Nutrition Situation at the Beginning of the New Millennium.

Table of Contents

Box 1: World Food and Nutrition Security situation – highlights

- The world food production globally is sufficient to feed all people in the world.
- The percentage of the world's population suffering from dietary energy deficit dropped from 22% to 13% between 1979–81 and 2004–2006. Despite a continued decline, progress was much slower than needed to meet the hunger-reduction target of the first Millennium Development Goal.
- However, an estimated 873 million people worldwide still suffered from hunger or undernourishment in 2004–2006, 858 million in developing countries, 12 million in developed countries.
- The number of undernourished people in the developing world is no longer falling, but climbing. As a consequence of the 2007/2008 food price crisis – combined with the financial and the fuel crisis – an estimated number of 1.02 billion people are undernourished worldwide in 2009.
- The number of hungry people increased between 1995–97 and 2004–06 in all regions except Latin America and the Caribbean. Even in this region, however, the downward trend was reversed due to the crisis.
- The locus of preschool malnutrition is steadily shifting from Asia to Africa, although the majority of the world's malnourished children still lives in Asia.
- For Sub-Saharan Africa, the prevalence of preschool underweight is increasing and will continue to do so unless strategic moves to improve the situation are implemented. Steady progress is being made in South-Central Asia. Preschool stunting shows similar patterns.
- 30% of all babies born at term in South Asia have low birth weights, with rates of 14% in Sub-Saharan Africa, 15% in the Middle East and North Africa, 10% in Latin America and the Caribbean and 8% in East Asia and the Pacific.
- Asia is making good progress towards the MDG target of halving child underweight from 1990 to 2015. However, much of this progress – but not all – is driven by improvements in China.
- The preschool malnutrition trends in Africa reflect the deteriorating situation in many Sub-Saharan African countries. There the poverty rate has increased, HIV/AIDS has devastating impacts, conflict persists, and gains in agricultural productivity as a key driver of overall economic growth remain elusive.
- Nearly two billion people (35.2%) worldwide have inadequate iodine nutrition.
- 140 million preschool children and more than 7 million pregnant women suffer from Vitamin A deficiency every year.
- Iron deficiency anemia among pregnant women is associated with an estimated 111,000 maternal deaths every year.

Source: FAO and WFP 2009, FAO 2003; FAO 1999; UN SCN 2004

1 Introduction

Food insecurity and various forms of malnutrition still affect millions and even billions of women, men, girls and boys all over the world, especially in developing countries.

1.1 Definitions and terms

It is useful to distinguish five types of malnutrition:

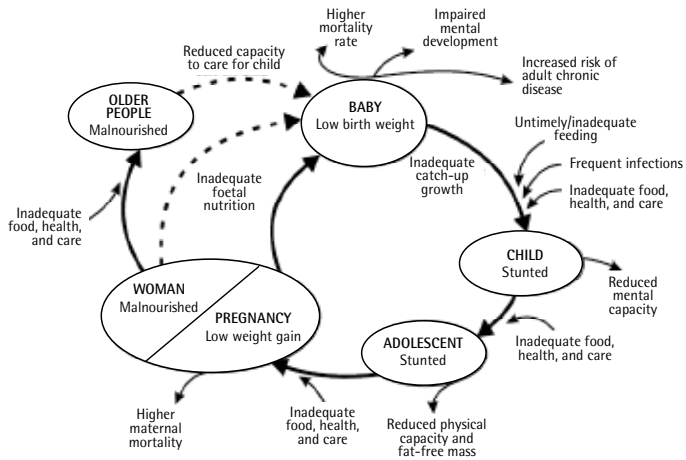
- undernourishment – when an individual simply does not get enough food,
- undernutrition (protein-energy-malnutrition – PEM) – measurable forms of lack of nutritional energy and protein, e.g., stunting, wasting and underweight in children and low Body Mass Index (BMI) in adults (see chapter 2.2 below),
- micronutrient deficiency, often also called 'hidden hunger' – a lack of sufficient amounts of one or more essential nutrients such as vitamins and/or minerals,
- secondary malnutrition – when an individual has a condition or illness that prevents him/her from properly absorbing or digesting food, and
- overnutrition – measurable form of malnutrition when an individual has consumed too many calories over a longer period of time, e.g., overweight and obesity.

1.2 Nutrition throughout the lifecycle

Nutrition is important at all stages in the lifecycle. Malnutrition and its consequences affect various age and physiological groups in a different way (Figure 1). It can start in utero leading to low birth weight, and then often continues during childhood and adolescence. These children do not catch-up much in their growth. As adults, they are also more likely to suffer from the diet-related diseases that were formerly thought to be associated with increasing affluence, such as diabetes, coronary heart disease, and hypertension. Women are particularly affected during pregnancy and lactation. This can even lead to an intergenerational cycle of malnutrition, when malnourished women give birth to malnourished babies.

As data for population groups other than for infants and young children are still rare, most of the analysis of malnutrition concentrates on preschool children.

Figure 1: Nutrition throughout the lifecycle



Source: UN SCN 2000

1.3 The double burden of malnutrition

Many of the developing regions in the world are now facing a double burden of malnutrition. Undernutrition and overnutrition occur in the same country or region. While underweight is specifically common among Asian women, both underweight and overweight are seen among women in Africa. In the Caribbean and Latin America, overweight affects up to one woman in four in all countries surveyed, except Haiti (UN ACC/SCN 2000, v).

Depending on the heterogeneity of population groups and living conditions under- and overnutrition and its serious health and development consequences coexist in many countries. E.g., recent national surveys from several Asian countries have shown that the prevalence of overweight and obesity is increasing markedly. Overweight leads to an increased risk of non-communicable diseases, such as diabetes, hypertension, and coronary heart disease among adults. Thus many countries are being faced with a double burden of malnutrition and disease in the affected populations (Gillespie and Haddad 2003). In some of the developing countries, these diseases have already become a major burden, and are forecasted to increase in others (UN SCN 2004, 10).

The World Health Organization (WHO) estimates that the number of cases of diabetes in developing countries is likely to increase more than twofold in the next 30 years from 115 million in 2000 to 284 million in 2030. Diabetes can be seen as part of the growing epidemic of non-communicable diseases that are beginning to impose a double burden of disease on the world's poorest countries (WHO 2003).

2 Assessing the Food and Nutrition Security situation

A number of different indicators and various methods are used to assess, monitor and evaluate the Food and Nutrition Security (FNS) situation at the macro, meso and micro level. Details are presented in Background Papers III, IV and V. The following chapters 2.1 and 2.2 present a brief overview of indicators commonly used to characterize the FNS situation.

2.1 How to calculate food insecurity

Food (in)security is measured through 'undernourishment', which is defined as insufficient food intake to meet basic energy requirements on a continuing basis. Calculations of undernourishment are based on estimates of food intake for a total population by comparing food intake data with country-specific food need standards factoring in a coefficient for distribution to take account of inequalities in access to food. These calculations produce an estimate of the number of people in each country whose average calorie intake falls below the minimum required to keep the body going and perform light activities. Adding these numbers together yields a global estimate of the total number of undernourished people (FAO 1999, 6, 11).

2.2 Most common indicators of nutritional status

While 'undernourishment' is based on calculations, nutritional outcome or impact indicators are based on individual measurements of the body or biochemical analyses of body fluids. The most frequently used indicators for nutritional status are listed in Table 1. The anthropometric index height-for-age shows linear growth achievement in children. Shortness or stunting due to growth

retardation indicates long-term, cumulative effects of inadequate nutrition and/or health. As a result, stunting is not only an indicator of poor nutritional status but also of unsatisfactory basic need coverage and therefore of absolute poverty. If a mother's nutrition and/or health situation are severely deteriorated, intrauterine growth retardation (IUGR) occurs and infants are born with low birth weight (LBW).

Table 1: Most common indicators of nutritional status (overview)

Groups	Index	Indicator and brief explanation
Children	Stunting	Low height-for-age ('chronic malnutrition' or growth retardation indicating general deprivation and poverty)
	Wasting	Low weight-for-height ('acute malnutrition')
	Underweight	Low weight-for-age
	MUAC	Low mid upper arm circumference (hunger)
	LBW	Low birth weight (intrauterine growth retardation)
	Night blindness	Vitamin A deficiency
	TGR	Total goiter rate (iodine deficiency)
Adults	BMI < 18.5	Low Body Mass Index (chronic energy deficiency)
	BMI > 25	Overweight
	BMI > 30	Obesity
	UIE	Low urine iodine excretion (iodine deficiency)
Children and Women	Anemia	Iron deficiency

Wasting (low weight-for-height) describes a substantial weight loss in children, usually due to acute starvation and/or severe disease. The same causes are responsible for low mid up-per arm circumference (**MUAC**). Due to the simpler and faster assessment procedure, this indicator is a useful marker/screening indicator for under nutrition in emergency situations. Low birth weight (**LBW**) indicates that the mother is severely malnourished (quantity and quality of food) and/or in poor health. It represents a risk factor for future undernutrition for the child. Body mass index (**BMI**) is the most commonly used indicator to measure undernutrition and overnutrition in adults and adolescents.

Vitamin A, iron and iodine deficiencies are the most common and most severe micronutrient deficiencies in developing countries. Vitamin A deficiency (VAD) causes **night blindness**, a simple functional indicator for this condition. Iron deficiency induces anemia, which can be measured by the hemoglobin concentration in blood. The most visible form of iodine deficiency is goitre. The total goitre rate (TRG) is an indicator of the duration and severity of iodine deficiency. However, a more accurate indicator of iodine deficiency is the measurement of urinary iodine excretion (UIE).

3 Current state of food insecurity

Although the world food production globally is sufficient to feed all people in the world, there are a number of countries which are not able to provide enough food for their population; under-nourishment or chronic and acute hunger are still widespread.

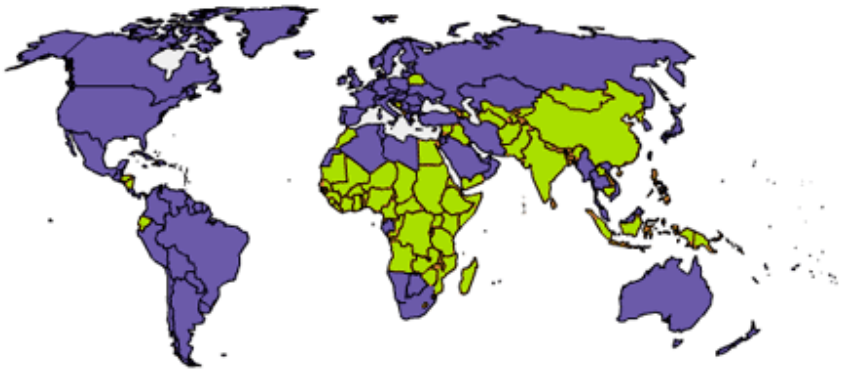
3.1 Low income food deficit countries (LIFDCs)

In the late 1970s, FAO developed a list of low-income food-deficit countries (LIFDCs) to assist in analysing and discussing food security issues. The classification is used as a basis for the allocation of food aid in relation to food insecurity and captures only the food problem (availability). LIFDCs are currently defined as nations that are:·

- **poor** – with a net income per person that falls below the level used by the World Bank to determine eligibility for IDA assistance (at present: their net income amounts to less than US$ 1,735 per person in 2006).
- **net importers of food** – with imports of basic foodstuffs (aggregated by the calorie content of the individual commodities) outweighing exports over the past three years. In many cases, particularly in Africa, these countries cannot produce enough food to meet all their needs and lack sufficient foreign exchange to fill the gap by purchasing food on the international market. It includes basic foodstuffs, i.e. cereals, roots and tubers, pulses, oilseeds and oils other than tree crop oils, meat and dairy products.

Figure 2 shows the countries which are currently classified as LIFDCs (as of September 2004[2]), most of them are African countries.

Figure 2: Low income food deficit countries



Source: FAO 2004

A country would graduate from the list in the fourth year after the statistics confirmed its position as no longer qualifying as a LIFDC. During these three years, the country in question would be considered to be in a transitional phase and would be so indicated in the LIFDC list.

As of May 2009, a total of 77 Low-Income Food Deficit Countries was listed (www.fao.org).

3.2 Global prevalence of undernourishment, trends and geographical distribution

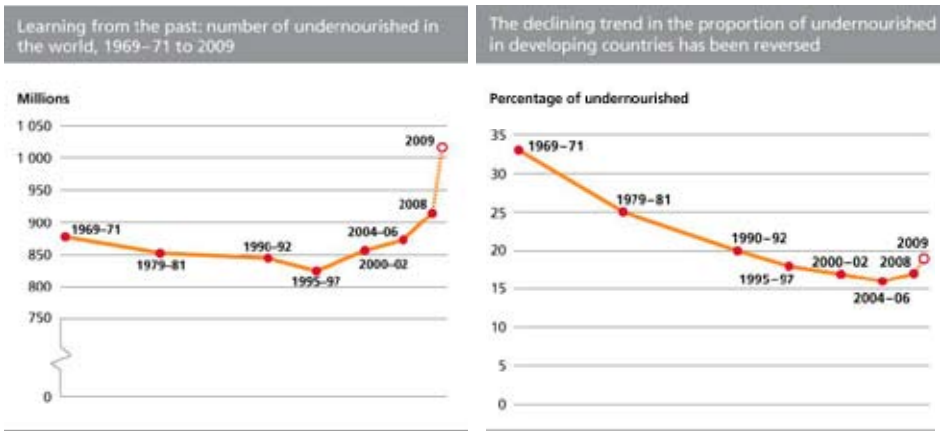
The most recent FAO estimates (FAO 2009) indicate that the number of undernourished people in the developing world is no longer falling, but climbing. As a consequence of the 2007/2008

2 See http://www.fao.org/countryprofiles/lifdc.asp?lang=en, visited 2/8/2005. This website includes a detailed list of the countries that are classified as LIFDC, including the countries that are in a transitorial phase.

food price crisis – combined with the financial and the fuel crisis – an estimated number of 1.02 billion people are undernourished worldwide in 2009.

The percentage of the world's population suffering from dietary energy deficit dropped from 22% to 13% between 1979–81 and 2004–2006. Despite a continued decline, progress was much slower than needed to meet the hunger-reduction target of the first Millennium Development Goal.

Figure 3: Number and proportion of undernourished worldwide (in million)

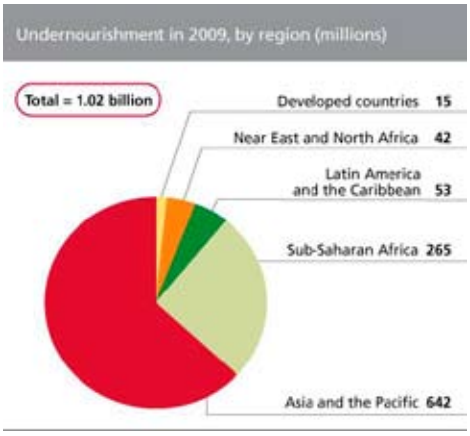


Source: www.fao.org, visited 11/11/2009

An estimated 873 million people worldwide still suffered from hunger or undernourishment in 2004–2006, 858 million in developing countries, 12 million in developed countries. The number of hungry people increased between 1995–97 and 2004–06 in all regions except Latin America and the Caribbean. Even in this region, however, the downward trend was reversed due to the crisis.

The majority of undernourished people still lives in Asia and the Pacific (642 million in 2009), followed by Sub-Saharan Africa (265 million in 2009), Latin America and the Caribbean (53 million in 2009) and Near East and North Africa (42 million in 2009). 15 million undernourished live in developed countries (see figure 4).

Figure 4: Geographical distribution of undernourishment in the world



Source: www.fao.org, visited 11/11/2009

3.3 Vulnerable groups

Determining the number of undernourishment and monitoring trends is important to evaluate progress or lack of progress towards the World Food Summit target of halving the number of hungry people by the year 2015. But knowing the numbers is not enough to target actions. Empirical vulnerability analysis through Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) indicate geographic areas where vulnerable and food-insecure people are most likely to be found, and describe living conditions of vulnerable people (see Box 2).

The economic crisis negatively affects large segments of the population in developing countries. Some groups are more affected by the economic crisis than others. Those who were hurt most by higher food prices were the rural landless, female-headed households and the urban poor. Their position is particularly precarious because they have already approached, or in many cases reached, the limit of their ability to cope during the food crisis. Among these groups, the urban poor may experience the most severe problems because lower export demand and reduced FDI are more likely to cause employment to fall in urban areas, which are more closely connected to world markets than rural areas. But rural areas will not be spared – reductions in employment have caused back-migration from urban to rural areas, forcing the rural poor to share the burden in many cases. In some countries, declining prices for specific crops will add to that burden. Thus, despite the recent fall in food prices, urban and rural areas have experienced a reduction in various sources of income, including remittances, diminishing the overall purchasing power of the poor and food-insecure (FAO and WFP 2009, 10).

Pregnant women and children are hardest hit by the global recession (UN SCN 2009a).

Box 2: Vulnerable groups identified through FIVIMS

Victims of conflict
- Internally displaced people
- Refugees
- Landless returnees
- Landmine disabled
- War invalids
- War widows and orphans

Migrant workers and their families
- Migrant herders tending herds of others
- Migrant laborers seeking seasonal work
- Female-headed households left behind by migrant male laborers

Marginal populations in urban areas
- School dropouts
- Unemployed
- Rickshaw and motorcycle taxi drivers
- Recently arrived migrants
- People living in slums in urban periphery
- Dockworkers and porters
- Construction workers
- Workers in the informal sector
- Homeless people
- Orphans
- Street children
- People living alone on small fixed incomes or without support (elderly, pensioners, widows and widowers, divorcees, invalids, handicapped people)
- Beggars

People belonging to at-risk social groups
- Indigenous people
- Ethnic minorities
- Illiterate households

Some or all members of low-income households within vulnerable livelihood systems
- Subsistence or small scale farmers
- Female-headed farming households
- Landless peasants
- Agricultural laborers
- Fishers
- Nomadic pastoralists
- Sedentary herders, small-scale livestock producers and agro-pastoralists
- Forest dwellers
- Peri-urban small-scale agricultural producers and market gardeners
- Day or contract laborers

Dependent people living alone or in low-income households with large family size
- Elderly
- Women of childbearing age, especially pregnant and nursing mothers
- Children under five years old, especially infants
- Disabled and ill

Source: FAO 1999, 15

4 Protein-energy malnutrition (PEM)

Chronic and acute malnutrition as measured through underweight, stunting and wasting among children 0–5 years old affect millions of children worldwide. Underweight is an indicator to measure progress towards the MDG 1. Available data suggest that women are also vulnerable and suffer from consequences of chronic energy deficiency (low BMI).

4.1 Global prevalence, geographical distribution and trends of protein-energy malnutrition among preschool children

Underweight

Estimates indicate that 135.5 million children 0–5 year old in developing countries or 24.8 percent of this age group were underweight in 2000 (Table 2).

Table 2: Estimated prevalence and number of underweight children (0–5 years)

	Prevalence (%)				Numbers (Mio.)			
	1990	1995	2000	2005	1990	1995	2000	2005
Africa	23.6	23.9	24.2	24.5	25.3	27.8	30.9	34.5
Asia	35.1	31.5	27.9	24.8	131.9	116.3	101.2	89.2
Latin America and Caribbean	8.7	7.3	6.1	5.0	4.8	4.0	3.4	2.8
All developing countries	30.1	27.3	24.8	22.7	162.2	148.2	135.5	126.5

Source: UN SCN 2004, 8

According to recent figures published by the United Nations Standing Committee on Nutrition (UN SCN) 143 million children were underweight in 2007. Another 4 million children will be so by 2010 unless action is taken (UN SCN 2009b).

Stunting

162.1 million preschool children were estimated to be suffering from stunting in 2000. This corresponds to a global prevalence of stunting of nearly 30 percent.

Table 3: Estimated prevalence and number of stunted children (0–5 years)

	Prevalence (%)				Numbers (Mio.)			
	1990	1995	2000	2005	1990	1995	2000	2005
Africa	36.9	36.1	35.2	34.5	39.6	41.9	45.1	48.5
Asia	41.1	35.4	30.1	25.7	154.6	130.8	109.4	92.4
Latin America and Caribbean	18.3	15.9	13.7	11.8	10.0	8.8	7.6	6.5
All developing countries	37.9	33.5	29.6	26.5	204.3	181.5	162.1	147.5

Source: UN SCN 2004, 9

Wasting

In 2000, 45.1 million children aged 0–5 years were estimated to be wasted, i.e., 8.2 percent of this age group.

Table 4: Estimated prevalence and number of wasted children (0–5 years)

	Prevalence (%)			Numbers (Mio.)		
	1995	2000	2005	1995	2000	2005
Africa	7.7	8.3	9.5	8.5	8.5	13.3
Asia	9.7	9.2	8.9	35.7	33.5	32.0
Latin America and Caribbean	1.6	1.6	1.5	0.9	0.9	0.8
All developing countries	8.3	8.2	8.3	45.2	45.1	46.2

Source: UN SCN 2004, 10

The most important trends in malnutrition rates among small children are as follows:

– The locus of preschool malnutrition is steadily shifting from Asia to Africa, although the majority of the world's malnourished children still live in Asia.

– For Sub-Saharan Africa, the prevalence of preschool underweight is increasing and will continue to do so unless strategic moves to improve the situation are implemented. Steady progress is being made in South-Central Asia. Preschool stunting shows similar patterns.

– Asia is making good progress towards the MDG target of halving child underweight from 1990 to 2015. However, much of this progress – but not all – is driven by improvements in China.

The preschool malnutrition trends in Africa reflect the deteriorating situation in many Sub-Saharan African countries. There the poverty rate has increased, HIV/AIDS has devastating impacts, conflict persists, and gains in agricultural productivity as a key driver of overall economic growth remain elusive.

Low birth weight

Latest UNICEF estimates indicate different prevalence of low birth weight – defined as less than 2,500g at birth – for different regions. It varies between as much as 30 percent of all children born at term in South Asia and 8 percent in East Asia and the Pacific, with 15 percent in the Middle East and North Africa, 14 percent in Sub-Saharan Africa and 10 percent in Latin America/Caribbean.

Low birth weight is a risk factor for child stunting and underweight, and some types of chronic diseases during adulthood (UN ACC/SCN 2000; UN SCN 2004).

4.2 Maternal malnutrition

Substantial evidence shows that this high prevalence of low birth weight reflects intrauterine growth retardation of the fetus due to maternal malnutrition. Maternal malnutrition is directly related to ill health, which places both the mother and the child at risk. Data available for ten African countries show that only three show a decline in severe maternal malnutrition (BMI < 16) during the 1990s. In addition women are affected by a number of micronutrient deficiencies (see chapter 5), which are associated with complications during pregnancy and contribute to maternal mortality (UN SCN 2004, 19–21).

5 Vitamin & mineral deficiencies

Two billion people in the developing world suffer from one or more micronutrient deficiencies – the most common being a lack of iron, vitamin A or iodine. Women and children are the most vulnerable groups. Certain specific micro nutrient deficiencies are still widespread on a global scale. Others, which were considered "eradicated", have re-emerged in the context of protracted emergency situations, when populations more or less entirely depend on external food rations for their daily diet over a longer period.

5.1 Iron deficiency anemia

Iron deficiency is the most common cause of anemia although other nutrition and non-nutrition related causes can be involved in the geneses of anemia. Nutritional iron deficiency or insufficient iron intake are the most common causes of iron deficiency.

Figure 5: Global prevalence of IDA in pregnant women

Source: Kennedy, G. et al. 2003, 10

It is estimated that two billion persons worldwide are affected by iron deficiency anemia (IDA) – many more probably suffer from sub-clinical forms of iron deficiency. IDA is more prevalent among women than men, and is also prevalent among children and the elderly. Prevalence among pregnant women can reach more than 50 percent (Figure 5).

IDA is considered a micronutrient deficiency of public health significance not only because it is widespread, but also because of its serious consequences in both adults and children. Iron-deficient women, e.g., have a higher mortality risk during childbirth and an increased incidence of low-birth-weight babies. Anemia has deleterious effects on the cognitive performance, behavior and physical growth of infants and children of preschool and school age. IDA in adults diminishes work capacity by as much as 10–15 percent.

5.2 Iodine deficiency

Iodine is an essential mineral required by the body to synthesize thyroid hormones. Seafood and ocean fish are the most important sources of dietary iodine. Populations with little access to these marine products, e.g., persons living in mountain areas, are the most likely to show iodine deficiencies resulting from a lack of natural dietary source.

Figure 6: Global prevalence of goitre

Source: Kennedy, G. et al. 2003, 10

Clinical iodine deficiency is detected by the presence of goitre, i.e., swelling of the thyroid gland. Latest estimates indicate that 741 million people or 13 percent of the world's population, are affected by goiter – many more are expected to suffer from sub-clinical forms (as measured by low urinary iodine). In some countries prevalence of goiter can reach more than 35 percent (Figure 6).

The most devastating consequences of iodine deficiency are reduced mental capacity and growth defects. 50 million people are mentally handicapped as a result of iodine deficiency. It has been estimated that 100,000 children are born each year with irreversible brain damage because their mothers lacked iodine prior to or during pregnancy.

5.3 Vitamin A deficiency

Vitamin A is required by all body tissues for normal growth and tissue repair. The visual and immune systems are particularly dependent on this vitamin. Important food sources of vitamin A or its precursor form carotene are eggs, milk and fish, yellow fruits and vegetables, green leafy vegetable and red palm oil.

Figure 7: Prevalence of low serum retinol (vitamin A deficiency)

Source: Kennedy, G. et al. 2003, 10

Vitamin A deficiency (VAD) can result in night blindness, various forms of eye damages (collectively known as xerophthalmia) and ultimately blindness, which is preventable. However, these clinical forms are now becoming less frequent. The detection of sub-clinical forms through measurement of serum retinol is thus gaining more importance.

Apart from eye damages, VAD leads to increased morbidity and mortality, esp. among children. Global prevalence can reach more than 20 percent (Figure 6), which is considered a severe public health problem.

5.4 Other micro nutrient deficiencies

Apart from iron, iodine and vitamin A, increasing attention is being paid to other micronutrients and knowledge about the vital role they play for growth, development, immune system functioning and prevention of birth defects is increasing. Zinc and folate are two such important nutrients (Kennedy et al. 2003, 11–12).

Folate deficiency, e.g., is responsible for approximately 200,000 severe birth defects every year in 80 countries (and perhaps as many as 50,000 more in the rest of the world). The deficiency is also associated with approximately 1 in every 10 deaths from heart diseases in adults (UNICEF and MI 2004, 3).

Preventing micronutrient deficiency diseases must be given more attention in the context of (prolonged) emergencies, when food rations from external sources often are the only significant

source of food for the daily diet of the affected population. In such situations food rations have to cover the energy requirements and provide more or less all macro and micronutrients (protein, fat, vitamins and minerals) to cover nutritional requirements. Recent reports about suspected thiamine deficiency in Angola (Duce et al. 2003) and a review of the situation of refugees and displaced people (Briend 2004) indicate that the national and international communities have to take more and better actions to prevent micronutrient deficiencies. The relevant knowledge and technical solutions are available.

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Paper III

Instruments for the Assessment and Analysis of the Food and Nutrition Security Situation at Macro Level[1]

Maria Gerster-Bentaya

1 This paper is a revision and update using elements from the following papers: Gross, R., 2000: Food and Nutrition: Definitions and Concepts. Hahn, H. 2000: Conceptual Framework of Food and Nutrition Security. Kaufmann, S. 2000: Selection of Indicators for Food and Nutrition Security Programs. Kaufmann, S. 2000: Assessment within the cycle of a FNS program. Metz, M. 2000: Methods for Analysis and Assessment of Aggregate Food Deficits.

Table of Contents

1 Introduction

1.1 Model to analyse the structure of aggregate food deficits

In analysing the overall food situation of a country, clarification has to be achieved on the nature and dimensions of prevailing food deficits. Here, an analytical model is presented which can serve as an instrument to broadly analyse the structure and dimensions of food deficits at macro-level. This, in turn, will enable one to determine the priority areas of policy interventions to improve food and nutrition security and help answer such questions as should food security policies focus on improving access or on increasing availability, or on both sides of the food equation simultaneously.

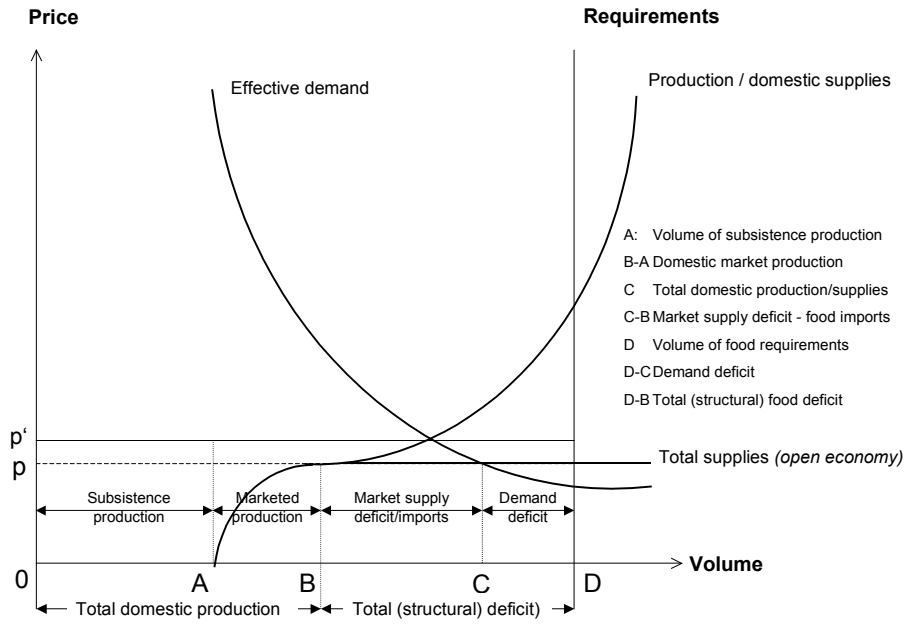
The overall structural food deficit of a country, defined as short-fall of domestic food production below aggregate national requirements, is often composed of two different types of sub-deficits with clearly distinct features, namely

– a supply deficit,

– a demand deficit.

Figure 1 depicts such a situation for an open economy case with food imports.

Figure 1: Type of food deficits



Source: www.fao.org, visited 11/11/2009

The elements of the model are:

Market price of food (p): In an open economy, as assumed here, the prevailing market price is determined by the world market price of food (import parity price, i.e. border price, expressed in local currency at the current exchange rate, plus internal marketing costs). The price level p may refer to average food prices or the price of a main staple food item (e.g. wheat, rice, maize).

In the case of a closed economy without food imports / exports, the market price is determined by domestic supply and demand and is p‘.

Effective demand curve: refers to aggregate effective demand for food. The position and shape of the effective demand curve is largely determined by income and income distribution. Increased incomes and more even income distribution lead to a right-upward shift of the effective demand curve (and vice versa).

Production/supply curve: refers to aggregate domestic production including subsistence production (volume at point A). The shape and position of the production/domestic supply curve is largely determined by the available production resources (land, labour, water, etc.), environmental factors (weather, soil fertility, etc.), and the technology applied. Improved production conditions (e.g. in a good harvest year or due to technical improvements) lead to a right-downward shift of the production/domestic supply curve, while worsening production conditions (e.g. due to droughts, soil erosion) to a left-upward shift. As an open economy is assumed, with the internal market price being determined by the world market price, the supply curve becomes fully elastic at the price level „p“ (in point B). The difference between the volumes of higher effective demand and lower domestic production (C–B) is imported, or respectively has to be imported to attain the market equilibrium. In a closed economy without food imports or exports, the production and the supply curves are identical if stocks changes are not considered.

Requirements line: refers to the aggregate food requirements of a country, i.e. the volume of food required to cover the nutritional needs of the total population. Major determining factors of the food requirements are the nutritional needs (adequate average nutritional intake in quantitative terms, usually measured in *dietary energy supply, DES*), the population number, population composition and growth.

Any variation of a parameter determining one of the factors/elements of the model mentioned above – the market price, the food production/domestic food supply, the aggregate food demand or the food requirements – leads to changing dimensions and a changed composition of the food deficit situation. An overall structural food deficit does not necessarily imply food insecurity, as the balance between domestic food production (subsistence and marketed production) and the aggregate national food requirements may be imported. It depends on the composition of the overall structural deficit and the nature and size of the sub-deficits in combination with other economic factors (e.g. foreign exchange position, cereal world market situation, degree of market integration, income level and income distribution, variability of production, supply and demand, fiscal position and policies, etc.) whether a structural food deficit situation implies food insecurity, and which type of policy interventions are appropriate and required to enhance food and nutrition security. In the following section, the model out-lined above is used to describe different food deficit scenarios which are typical for countries with food and nutrition security problems.

1.2 Typical food deficit scenarios and its implication for Food and Nutrition Security

Scenario 1: Supply problems arising from structural production problems

A structural food deficit, defined as permanent short-fall of domestic food production below aggregate food requirements (D–B in Figure 1), does not mean food insecurity if a country has the capacity to fill the gap through food imports. However, food insecurity in terms of insufficient availability occurs if, due to foreign exchange constraints, a country lacks the capacity to finance the food import requirements. In such situations, strategic approaches to mitigate food insecurity have to put emphasis on increasing food availability. Depending on the conditions, this can either be achieved by promoting domestic food production, or by measures to increase foreign exchange

earnings. As a transitory measure, external assistance in terms of food aid deliveries or balance of payments support can help to overcome availability constraints.

Scenario 2: Access problems and demand deficits as a result of mass poverty

This scenario refers to countries where, due to wide-spread poverty and/or large income differentials, access to food is the major problem for a significant proportion of the population. In the graphic model, this would show as a large gap between the volumes of effective demand and food requirements (D–C). Food supplies from domestic food production may, in such cases, cover or even exceed the existing market demand for food. Measures to improve Food and Nutrition Security in this case, have to emphasise employment and income generation and targeted assistance to the vulnerable and food insecure population groups. The appropriate type of assistance targeting (e.g. transfers in cash or in kind of food, food relief assistance, food subsidies, food-for-work, temporary or safety-net approaches, etc.) depends on the specific local situation, the groups to be assisted, and the availability of resources.

Scenario 3: Instability of food production and/or demand

Food insecurity in terms of instability, caused by sudden or repeated short-falls of supply or demand, can arise from factors affecting either food production (e.g. droughts, floods, other natural disasters) or income and demand (e.g. income losses due to depressed world market prices for major export commodities, or due to war and displacement). In the graphic model, either production or demand short-falls would lead to a shift of the production and the demand curve to the left, increased production and demand deficits, with corresponding negative implications for food security. Major approaches to prevent or mitigate the adverse effects of production and supply instabilities on food security, particularly in areas prone to natural disasters, comprise Early Warning Systems, Food Security Reserves, Buffer Stocks, and Emergency Food Aid.

Scenario 4: Availability and Access problems as a result of conflict/crisis situation

Most of the armed conflicts take place in regions heavily dependent upon agriculture. Due to civil war and displacements, fields can no longer be cultivated and whole regions lie fallow. Armed conflicts destroy crops, cattle herds and land, they ruin a country's infrastructure and markets. Even worse, they destroy the ecological and social resources needed for food production. These attacks on food systems are common instruments of war. Even after conflicts are settled, certain areas cannot be accessed due to land mines and other 'dormant weapons', and it takes much time and many resources (which often farmers do not have) to re-establish the production. Access to land, and thus indirectly access to food, is often the key demand of rebels. In case of open armed conflicts, populations often leave the region and settle within a short time at a different place – often in a different country due to security reasons. A sudden shortfall of demand due to displacement or a sudden demand at the new location overextends the local market. Food aid – sometimes over long periods – helps to mitigate this acute food insecurity situation. The longer such a situation lasts, the more difficult it will be to re-establish the production system back home. Interventions in such acute crisis situations therefore are crucial. Food aid runs the risk of even exacerbating conflicts.

Scenario 5: Combination of different scenarios

Very often, the situation in countries with Food and Nutrition Security problems is characterised by a combination of the different types of food deficits. Figure 1 presented the case of a combined demand and market supply/import deficit. The implications for Food and Nutrition Security are particularly severe if a country with structural production and/or demand deficits is hit by an

acute food crises resulting from natural or man-made disasters. On the other hand, there are also cases where a demand deficit, caused by mass poverty, goes hand in hand with domestic "surplus" food production. Such surpluses may be exported or stockpiled while, at the same time, the poor have no access to such "surpluses" for want of purchasing power. In this case, targeted food assistance programs should be combined with local procurement of food commodities, in order to compensate for the insufficient effective demand of the poor population groups, and to absorb the existing market surpluses. Local purchases will also enhance domestic food production, rural incomes and contribute to an improved food marketing system. External assistance in terms of budgetary and balance of payments support can help to finance local purchases to be used for targeted food assistance.

Although it may not always be possible to clearly assign one of the particular food deficit scenarios as described above to a specific country, the analysis of food deficits at macro-level, as outlined above, helps to identify the major factors causing food insecurity, and to define the appropriate strategies for improving Food and Nutrition Security under the specific country conditions.

2 Indicators to assess and analyse the Food and Nutrition Security situation at macro level

Different organizations use different indicators to assess the food and nutrition situation in a given situation and they have developed different methods to obtain this information. These different approaches have resulted in a "mass" of available indicators, instruments and methods. The challenge is to select the ones that are appropriate in a given situation under conditions of a set amount of resources and (restricted) time available (see more BP V). This paper explains the various methods that are used by various international organizations supporting countries to mitigate food and nutrition insecurity as well as by the countries themselves. Much of the information is not specifically used for this purpose only, and the challenge is to find available information and to combine various indicators to get a "real" and up-to-date picture of the food and nutrition situation in a given country or region.

2.1 Global food indicators on food security

FAO uses seven global food security indicators on which the Committee on World Food Security reports every year in its "Assessment of the World Food Security"[2].

- global stocks in relation to probable magnitude of market demand
- ability of the five major grain exporting countries to meet the demand for wheat and coarse grains imports
- ratio of the volume of closing cereal stocks
- changes in cereal production among the major cereal importing countries of China, India and the CIS
- Changes in aggregate cereal production of the Low Income Food Deficit Countries (LIFDCs),

2 For example, see http://www.fao.org/docrep/meeting/x1885E.htm#P480_24199 or http://www.fao.org/DOCREP/MEETING/004/Y6441E/Y6441E00.HTM

– changes in aggregate cereal production of the LIFDCs, excluding China and India

– comparison of export prices for the major cereals

These indicators will be briefly explained in the following paragraphs:

The first indicator provides information about **global stocks in relation to probable magnitude of market demand**. To show utilization trends for the coming marketing year, in general, the FAO Secretariat considers a 17–18 percent ratio of end-of-season cereal stocks as the minimum necessary to safeguard world food security.

The second indicator measures the **ability of the five major grain-exporting countries** (Argentina, Australia, Canada, EC and the United States) **to meet the demand for wheat and coarse grains imports**. It relates the sum of their production, imports and opening stocks to the sum of their domestic utilization plus exports.

The third set of indicators presents the **ratio of the volume of closing cereal stocks**[3] held by the major exporters of wheat, coarse grain and rice to the total disappearance of these cereals (domestic consumption plus exports).

Indicator four measures the changes in cereal production among the major cereal importing countries of China, India and the CIS (Commonwealth of Independent States) against the trend and the preceding year.

Changes in aggregate cereal production of the Low Income Food Deficit Countries (LIFDCs), shown by indicator five, provide another way of measuring food security in a group of countries considered vulnerable to fluctuations in supplies. However, given that production in China and India heavily influences the aggregate output for LIFDCs indicator six excludes these two countries.

Indicator six excludes the two countries China and India and talks about changes in aggregate cereal production of the LIFDCs.

Indicator seven provides a **comparison of export prices for the major cereals**.

In addition, FAO suggests indicators in the area of food, nutrition and health, as well as economic access and integration:

– **Food, Nutrition and Health Indicators**
  – Population undernourished in %
  – Number of people undernourished (millions)
  – Per capita dietary energy supply (kcal/day)
  – Underweight Under-fives (moderate and severe) in %
  – Under Five Mortality Rate in %
  – Economic Access and
– **Integration Indicators**
  – National income per capita (US $)

3 The "change in stocks" is always shown, corresponding in principle to the movement in stocks during the reference period: closing stocks – opening stocks. The latter are defined as follows: opening stocks: quantities not used but stored, existing on the first day of the reference period and arising from the previous reference period(s); closing stocks: quantities in store on the last day of the reference period.

– PPP Gross national income per capita (PPP$)

– Gross domestic product per capita growth (%)

– Trade in goods (% GDP)

– Growth in real trade less growth in real GDP in %

– Gross foreign direct investment (% GDP)

– World Trade and GDP Growth

– World Cereal Stock-to-Use Ratios (Cereals, Wheat, Coarse Grains, Rice in %)

– Value Index of Imports of Basic Food Commodities in '000 million $

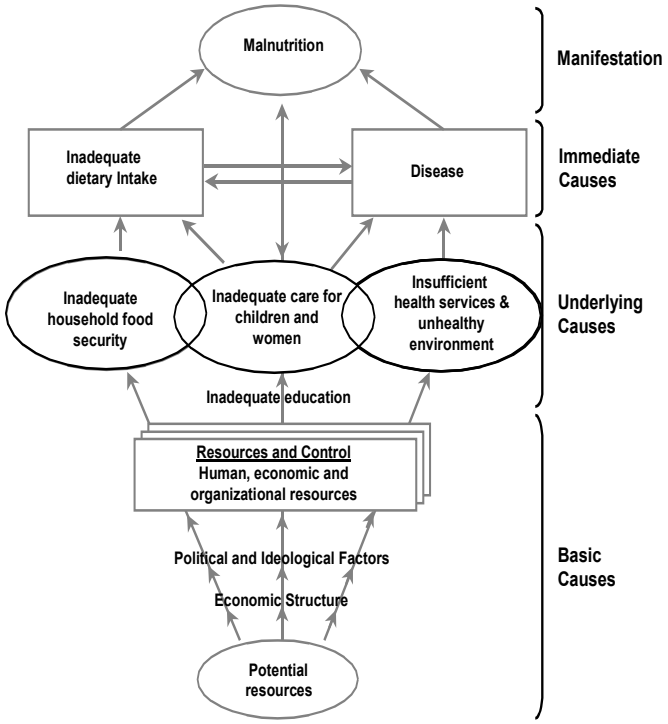
– Volume Index of Imports of Basic Food Commodities
  - Cereals
  - Meat
  - Dairy
  - Sugar
  - Oils, fats & Oilseeds

2.2 Indicators for Food and Nutrition Security at national and regional level

In order to assess and analyse the Food and Nutrition Security conditions in a given country, multiple indicators have to be used to reflect the various levels and dimensions of the problem. Typical indicators at macro level are: prevalence of common diseases, HIV/AIDS infections, etc., mortality rates, national storage etc.

For purposes of organisation, the overall framework of malnutrition will be recalled by the following figure. The presentation of methods to analyse the Food and Nutrition Security situation in a given country is based on this conceptual framework (see table 1).

Figure 2: Conceptual framework of malnutrition



Source: UNICEF 1991

Information on the nutritional status of a country will be provided using the following indicators[4]: The following list is only a selection of indicators suggested by UNICEF[5]. UNICEF itself maintains a huge data basis with information on the respective indicators for each country (see http://www.unicef.org/infobycountry). For World Bank economic figures see http://www.worldbank.org/poverty/data/index.htm.

4 According to UNICEF, see also http://www.unicef.org/infobycountry/stats_popup2.html

5 For more indicators, please consult the above mentioned internet links to UNICEF and the World Bank.

Table 1: Indicators for Food and Nutrition Security at national and regional level

Domain	Indicator	Definition / explanation
Nutritional status	Percent underweight	Moderate and severe – below minus two standard deviations from median weight for age of reference population; severe – below minus three standard deviations from median weight for age of reference population.
	Percent stunted	Moderate and severe – below minus two standard deviations from median height for age of reference population
	Percent wasted	Moderate and severe – below minus two standard deviations from median weight for height of reference population
	Vitamin A deficit	Percentage of children aged 6–59 months who have received at least one high dose of vitamin A capsules in a certain year
	Percent of Mothers with Low Body Mass Index (BMI)	Percent of women whose BMI is less than 18.5, where BMI – an indicator of adult nutritional status – is defined as weight in kilograms divided by the square of height in meters. In some countries BMI is presented for all sample women, while in other countries the figure is available only for mothers of children under five years old.
Food intake	Calorie consumption	Average daily calorie intake – if possible disaggregated according to age, sex, stage in lifecycle
Health status	Low birth weight	Percentage of children born with less than 2,500 grams.
	Under-five mortality rate	Probability of dying between birth and exactly five years of age expressed per 1,000 live births.
	Infant mortality rate	Probability of dying between birth and exactly one year of age expressed per 1,000 live births.
	Prevalence of common diseases	Diarrhoea Incidence < 5 per 1000: The number of children with diarrhoea per 1000 children in the target population. Diarrhoea is formally defined as 3 or more watery stools in 24 hours, but any episode diagnosed and/or treated as diarrhoea after an interview with the adult accompanying the child should be counted. Others: – Malaria, – measles, – tuberculosis, etc.
Health status	Immunization Rate	Percent of surviving children age 12–23 months who received measles vaccine (line a); three doses of DPT (line b); all vaccinations, namely BCG, three doses of DPT and oral polio, and measles (line c); no vaccines at all (line d). The figures are a combination of information recorded on the child's vaccination card, or, in cases where a card was not seen by the interviewer, as reported by the mother.
	HIV/AIDS Adult prevalence rate	Percentage of adults (15–49 years) living with HIV/AIDS
	Estimated number of people living with HIV/AIDS	Estimated number of adults and children living with HIV/AIDS
	HIV prevalence among pregnant women	Percentage of blood samples taken from pregnant women aged 15–24 that test positive for HIV during 'unlinked anonymous sentinel surveillance' at selected antenatal clinics.
	Children orphaned by AIDS	Estimated number of children (0–14 years) as of end-200x (at a certain point in time), who have lost one or both parents to AIDS

Domain	Indicator	Definition / explanation
	Total Fertility Rate (TFR)	The average number of births a woman could expect to have during her lifetime if she followed observed levels of fertility for her age group at every age. The TFR is calculated as the sum of average annual age-specific fertility rates for all reproductive age groups (usually at least 13 and at most 50 years old) during the three years preceding the survey. For most countries, the TFR is based on the number of women of reproductive age in all marital statuses. For some countries, however, the TFR is calculated based on a sample of ever-married women and then extrapolated by DHS (Demographic and Health Survey) to women of all marital statuses for that country.
	Water supply & sanitation	Percent of household residents with safe water supply Percent of household residents with latrine or toilet
Education	Adult literacy rate	Percentage of people aged 15 years and above who are literate.
	Education level	Percentage of people in a given age group who have received a particular level of education
	Literacy rate	People aged 20 years and more with no schooling or with some primary schooling are assumed to be illiterate. People with more schooling are therefore assumed to be literate.
	Net primary school enrolment/attendance	Percentage of boys and girls enrolled at primary school as reported by UNESCO/UIS (UNESCO Institute of Statistics) and from national household survey reports of attendance at primary school.
Availability of food	Population	Total number of people. Projected population figures are based on various projection models attempting to quantify the expected effects e.g. of HIV/AIDS on population growth.
	Annual Population Growth Rate	The rate at which the population is increasing or decreasing in a given year expressed as a percentage of the base population size. It takes into consideration all the components of population growth, namely births, deaths and migration.
	Average household size	Average number of people living in each household where household is defined as a person, or a group of persons, who occupy a common dwelling (or part of it) for at least four days a week and who provide themselves jointly with food and other essentials for living. In other words, they live together as a unit. People who occupy the same dwelling, but who do not share food or other essentials, are enumerated as separate households.
	Food production	Climate indicators: – rainfall (amount, distribution) – temperature (average, variations throughout the year) – wind – flood, drought Crop production & Production system – main crops (food, cash) – production system, etc. Land & soil – Soil quality (impoverishment, desertification, ...) – Availability/Scarcity of land Common animal and plant diseases Production / farming / herding techniques Insufficiency of labour Input supply & water availability & support services – Seed, tools, type and degree of mechanisation – irrigation / water – extension services, etc.

Domain	Indicator	Definition / explanation
Economic indicators	Expenditure for food	– total expenditure – food expenditure – share of expenditure on food
	Infrastructure	– Availability of roads (km roads) – availability of schools (number of schools/habitants) – health services (hospital beds, immunisation rate, etc) – markets (distance to local/regional market) etc.
Economic indicators	Markets	– Type of goods at local /regional markets – Prices for main food items – Price fluctuation etc.
	GNI per capita	Gross national income (GNI) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. GNI per capita is gross national income divided by mid-year population. GNI per capita in US dollars is converted using the World Bank Atlas method.
	GDP per capita	Gross domestic product (GDP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output. GDP per capita is gross domestic product divided by mid-year population. Growth is calculated from constant price GDP data in local currency
	% of population below the poverty line	The most commonly used way to measure poverty is based on income or consumption level. A person is considered poor if his or her consumption or income level falls below some minimum level necessary to meet basic needs. This minimum level is usually called the "poverty line". What is necessary to satisfy basic needs varies across time and societies. Therefore, poverty lines vary in time and place, and each country uses lines which are appropriate to its level of development, societal norms and values. Percentage of population living on less than $1.08 a day at 1993 international prices (equivalent to $1 a day in 1985 prices, adjusted for purchasing power parity) = poverty line
	Purchasing Power Parity (PPP)	PPPs measures the relative purchasing power of currencies across countries.
	Gini coefficient	The Gini coefficient is a measure of income inequality. It is a number between 0 and 1, where 0 means perfect equality (everyone has the same income) and 1 means perfect inequality (one person has all the income, everyone else earns nothing). While the Gini coefficient is mostly used to measure income inequality, it can be used to measure wealth inequality as well.
	Social and political environment	– Political stability – Migration rate – Conflicts / rebellion

The Global Hunger Index was developed by IFPRI in order to assess the global food and nutrition situation on an annual basis. This is a composite index based on available data on undernourishment, underweight children under the age of five and child mortality. This index thus combines information on the food and nutrition situation as well as one major consequence of malnutrition (and bad health). In 2009, a map and data are available for 121 countries (Welthungerhilfe, IFPRI and Concern 2009).

2.3 Indicators for Food Security Information Systems

Some of the indicators described above are also used for monitoring food security crisis (Maxwell 1992). Leading indicators give warning of future crisis (estimated crop production, rainfall). Concurrent indicators reflect the actual situation; food consumption, asset sales, increased coping strategies (e.g. eating wild foods, reducing food rations, credits taken to purchase food). Trailing indicators give information about the extent and impact of current crisis. They include the nutritional status, diseases, migration etc. (Care 1996).

At the World Food Summit 1996 it was agreed on the necessity of improved targeting towards those people and areas which suffer most from malnutrition and vulnerability; to identify causes and take remedial action to improve the situation. As a following step international organizations agreed on the consolidation and institutionalisation of a Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) for all countries. Sources of information are Baseline Information Reports, Monitoring Reports and Situation Assessments, Policy and Program Evaluations and Feasibility Studies. Within this scope of FIVIMS, indicators required at household level concentrate on the nutritional status and food consumption (wasting, stunting underweight, low-birth weight, body-mass-index of adults, night-blindness, prevalence of goitre, energy intake as well as food availability per household member). Indicators regarding food availability and access to food are collected from higher socio-organizational levels (FAO 1998).

3 Methods to assess and analyse the Food and Nutrition Security situation at macro level

In the following section, common methods for assessing the structure and dimensions of food deficits or public health problems at macro-level are briefly outlined. Many of these methods are not restricted to assessing the Food and Nutrition Security situation, but can include Food and Nutrition Security relevant information, or rather should be conceived to give Food and Nutrition Security relevant data. The various methods are used by different organisations and thus, there are quite some overlaps.

3.1 Population census

A Population Census is the official enumeration of persons in a country at a specified time. This enumeration also implies the collection, compilation, evaluation, analysis and publication of demographic, social and economic statistics relating to the population. The objectives of a Census is to count all the people in a country and to provide the Government with their number in each Local Government Area and District, by age, sex, where they live, their level of education, whether or not they attend school, work. In short, it relates to information on the total count of the population and its characteristics, etc. The usefulness of the census lies in the fact that it provides data which allows for cross-classification and comparison with data gained through other methods.

The total population of the country consists of all persons falling within the scope of the census. In the broadest sense, the total may comprise either all usual residents of the country or all persons present in the country at the time of the census. The total of all usual residents is generally referred to as the de jure population and the total of all persons present as the de facto population.

3.2 Sector analysis

Sector analyses investigate particular sectors more intensively. For Food and Nutrition Security (FNS) it is important to get more in depth information about the following sectors:

- Health
- Social welfare
- Education
- Agriculture
- Infrastructure (rail tracks, roads, energy, school, hospitals, etc.)
- Economy (finance and banking, industry, investment, etc.)

For each sector, specific indicators are relevant (see above chapter 2.2). Generally information required are absolute figures, volumes, rates, but also policies (whether existing or not, hampering or favouring food and nutrition security).

3.3 Demographic and Health Survey (DHS)

Demographic and Health Surveys[6] **(DHS)** are nationally-representative household surveys with large sample sizes (usually between 5,000 and 30,000 households). DHS surveys provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Typically, DHS surveys are conducted every 5 years, to allow comparisons over time.

Description

The core questionnaire for DHS emphasizes basic indicators and flexibility. Use of a standardized core questionnaire allows for comparisons across different countries. Special modules can also be added to questionnaires in order to meet host-country and USAID data needs. The standard DHS survey consists of a household questionnaire and a women's questionnaire. A nationally representative sample of women age 15–49 is interviewed.

The household questionnaire contains information on the following topics:

- **Household listing:** For every usual member of the household and visitor, information is collected about age, sex, relationship to the head of the household, education, and parental survivorship and residence.
- **Household characteristics:** Questions ask about the source of drinking water, toilet facilities, cooking fuel, and assets of the household. In areas with a high prevalence of malaria, questions about the use of bed nets in the household are added.
- **Nutritional status and anaemia:** The height and weight of women age 15–49 and young children are measured to assess nutritional status. For the same individuals, the level of hemoglobin in the blood is measured to assess the level of anaemia.

The women's questionnaire contains information on the following topics:

- **Background characteristics:** Questions on age, marital status, education, employment, and place of residence provide information on characteristics likely to influence demographic and health behaviour.

6 Source: http://www.measuredhs.com/aboutsurveys/dhs_surveys.cfm, 15.5.2004

- **Reproductive behaviour and intentions:** Questions cover dates and survival status of all births, pregnancies that did not end in a live birth, current pregnancy status, fertility preferences, and future childbearing intentions of each woman.
- **Contraception:** Questions cover knowledge and use of specific contraceptive methods, source of contraceptive methods, exposure to family planning messages, informed choice, and unmet needs for family planning. For women not using contraception, questions are included on knowledge of a source of contraception and intentions about future use.
- **Antenatal, delivery, and postpartum care:** The questionnaire collects information on antenatal and postpartum care, place of delivery, who attended the delivery, birth weight, and the nature of complications during pregnancy for recent births.
- **Breastfeeding and nutrition:** Questions cover feeding practices, the length of breastfeeding, and children's consumption of liquids and solid food.
- **Children's health:** Questions examine immunization coverage, vitamin A supplementation, recent occurrences of diarrhea, fever, and cough for young children and treatment of childhood diseases.
- **Status of women:** The questionnaire asks about various aspects of women's empowerment, including decision-making and autonomy, and about attitudes about domestic violence.
- **AIDS and other sexually transmitted infections:** Questions assess women's knowledge of AIDS and other sexually transmitted infections, the sources of their knowledge about AIDS, knowledge about ways to avoid getting AIDS, and high-risk sexual behaviour.
- **Husband's background:** Currently married women are asked about the age, education, and occupation of their husbands.
- **Other topics:** Questions examine behaviour related to environmental health and the use of tobacco.

Survey Methodology

Demographic and Health Surveys are executed in four steps. The first step involves preparatory activities, including designing the sample and developing the survey questionnaires to meet specific host-country needs. The survey instruments are then translated into local languages, pre-tested, and finalized.

The second stage involves training field staff and conducting fieldwork. Selected households and individual respondents are identified and interviewed. The third stage involves data processing, including editing, coding, and entering and verifying the data as well as checking them for consistency. This stage usually begins after the beginning of fieldwork.

The final stage involves analysing the data and preparing the final report. A survey will typically take about 18 months to complete, from updating the sample frame to publication of the final report. Details regarding the methodology of each survey are included in the first chapter of the final report.

For more information and additional support, contact http://www.measuredhs.com/.

3.4 Poverty assessment

Based on the collected data of the DHS, the poverty analysis concentrates on measuring the socio-economic status, wealth, and inequality[7].

The **socio-economic status** is measured using the asset approach and the questionnaire therefore includes questions on household's ownership of a number of consumer items ranging from a fan to a television and car; dwelling characteristics such as flooring material; type of drinking water source and toilet facilities used; and other characteristics that are related to wealth status. Questions are addressed to the head of household.

The asset index is generated from these variables and used to create the break points that define **wealth** quintiles. Rates for all health, nutrition and population indicators are calculated after applying the DHS sampling weights so that the resulting numbers are generalized for the total population.

For the measurement of **inequality**, two statistical indicators are relevant:

– **Poor/Rich Ratio:** This is the ratio between the rate prevailing in the poorest population quintile and that found in the richest quintile. Thus, a poor-rich ratio of 2.0 for, say, infant mortality, would mean that the infant mortality rate in the poorest quintile is twice the rate in the highest. This is a rather crude index since, among other things, it provides no information about the middle three quintiles. It does, however, provide a general order or magnitude of differences between the poorest and the richest 20 percent each in their access to better HNP (Health, Nutrition and Population) status or services.

– **Concentration Index:** The concentration index, which can vary in value between –1 and +1, is similar to the Gini Coefficient frequently used in the study of income inequalities. It measures the extent to which a particular health status variable is distributed unequally across all five asset quintiles – that is, the concentration of inequality. The closer the index is to zero for any one health indicator, the less concentrated is the wealth inequality for that indicator; conversely, the further away the index is from zero, the greater is the inequality. The sign on the index (negative or positive), and the meaning of the sign with respect to health inequality, reflect the expected direction of the relationship of an indicator with poverty and inequality. For example, there is typically an inverse relationship between infant mortality and wealth, so that a negative concentration index implies a regressive situation as concerns wealth inequality. Conversely, the relationship between immunization and wealth is typically direct, so that in this case a positive concentration index implies a regressive relationship. Standard errors for the concentration index are presented to show the statistical significance of the measured inequality (Wagstaff et al., 1997).

3.5 National Household Food Consumption

Because poverty indicators are based on income data, they only allow indirect conclusions on food and nutrition security. In order to get a clearer and more specific picture of the state of food and nutrition (in-)security of a country, special surveys on household and individual food consumption and/or the health and nutritional status of the population, respectively vulnerable population groups, need to be conducted. Such surveys are typically made for assessing food and nutrition security at micro and meso levels. If done on a statistically representative scale for a whole country, which involves quite substantial costs and efforts, the results of such surveys provide clear evidence on the state of food and nutrition security in terms of access and utilisation at macro level.

7 http://www.worldbank.org/poverty/health/data/datameth.htm, 17.5.04

3.6 Household Expenditure Surveys (HES)

The Household Expenditure Survey[8] measures the household food and nutrition (in)security using three different indicators: household calorie insufficiency, the degree of vulnerability to future food insecurity, and diet quality based on interviews with household members (men and women). At an aggregated level the HES evaluates the consumption and welfare of a country's population.

This is described more detailed in Paper IV.

3.7 Multiple Cluster Indicator Survey (MCIS)

The Central Office of Statistics in a country normally conducts a Multiple Cluster Indicator Survey (MICS). This method was developed as an affordable, representative, fast and reliable household survey system that would fill in gaps in knowledge and update available data. It was designed in collaboration with the World Health Organization (WHO), the United Nations Statistical Division, the London School of Hygiene and Tropical Medicine, and the United States Centers for Disease Control (CDC). By 1996, more than 60 countries had carried out a stand-alone MICS, and another 40 had incorporated some if its modules into other surveys. It aims at providing up-to-date information on various food and nutrition-relevant areas. According to the specific objectives, each MCIS has to be defined and conceived, referring to a set of indicators advised by UNICEF[9].

3.8 Living Standard Measurement Survey (LSMS)

LSMS[10] is an instrument for measuring and understanding poverty in developing countries developed and used by the World Bank. http://www.worldbank.org/lsms/index.htm LSMS surveys provide data on most aspects of household welfare (consumption, income from activities in the labour market, household enterprises or agriculture, asset ownership, migration, health, education, nutrition, fertility, and anthropometrics). LSMS surveys help to understand household economic decisions and the effects of social and economic policies. The use of LSMS data in poverty assessments helps to ensure that the development community's efforts to reduce poverty can be guided by quantitative information on levels, causes, and consequences of poverty.

Three different kinds of questionnaires are normally used: the household questionnaire, which collects detailed information on the household members; the community characteristics questionnaire, in which key community leaders and groups are asked about community infrastructure; and the price questionnaire, in which market vendors are asked about prices. A fourth type of questionnaire, school or health facility questionnaires is sometimes used as well.

Household Questionnaire. Because welfare is measured by consumption in most LSMS research on poverty, measurement of consumption is strongly emphasized in the questionnaires. There are detailed questions on cash expenditures, on the value of food items grown at home or received as gifts and on the ownership of housing and durable goods (for example, cars, televisions, bicycles and sewing machines) to make it possible to assign them a use rental value.

A wide range of income information is also collected. For individuals in formal sector jobs, most surveys contain detailed questions about wages, bonuses and various forms of in-kind compensa-

8 Smith, 2002

9 see http://www.unicef.org/infobycountry/stats_popup2.html for further indicators

10 see http://www.worldbank.org/lsms/guide/describe.html

tion. Information is usually sought on secondary as well as principal jobs. At the household level, lengthy agriculture and small enterprise modules are designed to yield estimates of net household income from these activities. Other sources of miscellaneous income, such as the receipt of private transfers (for example, child support or remittances from abroad), public transfers (in cash or in kind), lottery winnings and interest income, are recorded as well.

Collecting data on a variety of household characteristics (including those on health, education, fertility and migration) from the same households makes it possible to analyse the important relationships among different aspects that make up the quality of life, such as the impact of parents' education on child nutrition or the effect of health status on employment. The sectoral modules collect such information. However, they are shorter, and the amount of detail provided on any one topic is smaller, compared to a single-topic survey.

Community Questionnaires. In order to limit the length of the household questionnaire, information on local conditions that are common to all households in the area is gathered in the community questionnaire. These questionnaires are typically used only in rural areas, where local communities are easier to define than in urban areas. The information covered by the questionnaire usually includes the location and quality of nearby health facilities and schools, the condition of local infrastructure such as roads, the sources of fuel and water, the availability of electricity, means of communication and agricultural conditions and practices.

Price Questionnaires. In countries where prices vary considerably among regions, it is important to gather information on the prices that households are faced with in practice. Thus, in most LSMS surveys, questionnaires have been developed to compile information on the prices of commonly purchased goods.

Special Facility Questionnaires. Sometimes very detailed information on schools or health clinics is desired. When this is the case, special facility questionnaires may be developed to supplement or replace those sections of the community questionnaire.

A structure of the different types of questionnaires, the respondent and related subjects are attached in annex 1 and 2.

Data collection and data entry are highly decentralized in full-fledged LSMS surveys. The core work is performed by a team consisting of a supervisor, two interviewers, an anthropometrist, a data entry operator and a driver. The team is based in a regional office equipped with a personal computer for data entry. The data entry operator works only at the field office, while the other members of the team travel between the field sites and the office. Teams are supervised and supported by a national survey directorate, consisting of the survey director and assistants responsible for field operations and data management.

3.9 Supply Utilisation Accounts (SUA) and Food Balance Sheets (FBS)

Supply utilisation accounts (SUA) are time series data which put together and compare statistics on food supply and utilization. On the basis of SUAs, food balance sheets (FBS) are prepared[11]. A FBS presents a comprehensive picture of the pattern of a country's food supply and utilization during a specified reference period, usually one year or an average of a number of years. The total quantity of different foodstuffs produced in a country, increased by the total quantities imported as well as adjusted by stock changes, gives the supply available during that period. On

11 The Statistical Division of FAO provides FBS for all countries, see references. As an example, the FBS of Tanzania and Sri Lanka are attached as Annex 3 and 4. For each country it can be generated under the following web site: http://faostat.fao.org/faostat/collections?subset=nutrition

the utilization side, a distinction is made between the quantities exported, fed to livestock, used for seed, processed for food use and non-food uses, losses during storage and transportation, and food supplies available for human consumption. The per capita supply of each food item available for human consumption is then calculated by dividing the respective quantity by the population number. Data on per capita food supplies are expressed in terms of physical quantities and also – by using food composition tables and applying respective conversion factors – in terms of calories (DES), protein and fat.

FBS give an idea of the overall food situation of a country and allow a rough assessment of the state of food security. If the quantity of nutrients available for human consumption as calculated by the FBS is smaller than the aggregate nutritional requirements, the country has an obvious food deficit and is food insecure. In order to assume a relatively balanced food situation and a reasonable degree of food security at national level, the quantities available for human consumption, as calculated by FBS, ought to exceed the calculated national nutritional requirements by a fair amount. Allowing for unequal distribution of food within a country (geographically, between groups and individuals), there should be a minimum safety margin of 10 percent by which availability exceeds requirements.

By comparing the average production figures over several years with average commercial food imports and aggregate food requirements, the FBS can be used for assessing the dimensions of the structural production and domestic market supply/import deficits. Furthermore, a comparison of FBS data over several years shows trends in food production, supply and the respective deficits.

While FBS are, in principle, a useful instrument to analyse the overall *food supply situation* of a country and to identify major production and supply deficits and trends, there are also severe limitations: First and foremost, FBS are only as good and as correct as the data basis is, and this tends to be rather weak in many countries. Second, FBS only provide *average* figures for the whole country and do not take account of any differences in distribution between population groups, households and household members. Third, FBS only show the amount of food available to consumers but not the food actually consumed and the nutrients actually utilised. Therefore, in order to get a more comprehensive and real picture on the food security situation at macro-level, FBS analysis has to be complemented by other methods.

Annex 3 and 4 show an example of a Food Balance Sheet for Tanzania and Sri Lanka.

3.10 Market surveys

There are different types of market surveys. Market surveys can be undertaken as follows:

- Inventory surveys that describe physical and trading conditions in existing markets;
- Traffic surveys to measure the number of vehicles using a market, the mode of transport used and the origin and destination of agricultural produce;
- Socio-economic and environmental impact studies of specific issues or areas; and
- Case studies of small businesses, such as market traders, to investigate their financial viability. This is particularly important in order to evaluate their capacity to pay increased fees, which may be necessary after making improvements or building a new market.

The market inventory survey usually consists of two parts: a general review of market operations and a physical survey, which involves mapping the site and its facilities.

For more complex markets (such as an assembly market) this data should be supplemented by a traffic and origin/destination survey. Where there is a total lack of information on production,

a sample survey of farm households may be necessary, although this level of investigation is probably not appropriate for most rural markets. A count of the existing sellers and observation of the market users' activities, together with discussions with traders, should be adequate for most markets.

3.11 Market Information Systems

A Marketing Information System[12] (MIS) is a structured approach to collecting, analysing and communicating information about markets and marketing. It should increase market transparency for users and enable them to make more informed production and marketing decisions.

An MIS can organize the collection, analysis and dissemination of many different types of marketing data. This is particularly relevant when monitoring information that changes frequently, such as prices, since this is where local producers often have the most difficulty. It is not necessary to monitor prices that are known to remain stable, although participants may want to identify these in their initial situational analysis.

There are unlimited possibilities for the kind of information that can be gathered by a group setting up an MIS. Information collection and analysis implies certain costs, however. Visiting buyers and interviewing them about prices, whether in local markets or farther away, takes time. There also may be costs involved for transport to gather information in more distant markets. It is therefore very important that groups setting up an MIS give careful thought to what kind of information will be most useful to them and focus on the information that is most likely to increase the profitability of their enterprise. This information should be tailored to the specific circumstances of the group which is working to collect it. For example, there may be no use in collecting information from a distant market during the rainy season if the state of the roads makes access to that market virtually impossible.

Participants in an MIS need to take the time to think about what information is really needed and carefully weigh the benefits of having more information versus the cost of collecting it.

When working with a group of people producing goods for sale, it will often be relevant to start with an MIS that gathers information on the prices being paid by consumers (or traders) for the goods MIS participants sell. In most cases, this kind of information is readily accessible, data collection is relatively straight-forward, and analysis is not very difficult. Most important, once the information is gathered, it can usually be put right to use and the participants can see immediate benefits from their efforts. Such a system introduces the MIS concept to the community, demonstrates its utility and galvanizes interest. Once this has been accomplished, it is easier to introduce greater complexity and to consider gathering different kinds of information that will help community members further refine their marketing strategies.

When setting up an MIS with traders who are intermediaries for goods produced by others, a useful approach could be to start by gathering information on consumer preferences. Traders need to know what consumers look for in a product so they can place orders with producers, manage stock and set prices. An MIS that tracks the kind of goods that are being sold offers a simple introduction to the value and operation of an MIS.

Data gathered in an MIS can have many different uses, depending on the needs of the participants. As suggested above, a common MIS activity involves collecting information on the price of a given product in several markets. Such information can be collected by volunteers from the group on a weekly basis. This kind of information can be used in several different ways. It can be posted in

12 Source: http://www.fao.org/DOCREP/005/AC692E/AC692E03.htm#P68_9806, 15.5.2004

a central place so that each week individual producers can determine, the most profitable outlet for their goods. As information is gathered over the course of a year, it can be compiled on a price calendar. This permits participants to begin analysing the best time to market their goods and to calculate whether there might be benefits in storing some products while waiting for the price to rise. When the same kind of data is gathered for several different goods, participants can use the information to analyse which product provides the best returns.

3.12 National Food Storage System Analysis

The aim of a national food storage system is to ensure that consistent and adequate amounts of food are available in all parts of the country at all times (stability). For many years, it has been the government policy to undertake storage of large quantities of grain as a food security strategy. This strategy has aimed at maintaining sufficient strategic reserves to last the country for at least six months, which is considered the average lead time required before imports can arrive to relieve food shortage. A food storage system analysis has to look into the following areas:

- Current storage facilities in the country under the public and private sectors (capacity, location, type)
- Utilization of the facilities and management
- Total capacities with regard to population increase (capacity forecast)
- Food marketing.

3.13 Food crop assessment: pre/post harvest assessment

Food crop assessments review the outcome of the main season crop of a given year and estimate the cereal import requirements for marketing in the coming year. At the same time, these missions, which are jointly undertaken by FAO and WFP, also estimate the food assistance needs over the next 12 months for people affected by crop failure or significantly reduced production according to regions within a given county.

Areas covered by these types of assessments are:

- Food and agriculture in the macro-economic context (role of agriculture in the country's economy using indicators like GDP per capita in US $, annual growth rate of total GDP in %, Debt in billion US $, Debt service ratio in % of goods/service exports, Foreign reserves in million US $, Agricultural GDP as % of total GDP, Agr. GDP real growth rate in %, Agr. exports, annual growth rate (value), Agr. exports as % of total exports)
- Food crop production (rainfall, planted areas, yield, production of relevant crops)
- Livestock
- Food supply situation, (export, informal cross-border trade in marketing, food prices)
- Food demand situation
- Food supply/demand balance (using the food balance sheet, see Annex 3 an 4), based on
  - mid-marketing year population
  - forecast of the coming year's production result
  - annual **per capita** consumption parameters
  - estimated seed requirements
  - estimated opening stocks for main food crops
  - Closing stocks for main food crops
- Received food aid.

3.14 Early warning systems

The objective of early warning is to empower individuals and communities, threatened by natural or similar hazards, to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life and damage to property, or nearby and fragile environments[13].

According to the "Guiding Principles for Effective Early Warning" developed by the Secretariat of the International Decade for Natural Disaster Reduction, technologically advanced countries have an obligation to encourage and support early warning practices in developing countries. International bodies and regional organizations must work to maintain the vital importance of timely exchange and unrestricted access of observational data and other warning information between countries, particularly when hazardous conditions affect neighboring countries.

Risk assessment provides the basis for an effective warning system at any level of responsibility. It identifies potential threats from hazards and establishes the degree of local exposure or vulnerability to hazardous conditions. This knowledge is essential for policy decisions, which translate warning information into effective preventive action.

Several international organizations are involved in the preparation and dissemination of warnings, such as FAO, WFP, and USAID. These systems will be explained in the following sub-chapters. For information on other Early Warning Systems, please consult the respective website, such as for Forum for Early Warning and Early Response, London (FEWER) (http://www.fewer.org), the Integrated Regional Information Network (IRIN) (http://www.reliefweb.int/irin) of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Collaboration and coordination is essential between scientific institutions, early warning agencies, public authorities, the private sector, the media, and local community leaders to ensure that warnings are accurate, timely, meaningful and can result in appropriate action by an informed population.

3.14.1 Global Information and Early Warning System (GIEWS, FAO)

The GIEWS (Global Information and Early Warning System)[14] was established in 1975 and is managed by FAO in close cooperation with Governments, other UN and international agencies, research institutions and Non-Governmental Organizations (NGOs). Since then, it publishes regular bulletins on food crop production and markets at the global level and situation reports on a regional and country-by-country basis. The System aims to provide policy-makers and policy-analysts with the most up-to-date information available on all aspects of food supply and demand, warning of imminent food crises, so that timely interventions can be planned. To achieve this, the system

- monitors food supply and demand in all countries of the world on a continuous basis;
- compiles and analyses information on global production, stocks, trade and food aid, and monitors export prices and developments on major international grain exchanges;
- reacts to man-made and natural disasters by sending rapid evaluation missions to the countries affected and issuing Special Alerts Reports, which are quickly disseminated to the international community:

13 see also: IDNDR Secretariat, Geneva October 1997: Guiding Principles for Effective Early Warning, http://www.gfz-potsdam.de/ewc98/ 21.7.2004.

14 for more information, see http://www.fao.org/giews/english/giews.htm

– reports to the international community through its regular publications (e.g. "Food Outlook"), once-off reports and internet server;

– responds to specific requests for information from Governments, NGOs, research institutions and individuals;

– provides early warning information and promotes new early warning approaches;

– promotes global food information-sharing and database-coordination between Governments, NGOs, other UN agencies, research institutions, the international public and individuals;

By monitoring food production, supplies, stocks, imports, prices, markets and demand at global, regional, national and sub-national levels, GIEWS provides a comprehensive picture on the food situation, on structural as well as acute and anticipated food deficits. In some countries, governments and/or other organizations also operate national Food Market Information and/or Early Warning Systems.

3.14.2 Famine Early Warning Systems Network (FEWS Net, USAID)

The Goal of the **Famine Early Warning Systems Network**[15] **(FEWS NET)** is to strengthen the abilities of African countries and regional organizations to manage risk of food insecurity through the provision of timely and analytical early warning and vulnerability information. It assists in establishing more effective, sustainable, and African-led food security and response planning networks that reduce the vulnerability of at-risk groups.

FEWS NET's approach is designed to:

– strengthen African capacity for early warning and response planning,

– increase usefulness of information to decision makers,

– improve response planning based on relevant background food security information,

– improve response planning based on early warning information and the identification of food insecure groups,

– improve local monitoring and analysis.

The Famine Early Warning Systems Network (FEWS NET) is the principal activity in this food security information-based approach to preparedness and planning.

Analytical framework is the **Food Economy Analysis**, which is designed to help decision-makers understand the effects of different 'shocks' on household-level livelihood options. The food economy framework organizes information about people living in rural and urban households and connects it to decision makers providing different types of assistance in support of their livelihood.

This **livelihood-based** framework for analysis starts with the proposition that to understand how people will be affected by any change, it is necessary to first understand how their livelihoods are structured, and hence, which aspects of that livelihood will be vulnerable to specific changes.

The food economy approach employs 'static' baseline profiles to model or predict potential food shortages for different groups, using variable **hazard** information obtained from the national monitoring system. The predicted food security **outcome** is analysed using the current hazard information (which is constantly changing) in relation to the baseline profile (which tends to

15 http://www.fews.net/about/index.cfm

remain fairly stable). This means that analysis takes place more quickly, and with more rigor than in the past. **Food Economy Baselines** are the necessary tools to generate this information.

Food economy baselines are built up through intensive field work, using a rigorous, structured approach; shock information is derived from a myriad of traditional sources (national agricultural monitoring systems, remote sensing data, price monitoring systems, etc.) and where necessary, gaps are filled through targeted field enquiry. The **outcome analysis** is conducted in various ways, depending on the analyst, but increasingly, systematic **food economy spreadsheets** are used to store baselines and run outcome analyses.

A Food Economy Baseline is a quantitative representation of the different food and cash income options available to different types of households in a particular geographic area. Food Economy Baseline information is typically presented in a baseline report and stored as well in a designated food economy spreadsheet designed to facilitate food security outcome analysis.

There are two core sets of information encompassed in a baseline. The first set is information on access to food in a baseline year for different economic groups (e.g. poor, middle, rich) in a particular area. The second set is information on the coping steps utilized by different households to increase their access to food in response to a problem.

Figure 3 presents an example of a very condensed FEWS outcome.

3.14.3 Vulnerability Assessment Mapping (VAM, WFP)

Vulnerability Analysis & Mapping (VAM)[16] is an essential instrument for WFP to target its interventions. Specifically in emergencies there is an urgent need for information about the quantity of emergency aid needed. VAM helps the Agency answer these questions through five activities:

- **Geographic targeting:** assessing the degree of food (in)security of specified geographic areas, so that WFP can determine where to prioritise further assessment and response.
- **Problem assessment:** understanding the probable causes of food insecurity and vulnerability, which can exist at any given time in a particular geographic region or population group.
- **Beneficiary assessment:** determining the characteristics of food insecure and vulnerable populations, and whether food assistance can improve their conditions.
- **The role of food aid:** identifying whether the use of food aid represents a comparative advantage in addressing the basic causes of food insecurity and vulnerability among a targeted population.
- **Advocacy for the hungry poor:** assisting the hungry poor by accurately representing their conditions to others who may be able to provide assistance.

Information from VAM activities is fed directly into WFP program decision making through specific sections of WFP Country Strategy Outlines, Country Programs and emergency and recovery program documents.

The final products of VAMs are analytical reports and assessments, maps and databases.

Used information sources are:
- satellite images showing agro-climatic conditions,
- secondary data on education, health & nutrition status,
- market prices,

16 after http://151.99.241.13/vam_old/about_vam/what.html

– face-to-face discussions with members of food insecure communities,
– household coping behaviours, such as selling off livestock or jewellery to buy food.

Main instruments of the VAM are the SAF (Standard Analytical Framework for Food Security and Vulnerability Assessment) from which a set of standard guidelines are derived to be used for the analysis. SAF includes two major areas: food security and vulnerability.

Applied measurements for food security are

– **Aggregate food availability** in a specified area: Are the food stocks already in, or brought to, the area from all sources – local and national production, international imports – and distributed by whatever method – markets, food aid, gifts – sufficient to meet human consumption requirements in that area?

– H**ousehold food access:** do the amount and timing of a household's income, food production and entitlements give all its members the means to acquire enough food to meet consumption requirements?

– **Food utilisation:** will the quantity, type, and quality of food consumed be sufficient to maintain an active and healthy life?

– Measurements to assess vulnerability that are used are:

– **Exposure to risk:** a factor of the frequency, probability of occurrence, and severity of impact of natural/man-made hazards.

– **Ability to cope:** determined by the existing level of food security and the ability of vulnerable groups to offset income and food production losses caused by natural/man-made hazards, then transferred into a vulnerability graphic

3.14.4 Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS)[17]

The World Food Summit mandated the establishment of a Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) program to provide detailed information about food insecurity and vulnerability on global and national levels[18]. The FIVIMS draws on many existing information systems, such as crop forecasting and early warning systems, household food security and nutritional information systems, and vulnerability assessment and mapping systems. FIVIMS operates on both national and global levels. Nationally, it provides a link for existing information systems that gather and analyse relevant data, ranging from health and climate to market and household food and nutrition security. Globally, it is coordinated by an inter-agency working group (IAWG), with FAO as its secretariat. The IAWG supports the national-level systems and is working to establish a common database and information exchange network. Its members include United Nations agencies, bilateral aid agencies, and international and non-governmental organizations.

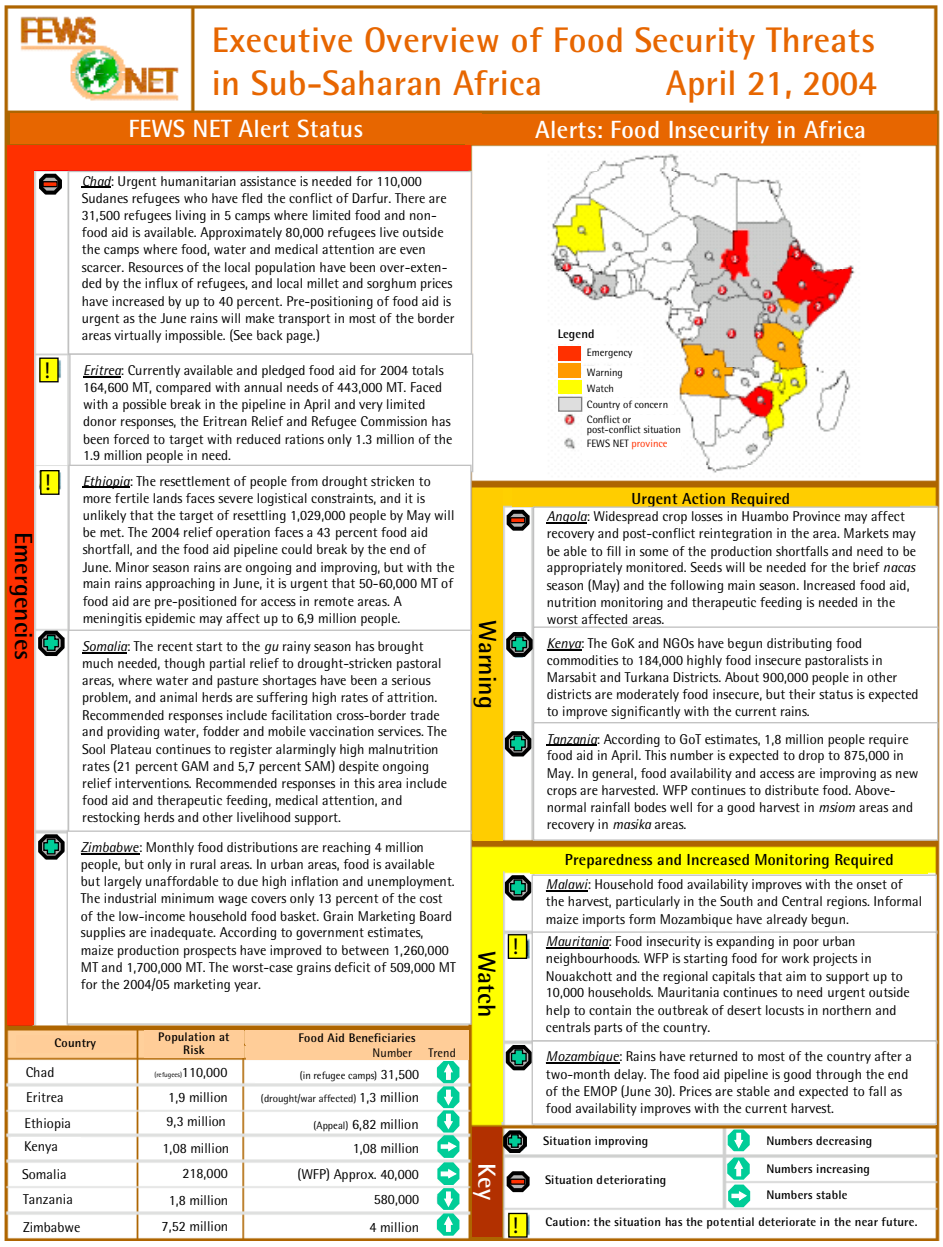
Member countries of the Committee on World Food Security (CFS) have been requested to designate national focal points for FIVIMS. The main functions of these focal points are to establish a collaborative mechanism involving all operating systems that produce or use information and statistics relevant to FIVIMS.

17 http://www.fivims.net/static.jspx?lang=en&page=fivims

18 The establishment of FIVIMS replaced the former FAO approach to calculate an "Aggregate Household Food Security Index" for different countries

FIVIMS will make a major contribution to the common UN country planning process through the Common Country Assessment (CCA) and the United Nations Development Assistance Framework (UNDAF) exercises.

Figure 3: Example of a FEWS outcome: Food Security Threats



Source: http://www.fews.net/learning/activities/report/?g=1000420&i=1013

Core Functions of FIVIMS are therefore

– Development of a consensus among donors and technical agencies on best practices in food and nutrition security information system work at country level and across a variety of socio-economic circumstances;

– Insistence on greater co-ordination among donor and technical agency efforts in food and nutrition security information system work, especially in the poorest countries, since duplication of effort can not be justified;

– Linking information systems to remedial action programs and evaluating the impact of these combined programs on real reductions over time in the number of undernourished (in the shorter run) and the number of the poor and vulnerable (in the longer run)

By combining data on access, availability, stability and utilisation, the FIVIMS provides estimates of existing food deficits, of the number of the chronically food insecure and vulnerable people at national and global level, and on the dynamics and changes of food insecurity over time, including impacts of short-term "shocks", such as war, natural disaster or financial crises. Records of national efforts to identify population groups particularly prone to food insecurity and malnutrition are made, using data about food access with analysis of data about weight and height of young children. A first report of the results of this exercise was published by FAO in 1999[19].

3.15 Conflict Analysis[20]

Experiences of past years have shown that food and nutrition insecurity is often cause by (armed) conflicts or even wars. As food aid even may exacerbate conflicts it is important to know the reason for the conflict, the specific impact on food and nutrition of the concerned population and specifically the stakeholders involved. Conflict analysis therefore is one of the key pre-requisites for successful intervention in conflict situations to get an in-depth understanding of the local situation to be able to conclude on impact at national level.

The **purpose** of conflict analysis in a development-policy context is to devise strategies, programs and projects which respond sensitively to a conflict in a particular country and hence make a certain contribution to reducing or resolving the conflict. Conflict analysis can be performed at the country level and at the project level. Whereas at the country level the aim is to develop long-term political strategies of conflict management and to manage entire project portfolios, at the project level the primary focus is on the local impacts of the conflict or on local conflicts themselves.

Conflict analysis can assist in dealing with the following types of questions:

– What is the risk of conflict and violence in the specific region? What negative effects on possible project activities can be anticipated? How can these be reduced?

– What risks do the project activities hold in terms of potential exacerbation of the conflict? How can these be avoided (risk appraisal)?

– Where are there possible starting points for constructive conflict management and/or peace-building? How can these be integrated into the project?

Two types of conflict analysis at macro level can be distinguished:

19 FAO, 1999, 2001, The state of food insecurity in the world, see references. The table of content of the report is attached as Annex 5; it can be downloaded under http://www.fao.org/sof/sofi/index_en.htm

20 Adapted from http://www.gtz.de/crisisprevention/download/conflictanalysis.pdf , 19.7.2004.

Indicator-based conflict analysis

These methods use checklists with qualitative and quantitative crisis and conflict indicators. Depending on how the instrument is aligned, the indicators relate to structural causes of the conflict, factors precipitating the conflict (accelerators and triggers) and the intensity of the conflict. Normally these are derived from research in the fields of political science and peace studies, and are claimed to be universally applicable. The indicator frameworks are often associated with the creation of an index, which is used as a basis for measuring conflict risk, conflict intensity or the significance of certain conflict causes.

Indicator-based analysis schemes are mainly used in **early warning**[21], where they assist in detecting potential for conflict and risks of violence. Checklists are also used to **identify** conflict causes or **problem areas** on which development cooperation is hoped to have a positive influence. – Indicator-based analysis is primarily used at the country level. It requires little empirical survey work and is thus principally suited for use at head offices of development organisations. It can be performed by an individual country adviser or project desk officer with good knowledge of the country on the basis of publicly accessible information sources.

Universally applicable indicators can only begin to capture the full complexity of any particular conflict. Although structural conflict causes can be covered by checklists to a certain degree, they provide no information about the interests of and relationships between the parties to the conflict. They therefore provide only limited guidance on the planning of projects intended to prevent crises and build peace.

Strategic conflict analysis

Approaches based on strategic conflict analysis are more open than indicator-based methods. They invite the user to examine a range of topics such as contextual conditions, structures, institutions, actors, attitudes etc. in connection with the conflict. As well as this, individual conflict factors such as security, politics, economics, social structure, culture and external influences are examined more closely. These approaches often provide analytical instruments for answering individual questions. The aim in all of this is not precise measurement but the identification of connections and trends. Strategic conflict analysis is action-oriented and often includes specific stages for conflict-sensitive planning. It can be used at macro and micro level.

Peace and conflict impact assessment – PCIA[22]

Peace and Conflict Impact Assessment (PCIA) is an overarching term that can be used, prior to the programming of aid (Macro level) and project planning (Micro level), for the ongoing impact monitoring during the implementation of interventions, or for post program and project evaluation.

At the country level, the national implications of the conflict and attempts to develop long-term political strategies of conflict management are examined. Information about possible and necessary country portfolio adjustments is gathered.

A comprehensive description of this method can be found in the methodfinder in the internet: http://www.methodfinder.de/

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21 Special "conflict" early warning systems are Eurasianet (http://www.eurasianet.org), International Alert (http://www.international-alert.org), Integrated Regional Information Network (IRIN) of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), (http://www.irinnews.org), etc.

22 developed and described by SLE, Berlin.

The Conflict Analysis Framework (CAF)

The Conflict Prevention and Reconstruction Unit of the World Bank has developed a Conflict Analysis Framework (CAF) to enhance conflict sensitivity and conflict prevention potential of World Bank assistance. The CAF analyzes key factors influencing conflict, focusing on six areas:

- social and ethnic relations;
- governance and political institutions;
- human rights and security;
- economic structure and performance;
- environment and natural resources; and
- external factors.

For each area, a set of questions and indicators has been developed that guide the analysis. Each of these categories consists of several variables, each with corresponding indicators. The indicators are qualitative and serve as a guide in explaining the essence of the variable. With the help of the indicators, the variable's impact on a country's conflict and link with poverty is estimated:[23].

Tools for conflict analysis

Describing all tools that meanwhile are available to analysis conflict situation (see table 2) would go beyond the scope of our paper. For further information please refer to the following literature and internet links:

Table 2: Tools for conflict analysis

– conflict profile
– conflict phases
– timeline
– conflict arena
– conflict mapping
– conflict pyramid
– conflict layer model
– conflict tree
– conflict pillars
– trend analysis
– conflict scenario
– capacities and vulnerabilities analysis
– institution analysis
– capacity analysis
– do no harm analysis

Source: Leonhardt, 2001

23 For more details, see http://lnweb18.worldbank.org/ESSD/sdvext.nsf/67ByDocName/TheConflict-AnalysisFrame-work/$FILE/CAFAugust03.pdf

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Annexes

Annex 1: Indicators used in the Swaziland Household Income and Expenditure Survey[24]

Indicator	Unit of measure
Demographic indicators	
Sample size (households)	Number
Total population	000s
Population below 15 years	Percent
Population 60 years and above	Percent
Age dependency ratio	Percent
Number of males per 100 females (age 15 and over)	Number
Average household size	Number
Education and literacy	
Net primary enrolment rate (total) – male – female	Percent
net secondary enrollment rate (total) – male – female	Percent
Literacy rate (total) – male – female	Percent
Head of household	
Marital status of head – Monogamous male-headed – Polygamous male-headed – Single male-headed – De facto female-headed – De jure female-headed	Percent
Education level of head – no level – primary not completed – completed primary, no secondary – Secondary not completed – Completed secondary / higher level	Percent
Malnutrition (children aged 0 to 59 months)	
Stunting	Percent
Wasting	Percent
Underweight	Percent
Labor market (population aged 15 to 64)	
Number of employed people in sample	Number
proportion of employed	Percent

24 Source: http://www4.worldbank.org/afr/poverty/measuring/indicators/swz_95.htm

Indicator	Unit of measure
Branch of activity – Agriculture/Fishing – Manufacturing/Mining/Construction – Commerce – Civil servant/Army – Other sector	Percent
Labor force participation (total) – male – female	Percent
Household expenditure	
Mean per capita expenditure	ooos
Population below relative poverty line	Percent
Share of food in total expenditure	Percent
Household amenities	
Type of fuel for cooking – firewood – gas, kerosene – charcoal – electricity – other	Percent
Access to sanitation	Percent
Access to water – pipe/borne – well – other	Percent
Owner occupancy rate	Percent

Source: Swaziland Household Income Expenditure Survey, 1994.

Annex 2: Questionnaire for the Living Standard Measurement Survey (LSMS)

Module	Respondent	Subject
Household Questionnaire		
Household Composition	Head of household / principal respondent	Household roster, demographic data, information on parents of all household members
Consumption Modules		
Food Expenditures	Best-informed household member	Food expenditures in the past 14 days and past 12 months; consumption of home production in past 12 months.
Non-Food Expenditures	Best-informed household member	Expenditures in the past 14 days and past 12 months; remittances to other households
Housing	Head of household / principal respondent	Type of dwelling; housing and utilities expenditures
Durable Goods	Best-informed household member	Inventory of durable goods and their characteristics
Income-related Modules		
Non-farm self-employment	Best-informed household member for each of three businesses	Income, expenditures, and assets for three most important household businesses
Agro-pastoral activities	Best-informed household member	Land, crops, income, and expenditure from raising crops and animals; livestock and farm equipment inventory
Economic Activities	All household members 7 years and older (all adults must respond for themselves)	Employment, income, and time data for the main and secondary jobs in the last 7 days and the last 12 months; employment history; unemployment spells in the last 12 months; time use in the home
Other income	Best-informed household member	Income from other sources, including remittances from other households
Saving and credit	Best-informed household member	Savings and net debt the day of the interview; characteristics of outstanding loans to and from household members
Sectoral Modules		
Education	Head of household / principal respondent	Completed schooling and schooling expenditures for all household members 5 or older; schooling and other information of all non-member children under 30
Health	All household members (parents respond for young children)	Utilization of health services and medical expenditures for any illness in the last four weeks; utilization of and expenditures for preventive services in the last 12 months
Migration	All household members 15 years and older	Place of birth, time and current place of residence, and reasons for first and last moves
Fertility	One randomly selected woman 15 years or older	Birth history; use of maternity services and duration of breastfeeding for last live birth
Anthropometrics	All	Height and weight measurements of all household members

Module	Respondent	Subject
Community Questionnaire		
Demographics	Community leader	Size, growth, ethnic mix
Economy and Infra-structure	Community leader	Economic activities, access to roads, electricity, water, public services such as public transport, mail service, etc.
Education	Headmaster or Community leader	Location and characteristics of schools serving community
Health	Health workers or Community leader	Location and characteristics of health facilities serving community
Agriculture	Extension agent or Community leader	Location and characteristics of health facilities serving community
Price Questionnaire		
Market, shops	Community	Prices on frequently purchased items

Source: World Bank, http://www.worldbank.org/lsms/guide/describe.html

Annex 3: Tanzania – Food Balance Sheet, June 1998 – May 1999 ('000 tonnes in cereal equivalent)[25]

	Maize	Sorghum and Millet	Rice	Wheat	Pulses	Roots & tub.	Bananas	Total food
Domestic Availability	3 034	585	677	153	419	2 292	777	7 937
Opening stocks	212	10	18	57	7	0	0	304
Production	2 822	575	659	96	412	2 292	777	7 633
Total utilization	3 034	817	677	165	406	2 128	722	7 949
Consumption	2 348	746	509	136	359	1 813	506	6 417
Other uses/losses	432	71	33	5	31	206	215	993
Exports 1/	70	0	100	5	5	2	1	183
Closing stocks 2/	184	0	35	20	11	107	0	357
Deficit/surpluses	0	(- 232)	0	(- 12)	13	164	55	(- 12)
Imports	0	0	0	12	0	0	0	12
Cross substitution	0	232	0	0	- 13	- 164	- 55	0

1/ Includes informal, unrecorded cross-border net exports.

2/ Closing stocks of roots and tubers refer to crops standing in the field.

25 Source: http://www.fao.org/waicent/faoinfo/economic/giews/english/alertes/1998/Srtan986.htm#E61E3, 10.5.04

Annex 4: Sri Lanka Food Balance Sheet

COUNTRY Sri Lanka YEAR 2000 POPULATION 18,924,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	TOTAL	FEED	SEED	PROCESSING	WASTE	OTHER USES	FOOD	KILOGRAMS PER YEAR	PER DAY CALORIES	PER DAY PROTEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Grand Total													**2405**	**54.1**	**46.3**
Vegetable Products													2249	40.3	38.0
Animal Products													155	13.8	8.3
Cereals - excluding Beer	**1943**	**1042**	**64**	**3**	**3047**	**88**	**61**	**4**	**144**	**5**	**2744**	**145.0**	**1276**	**28.5**	**2.4**
Wheat		891	0	1	891	0		0	17	2	872	46.1	321	10.1	0.9
Rice (milled equivalent	1907	15	64	3	1983	0	60	0	122	0	1801	95.1	921	17.6	1.2
Barley - excluding beer		8	0	0	8	0		4			4	0.2	2	0.1	0.1
Maize	31	127		0	158	88	1		5	3	61	3.2	29	0.7	0.3
Rye		0		0	0						0	0.0	0		
Oats		0			0						0	0.0	0	0.0	0.1
Millet	5	2		0	7		0		0		6	0.3	3	0.1	0.0
Sorghum	0	0			0		0		0		0	0.1	0	0.0	0.1
Cereals, other		0		0	0	0					0	0.1	0	0.0	0.0
Starchy Roots	**349**	**141**	**0**	**6**	**485**	**75**	**7**		**32**	**13**	**359**	**19.0**	**65**	**0.6**	**0.1**
Cassava	249	20		5	264	62			12	13	176	9.3	39	0.2	0.0
Potatoes	48	121	0	0	169		7		17	0	146	7.7	20	0.3	0.0
Sweet Potatoes	52	0			52	13			3	0	36	1.9	6	0.1	0.0
Roots, other		1	0	1	0						0	0.0	0	0.0	0.0
Sugarcrops	**1066**	**0**			**1066**			**589**			**477**	**25.2**	**20**	**0.1**	**0.1**
Sugar Cane	1066	0			1066			589			477	25.2	20	0.1	0.1
Sweeteners	**65**	**617**	**-80**	**0**	**602**	**0**				**19**	**583**	**30.8**	**310**	**0.0**	**0.0**
Sugar, Non-Centrifugal	1				1						1	0.1	1	0.0	
Sugar (Raw Equivalent)	64	610	-80	0	594	0				18	575	30.4	307		
Sweeteners, other		7		0	7					0	7	0.4	3	0.0	0.0
Honey		0		0	0						0	0.0	0		

F O O D B A L A N C E S H E E T

COUNTRY Sri Lanka YEAR 2000 POPULATION 18,924,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	TOTAL	FEED	SEED	PROCESSING	WASTE	OTHER USES	FOOD	KILOGRAMS PER YEAR	PER DAY CALORIES	PER DAY PROTEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Pulses	**21**	**132**		**0**	**152**		**1**		**5**		**147**	**7.8**	**73**	**4.6**	**0.3**
Beans	12	15		0	26		0		1		25	1.3	13	0.9	0.0
Peas		22		0	22				1		21	1.1	10	0.7	0.0
Pulses, other	9	95		0	104		0		3		101	5.3	50	3.0	0.2
Treenuts	**15**	**0**	**0**	**7**	**9**						**15**	**0.8**	**3**	**0.1**	**0.3**
Oilcrops	**2363**	**10**	**0**	**539**	**1834**	**0**	**1**	**395**	**1**	**120**	**1317**	**69.6**	**289**	**3.0**	**26.0**
Soyabeans	1	3		0	4	0	0	3	0		0	0.0	0		
Groundnuts (Shld Eq.)	5	4		0	9		0	8	0		0	0.0	0	0.0	0.0
Rape and Mustardseed	0	1		0	2	0	0		0		2	0.1	1	0.1	0.1
Coconuts - incl. Copra	2353	1	0	539	1814			383		120	1311	69.3	284	2.8	25.6
Sesameseed	5	1	0	0	6		0	1	0		5	0.2	4	0.1	0.3
Olives		0			0						0	0.0	0		0.0
Oilcrops, other		0	0	0	0					0	0	0.0	0	0.0	0.1
Vegetable Oils	**55**	**93**	**-5**	**5**	**139**					**88**	**50**	**2.7**	**65**	**0.0**	**7.3**
Soyabean Oil	1	1	0	0	1						1	0.1	2		0.2
Groundnut Oil	3	0		0	3						3	0.1	3		0.4
Sunflowerseed Oil		0		0	0						0	0.0	0		0.1
Rape and Mustard Oil		0	0	0	0						0	0.0	0		0.0
Palmkernel Oil		4	0	0	4					3	1	0.1	2		0.2
Palm Oil		79		0	79					79					
Copra Oil	44	8	-5	5	43					5	39	2.0	50		5.6
Sesameseed Oil	0	0		0	0						0	0.0	0	0.0	0.1
Olive Oil		0			0						0	0.0	0		0.1
Ricebran Oil	6				6						6	0.3	7		0.8
Maize Germ Oil		0			0						0	0.0	0		0.0
Oilcrops Oil, other	1	0		0	2					2					

F O O D B A L A N C E S H E E T

COUNTRY Sri Lanka | YEAR 2000 | POPULATION 18,924,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	TOTAL	FEED	SEED	PROCESSING	WASTE	OTHER USES	FOOD	KILOGRAMS PER YEAR	PER DAY CALORIES	PER DAY PROTEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Vegetables	**629**	**145**		**10**	**763**		**17**	**0**	**86**		**660**	**34.9**	**32**	**1.3**	**0.2**
Tomatoes	44	3		0	47				7		40	2.1	1	0.1	0.0
Onions	79	126		0	205		17		14		174	9.2	15	0.5	0.0
Vegetables, other	505	16		10	511			0	65		446	23.6	16	0.8	0.1
Fruit - excluding Wine	**832**	**54**		**24**	**861**			**0**	**93**		**771**	**40.7**	**78**	**0.6**	**0.2**
Oranges, Mandarines	5	13		0	18				2		17	0.9	1	0.0	0.0
Lemons, Limes	21	0		0	21						21	1.1	1	0.0	0.0
Grapefruit		0		0	0						0	0.0	0		
Citrus, other		0		0	0										
Bananas		0		0	0										
Plantains	615				615				62		554	29.2	62	0.5	0.1
Apples - excl. Cider		15		0	15						15	0.8	1	0.0	0.1
Pineapples	42	0		3	39				6		33	1.7	1	0.0	0.1
Dates		10		0	10						10	0.5	3	0.0	0.1
Grapes - excl. Wine		11		0	11						11	0.6	1	0.0	0.0
Fruit, other	149	4		22	132			0	24		110	5.8	9	0.1	0.0
Stimulants	**319**	**6**	**-6**	**288**	**31**			**0**		**0**	**32**	**1.7**	**3**	**0.4**	**0.1**
Coffee	10	0		0	10			0			10	0.5	1	0.1	
Cocoa Beans	4	2		0	5						5	0.3	1	0.1	0.1
Tea	306	4	-6	288	15					0	16	0.9	1	0.2	
Spices	**43**	**46**	**0**	**18**	**71**				**1**		**70**	**3.7**	**31**	**1.2**	**1.0**
Pepper	17	0		5	12						12	0.6	5	0.2	0.0
Pimento		23		0	23				1		22	1.2	9	0.4	0.4
Cloves	2	0	0	1	1						1	0.0	0	0.1	0.0
Spices, other	25	22		12	35						35	1.8	17	0.6	0.6

F O O D B A L A N C E S H E E T

COUNTRY Sri Lanka YEAR 2000 POPULATION 18,924,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	TOTAL	FEED	SEED	PROCESSING	WASTE	OTHER USES	FOOD	KILOGRAMS PER YEAR	PER DAY CALORIES	PER DAY PROTEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Alcoholic Beverages	**22**	**10**		**0**	**31**					**8**	**23**	**1.2**	**3**	**0.0**	
Wine		1		0	0						0	0.0	0		
Barley, Beer	18	1		0	18						18	0.9	1	0.0	
Beverages, Fermented		0		0	0						0	0.0	0		
Beverages, Alcoholic	4	1		0	5						5	0.3	2		
Alcohol, Non-Food		8		0	8					8					
Meat	**98**	**3**	**0**	**0**	**101**			**0**			**101**	**5.3**	**20**	**1.9**	**1.3**
Beef and Veal	31	0		0	31						31	1.7	7	0.7	0.4
Mutton & Goat Meat	2	1		0	3						3	0.1	1	0.1	0.0
Pigmeat	2	0		0	2			0			2	0.1	1	0.0	0.1
Poultry Meat	63	2	0	0	65						65	3.4	12	1.2	0.7
other Meat		0	0	0	0						0	0.0	0	0.1	0.0
Offals	**12**	**0**		**0**	**12**						**12**	**0.6**	**2**	**0.3**	**0.1**
Animal Fats	**2**	**16**		**0**	**17**	**0**				**10**	**7**	**0.4**	**7**	**0.0**	**0.8**
Butter, Ghee	0	1		0	2						2	0.1	2		0.2
Cream		0		0	0						0	0.1	0	0.0	0.0
Fats, Animals, Raw	1	14		0	15					10	5	0.3	5	0.0	0.6
Fish, Body Oil	0	0		0	0	0				0					
Fish, Liver Oil	0	0		0	0					0					
Milk - excl. Butter	**294**	**503**	**0**	**1**	**797**	**7**			**15**		**774**	**40.9**	**70**	**3.6**	**3.8**
Eggs	**52**	**0**	**0**	**0**	**52**		**4**		**3**		**45**	**2.4**	**9**	**0.7**	**0.7**

F O O D B A L A N C E S H E E T

COUNTRY Sri Lanka | YEAR 2000 | POPULATION 18,924,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	TOTAL	FEED	SEED	PRO-CESS-ING	WASTE	OTHER USES	FOOD	KILO-GRAMS PER YEAR	PER DAY CALO-RIES	PER DAY PRO-TEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Fish, Seafood	**280**	**189**	**0**	**12**	**457**	**57**		**0**		**0**	**400**	**21.1**	**46**	**7.2**	**1.7**
Freshwater Fish	31	0	0	1	31					0	31	1.6	3	0.5	0.1
Demersal Fish	40	0		3	37						37	1.9	3	0.5	0.0
Pelagic Fish	185	188		3	371	57					313	16.5	39	5.9	1.5
Marine Fish, other	16	0		0	16						16	0.9	1	0.2	0.1
Crustaceans	7	1	0	5	3			0			3	0.2	0	0.0	0.0
Cephalopods	0	0		0	0						0	0.0	0	0.1	0.0
Molluscs, other	0	0	0	0	0						0	0.0	0	0.0	0.0
Aquatic Products, other	0			0							0	0.0	0		
Aquatic Animals, other	0			0	0						0	0.0	0		
Miscellaneous													1	0.0	0.1

Annex 5: Example of a FIVIMS-Outcome: The State of Food Insecurity in the World Report.

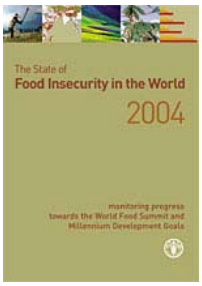


Table of content

Paper IV

Instruments for the Assessment and Analysis of the Food and Nutrition Security Situation at Micro and Meso Level[1]

Maria Gerster-Bentaya

1 This paper is a revision and update using elements from the following papers: Gross 2000: Food and Nutrition: Definitions and Concepts. Hahn 2000: Conceptual Framework of Food and Nutrition Security. Kaufmann 2000: Selection of Indicators for Food and Nutrition Security Programs. Kaufmann 2000: Assessment within the cycle of a FNS program. Hahn 2000: Conceptual Framework of Food and Nutrition Security

Table of Contents

1 Introduction

An assessment of the nutritional situation is essential to determine the nature, extent and causes of food and nutrition insecurity. This assessment typically is guided by the following questions:

– Who is food-insecure or at nutritional risk?

– Where are the food insecure populations located and thus where should interventions be located in order to maximize impact to reduce food insecurity?

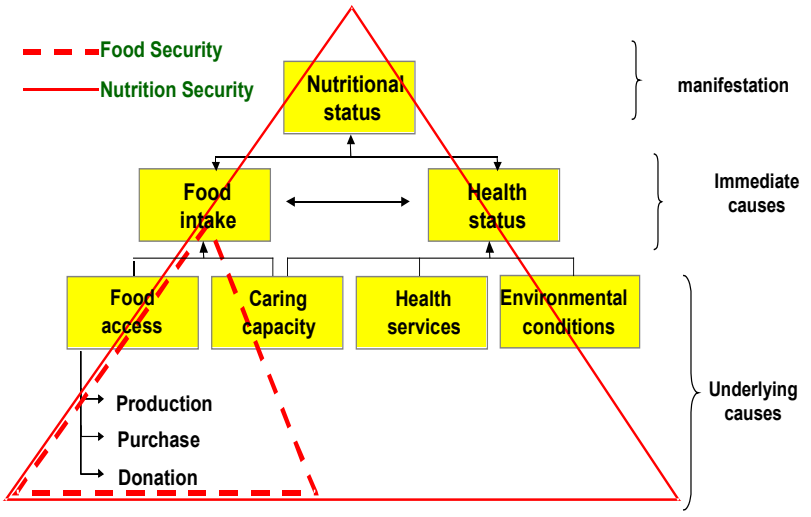
– Why are they food and nutrition insecure? Or: What interventions will have maximal impact on improving the security situation?

Only based on such an assessment and a deeper analysis of the causes, is it possible to design interventions believed to improve the situation? To assess the situation we have to use indicators to measure various aspects related to food and nutrition security. While indicators at macro level are mostly used by national governments to monitor the food and nutrition security or poverty situation of a whole population, indicators at micro level provide important information which can be used to design adequate food and nutrition interventions within a food and nutrition insecure region.

2 Indicators to assess the Food and Nutrition Security Situation at micro and meso level

Indicators are essential in the initial phase of a program, since they provide the basic information required for appropriate planning, targeting and monitoring. For evaluation purposes indicators allow the assessment of changes over time and the evaluation of the impact of a program.

Figure 1: Conceptual framework of the nutritional status at household level



Source: Gross, R. et al. 2000, following UNICEF 1990.

The presentation of the indicators for assessing and analysing the food and nutrition situation in a given region/country is based on the UNICEF conceptual framework of nutritional status at household level presented in BGP I. This begins with a description of the impact indicators of malnutrition (manifestation), expressing the nutritional status. In the next part, indicators are presented which are used to assess the immediate causes of malnutrition (food intake/consumption and health status), followed by indicators related to the underlying causes (food availability, caring capacity, health services and environmental conditions).

2.1 Indicators for measuring the nutritional status at household level – the manifestation of malnutrition[2]

Anthropometric indices represent the cumulative effect of access to food, health, education and environmental health conditions. Therefore, the **nutritional status** is a powerful indicator of nutrition security and well being of an individual and reflects the nutritional and poverty situation of a household. Especially the nutritional status of pre-school children is a sensitive indicator, because children are most vulnerable to nutritional imbalances. The most commonly used indices are weight-for-height, height-for-age, weight-for-age and mid-upper arm circumference. Except for the latter, all anthropometric measurements taken are compared to a well fed reference population, the NCHS (National Centre for Health Statistics[3]) reference population. Cut-off points are expressed as z-scores or percentage of median. The z-score uses the standard deviation of median of the reference distribution for a given weight or height as a unit. The index expressed as z-score represents the difference between the observed value and the median value of the reference population. The percentage of median is calculated by dividing the observed value by the median weight or height of the reference population and multiplied by 100. Both indices can be calculated by using reference tables or by using appropriate computer software (WHO 1996, WHO 1983, MSF 1995).

Table 1 gives an overview of the indicators, followed by a more detailed description.

Table 1: Manifestation of malnutrition and food insecurity

Groups	Malnutrition Problem	Brief Explanation	Indicator
Children	**Stunting**	Growth retardation, „chronic malnutrition" (poverty)	Low height/age
	Wasting	„Acute malnutrition", hunger	Low weight/height
	Underweight	Malnutrition	Low weight/age
	Low MUAC (mid-upper arm circumference)	Thin mid-upper arm circumference (hunger)	MUAC < 13,5 cm (or 12,5 cm), MUAC/height
	Low birth weight (LBW)	Intrauterine growth retardation	Birth weight < 2500 g
	Marasmus	Clinical manifestation of severe malnutrition	Very low weight/height or weight/age
	Kwashiorkor	Clinical manifestation of severe malnutrition	(Nutritional) Oedema
	Overnutrition	High energy intake	BMI between 25 and 30
	Vitamin A deficiency	Xerophthalmia	Prevalence of low serum retinal in pre-school children, night blindness

2 Based on papers written by Hahn 2000 and Kauffmann 2000

3 http://www.cdc.gov/nchs/nhcs.htm

Groups	Malnutrition Problem	Brief Explanation	Indicator
Children	**Iodine deficiency disorders (IDD)**	Physical and mental retardation due to iodine deficiency (cretinism in severe cases)	Total goitre rate (TGR) among school children, low urine iodine excretion
	(Nutritional) Anemia	In most cases iron deficiency (but also other micronutrients and other causes involved)	Prevalence of low hemoglobine levels
Adults	**Chronic energy deficit**	Hunger	BMI (body mass index) < 18.5
	Overnutrition	High energy intake	BMI between 25 and 30
	Obesity	Very high energy intake	BMI > 30
	Vitamin A deficiency	Xerophthalmia	e.g. night blindness and other
	Iodine deficiency disorders (IDD)	Goitre (enlargement of the thyroid size)	E.g. Low urine iodine excretion
Esp. women	**(Nutritional) Anemia**	In most cases iron deficiency (but also other micronutrients involved)	Low hemoglobine level

Source: adapted from Weingaertner, 2003[4]

The **height-for-age** index, also called **stunting**, expresses the height of a child in relation to his age. In cases of nutritional stress, the speed of growing is slowed down. Even in times of healthy nutrition the growth failure cannot be corrected entirely. Linear growth is a good indicator for general development, providing information on long-term changes in the environment and their nutritional consequences. It shows long-term deprivation. Portions of the population falling below two standard deviations of the reference population are at high risk, and should be classified as being below the absolute poverty line (MSF 1995, WHO 1996, Care 1996, GTZ 1997)

The **weight-for-height** index expresses the weight of the child in relation to his height. It reveals whether a child is thin or not. However, it does not discriminate between 2 children of the same height and weight, one being older than the other one, and possibly being too short for his age. The index, also called **wasting**, means acute or current malnutrition at the time of the survey. The weight of a child can change tremendously in a short period of time. A child exposed to nutritional stress may lose up to 20% of his body weight within a few weeks and this can be corrected rapidly if the nutritional situation improves. For emergency programmes the weight-for-height index is recommended. Children below -2 z-score or below 80% of the median are classified as being wasted. Children who are below -3 z-score or below 70 % of median are at severe risk. A prevalence rate within a surveyed population of more than 5% under the cut-off point is of concern, and a prevalence of more than 10% is regarded as a serious public health problem which needs to be tackled immediately (MSF 1995,WHO 1996, Care 1996).

The **weight-for-age** index expresses the weight of a child in relation to his age. The index does not differentiate between two children of the same age and weight, one being tall and wasted and the other one being shorter and not wasted. The indicator, also called **underweight**, is less powerful to assess the nutritional status, since it also does not make any differentiation. However, it is easy to measure and performs well for growth monitoring at community level or clinics, and is therefore a good way to assess the nutritional evolution of an individual over time (WHO 1996).

A **very low weight-for-height or weight-for-age** index expresses an existing clinical manifestation of severe malnutrition, and is called **Marasmus**. It is one of the three forms of serious protein-energy malnutrition (PEM) mainly in young children at the time of weaning. These forms of malnutrition are frequently associated with infections, mainly gastrointestinal infections.

4 prepared for the InWEnt/GAA/GTZ training course on Food and Nutrition Security

Nutritional Oedema, swelling of legs and feet, are an indicator for severe nutritional deficiencies over a long period of time (Jelliffe 1989). Children suffering from oedema, also called **Kwashiorkor** urgently need treatment. Nutritional oedema in adults only appears during severe famines.

Mid-upper-arm-circumference (MUAC) also assesses the actual nutritional status of a child. MUAC can be quickly measured and requires simple equipment (a tape measure), but is subject to higher measurement errors and is therefore less reliable. Where measuring weight and height is not feasible, MUAC is an adequate substitute. Children showing an arm circumference of less than 13.5 cm are classified as being at risk, children with less than 12.5 cm at severe risk. Weight-for-height and MUAC are strong predictors for mortality in the near future (WHO 1993). However, recent research has proved that MUAC related to weight or age does give more precise information than the MUAC based on a fixed cut-off point (Mei et al. 1997).

The **Body-Mass-Index** (BMI) of adults has increasingly become more accepted as an important indicator for good nutrition of adults. Usual measurements are weight and length, generally calculated as body-mass-index (BMI: (weight in kg) divided by (length in metres squared)). A BMI over 18.5 indicates adequate nutrition, a BMI below 16 clearly shows chronic **energy deficiency**. A BMI between 16 and 18.5 requires more detailed information on food consumption. This also applies when a BMI is above between 25 and 30, which indicates **overnutrition**. A very high energy (**obesity**) intake is expressed by a BMI of > 30 (WHO 1996).

The **micro-nutrient deficiency** situation should be assessed for planning appropriate action. **Vitamin A deficiency (VAD)** increases risk of infections, causes various skin and eye diseases and may lead to growth retardation and blindness. To detect VAD at an early stage expensive biochemical analysis is necessary. The existence of a local word for night blindness within a community and the extent to which this word is known indicates the presence of VAD. A simple and functional indicator is the appearance of night-blindness in children.

Iodine deficiency (IDD) leads to retarded mental development and cretinism. It is most easily recognised by enlarged thyroid glands in mothers or older school children. But not every case of an enlarged gland can be interpreted as iodine deficiency. However, if there are many persons with swollen thyroid glands, it can be concluded that there is an endemic iodine deficiency. The total **rate of goitre (TRG)** is an indicator for the duration and severity of iodine deficiency in the population (GTZ 1997, Jellife 1989). A more accurate measurement is the **urinary excretion of iodine (UIE)**, which is a recommended method when measuring school children.

Low hemoglobine level indicates **(nutritional) anemia**[5] **(iron deficiency)**, which increases the risk of infections and reduces the level of mental and physical activity. Specifically women between puberty and menopause are at higher risk for iron deficiency anemia than men and women of other age groups. Pregnancy also places extra iron demands on women. Symptoms of anaemia are caused by inadequate oxygen reaching important organs, such as your muscles, heart, and brain. As a consequence, your heart and lungs have to work harder to deliver oxygen to these organs. The symptoms are loss of stamina, shortness of breath, rapid heart beat, paleness, headache, worsening of symptoms of other diseases, such as Angina (heart pain from inadequate oxygen) and claudication (cramping in muscles when they are being used). Iron deficiency anaemia can be measured by haemoglobin concentration in the blood. Various simple and quick test systems, suitable for use in the field, are available on the market for medical equipment (GTZ 1997).

All indicators listed above are assessable at individual level.

Infant and child mortality rate (IMR, CMR). The IMR gives the number of infant deaths before the age of 1 year, divided by the number live births within the period of one year. The CMR gives

5 http://www.womenandinfants.com/body.cfm?id=388&chunkiid=19079

the number of deaths of children below 5 years, divided by the number of live births within the period of one year. Its exact determination requires proper health statistics and a large sample size (GTZ 1989). However, when doing a household survey mothers could also been asked about the number of children they have given birth to and the number of children who died between the ages of one and five. This indirect technique would cover the reproductive live-span of the mothers surveyed, rather than the actual situation during the last year (GTZ 1997).

Low-birth-weight rate (LBW) is defined as the number of live births with **birth-weight less than 2500g** divided by the total number of live births with recorded birth weight. LBW is a result of intra-uterine growth retardation and indicates severe malnutrition or poor health of pregnant women. It predicts future undernutrition and potential health problems particularly in the first year of life. LBW indicates the overall nutrition and health situation within an area. Areas showing high rates need intensive health and nutrition intervention with special attention to infants and women. Low birth weight rates have to be collected from district health statistics (GTZ 1989, WHO 1996).

2.2 Indicators for measuring the immediate causes of malnutrition

People's nutritional status is influenced by their food consumption and their health status. The above-mentioned indicators also provide a first indication on whether the causes of malnutrition are food or health related or both.

2.2.1 Food consumption indicators

Food consumption is one of the first direct influences of the nutritional status of a person. Beside food availability and access, other factors determine the actual food consumption of an individual and household. Such factors could be time availability, especially of women, access to food processing technology (mills, dryers, stoves), food storing capacity, skills and knowledge on food preparation, availability or access to cooking tools or fuel. Additionally, the control over budget and household resources by women is an important factor (FAO 1990). Indicators of food consumption serve as out-come indicators for food availability, access and other underlying indicators listed above. (This last sentence is not very clear)

Various methods do exist to measure food consumption. Comprehensive food consumption surveys are time intensive and complex, especially if weighing or recall methods are used (Haddad 1994). In addition, seasonal variations make the data hard to interpret. Therefore, indicators which are easy to collect should be chosen. Most common in FNS programmes are food consumption surveys assessing the number of food items consumed during the day rather than the quantity consumed (FAO 1990, Maxwell 1992, Care 1996). Easily assessable indicators are:

- **number of meals**, especially number of meals for children and number of meals for women compared to men,
- **numbers of different** food items consumed, which can be aggregated by food groups, such as number of animal products, fat or protein rich food items, number of Vitamin A rich foods, number of ingredients,
- **frequency of most common food items** (categorised as daily, weekly, monthly, seasonally or never) serves as a powerful indicator (GTZ 1997),
- **frequency of consumption of famine food or wild foods** indicates poor or food insecure households (Care 1996),

– **number of meals consisting exclusively of staple food** is a suitable indicator in very poor societies,

– **amount of staple food consumed per consumption unit**, from which the energy intake derived from staples, can be calculated.

– **percentage** of households consuming **minimum daily caloric requirements**.

However, long term planning of adequate project measures requires detailed data on the **coverage of the daily nutrient requirements**. It is therefore recommended to conduct food consumption surveys within a small sub-sample that represents the entire population. In doing so the percent of **coverage of energy, protein, and fat requirements** is of particular concern. Special consideration should be given to the **intra-household food distribution**; between women and men, old and young household members. **Breastfeeding practices, weaning habits, child feeding practices** as well as **food pattern of pregnant** and **lactating women** are important to be taken into account when planning appropriate action targeted towards the highest risk groups. They are also reliable indicators to monitor and evaluate the success of nutrition promotion activities (Oxfam 1995). In addition, results of participatory assessment methods can indicate times and severity of **seasonal or periodical food shortages** (coping strategies, pre-harvest food pattern).

In mountainous areas, where the iodine content of soil and crops grown is low and sea-food is uncommon, the **consumption of iodised salt** is necessary to meet the requirements of an individual. The consumption of iodised salt is a valid and simple indicator for the iodine situation. The iodine content of the salt can easily be assessed at household level by using a rapid test kit (GTZ 1997).

2.2.2 Indicators for health status

According to UNICEF[6], the following indicators are used to measure the health status:

– newborns with birth weight at least 2.5 kg (%)

– children with acceptable weight for age (%)

– infant mortality rate per 1,000 live births

– probability of dying before reaching 5th birthday per 1,000 live births (%)

– maternal mortality rate per 100,000 live births

– total life expectancy at birth (years)

– male life expectancy at birth (years)

– female life expectancy at birth (years)

– HIV prevalence

– In addition, the prevalence rate of most common diseases, such as
  - diarrhoea,
  - malaria
  - fever and
  - acute respiratory infections (ARI),
  is a strong indicator and is simple to assess. All diseases are usually widespread, accurately recognised and recorded by the caretaker (FAO 1990). However, most infectious diseases show a seasonality. Information should therefore be collated with health statistics (hospital data) and participatory assessments methods, e.g. seasonal calendar of diseases, etc.

6 http://www.unicef.org/infobycountry/stats_popup1.html

More indicators can be found under http://www.unicef.org/infobycountry/stats_popup1.html.

2.3 Indicators for measuring the underlying causes of malnutrition

Following the UNICEF/Gross model on causes of malnutrition, the second layer of underlying causes are environmental conditions, utilisation and quality of health services, caring capacities and practices as well as food availability and access to food at household level. The following indicators should be regarded as a checklist that can be used to compile the survey.

2.3.1 Indicators/issues for food security (access to food) at household level

Household food security can be described as the capacity of a household to procure adequate food on a sustainable basis (Care 1996). A distinction can be drawn between chronic and transitory food insecurity (FAO 1997). Transitory food insecurity occurs when households face a temporary decline in availability or access. Temporary food insecurity can be divided into cyclic or seasonal. Food may be procured from home production, through gathering, through purchase or through public or private transfers or social mechanism that buffer households from periodic shocks (Care 1996, FAO 1997). A number of different variables can be used to assess household food security.

The resources necessary for gaining **access to food** are food production, income for food purchases, or in-kind transfers of food (whether from other private citizens, national or foreign governments or international institutions). That enough food is available (**food availability**) is determined, aside from own household production, by the market supply originating from the combination of domestic food stocks, commercial food imports, food aid and domestic food production.

Dietary energy supply[7] indicates the food available for human consumption, expressed in kilo calories per person per day. At country level it is calculated as the food remaining for human use after deduction of all non-food consumption (exports, animal feed, industrial use, seed and wastage). Total number of calories available is divided by the number of people in the country to give a national level of dietary energy supply.

Household calorie insufficiency[8] indicates whether a certain household falls below a certain calorie consumption requirement. Specifically, a household's calorie availability is compared to a requirement that is based on its age and sex composition. The extent of calorie insufficiency (by how many calories a household falls below its requirements) gives a sense of the severity of food insecurity in households categorised as "food insecure".

Indicators reflecting food availability include inputs and measures of agricultural production (including all resources), access to natural resources, institutional development, market infrastructure and exposure to conflicts. Indicators reflecting access to food are various means or strategies used by households to cover their basic food needs, such as economical activities, indebtedness. These strategies vary between region, community, social class, ethnic group, gender and season (Maxwell 1992). The lower the own food production is, the more important are the economic activities of a household. Accordingly, the food and nutrition security situation in urban areas depends to a higher extent on the economic activities of a household.

Specifically one may look at the following areas:

– Production related indicators
  - availability/scarcity of and access to land – according to gender
  - household food production (crop, livestock)

7 http://unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=430

8 see Smith, 2002, 7.

- Insufficiency of labour
- Techniques for driving and managing livestock herds
- Farming techniques
- availability/shortage of seed
- climate: rainfall (amount, distribution), temperature (average, variations throughout the year) wind, flood
- Pests and noxious animals
- Soil quality (impoverishment)
- Common animal and plant diseases
- availability of and access to other production related resources

– Coping strategies in food shortage situations:
  - Wild crops gathered
  - field labour
  - short-term jobs
  - exchange of food items with other families
  - sell some animals
  - send some household members to stay with relatives
  - share cropping
  - pre-harvest food practices

– Socio-cultural and institutional aspects:
  - Historical profile of food security
  - Social organisation and hierarchy at village / community level
  - Status of women
  - Exodus of young people
  - Migration
  - Conflicts / rebellion

– Socio-economic stratification (using criteria of well-being, such as
  - number of animals
  - food stuff self-reliance (such as permanent food reserves)
  - being capable of assisting the needy in periods of crisis – by means of loans or gifts and donations

– Purchasing power
  - principal economic activities
  - additional income-generating activities
  - monetary liquidity
  - indebtedness
  - income from exchange of household production and labour
  - savings, assets and reserves

– Economics / market / trade
  - market use (use of income that is not spent for consumption requirements; added value products)
  - prices, price fluctuations
  - supply / demand
  - market distance,
  - access to markets in the context of violent conflict.

– Exchange

Food and nutrition security at household level is determined by the food security and economic situation at higher socio-organizational levels; community, district, provincial or suburb, metropolitan and national level. Consequently, evaluations of the food security and economic situation at household level need to take statistics from higher levels into consideration.

Some of the indicators described above are also used for monitoring food security crisis (Maxwell 1992). **Leading indicators** give warning of future crisis (estimated crop production, rainfall). **Concurrent indicators** reflect the actual situation; food consumption, asset sales, increased coping strategies (e.g. eating wild foods, reducing food rations, credits taken to purchase food). **Trailing indicators** give information about the extent and impact of current crisis. They include the nutritional status, diseases, migration etc. (Care 1996)

2.3.2 Indicators/issues for caring capacity

Caring capacity, the second underlying cause of malnutrition, is the provision in households and communities "of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members" (ICN 1992). Examples of caring practices are child-feeding, health seeking behaviours, support and cognitive stimulation for children, and care and support for mothers during pregnancy and lactation. The adequacy of such care is determined by the caregiver's control of economic resources, autonomy in decision-making, and physical and mental status. Decisive to execute control is the caretaker's status relative to other household members. Additional influences are women's workload, time availability for food preparation, the time available for child caring practices, seasonal changes in time availability, knowledge on food preparation, beliefs etc. A final resource for care is the caretaker's knowledge. According to the situation, the number of household members could also be a meaningful indicator for the caring capacity (for an in depth study see Smith and Haddad 1999).

UNICEF (1997) mentions six areas of aspects of care for mothers and children

- Care for women
- Breastfeeding/feeding
- Psycho-social care
- Food processing
- Hygiene practices
- Home health practices

The following paragraphs will explain the various issues in more detail and give indications on how to assess these aspects:

Care for women

- During pregnancy and lactation (provision of extra amount of family food, workload reduction and support, facilitating prenatal care and safe birthing, postpartum rest)
- Reproductive health (delayed age at first pregnancy, support for birth spacing)
- Physical health and nutritional status (provision of a fair share of family food at all ages, protection from physical abuse)
- Mental health, stress and self-confidence (reduction of stress, enhances self-confidence and esteem, protection from emotional abuse)
- Autonomy and/or respect in the family (adequate decision-making power, access to family income, assets and credit)
- Workload and time (shared workload)

– Education (support of equal access to school for girls, support of women's access to information)

Breastfeeding/feeding

– Exclusive breastfeeding (exclusive breastfeeding for six months, initiation within first hour after the birth, breastfeeding on demand, of breast milk expression, protection from commercial pressures for artificial feeding)

– Complementary feeding and sustained breastfeeding (timely introduction of complementary foods, breastfeeding into the second year, adequate complementary foods in energy and nutrition density as well as quantity, frequent feeding)

– Active complementary feeding practices (adaptation to psychomotor abilities for feeding, feeding responsively, adequate feeding situation)

– Adaptation to family diet (ensuring adequate intra-household food distribution, appropriate response to poor appetite in young children)

Psycho-social care

– Responsiveness to developmental milestones and cues (adapting behaviour to child's developmental level, attention to low activity levels and slow development of child)

– Attention, affection, and involvement (frequent positive interactions: touching, holding, talking, maintenance of valuable traditional practices)

– Encouragement of autonomy, exploration and learning (encouragement of playing, exploration, talking, adoption of a teaching or guiding role)

– Prevention of and protection from child abuse and violence

– Treatment after psycho-shocks due to war, displacement and violence

Food processing

– Household food preparation, cooking and processing

– Food storage & Food hygiene

Hygiene practices

– Personal hygiene practices (hand washing, bathing and cleaning the child)

– Household hygiene practices (cleaning of house and children's play area, adequate disposal of child's wastes, use of sanitary facilities, making water safe, and choosing safe water)

Home health practices

– Home management of illnesses (prevention of illness, diagnosing illness, providing home treatment)

– Utilisation of Health services (preventive and promotive health services, timely seeking of curative health services)

– Home-based protection (control of pests (mosquito nets, rat-traps), avoidance of accidents (burns, falls, bites), prevention of abuse/violence)

Care for HIV/Aids affected persons[9] (See for more details Annex 1)

– Who is affected by HIV/AIDS, in what ways and why?

– Who takes care of orphans and older persons

2.3.3 Indicators/issues for health services

The third underlying determinant of the nutritional status is the availability of a functioning health service. It has a direct impact on morbidity and mortality and in consequence on the nutrition status. Furthermore, a key issues is the knowledge of the caretaker on health and nutrition related topics (specifically child feeding practices and hygiene) that impact indirectly.

To get information on health services at individual and household level, the utilisation of health care services and their quality as well as the financing and resource allocation of the household are areas to be looked into.

– Health Care Utilisation and Quality
  - General Coverage
  - Immunisation coverage, specifically the immunisation rate of children under 1 year
  - Reproductive health care coverage
  - Antenatal care coverage
  - Safe delivery coverage
  - Contraceptive prevalence
  - Quality of care: availability of essential drugs, satisfaction with healthcare system
  - Gender mix of health personnel

– Health Care Financing and Resource Allocation:
  - Households' burden of payment for health care
  - Participation as health care workers

2.3.4 Indicators/issues for environmental conditions

The last cause of malnutrition refers to the environmental conditions. They play a crucial role in influencing the nutritional status via the health situation. They are determined mainly by the availability of safe water, sanitation, and environmental safety, including shelter. Water and sanitation improvements, in association with changes in hygiene behaviour, can have significant effects on population and health by reducing a variety of disease conditions such as diarrhoea, intestinal helminths, guinea worm, and skin diseases. These improvements in health can, in turn, lead to reduced morbidity and mortality and improved nutritional status. (see Billig et al 1999).

A further key factor affecting all underlying categories of causes is **poverty**. A person is considered to be in (absolute) poverty when the person is unable to satisfy his or her basic needs – for example, food, health, water, shelter, primary education and community participation – adequately (Frankenberger 1996). The effects of poverty on child malnutrition are pervasive. Poor households and individuals are unable to achieve food security. They have inadequate resources for care and are not able to utilize (or contribute to the creation of) resources for health on a sustainable basis.

Finally, the general socio-economic and political conditions of a country influence the determinants of nutrition (and poverty). These include the potential resources available to a country or community, which are limited by the natural environment, access to technology, and the quality of human resources. Political, economic, cultural, and social factors affect the utilization of these

9 see for more details: FAO (ed.), 2003: Incorporating HIV/AIDS consideration into food security and livelihood projects. Rome.

potential resources and how they are translated into resources for food security, care and health environments and services (see Smith and Haddad 1999).

– Integrity of water supply:
  - access to safe water supply
  - vulnerability to faecal contamination
  - reliability of the existing supplies
  - protected water supply (unprotected springs/wells to streams and rivers)
  - bacteriological quality of water
  - options for alternative water sources and their quality (River water, rainwater harvesting
– Risk of vector borne diseases
– Sufficiency of sanitation
  - environmental hygiene
  - use of latrines
  - households applying hygiene practices etc.
– Procedures for solid waste disposal
  - place of household waste disposal
– Socio-cultural influence on health
  - health knowledge
  - sexual initiation
  - harmful traditional practices
  - protective behaviours
  - household characteristics
  - marriage/sexual unions

3 Instruments and methods to assess the Food and Nutrition Security at micro and meso level

Food intake and the health status are identified as immediate determinants of the nutritional status as presented in the framework. Measurements will therefore enable one to make inferences about the nutritional status.

Following the conceptual framework as presented above, we start with the outcome of food and nutrition security, the nutritional status.

At **micro level** agricultural production surveys, intra-household food frequency interviews, immunization surveys, and anthropometric surveys in children under five can be used to assess the availability, accessibility, and utilization of food and its stability.

At the **meso or sub-national level**, food market surveys provide data on the availability of food, and qualitative surveys, such as food focus group discussions, provide other information on the accessibility of food for those in greatest need. District health surveys describe health conditions that may reflect food utilization problems. For quantitative situation analysis, food and nutrition security programs assisted by GTZ use the standardized BASELINE survey method.

In the following, some instruments and methods will be described in more detail.

3.1 Anthropometry

Anthropometry is the body measurement for use in classification and comparison. It is used to assess nutritional status of a person and to monitor e.g. the growth of children. Measurements that are taken, such as weight, height, MUAC (middle arm circumference) are described under 2.1.

3.2 Food consumption surveys – individual dietary surveys

Individual-level dietary intake information is particularly useful for studying special subgroups of population, such as pregnant women, infants, the elderly, or persons in special circumstances, such as refugees or hospital patients. The main objective is to study the nutritional adequacy of diets in relation to requirements. This approach may also be necessary when it would be incorrect to assume that food is equally distributed within the household according to each member's needs, and there are individual family members who may be at a higher risk than others (Ferro-Luzzi 2002). These surveys are necessary to identify nutritional shortcomings during different times and within a given area to establish appropriate measures to tackle the problem.

Individual surveys provide data on the amount of foods or food categories consumed by the selected individual over the period covered by the survey. This period may be in some recent or less recent past, or may be concurrent to the survey. The survey may also uncover additional information, such as

- the daily episodes when the specified foods have been consumed,
- whether they were home-produced or bought and in such cases also the commercial label,
- the way foods were cooked,
- the place where they were consumed,
- whether there was edible wastage,
- etc.

Tables of food composition are used to calculate the energy and nutrient content of the consumed foods.

To measure **individual intake** two main categories of methods can be classified: the *retrospective* reporting of intake from the recent or remote past, and the *prospective* recording of consumption, see Table (Ferro-Luzzi 2002).

Table 2: Typology of individual dietary survey methods

Category	Methods
Retrospective intakes, questionnaire based	Dietary history Food-frequency 24-h-recall
Current intakes	Dietary records Chemical analysis of duplicates

Source: after Ferro-Luzzi 2002, 23

The 24 h recall measures the food intake of an individual during the immediately preceding 24 hours by asking detailed questions. It estimates the **actual or current** food intake, as recalled from memory (e.g. What did you have for breakfast this morning). If the procedure is limited to one interview per respondent, information is limited to the food intake during that particular day. However, day to day or seasonal variation might be high for most areas or people and current

intake is not usual intake. Therefore, 24 h recall often is combined with other methods (Hartog 1995).

The **dietary history** estimates the usual dietary intake over a period of time (e.g. what do you usually have for breakfast). The amounts are recorded in common household measures. If an individual does not have a constant eating pattern, the method is not appropriate. The dietary history needs to be cross checked using a list of all food items consumed in a three days period. Dietary history and cross checking give a good picture of food intake for a group of individuals over a period of past time. Food intake can be related to the nutrition status (Hartog 1995).

An appropriate method to assess **food consumption pattern of a household** is the **food frequency** method. Giving the frequency (daily, weekly, monthly, seldom or seasonally, never) of common foods consumed within a household. This method does not allow one to obtain an exact picture of the nutrient intake of each household member. But it allows a qualitative statement on potential nutritional problems (GTZ 1997).

There are two more methods for assessing household food consumption patterns (FAO 1997):

Dietary records list present intake or estimate current food intake during one or more days. The amounts of food eaten can be weighed or estimated using common household measures. It gives a fairly clear picture of the actual food intake. However, recording may alter the usual food pattern (Hartog 1995).

For the **chemical analysis of duplicates**, all foods consumed, including beverages, over the stipulated number of days have to be provided. The duplicates are collected either via an exact weighted replica of all the foods consumed, or as an aliquot of each of the servings, or as a posteriori, on the basis of the records of a dietary survey, aliquots of all raw food ingredients that have been eaten by the person. At the end of the survey, the container is brought to the laboratory, weighed, homogenised and chemically analysed for the nutrient of interest. As this method is very cumbersome and costly, it is seldom used (Ferro-Luzzi 2002).

All methods have specific advantages and disadvantages. Very often a **combination of methods** might give better information. A combination of dietary history and current recording gives information of a food pattern in the past and a more exact picture of current food intake (Hartog 1995).

Inventory method: measuring household stocks at certain times and additionally recording all foods brought into the household over a period of three to seven days.

Food accounts: keeping records of all foods and amounts purchased during a certain period. This is appropriate in urban areas where households do not produce food.

In order to avoid time and resource intensive assessments, consumption surveys can be conducted using sub-samples representing the entire population.

3.3 Laboratory methods

Laboratory methods are used to detect decreased levels of nutrients in body tissues or fluids, or decreased activity of an enzyme that is nutrient-dependent. One example of a "laboratory" method which potentially could be put into use more generally is the detection of anemia by hemoglobinometry. It is detected by the red blood cell count or the concentration of the oxygen binding molecules of hemoglobin (Hb) in the blood. This and other laboratory methods are usually invasive as they involve taking samples directly from a person that are not immediately accessible (such as blood, urine), and therefore poorly suited for routine use in a program situation.

3.4 (Nutrition) Baseline Survey

The Nutrition Baseline Survey is a standardised methodology providing objective data that can be used to assess, monitor and evaluate the nutritional and/or poverty situation of a population. The objective of many nutrition or poverty related development projects is to improve the nutritional status and the overall living conditions of marginalized populations. To achieve this objective, it is necessary to determine the nature, magnitude and causes of malnutrition and to define risk groups which need adequate interventions.

The Nutrition Baseline Survey combines internationally used techniques and procedures, which have been tested in various projects, to collect data directly from the people in the communities. Two main methods are designed for data collection:

– A standardised questionnaire which includes standardised socio-economic and health related questions, and

– Anthropometric measurements, which include weight and physical measurement of children and adults in order to calculate anthropometric indices for nutritional classification (see above chapter 2.1 for more details).

On the basis of adequate and simple statistical tests and standardised procedures of analysis, these methods describe nutritional problems within a population (e.g. chronic and acute malnutrition) and the determinants of the identified problems. Finally, the methodology provides a comparable data base for monitoring and evaluation purposes during project implementation.

Implementing a Nutrition Baseline Survey takes several weeks or months and requires specific skills to design and apply the questionnaire as well as to analyse the collected data.

The information of a baseline survey is used to set benchmarks for further references and serves as a data base for cross-sectional comparison within the country and the project target groups. Once this information has been gathered and analysed, the findings should be taken back to the surveyed community and be used to initiate discussions and raise awareness about their existing nutritional problems. Additionally, these indicators are applied for project monitoring and evaluation purposes.

Based on the Guideline for Nutrition Baseline Surveys in Communities a computer programme has been developed by GTZ and the University of Hohenheim. It contains a module for creating or adjusting the suggested questionnaire, for data entry, plausibility check, analysis and presentation of information. For additional description and analysis of the results, the programme is linked to Excel and SPSS Computer Programme. The programme is available in a windows version and can be obtained from the World Wide Web (www.nutrisurvey.de). Please visit this site for more information.

However, a comprehensive nutritional baseline and follow-up survey as recommended should only be considered for a project in which the **objective** is the improvement of the nutritional situation. For projects only expected to have a **positive impact** on the nutritional situation, but not specifically targeted to improve the nutritional situation, only selected nutrition indicators should be assessed. In such cases, modified project specific baseline surveys should be made.

Further description is available in the internet at www.methodfinder.de

3.5 Rapid Food and Livelihood Security Assessments (RFLS)

Care International also recommends two surveys with similar objectives and contents: Rapid Food and Livelihood Security Assessments (RFLS) and Rapid Nutritional Assessments (RNA).

These assessment methods use quantitative as well as qualitative survey methods (Care 1996). In 1990 FAO developed a field manual for conducting small-scale nutrition surveys. This survey, which predominantly uses quantitative assessment methods, focuses on food production and nutritional status. However, health aspects are not particularly covered (FAO 1990). However, the training manual for food security of FAO developed in 1997 additionally stresses the importance of measuring the food consumption at household and individual level to understand the overall picture of the food situation in the country (FAO 1997).

3.6 Food system analysis

Food distribution and consumption are the main foci of the surveys presented above. It is also important to know how people deal with their food. Food ethnography studies the food culture of people, of which the food system is an integral t component. The food system consists of:

– food supply: food production, gathering, purchasing and exchange, gifts, food aid

– food preservation and storage, and

– food preparation.

A food system includes the way in which people chose, consume and use available foods, in response to habits. Habits are influenced by social, cultural, economical and ecological pressure. Data of food systems are most commonly collected by interviewing and observing the population (Hartog 1995).

3.7 Qualitative assessments of the Food and Nutrition Security situation

Qualitative assessments on villager's perception about their nutritional situation and living conditions should complement the quantitative results of the baseline survey. For this purpose methods can be used which are similar to those, which were suggested for the phase of project identification. Differences between qualitative assessments during the project identification and conceptualisation phase are seen in the greater number of communities to be covered, a wider range of subjects to be assessed and consequently a larger number of tools to be used. Sessions should also be conducted with various sub-groups of a community, men and women, older population younger population, wealthy households, and poor households to understand the heterogeneity of nutritional and poverty problems and causes with in the communities. To initiate a nutrition communication process within the communities, methods used should moreover consist of participatory assessment or learning methods rather then isolated rapid appraisals or assessment methods. Participatory assessment procedures empower people to take over an active role in analysing problems and drawing up plans, with outsiders only acting as facilitators. Appropriate tools are Participatory Rural Appraisals, participatory learning methods, focus group discussions and other rapid assessment procedures (RRA Notes on health and nutrition, GTZ 1994, Scrimshaw and Hutardo 1987), as well as gender analysis tools.

Further description is available in the internet at www.methodfinder.de

3.7.1 Rapid Assessment of Nutrition (RAN)

RAN stands for Rapid Assessment of Nutrition[10] for poverty and/or nutrition related Project / Programs in developing countries. RAN is an exploratory method for initial assessment of the absolute poverty and the nutritional situation during project identification (e.g. pre-feasibility

10 see http://www.methodfinder.de, 16.5.2004

study). Once a project idea is considered to be relevant for project/program development within a deprived region or population, RAN is to be carried out before the decision about the purpose or nature of the evaluated project is made. This method normally is realised by an interdisciplinary team and is recommended where problems in different areas are to be discussed as causes of the poverty situation. RAN offers a set of methods for data collection:

- Analysis of existing data, use of results of local surveys or data bases from relevant public or private institutions.
- Interviews with national, provincial or district planners.
- Talks with the local resource persons.
- Transects (compare Transect method in MethodFinder).
- Group discussions with the potential target population.

These methods provide an overview of the situation in which the main facts are summarized and causes of the preliminary problems are defined. The final conclusion describes the degree of concern for the particular nutritional problems.

Malnutrition remains the most adequate indicator for assessing the poverty situation and nutritional vulnerability within a region. Therefore, RAN has integrated the study of body stature of schoolchildren into the project identification phase because these findings reflect the poor conditions and food insecure situation of the communities. (http://www.methodfinder.de for more information)

3.7.2 PRA tools and techniques

- **Resource map** (or land use map), making it possible to inventory the resources of the area and to observe any changes occurring in the utilisation of these resources;
- **Social map**, enabling an inventory of social, economic and cultural infrastructures in the community. This map provides information on the community's level of organisation and equipment, e.g. existence of a market, co-operatives, grain banks, etc.;
- **Historical profile of food security**, providing information about significant events that have impacted economic, political and social life in the community.
- **Venn diagram**, making it possible to inventory internal and external organisations in the area and to explain the links existing between them. It allows in particular for an evaluation of the level of social cohesion in the community and its impact on food security;
- **Polarisation diagram**, making it possible to measure the influence that an area has on its immediate surroundings, for example, that of villages with a market or with administrative headquarters;
- **Prioritisation diagram**, which classifies problems and solutions according to degree of importance and the priorities of local populations;
- **Semi-structured interview** checklist, which is attached to each tool and which allows for a free discussion of topics with local populations
- **Problem tree** for structuring the problems according to core problem, effects and causes.
- **Participatory observations** about the living conditions of local populations, for example, relating to activities in practise, products consumed or sold on the market, state of food security, condition of livestock, prices, incomes, etc.;

– Annual or **seasonal calendar**, providing information about the staggering of activities throughout the seasons and/or year, as well as about the state of available food reserves;

– **Socio-economic stratification profile** enabling inhabitants to classify themselves according to socio-economic categories: well-off, poor, destitute, etc. This profile provides information about levels of affluence and poverty:

– **Revealing proverbs** and idioms, providing information about the community's deepest thoughts – about relations between man and woman, about production, famines, droughts, etc.

3.7.3 Crisis analysis focused instruments

It is not always necessary to invent new methods because already existing methods can be used to focus on crisis analysis. Table 1 shows how current PRA tools can be used.

Some examples may highlight how to use these tools in the context of a crisis analysis:

– **Conflict mapping:** The conflict mapping method entails producing a graphical representation of the conflict actors, their relationships and the respective conflict issues. As well as the parties directly involved in the conflict, this should also take account of other groups which are allied with the parties or which are able to influence them. This helps the observer to identify patterns of power, alliances, neutral third parties, potential partners for cooperation and possible points where influence could be exerted. It is therefore important to include your own organisation and its relationships with the various actors as well.

– **Conflict scenario:** The conflict scenario is a useful method in confused situations where it is difficult to foresee how the conflict will develop in the future. Scenarios should always be drawn up in cases where there is a danger of rapid violent escalation and, associated with that, a humanitarian crisis. By producing a conflict scenario the organisation is able to prepare itself in advance for certain developments, in particular potential crises, and make plans accordingly. If the envisaged situation does then arise, the organisation can fall back on existing strategies. The scenario approach emerged due to dissatisfaction with conventional planning methods, which were considered too inflexible to allow an appropriate response to be made to crises and take advantage of opportunities for peace.

– **Do-no-harm-analysis:** Do-no-harm-analysis is used to support risk appraisal in development projects, and can also be used for the evaluation of impact assessment. The Do No Harm principle works on the premise that in every conflict there are factors that separate people from each other (dividers) and factors which bond people to each other (connectors). These factors can appear in a number of areas: structures and institutions, attitudes and actions, values and interests, experiences and symbols. Development organisations have the task of supporting the connectors and weakening the dividers.

For further information on conflict analysis tools, please consult Leonhardt 2001, to be downloaded under http://www.gtz.de/crisisprevention/download/conflictanalysis.pdf

Table 3: PRA tools for crisis situation analysis

Level	Issue to be examined	PRA tools
Household	Family structures and social capital	Semi structured interviews (with men and women young people and older people) Participatory observation
	Livelihood	
	Men and women old and young	
	Local institutions and networks	
	Violence Conflict settlement in the village	
Village	Course of the conflict	Timeline
	Causes and consequences of the conflict (in general)	Village / town history Problem tree Seasonal calendar (especially where conflict escalate on a seasonal basis)
	Mobility and access to resources	Village map Recoure map Transect
	Economics and livelihood	Stocktaking and ranking of economic activities, comparison with situation 5–10 years ago
	Political and social differentiation	Social mapping (particularly including refugees, minorities, ethnic / religious etc. grouping) comparison with situation 5–10 etc. years ago (ethnic cleansing?) Well-being/wealth ranking of individuals (not households), comparison with situation 5–10 etc. years ago
	Local institutions	Venn diagram, comparison with situation 5–10 etc. years ago Institution analysis
	Conflict settlement in the village Violence	Expert interview Case studies Participatory observation
	Behaviour and attitudes	Participatory observation Semi-structured interviews
	Common values	Folklore, poetry, songs, theatre
	Problem analysis Approaches to solutions	Problem ranking Discussion and ranking of approaches to solutions

Source: Leonhardt 1991, 32.

3.7.4 Tools and techniques to mainstream gender

– **Activity profiles**, enabling an inventory of activities of production and reproduction, as well as of activities associated with community management. These profiles also enable observations of current workloads and their impact on the implementation of projects. Furthermore, they provide highly sensitive information about the social division of labour and highlight disparities and discrimination in relationships between men and women;

– **Profiles of access to/control over resources and benefits**; within the context of man-woman relationships. Such profiles provide information about the way in which resources and benefits are utilised and managed within a community. Hence, inequalities and discrimination between men and women show up in the profiles;

– Impact factor profiles, enabling an analysis of any detected gender problems and proposing solutions to overcome them with a view to achieving social equality.

For further information on participatory needs assessment in nutrition and food security, please consult www.methodfinder.de

3.8 Household Expenditure Survey (HES)[11]

The Household Expenditure Survey measures the household food (in)security using three different indicators: (1) the household calorie insufficiency, (2) the degree of vulnerability to future food insecurity, and (3) diet quality based on interviews with household members (men and women). At an aggregated level the HES evaluates the consumption and welfare of a country's population.

For the survey, a systematic, scientific sampling, ensuring a nationally representative sample is done (but likely to be missed: migrants and homeless people, people living in isolated areas with poor infrastructure or in areas with violence due to conflict, food insecure people living in food secure households).

Methods for data collection are based on personal interviews asking people to recall following areas:

– recall expenditures made over a reference period (usually a week, two weeks or a month)

– diary method (used only occasionally) on expenditures made over a reference period

– household calorie availability measures:
  - reported quantities of food
  - reported food expenditures and prices

– food acquirement
  - food purchases, including food purchased and consumed away from home
  - food given to a household member as a gift or as a payment for work
  - home produced food

On the basis of these information the **household calorie availability** is computed out of which several measures of food insecurity can be constructed. Key measures are household calorie insufficiency, depth of calorie insufficiency, diet diversity, percent of total expenditures on food. The strengths and weaknesses of these compared to other food security measurements can be found in annex 2.

3.9 Assessments in emergency situations

Oxfam divides emergency assessments into two broad categories, the **initial**, **general assessment**, to decide whether a situation needs response. Information is collected on the nature and extent of the emergency, local and national policies, resources available and whether local, national and international organisations are able to intervene. Furthermore demographic composition of the population affected and preliminary considerations of the different needs of the particular groups of people are assessed (Oxfam1995). A plan for immediate assistance, financial and staff resources is drawn up based on these findings.

The second step, which may take two weeks or more, is a detailed **technical assessment** to determine exactly what that response should be to cover immediate needs (food, water, health facili-

11 based on: Smith 2002.

ties, shelter, clothing, protection) and long term needs. It includes an exploration of short- and medium term concerns within a broader political context (Oxfam 1995).

A quick and precise **assessment of the nutritional situation** is based on surveillance data, demographic indicators, direct observations, advises from experts and rapid anthropometric surveys for measuring the prevalence of malnutrition. Anthropometric data provide information on the current and changing scale of the problem – how many people are affected and at immediate risk? Which region is affected? Which groups? An anthropometric survey in emergencies concentrates on rapid screening of weight and height indicating wasting, or if this is impractical by measuring MUAC (WHO 1990). Furthermore, information on age, sex and presence of oedema is collected. Additional information required may be measles immunisation status, availability of cooking tools and fuel as well as availability of food. Any additional questions included should be limited in number, precise and easy to measure (WHO 1993, MSF 1995).

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Annexes

Annex 1: Key questions for incorporating HIV/AIDS considerations into food security and livelihoods during the identification & preparation of a project[12]

- How is HIV/AIDS an issue in the area? (Consider HIV prevalence, number of orphans, prevalence of opportunistic infections, number of affected households, etc.
- How is HIV/AIDS recognised as an issue by local people and institutions? (Consider general awareness, as well as policy, programme and project context.)
- What local HIV/AIDS-related knowledge exists and who transmits it? (Consider information related to the recognition of symptoms, home care, local treatment, taboos, myths, etc.)
- Who are the important institutional stakeholders in relation to HIV/AIDS? (List those involved in prevention, care and mitigation of impact. Indicate the level they are operating at, their coverage, their activities relating to nutrition and household food security, their constraints, and their collaborators)
- Who are the important community stakeholders in relation to HIV/AIDS? (List those involved in prevention, care and mitigation of impact, indicate who participates in terms of gender status, etc.)
- Who is affected by HIV/AIDS, in what ways and why? Consider
  - people (e.g. orphans, the elderly, chronically ill adults, adolescents)
  - households (e.g. sex and age of household head, households fostering orphans, socio-economic status, access to assets)
  - communities (e.g. urban, peri-urban, rural, access to resources, farming systems, market opportunities)
  - institutions (e.g. schools, extension services, health care, orphanages, extended family, community organisations, financial service providers)
- How does HIV/AIDS contribute to poverty, food insecurity and malnutrition?
- How do poverty, food insecurity and malnutrition affect the development of AIDS in people who are HIV-positive?
- How do poverty and food insecurity affect the spread of HIV/AIDS within the community?

12 FAO (ed.) 2003: Incorporating HIV/AIDS consideration into food security and livelihood projects. Rome,

Annex 2: Strengths and weaknesses of the household expenditure survey (HES) method of food security measurement compared to four other methods[13].

Method	Strengths relative to HES method	Weaknesses relative to HES method
Dietary energy supply – based (DES) (current FAO method) Notes: DES = per capita dietary energy supply CV = coefficient of variation of dietary energy consumption	– System currently in place for frequent updating of DES data for all developing countries, thus facilitating comparisons across countries and over time. – Ability to produce annual estimates for all countries makes measure a useful advocacy tool. – Covers entire population of a country, including homeless and people living in institutions.	– Comparisons across countries and over time or unknown reliability: (1) DES data employed unreliable; (2) distribution parameter (CV) based on food acquisition data collected in household expenditure surveys not available for all countries and periods (Naiken 2001, Svedberg 2000). – Limited ability to capture access to food (estimates of undernourishment highly correlated with DES). – Cannot be used to understand the causes of food insecurity (methodological bias in favor of food availability relative to other potential determinants; Smith 1998, Svedberg 2000). – Cannot be used to estimate within-country food insecurity or to identify who the food insecure are. – Does not capture quality and vulnerability aspects of food security.
Individual food intake	– More reliable measure because (1) based on actual food consumption rather than food acquisition; and (2) less susceptible to misreporting (Hoddinott 2001) – Measurement at individual level allows intra-household comparisons among age and sex groups	– Collection and processing of data considerably more costly and skill-intensive – Not feasible to collect data at a national level for most countries due to high costs
Anthropometry	– Less costly to collect and process – Standardized collection technique facilitates comparisons across countries and over time – Measurement at individual level allows intrahousehold comparisons among age and sex groups	– Not a valid indicator of food insecurity (Kennedy et al. 2002)
Qualitative methods	– Less costly to collect and process – Measures more directly focused on food insecurity – Cut-offs separating food insecure from food secure easier to establish and more intuitive – Reveals human side of food insecurity by gathering information on perceptions of those actually affected – May be more reliable due to longer recall period possible. Further research needed.	– Cross-country comparison hampered by need to adapt to local circumstances – Costs of development in each new setting very high (Kennedy 2001) – May be less reliable due to subjective nature of questions asked and greater susceptibility to misreporting (Hoddinott 2001). Further research needed.

12 Smith 2002, 22.

Paper V

Designing a Plan for Assessing and Analysing the Food and Nutrition Security Situation

Maria Gerster-Bentaya

Table of Contents

1 Introduction

A good and profound assessment and analysis of the food and nutrition security situation is the key for responsive actions to mitigate causes of food insecurity. This, in turn, will improve the nutritional status of the affected population.

The previous two papers provide a general overview of possible indicators and methods that can be used to assess and analyse the food and nutrition security at various levels. How does one choose the right indicator from among the long lists that have been presented? And how should a good assessment process be conceptualised and realised? Where does one start? What information and sources should be used and when should they be used? How much in depth information should be sought and over what time period should investigations be made? Whom should one consult? Which information sources should one believe? – These are questions that will be tackled in the following paper.

2 Finding and using data[1]

Data are raw numbers of values and usually are not very meaningful until they have been analysed and interpreted to become *information*. For example, the percentage of households suffering from food insecurity in the community, especially when compared with national or state averages, is information and says something about the relative magnitude and importance of the problem. The raw number of such households – or data – may alone be useful but it does not indicate how big the problem is relative to state or national norms.

Qualitative and quantitative data

In general, there is a distinction between qualitative and quantitative data. Both types have their merits. Each type provides different kinds of information, which can be used in assessing a situation.

Quantitative data can help describe the extent of a problem by providing precise information in precise amounts, such as "HIV prevalence among ANC attendees in Botswana increased rapidly from 18.1% in 1992 to 32.4% in 1995, 38.5% in 2000 and 36.3% in 2001."[2].

Qualitative data provide a descriptive account of a situation: "Food-insecure households in Alacaster reported using strategies such as community gardening, neighbourhood group meals, borrowing food from neighbours and family members to help them cope with food security problems".

Secondary (existing) and primary (original) data

In making an assessment we use two basic types of data, i.e., existing (secondary) ones and original ones (primary). **Existing data** are data that have already been collected. They may be either compiled or uncompiled. Examples of compiled existing data include country-level poverty numbers published by the Ministry. Existing uncompiled data are not yet aggregated and summarised (such as the number of emergency food providers in a certain community). Compiled data are easier to find. Because they are already available they are more cost effective as less expensive to gather. A number of questions help to decide which data to access:

1 Based on Cohen 2000

2 Source: http://www.who.int/GlobalAtlas/PDFFactory/HIV/reportExporting.asp

– What are the sources of the existing data?

– How suitable are the existing data for the current assessment?

– What resources must be set aside before the data are accessed (personnel, duplication fees, computer hardware and software, transportation costs)

– Who must be contacted before a trip is made to an agency to request data?

It is also important to remember that when using exiting data the most recent and available data should be taken. The first data source that you find may not contain the most recent data. In particular data from national census are quite "old", therefore, other sources should be found. If existing data is not appropriate, **primary data** needs to be collected.

3 Planning the assessment and analysis process

For all involved persons it is much easier if at the beginning of an assessment, a precise assessment implementation plan is drawn up to describe procedures in detail.

3.1 The various steps

The specific objective(s) of the assessment, coverage, the participation process and technical implications should be known by all key actors who are involved in the assessment and analysis **before one starts** to gather information. From the very beginning it should be clear to all actors involved that the assessment and analysis process is meant to answer the following questions:

– Who is food insecure?

– Where are these people located?

– Why are they food insecure? And at what time(s) of year?

– And finally: "How will we ultimately utilise the findings of the completed analysis?" and: How is the collected data going to be used as a basis for action?

Data collection begins with establishing an overview of the defined problem, its magnitude and the context. This includes reviewing relevant laws, policies and services and the activities of organisations which are involved in the respective field of interest. Once this overview has been made, it is easier to decide which additional information at what level is still needed, specifically from the meso and mirco level. Information from the local level provides a deeper understanding of the problem, and gives more specific information on the causes for each category of people affected. Depending on the methods that are chosen, this information is quantitative or qualitative

Simply gathering and presenting information is not very useful. It is necessary to sift through and organise the most significant and meaningful information and to draw from it issues and priorities for action.

The analysis phase should then give the answers to the questions asked at the beginning of the process.

An overview looking at the various phases and respective activities and expected outcomes of an assessment and analysis process is presented in the following figure.

Table 1: Elements of an assessment and analysis process

	Planning	Information Gathering		Analysis
		National Level	Local Level	
Activities	Engage all key actors Define: – Objectives – Technical scope – Geographical coverage – Process and participation – Skills needed – Budget(s)	Collect and review existing: – Reports and other documents from national sources as well as from EWS – Statistics (State, international organizations, such as UNICEF, WHO, WFP, FAO, etc.) – Programs – Interview of key informants	Collect reports and statistical information Carry out focus group discussions in priority areas Interview key informants Anthropometric measurements Observation – clinical signs – feeding practices – etc. Laboratory examinations	Identify – Most urgent problems – Causes – Most vulnerable groups – Local responses, coping strategies, and capacities – Key aspects of context Identify potential intervention strategies and measures
Outputs	A written plan that includes responsibilities of each participating body with a line item budget	A full overview of: – Problems – Context of problems – Local responses, coping strategies, and capacities – Relevant laws and policies – Relevant services – Intervention organizations	In-depth understanding of – Problems – Context of problems – Coping strategies – Current and potential actions – Relevant laws and policies – Services – Refined information on coverage of – Existing services – Intervention organization	Report containing – Overview of problems – Determination and characterisation of affected groups – Identification of priority issues, capacities and resources – Identification of key intervention points – Recommendations for actions – Key information and sources for ongoing monitoring

Source: Adapted and enlarged from William et al. 2004

3.2 Information gathering

In fact, there are only a few basic methods of acquiring information on the food and nutrition situation.

– Review and evaluation of **secondary material**, i.e. using the data and information that is already available about a region's food security situation and its related causes. This may be reports on ongoing or earlier programs, statistics, etc or information obtained by asking key informants about a certain situation. Examples of existing data sources are:
  - field reports
  - baseline data from household surveys to estimate population size
  - census
  - mapping the population and spread of diseases, HIV infection using GIS
  - EWS-results like GIEWS, FEWS Net
  - UNICEF, World Bank, USAID database
  - international and national databases to inventory interventions and other topics
  - etc.

Box 1: Findings from a first review of secondary material

"....we knew that levels of malnutrition were high across the country and not just in marginal area; but we knew very little about the socio-economic characteristics of malnourished or under nourished individuals;

we knew that income distribution was poor and getting worse, but we had very little information about the social relations underlying poverty, especially in rural areas where there was said to be a land frontier, and

we knew from the experience of the drought in 1984/85 that many people in Sudan were vulnerable to a sudden collapse of livelihood and food security,; but it was not clear how vulnerability was distributed throughout the population, nor how vulnerable groups could be identified."

Maxwell 1989, 1

To get an overview and to know then where a more in depth analysis should be carried out, one normally starts with reviewing secondary sources at national level, and then approaches the lower level (meso and micro). A report from Maxwell (1989,1) gives an idea about what kind of information can be obtained and what conclusion can be made when one begins with secondary data at the meso level (see box 1).

Once this general survey of the situation has been made, one has to decide about what further data are needed and how these data should be collected.

– **Observations** and descriptions
  i.e. observation of clinical signs, such as oedema, night blindness, etc. as well as observation of certain practices (practices for food preparation, feeding, care, etc.)

– **Questioning people** using various interview techniques
  - individual, interviews using methods such as 24-hours-recall, dietary history, etc., addressing directly affected persons. This category includes all kinds of survey methods which use different kinds of questionnaires
  - (focus) group interviews for discussions

– **Direct measurement**, such as anthropometric measures of height, weight, MUAC, blood tests, etc.

4 Choosing (the right) indicators and methods[3]

As described in the previous papers, there are many commonly used measures that can show the various dimensions of food security. In addition, there are usually a number of ways of measuring any single indicator. But where does one start and which instrument / method should be used? For example, an indicator defined as the "average total calorie consumption per capita" may be measured through a detailed dietary intake survey based on the weighing of food portions in units of measure given in the survey, or from information based on a 24-hour recall of survey respondents. Similarly, measures of household income can be derived as a lump sum estimate

3 Based on Riley et al. 1999.

based on the recall of a household head over the past month, or as an aggregate of income from individual household member activities based on individual recall. Obviously, decisions about how indicators will be measured are critical because they influence their eventual credibility, cost of collection, and interpretation.

In some cases, there is international consensus on either measurement or analysis protocols for an indicator. The World Health Organization, for example, has published recommended methods for obtaining anthropometric measurements and has developed indexes for wasting, stunting, and underweight. Standard definitions for certain aspects of infant feeding, such as exclusive breastfeeding and timely complementary feeding, are also available. For other indicators no such standards exist. In these cases, indicators should be defined in ways that are appropriate to the local food security conditions and the needs of the program. In areas where women have traditionally not worked for wages outside the household, as in some Moslem cultures for example, it may be misleading to include women in the pool of eligible working adults when calculating a dependency ratio. Where program capacity is limited, it may only be feasible to obtain consumption estimates based on respondent recall, rather than extensive food weighing methods.

4.1 Classification and cut-off points

It is often important to determine whether or not a household or an individual is actually food insecure or actually malnourished. This classification requires establishing some basic criteria for making that evaluation. In addition, to ensure that effective comparisons of indicators can be made, it is usually important to assign them explicit criteria. While it is always possible to examine relative levels of food insecurity or rank orders defined by specific indicators, it is often desirable to define cut-off points to establish absolute levels of food insecurity. For some indicators, again, commonly accepted conventions for cut-points exist, although they may be difficult to justify on technical or objective grounds. For example, underweight, malnourished children are often defined as those who are more than 2 standard deviations below the median weight of a reference population of the same age group – a cut-off point that is something of an "industry standard." For other indicators, cut-off points might need to be defined according to the local context. An indicator of the percentage of food deficit households would depend, in part, on an estimate of per capita food needs. However, actual food needs vary across populations, with differences in climate, work energy expenditure levels, and other factors. The choice of any cut-off may have important implications for the interpretation of an indicator and an understanding of food security conditions. While food insecure households are often defined as those consuming less than 80 percent of minimum recommended calories, a reduction in the percentage of households consuming less than 70 percent of recommended calories may suggest important improvements in minimizing extreme food insecurity. This improvement would not be fully captured if an 80 percent cut-off point was used. Therefore, it is often useful to test a range of cut-off points when classification is important.

Table 2 shows the proposed classification of worldwide prevalence ranges of low height-for-age and low weight-for-age among children under five.

Table 2: Proposed classification of prevalence ranges

	Prevalence ranges (% of children below –2 Z-scores)	
Prevalence group	**Low height-for-age (stunting)**	**Low weight-for-age (underweight)**
Low	< 20	< 10
Medium	20 – 29	10 – 19
High	30 – 39	20 – 29
Very high	≥ 40	≥ 30

Source: WHO 1995, 208

Rapid anthropometric surveys are useful for determining the need for and type of relief rations and for establishing priories for the allocation of resources in emergency situations such as famine or refugee crisis (WHO 1995). Table 3 shows a proposed classification of the severity of malnutrition according to the prevalence of wasting and the mean weight-for-height Z-score for children under 5 years of age.

Table 3: Severity index for malnutrition in emergency situations

Classification of severity	Prevalence of wasting (% of children <-2 Z-scores)	Mean weight-for-height Z-score
Acceptable	< 5	< -0.40
Poor	5 – 9	-0.40 to – 0.69
Serious	10 – 14	-0.70 to – 0.99
Critical	≥ 15	≥ -1.00

Source: WHO 1995, 212

The distribution of BMI in a population can provide valuable guidance for the targeting and planning of long-term development programmes, especially in agriculture and health. Programmes aiming to improve total food supply can be directed specifically towards populations with low BMI, whereas a population with "normal" BMI may require only the limited nutritional improvements that are necessary to counteract anaemia and other selective nutritional deficiencies. Table 4 shows the suggestions of the Expert Committee for the classification of the public health problem of low BMI, based on BMI distribution in adult population worldwide.

Table 4: BMI classification

Prevalence		% of population with BMI < 18.5
Low	Warning sign, monitoring required	5 – 9
Medium	Poor situation	10 – 19 %
High	Serious situation	20 – 39 %
Very high	Critical situation	≥ 40 %

Source: WHO 1995, 262–63

4.2 Perspective

The final step in constructing an indicator is the aggregation of individual observations and placement of these measures in the proper socio-economic or program perspective. In general, impact indicators should be expressed not only in terms of a numerator (i.e., an absolute number), but should also include a denominator whenever possible. The denominator indicates the magnitude of the food security problem being tackled, for example, representing an estimate of the intended

program coverage or the size of the intended target group. Using a denominator – which implies expressing an indicator as a rate of change, a percentage, or other ratio – adds an important perspective to the interpretation of the indicator This indicator illustrates the extent to which a particular problem has been addressed. For example, reporting on numbers fed in an emergency feeding program or the number of students attending classes in a school feeding program does not give a sense of the extent of the accomplishment because it does not say anything about the total numbers requiring emergency assistance or the total number of school-aged children in the community. In contrast, output indicators typically include simple "count" measures, such as the absolute number of rations distributed, in addition to indicators expressed as percentages or ratios.

5 Choosing among indicators

There are usually a range of possible indicators that can be identified and that may be useful. And, as stated above, there are often a variety of different ways of actually measuring any given indicator. The problem in choosing specific measures is in how to maximize the quality of the information and its benefit for decision-making while taking into account the costs of collecting, processing, and analysing that information. In deciding which indicator or which measure should be included in an M&E system, several considerations should be kept in mind: relevance, credibility, costs, comparability, time sensitivity, and information use.

5.1 Selection criteria[4]

5.1.1 Relevance

Indicators selected should have relevance to local production systems and the food security context. Differentiating income by gender may be of little relevance in cultures where women do not work outside the home or control income generated from their own production. Similarly, there is little point in obtaining data on micronutrient deficiencies, for example, if these are not considered important aspects of food insecurity in a specific program area. In the latter case, existing secondary information on micronutrient-related disease prevalence may be sufficient to monitor those conditions. Indicators should also relate directly to the objectives, structure, and implementation plan of the program. In the context of an M&E system, program stakeholders should immediately use indicators selected for decision-making. In the case of a food-for-work program involved in road improvement, for example, an indicator of the volume of road traffic may be interesting from a research perspective and may be somewhat suggestive of changes in economic conditions as a result of the road, but may have little direct relevance to program activities or their intended impacts on beneficiary incomes and food security status. In this example, an indicator of changes in transportation costs associated with the improved road, or in the income generated from the sale of goods transported along the road may be more directly relevant to understanding program impact.

5.1.2 Credibility

There are a number of factors which contribute to the credibility of an indicator :

– universally understood vs. being understood only by specialists

– objectivity

4 Based on Riley et al. 1999.

– accuracy

– ability to control for measurement error

The first step in developing a credible indicator is to ensure that it is defined in a way that is universally understood and grounded in accepted practice and theory. For example, while anthropometric measures are widely understood among technical and non-technical staff, indicators of specific feeding practices may have less resonance among non-technical staff, and therefore, may be less persuasive of impact at certain levels of decision-making. Indicators related to the "psychology" of food insecurity, which attempt to capture the degree of anxiety about the ability of individuals to meet their food needs, have yet to be fully tested, and relative to other more widely used indicators, their interpretation remains somewhat uncertain.

A central feature that defines indicator credibility is the degree of **objectivity** of the indicator. In general, indicators based on a self-evaluation of people's own food security status, such as whether or not they "feel hungry," are less objective than responses to questions related to more objective facts, such as daily meal frequencies. The greater the degree which these more objective facts can be directly observed by the person responsible for collecting the data, rather than the responses of interviewees, the greater will be the objectivity of the indicator, and therefore, its credibility.

The **ability to control for measurement error** also influences the credibility of an indicator. Poorly adjusted scales used in measuring the weight of children in anthropometric surveys may lead to inaccurate measurement, for example. In a study conducted by the World Bank, farmers' crop production estimates were found to be within a relatively accurate range of 10 percent measurement error. In contrast, crop-cutting methods for estimating yields and production resulted in more serious measurement errors, ranging from 10 to 30 percent (Vera, Merchant, and Scott, 1988). Errors in measurement also can result from inaccurate responses by survey participants. This can be due simply to faulty recall, as in attempts to estimate the quantity of foods consumed in the recent past (week or day). In many cases, measurement errors occur when respondents perceive some benefit if they manipulate information, such as in under-reporting their incomes in the hopes of qualifying for a feeding program. Again, the ability to observe conditions directly can minimize this source of error and improve indicator credibility.

5.1.3 Accuracy

Credibility also reflects a concern for the accuracy of an indicator and is influenced by a range of factors. The **nature of the sample population** from which the observations are drawn can have important implications for accuracy. For example, estimates of nutritional status based on growth monitoring data may not provide an accurate estimate of overall rates of malnutrition in the target population if only those children living near a health clinic are monitored. If those children are more likely to come from wealthier households, a quite plausible situation, then the growth monitoring data may underestimate the actual malnutrition rate of the total population.

If conditions cannot be observed directly, there may be other **methods to improve the accuracy of responses** concerning age and quantities:

– Where **birth data** is not recorded, for example, making reference to the local calendar and other methods may increase accuracy about a child's actual age.

– **Food quantities** consumed during a meal can be measured in terms of cup or bowl sizes (where the volumes of those containers are known) rather than rely on respondent recall in units, which are not normally used in meal preparation.

5.1.4 Cost

The cost of collecting data for an indicator is typically related to the

- **type of indicator** needed, the **accuracy** and the **degree of detailedness** (indicators derived from existing secondary data are relatively inexpensive, but are often difficult to disaggregate and link directly to program beneficiaries);
- **time** involved;
- **personnel** involved (if staff are already located in the field and involved in the delivery of goods and services to program beneficiaries, the additional costs of data collection efforts may be lower than if additional personnel has to be hired for data collection);
- **method**(s) used for data collection and logistic costs associated with data collection, processing, and analysis (e.g. indicators of dietary intake derived from the actual weighing of food portions may be quite labour- and time-intensive, and therefore, are expensive compared to a similar indicators based on the 24-hour recall of respondents).

5.1.5 Comparability

Comparing the impacts of one program to those of another is a critical function in the management of food-assisted programs. Understanding why a nutrition program in one region had a more substantial impact on feeding practices, compared to a similar program in another region is one example of the usefulness of making comparisons across programs when designing a program. Another central concern for comparability is one of making resource allocation decisions between programs or program components. Simply put, programs that are more (cost-) effective in promoting improvements in food security conditions are likely to receive more funding than those that are less effective.

Comparability first requires that indicators are conceptually equivalent. Obviously, an assessment of the percentage of food insecure households based on measures of dietary intake cannot be compared to similar percentages based on the level of per capita food expenditures. Conceptual differences in definitions of indicators can also be more subtle. Poverty estimates, for example, are often based on cut-off points for income or expenditures defined by some estimate of the value of "minimum basic needs". However, because the definition of minimum basic needs may vary in both quantitative and qualitative terms from country-to-country, different countries' poverty lines may reflect quite different standards of living and may not be readily comparable. Differences in data collection methods for the same indicator, which imply that measurements may be more or less accurate, also limit the ability to compare indicators with any degree of confidence. Given even hourly variations in market prices, for example, price estimates based on one observation at a single point in time may be difficult to compare with any confidence to estimates which reflect average prices through the course of a day. In cases where the indicator definition and data collection methods have been standardized, such as with many anthropometric measures, comparability across programs may be more straightforward.

5.1.6 Time sensitivity

The indicator selected should also be responsive to program activities and outputs within the time frame of the program. This is particularly an issue when evaluating food security programs. In the context of a food-assisted MCH program with an emphasis on family planning, changes in overall fertility rates may not occur in a five-year time frame, while measures of contraceptive prevalence and over a period of a couple of years of protection would. Similarly, school snack programs may not result in immediate improvements in nutritional status within the time frame

of a typical project. Improvements in attendance, and possibly test scores, are more likely to be observed. The impacts of these activities on nutritional status may be deferred until the point at which the participating school children are able to earn higher incomes as a result of their improved educational achievement, and perhaps as a result of their education, employ more appropriate feeding practices with their own children.

5.1.7 Information use

The selection of indicators and data collection methods must be closely tied to the intended uses of the information, that is, be program relevant. Data required for needs assessments, targeting, monitoring, and evaluating programs will vary greatly. As already mentioned, growth monitoring data may be quite useful in the context of program monitoring to identify the need for supplementary rations in individual cases of undernutrition or growth faltering. However, given its limited geographic coverage, these data may not be useful and appropriate in program targeting activities where rapid anthropometric surveys may provide a less biased understanding of general nutritional conditions. Again, time sensitivity is another important consideration in assessing indicators for various types of information uses. In general, indicators used for food security assessments or for targeting purposes may be relatively static in nature, such as the occupation of the household head or household demographic composition in addition to indicators, which show more variation over time. For program monitoring, on the other hand, indicators are typically derived from the routine observation of both program input and output indicators at fairly regular intervals over time. In this context, as well as the case of impact assessments, static indicators would be inappropriate. In general, information should only be collected if there is some expectation that the indicators will actually show change within the necessary measurement interval.

5.2 Indicator proxies

As is apparent from the discussion above, some food security indicators are too difficult or expensive to measure directly either because:

- the process of measurement is time consuming and expensive, such as in the assessment of dietary intake
- they reflect complex processes, such as in the recording of total household income derived from a number of household members involved in diverse economic activities or total household expenditures, or
- respondents perceive there is some incentive to distort their responses, as in the case of the underreporting of income levels which may be tied to the targeting of some program benefit.

To overcome these problems, there has been considerable interest in identifying more reliable or efficient indicators that strongly reflect the food security dimension under study. To date, a great deal of research has gone into identifying proxy indicators for household income or wealth, for example (see Box 2).

Box 2: Alternative indicators of income

The following are examples of alternative indicators for incomes:

- the gender of the household head
- the availability of working age individuals within the household
- ethnic background, social class, or caste
- the size of a family dwelling or its number of rooms
- the type of materials used in the construction of the roof, floor, and walls of a dwelling
- the method of water collection and sanitation available
- the ownership of key assets, such as land, and luxury goods (e.g., radios), and
- the geographic location of households.
- affect of crises, violence, displacement etc.

Proxies for income are often desired because they are less time consuming to collect, and therefore, less expensive. More importantly, given the concern for under reporting of incomes from respondents, proxies are thought to be more easily observed by the survey enumerator, and therefore, more credible. At the same time, there is rarely a one-to-one relation between changes in direct indicators and changes in their proxies. Thus, the use of proxies involves a trade-off of one potential set of biases against another set of biases.

Promising approaches are also being developed for the assessment of vitamin A dietary intake through the use of food frequency recall data. This information is much more practical to obtain than either quantitative dietary recalls or biochemical measures and is thought to capture the essential information about the adequacy of vitamin A intake. Assessing the overall energy adequacy of diets through meal frequency measurement is another approach that may also be useful in certain settings.

One major disadvantage of using proxies is that they are typically context-specific, with relationships between a direct indicator and its proxy likely to be stronger in one setting than in another. For example, the same indicators of water source or the materials used in housing construction may not be useful in capturing differences in income across both farming and pastoral populations. Usually, proxy indicators must be tested in each new setting, which implies the collection of the direct indicator, as well as a range of possible proxies. This is typically an expensive undertaking, which undermines part of the attractiveness of using proxies.

The value of this approach increases with the intended frequency of using the proxies, in program monitoring, for example, or in the screening of applicants for program participation over time. For impact evaluation purposes, however, where data collection activities may be relatively infrequent, the cost-effectiveness of the proxy indicator approach may be quite limited. In addition to considerations of cost and credibility, proxy indicators must also be evaluated on the criteria of program relevance, time sensitivity, and intended information use. The indicators listed in Box 2 above underscore a potential difficulty in using proxies in the context of an M&E system. In the case of a food-for-work program intended to promote higher incomes through improved soil and water conservation methods, for example, variables listed in the box above such as gender of household head, size of family, and home construction materials are unlikely to vary in the short-term as a result of the program activities. Therefore, they would not capture directly or indirectly any of the potential impact of the program on incomes. Changes in the ownership of key assets, particularly smaller consumer goods such as radios, may be more useful in capturing short-term aspects of income changes, but this may be somewhat difficult to interpret given a range of possible confounding factors which might also influence asset ownership.

6 From data to recommendations

After having accomplished the data collection at the various levels (either looking for already available statistics or own measurements, surveys or investigations), a critical step will be the analysis of the gathered data. Information has to be put together and assessed whether certain statistical data in the specific situation have to be assessed as "normal", "critical" or "severe", and conclusions for possible actions have to be drawn. During the analysis the following points have to be tackled, and presented in the final report:

- determination and characterization of the most vulnerable groups/categories of vulnerable groups;
- description of the most urgent problems for each category of affected groups including how long the various groups have already suffered from these problems, what has been done so far,
- outline of possible effects if the problem situation continues, specifically in the context of a crisis or armed conflict;
- causes of malnutrition for each category, links to former interventions;
- description of local responses, coping strategies, and capacities by the affected groups;
- description of responses by local, regional and national government;
- key aspects of the context at the various levels;
- presentation of key intervention points;
- presentation of potential intervention strategies and measures, as well as recommendations for concrete actions;
- key information and sources for ongoing monitoring.

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Paper VI

Actions / Interventions to Improve Food and Nutrition Security at Macro Level[1]

Georg Bokeloh

1 This paper is a revision and update using elements of the following papers: Metz, M., 2000a: Impacts of Macro and Sector Policies on Food Security. April 2000, Metz, M. 2000b: Instruments on the Prevention of Food Crises, April 2000.

Table of Contents

1 Macro and Sector-Policies in Food and Nutrition Security

The macro level for intervention is predominantly the national level where governments try to shape the development through various sector related policies. International or supra-national and the global levels can additionally be considered as economic (e.g. WTO), ecological and social interrelationships ("globalisation") and increasingly go beyond national boundaries.

1.1 Conceptual framework for analysing policy impacts on Food and Nutrition Security

The conceptual framework presented here is a tool for analysing impacts of macro-level policies on factors determining household food and nutrition security at micro-level[2]. Macro-level policies on food and nutrition security, in most cases, indirectly affect markets and infrastructures. Economic changes on the macro-level, induced by various policies, are passed through the meso-economy down to the micro or household level where these measures affect supply and demand, or, in other words, as food entitlement in terms of availability and access to food at the household level. The following graph shows major macro-meso-micro linkages and impact chains.

The graph shows selected policies, which have major effects on food. The policies have direct effects on the meso economy, which is composed of **markets and infrastructure**. The most relevant markets are those for food products, other essential consumer goods, production inputs, labour and credit. The main questions here are which impacts do policies / policy changes have on quantities of supply, demand, and on respective prices in these markets (e.g. wages on the labour market). Infrastructure comprises the economic and social, institutional as well as physical infrastructure, e.g. market institutions, transparency and competition; roads; education; health and other social services including food assistance and nutrition programmes. Markets and infrastructure are linked together in many ways (e.g. markets and road conditions, markets and market institutions, social infrastructure and labour market, social security programmes and food markets, public works programmes and the labour market, etc.). This diagram uses a line with arrows in both directions to show the inter-linkages between the markets and infrastructure.

Changes induced by policies on different markets and on the economic and institutional infrastructural factors affect household incomes (nominal income from various sources and income effects caused by price changes), household assets (land, labour, savings, properties) and household behaviour. These three factors in turn determine household **food demand** (household income devoted to food purchases) as well as household resources devoted to subsistence food production. **Income** is the major determinant of household food demand, that is, their ability to purchase food supplies in the market. The level of market demand influences the level of local production, which supplies food to these markets. This linkage between effective demand and food production (as shown in the graph by the arrow on the far left) is very important, as the volume of market supplies is determined not only by production factors but also by demand factors. In fact, **effective demand** constitutes a **prerequisite for market oriented food production**, and one-sided policies merely aiming at increasing food production will fail if the increased production is not absorbed by increased demand.

2 It was developed by Manfred Metz for a FAO training manual on food security policy analysis, see Chapter 4 of Anne Thomson & Manfred Metz: Implications of economic policies on food security, A training manual, Training Materials for Agricultural Planning 40, FAO, Rome 1997.

On the **supply** side, a distinction is made between subsistence production, market supplies and non-market transfers. **Market supplies** refer to domestic market production plus food imports which are channelled through markets,. **Subsistence production**, by definition, does not enter the market. It contributes directly to household food entitlement. In this case, access to and availability of food at household level are identical. The volume of subsistence production depends on household decisions to allocate (part of) its productive resources (labour, land, other assets) for this purpose.

Transfers refer to food distributed to beneficiaries outside the marketing channels, such as free relief assistance or feeding programmes. Food transfers simultaneously increase access and availability at household level. Food commodities distributed by food transfers can either come from food aid deliveries, which bypass the local market, or from local procurements, which are initiated at the meso-economic level. By increasing the local demand for food commodities, local food procurement compensates the market for the otherwise insufficient demand on the part of the poor and food insecure population groups[3].

There are also **indirect linkages between non-market supplies and the food market**. Subsistence production or food transfers tend to reduce household expenditures for food, which, in turn, reduces market demand for food. If the recipients of non-market transfers (beneficiaries of free food rations) sell part of their received food, this not only increases their income but also increases the market supplies of food. Such linkages between non-market supplies and household food demand, household income, and food markets are indicated in the graph as dotted lines.

Both the supply and the demand factors determine the level of household **food entitlement** (food available at household level). **Household food security** is achieved if subsistence production, transfers and household food purchases are sufficient to meet the household food requirements. **Nutrition security** includes even more environmental conditions, health services and the caring capacity (see paper II.)

The analytical framework presented above provides a tool for tracing the impacts of macro-level policies on the meso-economy (markets and infrastructure) down to the factors determining availability and food demand at household level. Depending on their living conditions, their sources of income and livelihood, households will be affected by the policies in different ways and to different degrees. Some will gain, others will loose, and some will gain in some and loose in other respects. Furthermore, there are short-run and longer-term effects of policies. Negative short-run effects may be outweighed by positive effects in the long-run, but may still be a matter of concern if they worsen the position of food insecure households. Therefore, it is important that the general analysis of policy impacts on factors determining household food and nutrition security is complemented by a differentiated view of different population groups, particularly those groups of the society who are vulnerable to food insecurity. Their specific conditions and sources of food entitlement ought to be taken into account.[4] To give an example: A currency devaluation (macro-policy), leading to increased market prices of food and other tradable commodities (impact on meso-level), is likely to benefit the food-crop and cash-crop farmers (positive income effect) but will adversely affect poor urban and rural consumers who depend on the market for their food supplies (negative real income effect). As to the impacts of a currency devaluation on food availability, the effects of a reduced market supply caused by reduced food imports have to be weighed against increased supplies from domestic market production[5].

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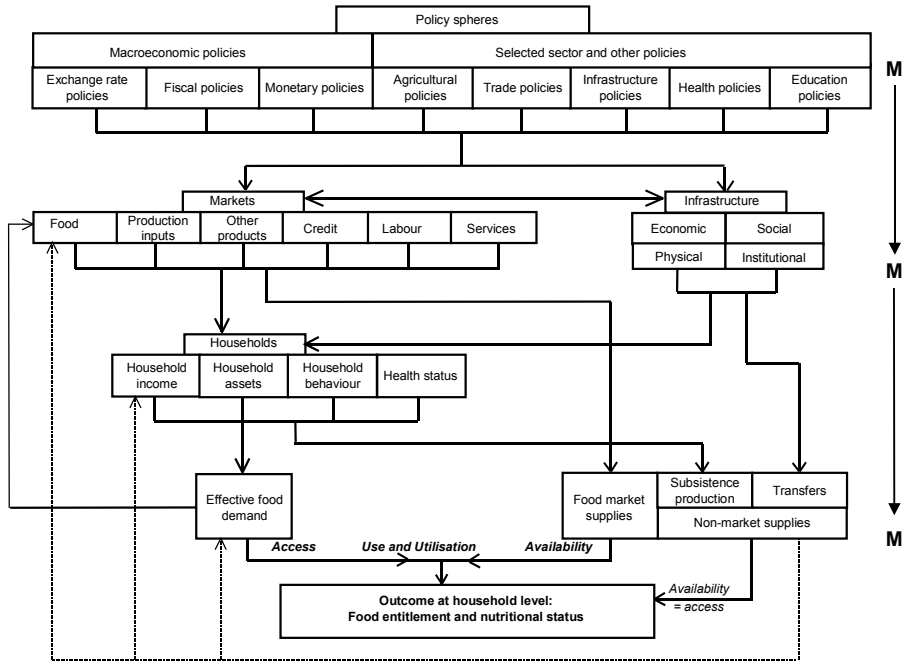
3 As to the justification, role and effects of local procurement of food aid see Thomson, A. and M. Metz (1997), Chapter 6, section 2.5.4.

4 For special impacts of policies on vulnerable groups see Chapter 4 of Thomson, A. and M. Metz, 1997.

5 See also the analytical model presented in the Paper III on "Instruments for AA at macro level".

Figure 1: Framework of macro – meso – micro linkages between policies and Food and Nutrition Security



Source: Metz 2000a, 2

1.2 Effects of selected macro- and sector policies on Food and Nutrition Security

This section presents a selection of policies with major direct or indirect impacts on food and nutrition security. It serves as an example for analysing the effects of macro policies and food and nutrition security and cannot be exhaustive, neither in regard of the policies discussed nor the food and nutrition security issues addressed.

FAO is providing policy support to developing countries in the field of food security and has compiled lessons from experiences from influencing policy processes (Kidane et al. 2006; Maetz and Balié 2008).

1.2.1 Macroeconomic policies

The macroeconomic environment is determined by the rules of the existing ordo-political framework and key parameters, often set by government, which form the conditions for economic development within an economy and its relations with external economies. The parameters can be grouped into three broad areas:

a. those affecting international resource flows, such as exchange rate regulations;

b. those set by government in budgeting its own operations, i.e. fiscal mechanisms such as taxation and public expenditures; and

c. those concerned with the monetary regime, such as credit supply and the rate of interest.

Some general statements can be made on the implications and nature of effects of macroeconomic policies on food and nutrition security:

Exchange rate policies

The currency exchange rate determines the *prices* of food and other commodities being exported or imported, the volumes of exports/imports, and hence influence the *volume of production and supplies* available on the internal markets. An overvalued currency leads to depressed domestic market prices of tradable commodities and favours imports over exports. As staple food commodities, especially grains, are usually tradable goods, food prices are kept relatively low. This has positive implications (positive real income effects) for market-dependent consumers, but negative implications for local producers of imported and exported items (depressed sales prices) and for the volume for domestic agricultural and food production in general. On the other hand, an overvalued exchange rate also leads to lower prices of imported production inputs (e.g. fertiliser, machinery, plant protection materials) which partly compensates for these negative effects. The effects as described above are reversed if a currency is devalued, a policy frequently pursued under economic stabilisation and structural adjustment programmes.

In summary, the major impact of exchange rate policies on food and nutrition security is on:

- the prices of (main staple) food and other commodities, hence the
- real income of market-dependent consumers;
- the returns and the nominal income of agricultural producers;
- the volume of domestic food production and food demand, depending on response of food production and demand to price changes (price and income elasticities);
- the volume of food supplies from domestic production and of imports.

Fiscal policies

Fiscal policies refer to the group of fiscal measures (taxes, subsidies, expenditures) that governments apply to influence the working of an economy. As the public sector makes up a major share of the GDP, the governments themselves generally are the single most important economic force in a country. Hence, just by volume, fiscal policy has substantial influence on all spheres of an economy. Taxation and government spending influence food and nutrition security in many ways, e.g.:

- direct taxes reduce disposable incomes. This mainly affects enterprises and formal sector employees;
- indirect taxes reduce the real income of market-dependent consumers to the extent that they buy products which are subject to indirect taxation;
- government spending for salaries and wages creates employment and income;
- government expenditures for food or other subsidies lead to cheaper supplies for consumers;
- government expenditures for social security systems, e.g. through transfers in cash or in kind, ensure minimum subsistence levels;
- government spending for education and health services may have positive impacts on food utilisation;
- government investments in social and economic infrastructure may have positive longer-term impacts on food and nutrition security.

If government expenditures exceed revenues – a rather frequent case – budgetary deficits need to be tackled, and the management of this problem constitutes a major element of most economic stabilisation and structural adjustment programmes. Common approaches are a reduction of government expenditures, e.g. by cutting back government staff, reducing / removal of subsidies, reducing social sector expenditures and investments. This often adversely effects food and nutrition security of poor and vulnerable population groups which in turn requires specifically targeted interventions to help these groups.

Monetary policies

Monetary policies and fiscal policies are closely linked because budgetary deficits are often financed through the mechanism of monetary expansion. Monetary policies determine the volume of money supply and credit costs (interest rate). The impacts of monetary policies on food and nutrition security are rather indirect, and are shown by the investment response of farmers and other agents involved in the food chain (e.g. traders, transporters, public marketing organizations) as well as by general employment and income effects of a changing rate of investments in the economy induced by any changes in credit supply and interest rates.

1.2.2 Agricultural sector policies

There are close links between agricultural sector policies and food and nutrition security, not only because of the importance of the agricultural sector for securing food production and supply, but also because of its role as the major source of livelihood for the majority of the poor and vulnerable populations in many countries.

Agricultural policies include a wide set of different policy interventions, such as agricultural research, training and extension policies, promotion of new and improved agricultural technologies (mechanisation, irrigation, inputs), land use policies, natural resource conservation, agricultural credits, and agricultural pricing, stocking and marketing policies. Through their manifold impacts on agricultural incomes, rural employment, food production and prices, agricultural sector policies simultaneously affect both access/demand and production/supply in various ways.

1.2.3 Marketing and pricing policies

Marketing and pricing policies comprise all measures and regulations, which affect the functioning of markets and prices of food and/or other goods. The policies may be guided by different objectives, for example to provide incentive prices to producers in order to increase their incomes and/or food production, to protect producers or consumers against price fluctuations, to control consumer prices and to keep them low, to ensure steady food supplies for urban consumers, etc. In general, such policies have impacts on both the supply and the demand side of the food economy:

– *On the supply side:* The decisions of farmers to produce food and/or other commodities for sale (and also for own consumption) are substantially influenced by the marketing conditions they face (producer prices, price variations, price/cost relations, prices of production inputs, reliable marketing outlets, procurement and payment procedures, etc.). These conditions can be – and are often – influenced by governmental marketing and pricing policies, especially in the agricultural and food sector.

– *On the demand side:* Because they determine the real income of market-dependent consumers, marketing and pricing policies also influence the capacities and decisions of households to gain *access to food*. The lower the price of food and other consumer goods, the higher the real income and the capacity of households to buy the food they need. As to food and nutrition security, this is specifically important for low income households which

spend the largest share of their income on food. For political or social welfare reasons, consumer price policy (consumer price regulations, general or targeted consumer price subsidies) are applied in many countries, including highly industrialized countries, in some way or other.

1.2.4 Trade policies

International trade can make substantial contributions to the food and nutrition security of countries and households. Food supplies can be stabilised and increased by food imports, the import of production inputs helps to increase domestic food production and supplies, export production generates employment and income for large segments of the population, and the foreign exchange earned from exports allows countries to buy what they need on the world market.

Trade policies refer to tariffs and regulations concerning imports and exports. The agricultural sector has specifically been subjected to tariff and non-tariff trade barriers (import and export taxes, import and export quotas/restrictions, variable levies). Trade policies have crucial implications for food and nutrition security because they effect food prices and volume of food supplies available at the internal market. Trade barriers usually imply higher prices and a reduced volume of supplies which affects food access and availability.

1.2.5 Infrastructure policies

Infrastructure policies, especially policies to establish, expand and maintain the transport infrastructure in a country, are relevant for food and nutrition security under various aspects:

- An improved road network strengthens the marketing links within a country. It facilitates the transport of food from surplus to deficit areas and reduces marketing costs, benefiting producers as well as the consumers.
- An expansion of the road network, e.g. through a feeder road programme, establishes new marketing links to areas with yet untapped production potential. Producers gain from new marketing possibilities, and overall food supplies from domestic production will increase.
- Road construction and maintenance can be done with substantial manual labour inputs, e.g. in the framework of public work schemes, which leads to employment and income generation during the investment phase.

1.2.6 Poverty alleviation and social sector policies

Poverty alleviation and social sector policies comprise all policy measures aimed at safeguarding minimum standards of living of the population, such as social safety net and targeted employment and income generation programmes. By generating income or providing transfers in cash or kind to vulnerable people, such measures play a key role in improving access to food.

Due to the dimensions of poverty and limited budgetary and administrative capacities, many countries lack the means to support a comprehensive public social safety net and are unable to reach all people in need. NGOs, community and religious organizations and other civil societies often play a – or the – major role in the social security system in many countries. Therefore, an essential element of social security policies is to provide a conducive legal and institutional framework for these organizations, enabling them to work effectively.

1.2.7 Health policies

Health and nutrition are closely interrelated. Many common diseases are directly or indirectly caused or aggravated by quantitatively and qualitatively inadequate nutrition, and ill-health often

leads to sub-optimal utilisation of nutrients contained in the food actually consumed. Crucial health related aspects of nutrition are quality of water, general hygiene, and food preparation methods. Only by combining sufficient food intake with complementary aspects of caring capacity, health and environmental factors, food and nutrition security can be achieved.

1.2.8 Education policies

Education policies are relevant for food and nutrition security under various aspects:

- Better education implies, in general, better knowledge about food production, farm and household management and nutrition issues, contributing to improved food and nutrition security from various sides. Especially the promotion of education of girls and women is likely to have positive side-effects on food utilisation and household food and nutrition security in medium-term.
- Child health and nutrition programmes are more effective and more sustainable if combined with education and training of mothers. Therefore, mother and child health care and nutrition programmes often include education and training components which are relevant for food and nutrition security (nutrition, health, home economics, income generation).
- School feeding is a component of primary education in many countries. It serves a dual purpose of providing a channel for distributing food to children of low-income families and being an incentive for such families to send their children to school. This can contribute to increased school enrolment and attendance among school-age children while also improving their health and nutrition status. SFP can be appropriate in emergency/crisis situations to encourage children to attend school, protect from harmful impact and restore an element of normalcy in their lives. Nevertheless they are expensive compared to other interventions aimed at improving education.[6]

1.2.9 Population policies

In many countries, rapid population growth is putting a heavy strain on natural resources, Prospects for sustainable development and the capacity of the population to attain food and nutrition security are endangered. Therefore, policies to curb population growth are to be seen as an essential element of a long-term strategy towards food and nutrition security. Again, especially education for girls and women, sex education, and policies strengthening their social and economic position play a key role. Such measures are a precondition if direct birth control measures are to be effective.

1.3 Food and Nutrition Security: A cross-cutting policy issue

Food and nutrition security is an issue, which cuts across many different policy spheres. Macroeconomic parameters and policy options, for example, may well have as much or even more impact on food and nutrition security if compared with policies specifically aimed at the food and agricultural sector; yet the links between macroeconomic policies and food and nutrition security are often not well understood. Even where they are understood, the longer term objectives of achieving food and nutrition security for all citizens and the short-term issue of protecting existing levels of food and nutrition security often take only second or third place and are overridden by more immediate concerns stemming from a balance of payments crisis or high levels of inflation. However, different objectives do not always, nor necessarily, need to be incompatible. Governments can make choices between alternative strategies for achieving economic stability and growth. If major policy decisions have to be made with likely negative implications for those

6 See also Paper VII, 4.2 and 3.2.2

who are food insecure, these can be offset by special poverty alleviation and food and nutrition security programmes which specifically aim at ensuring and increasing income, employment and welfare of the poor and food insecure population groups.

In this context the debate on poverty orientation of development policies, meaning the political intention to grant priority to poverty reduction becomes evident. More than 60 countries (November 2009) have produced (Interim) Poverty Reduction Strategy Papers (I-PRSP or PRSP) since the ratification and further promotion through the Word Bank vis a vis the Highly Indebted Poor Countries (HIPC). The focus on reduction of extreme poverty and malnutrition (also the goal No1 of the Millennium Development Goals) is not only connected to the macro-economic debt-relief of a country but the overall participation of all actors in a society and the sensitisation towards food and nutrition security importance.

A country specific analysis of policy impacts on food and nutrition security must take into account the particular set of political, economic and social conditions, the type and magnitude of the prevailing food deficits and food and nutrition security problems (Is availability, access, use & utilisation and/or stability a major threat to food and nutrition security? Which population groups in particular suffer from food insecurity and why?)[7], and the actual policies pursued in the country concerned.

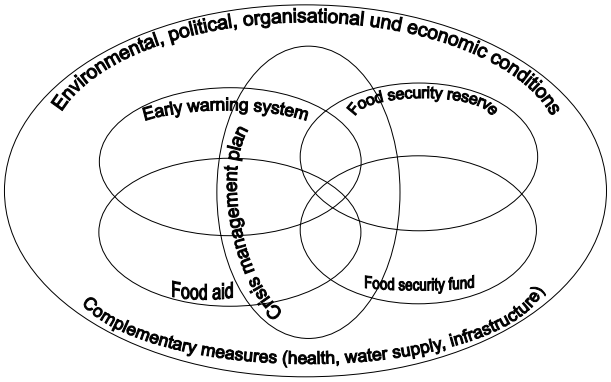
2 Instruments for the prevention and management of food crises

2.1 Nutrition-oriented agriculture and food diversification

Food *supply instabilities*, triggered by harvest failures due to drought or other natural or man-made disasters, lead to acute food shortages, further compounding the problem of structural food deficits in many countries. Apart from measures designed to increase food production and incomes to reduce structural food deficits, special measures are required to prevent catastrophic food crises or, at least, to mitigate their fatal consequences. This particularly applies to countries and regions prone to natural disasters. Acute food crises can be prevented or mitigated with the following instruments:

- Early Warning and Market Information Systems,
- Food Security Reserves,
- Food Security Funds,
- Crises Management Plans,
- Food Aid.

Figure 2: Type and interdependence of measures to prevent and manage food crisis



Source: Metz 2000b, 2

7 See background paper III "Instruments for AA at macro level".

These instruments are closely interrelated and interdependent. To be effective, crisis prevention and -management generally require co-ordination and a combination of the various instruments, as shown in figure 2.

The instruments are briefly outlined in the following sections. The instruments may be applied at different levels: In certain disaster prone areas of a country, in a country as a whole, or as a co-ordinated approach in certain disaster affected regions, comprising different countries with similar patterns of food supply instability[8] or the need to rehabilitate social and economic infrastructure towards FNS after civil wars or violent conflicts in an area.

2.2 Early Warning Systems and Market Information systems

The *purpose* of **Early Warning Systems (EWS)** is to facilitate an early detection of first symptoms of an approaching food crisis. This shall enable decision makers and organizations to promptly initiate pre-identified measures of crisis prevention. This refers to an advanced quantification of food requirements, the advanced information of potential (food aid) donors, and the identification of vulnerable groups and/or geographical regions. Such identification allows advanced planning and improved efficiency and effectiveness of any eventual food logistics operations.

Market Information Systems (MIS) increase market transparency and thereby the overall efficiency and effectiveness of the entire range of measures and instruments employed to achieve short- and long-term food and nutrition security:

Improved market transparency essentially contributes to an improved and balanced allocation of resources and food supply, both in terms of timeliness and regional distribution.

The data base of MIS allows efficient and effective market interventions.

The monitoring of market-, price- and side-effects induced by market interventions or food distribution helps to identify any necessary corrective measures and re-adjustment of interventionary measures (see Background Paper IV, 3.11 and 3.14).

2.2.1 Data requirements

Two sets of data types are required for the operation of an EWS:

Baseline data for specific crisis-prone regions, and crisis-indicators.

Baseline data permit a general crisis risk assessment (using categories: very high, high, medium, sporadic, low) and form the basis for any status-quo analysis and comparative, time-bound observations. The list of important baseline data includes demographic data, general climatic parameters; information on food habits; nutritional and health status; water supply for human consumption, livestock and irrigation; data on food production; data on food requirements and sources to meet them; prices and volumes describing the food market situation; information about the physical and institutional infrastructure, data on food stocks and information on traditional local food and nutrition security systems and crisis-coping strategies. The better the baseline data in terms of precision and relevance, the more reliably can any changes of the supply situation be monitored, the more accurately can the risks and consequences of a crisis situation be assessed and the better can appropriate intervention measures be determined.

8 An example for a coordinated approach of governments and donors in regard of food security interventions at regional level is CILSS (Comité Permanent Inter-Etat pour la Lutte contre la Sècheresse dans le Sahel) in West Africa.

Crisis-indicators function as "trigger" variables for an immediate initiation of prevention- and emergency measures. They help to *identify changes of such critical parameters* which either trigger crises themselves or are typical phenomena of processes accompanying an aggravation of food supply problems. The degree to which they change determines the type, urgency and size of necessary intervention measures. The selection of *suitable* indicators is critical; indicators shall permit an early detection of potentially critical developments, they must be food-security relevant and country-specific. The set of indicators covers the spheres of food production, availability and access and help to identify *unusual deviations from "normalcy"* with respect to e.g. weather, rainfall; acreage sown or affected by crop diseases / pests; mortality rates in livestock; market prices and supplies of staple food commodities and livestock (a relative increase of crop / decrease of livestock prices often is a valid crisis indicator); food stocks with households, traders, marketing organizations; health and nutrition status (e.g. wasting in children); crisis behaviour of the population (e.g. migration; distress sales of household goods or productive assets); etc.

2.2.2 Data collection

Data collection for baseline data and crisis indicators is a costly and time consuming exercise. It should be guided by the following principles:

- data relevance as regards the specifics of local conditions and problems;
- minimising the costs of data collection and processing;
- technical feasibility of data collection, processing and transmission;
- timely provision of data and presentation of data analysis in a concise form to users and decision makers;
- maximum utilisation of established and reliable sources of information;
- clear mandate to and commitments of respective institutions involved (central/decentral);

National EWS exercises should, as far as possible, be coordinated with and integrated into the Global Information and Early Warning System (GIEWS) managed by FAO.[9]

2.3 Food Aid

Food aid is a vital instrument for the prevention and mitigation of acute food crises. Bilateral and multilateral donors, governments as well as NGOs offer food aid in different forms: as emergency relief, project and programme food aid.

Emergency Relief Food Aid is particularly designed to meet requirements in times of acute food crises. To this end, implementing agencies have developed special *fast-track procedures* allowing for special and speedy budgetary sanctioning and quick commodity mobilisation. Generally, emergency relief food aid is meant for free and direct distribution to disaster affected and vulnerable population groups or to be used in special feeding programmes. Emergency food can also be provided as in-kind-payment through food-for-work projects and programmes.[10] In this way relief measures can be linked with development objectives and so contribute to maintaining or creating productive assets. When linking food aid with food-for-work-programmes, preference shall be given to such works which contribute to improved food and nutrition security in medium and long term (e.g. rural infrastructure, small-scale irrigation, land and water conservation). Such dual objectives to provide immediate relief and contribute to improved food and nutrition security in

9 See paper III on "Instruments for AA at macro level"

10 See paper VII on "Actions/interventions at meso + micro level"

the longer run are a typical feature of projects/programmes in the field of development oriented emergency and transitional aid (DETA) as promoted by German Development Cooperation.[11]

Programme Aid can also play a role in mitigating acute food crises. Programme aid which is *monetised through market sales*, increases food market supply and thus moderates otherwise excessive market price hikes for staple food items, a phenomenon, which is invariably, linked with food crisis situations. This contributes to food and nutrition security of market dependent consumers, especially of the urban population.

Food aid is not without problems. Typical risks involved are:

– imbalances on local food markets and impairment of local food production;

– dependencies of beneficiaries, involved organizations and governments;

– induced changes of local food habits and consumption patterns;

– negative price-, income- and growth effects for local food producers.

Such risks can partly be controlled by choosing such food and form of food aid which fits local consumption habits, market conditions and quantitative market requirements. In case of a localised food crisis, food aid can often be arranged through procurement from neighbouring (surplus) areas. If larger regions are crisis-affected or if the deficit is fairly large, food supply from external sources and larger distance transport is normally required. The negative effects of food aid are becoming increasingly a topic of discussion. In order to minimize the named risks food aid should be restricted only to specific emergency situations.[12]

2.4 Food Security Reserves

Food security reserves are particularly relevant for land-locked countries/regions with comparatively high risks of harvest failures or disruptions in supplies. The main purpose of a security reserve is to guarantee and bridge food supply during a defined period of scarcity until food will again become available from other sources, e.g. new harvests, food imports and/or food aid deliveries. Depending on a security reserve's *primary* purpose, one distinguishes between *Market Buffer Stocks* and *Emergency Food Reserves*.

Buffer stocks are to make up for any market deficits and – by checking excessive price hikes – are geared towards a market dependant population. *Emergency food reserves* aim at vulnerable and needy population groups to whom food is generally distributed directly and at no cost or through food-/cash-for-work projects.

A central and problematic issue of food security reserves is the determination of their proper size and the selection of their locations. Size and location of a security reserve have considerable implications for the organization, costs and financing of setting up a security reserve and its continuing management. Amongst others, major issues are: construction of/or provision of stock capacities; sources and organization of procurement of food commodities required for building up reserve stocks as well as organization of the reserve management. A fair number of factors have to be considered *simultaneously* and conflicts resolved between aspects of food security and costs of reserve stock operations.[13]

11 Ibid

12 See for detailed recommendations the "Berlin Statement" of the International Workshop on Food Aid, 2003

13 See, for example, the GTZ evaluation study from Ethiopia

To ensure food availability in times of crises and its effective use, food security reserves require clear regulations with regard to the purpose of the reserve; building up of the reserve stocks (e.g. local purchases, food aid); trigger thresholds, when reserve stocks are to be mobilised; and the conditions of its utilisation. Otherwise, risks are high that stocks will be misused, e.g. during non-crisis times for normal supply operations. Moreover, as a prerequisite for their effective and efficient management and also to minimise undue interference of politicians as well as the dangers of corruption – it has proven absolutely essential that

– food security reserves are given a fair degree of autonomy,
– their operations are independently controlled and transparent,
– sound budgeting and accounting procedures are observed.

A critical aspect of proper management of FSR is the annual routine stock rotation, i.e. the sale of old stock and its replenishment.

2.5 Food Security Funds

Food Security Funds (FSF) are *monetary* security reserves kept in local and/or foreign currency to finance measures coping with food crises. FSFs are a relatively new, flexible and complementary instrument of food crisis prevention addressing two major problems typically connected with Food Aid and Security Reserves, namely: time-lines and costs.

Food Security Funds enable *commercial* imports in times of an acute crisis. This leads to time-gains due to faster food deliveries if compared with official food aid and enable keeping smaller *physical* security reserves. Both advantages can amount to significant savings in terms of investment and operational costs.

Food security funds can also help finance the establishment and maintenance of security reserves, meet costs for operating early warning systems or even be used for forward dated contracts for commercial imports ("futures").

A Food Security Fund itself can be built up with funds originating from monetised programme aid, the national budget and donor contributions as direct foreign currency transfers or ready-to-use letters of credit. The strategy to partly replace physical security reserves with "monetary security reserves" appears economically attractive. Donors' readiness to support FSFs could possibly be stimulated if commercial food imports would be made from those countries that have contributed to the FSFs (FAO is implementing such measures).

The same principles mentioned above for good administration and decision making procedures of food security reserves also apply for the management of FSFs. Effective safeguards to prevent untimely and improper use of FSFs – e.g. for payment of commercial imports in non-crisis situations – seem important – probably even more so than those necessary for "normal" food security reserves.

2.6 Crisis Management Plans

Ideally, all individual instruments of crisis prevention and management mentioned above, i.e. EWS/MIS, food aid, food security reserves and food security funds, should become components of a *system* of disaster prevention and mitigation. Their respective role and *co-ordinated* functioning should be regulated through a Crisis Management Plan (CMP).

In the absence of such a plan, serious organization- and management deficiencies have been experienced in the past. The function of CMPs is to co-ordinate all instruments of crisis prevention

and crisis management as well as all involved agents/agencies (governmental, parastatals, donors, NGOs), and so ensure an efficient and effective deployment of human and material resources in the event of a crisis (who does what, when, where, in co-ordination with whom, how?). To the extent possible, measures in pursuance of the immediate objective to mitigate an acute crisis should be consistent with the long-term objective of removing structural food deficits.

Crisis management plans comprise the following essential components[14].

– *The institutional framework:* Adequate institutional capacities of governmental and non-governmental agencies are decisive preconditions and the very basis for a successful execution of crisis prevention measures and good management. The CMP also defines the responsibilities for central co-ordination and planning as well as for the implementation of individual activities under the plan.

– *The early warning system:* It provides the basis of information enabling a continuous control of crises indicators allowing an advanced identification of critical developments and the early initiation of appropriate prevention measures.

– *Planning* refers to both, planning of crisis prevention operations (ex-ante planning) and planning of activities of the crisis management itself, i.e. after a state of crisis has actually been reached. Crisis management plans may also include contingency plans for food/cash-for-work projects, e.g. pre-planned "on the shelf"-projects, ready for implementation.

– *Resources:* effective crisis management presupposes the availability of adequate financial and material resources (food from food aid and/or security reserves, funds from FSFs, transport capacities, etc.), to be provided by the government, donors or other organizations.

In any of the *spheres of action* mentioned above technical assistance may be required. Such assistance is provided by multilateral organizations (e.g. FAO, WFP, UNDP, UNHCR, UNICEF), bilateral donor organizations (e.g. GTZ) as well as by NGOs (e.g. Red Cross, GAA, churches, other humanitarian organizations). Under all circumstances, a **central governmental co-ordination cell/agency** dealing with crises prevention and -management must be established in high risk countries – and suitable provisions made to ensure their continuity and fast decision making at any time.

2.7 Sequence of interventions in an event of food crisis

The diagram on the following page shows the sequence of crisis prevention and -management measures as described above:

14 See Webb et al. (ed.) 1992.

Figure 3: Sequence of interventions in an event of food crisis

	Phase 1	Phase 2	Phase 3	Phase 4
A coming food crisis is anticipated by the EWS. Preventive activities are initiated according to CMP, e.g. • Implementation of CMP; • Utilisation of food security funds for mobilisation of commercial food imports; • Requests for food aid; • Identification of target groups; • Mobilisation of institutional and material infrastructure	Mobilisation of available food supplies, e.g. : • Locally available marketable food surpluses; • Private stocks; • Stock rotation of public reserves; • Arriving regular food aid deliveries; • Existing stocks of public, NGOs' or private organizations, earmarked for distribution to the needy	Mobilisation of security reserves and their use according to regulations of CMP, such as : • increase of market supplies (general or in specific crisis affected regions), and/or • direct distribution to targeted needy population	The food imports ordered at crisis set-out and financed with FSF arrive in the country and are available for distribution according to CMP. *(Remark:* *These quantities represent the very volume by which FSF help to reduce the required volume of food security reserves)*	*Emergency food aid deliveries which had been requested arrive in the country and are available for distribution according to CMP.* *(Remark:* *The quicker food aid is mobilised and made available for distribution, the smaller the security reserve stocks can be.)*

Source: Metz 2000b, 7

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Paper VII

Actions / Interventions to Improve Food and Nutrition Security at Meso and Micro Level[1]

Georg Bokeloh

1 This paper is a revision and update using elements of the following papers: Metz, M., 2000: Targeted interventions to improve food security of vulnerable groups, April 2000, Kaufmann. S. 2000: Interventions to achieve nutrition security, April 2000.

Table of Contents

1

Introduction: Targeted Food and Nutrition Security interventions

Targeted food and nutrition security interventions comprise a wide variety of measures aiming at improving food and nutrition security of specific population groups which have been identified as vulnerable or food-insecure. The selection of feasible and (most) suitable approaches of targeted interventions depends on the prevailing conditions, the specific socio-economic features of the target population, the nature and causes of their food deficits, and the available resources and implementation capacities. Targeted interventions can be broadly categorised as:

1. Measures aimed at *enhancing availability and access entitlement* at the individual or household level[2], such as measures to promote food production among small and subsistence farmers, employment and income generation measures, as well as targeted subsidy and transfer systems also at the meso level (see chapter 2 and 3).

2. Measures to *improve food utilisation* among the target groups, e.g. through health and nutrition education, measures of preventive and curative health care, provision of safe potable water, sanitation, promotion of suitable food preservation, food preparation and feeding practices, etc. (see chapter 4).

Although targeted interventions may be defined under macro-level policies[3], they are usually implemented at meso-level, i.e. as (components of) projects and programmes in certain areas with a high incidence of food insecure and vulnerable population groups (e.g. drought prone or disaster affected areas; low-income urban districts; slum and squatter areas). Indispensable prerequisites for targeted interventions are institutional capacities, which can identify and screen the food insecure and vulnerable population groups, implement the measures to ensure that the eligible target groups are effectively reached, and monitor programme performance. The institutions involved may be local self-help groups, community organizations, NGOs, government institutions, international and/or donor organizations. Depending on the conditions and the type of intervention, administrative, community or self-targeting approaches can be applied.

The following table provides an overview of the main types of targeted interventions to improve food and nutrition security at household level, the relevant target groups, and the expected outcome on the factors determining household food and nutrition security. The type of intervention under No 1 refers to the availability of food, under No 2 and 3 to the access to food and under No 4 the use and utilisation of food. The three dimensions cannot always be strictly separated. More detailed elaborations are to be found in the following chapters and the annexes (see specially the methodfinder webpage).

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2 At the micro-level (households, individuals), the distinction between access and availability is irrelevant. Both are identical at this level. However, the different sources of access and availability are important, or what Sen defines as "food entitlements" of households and individuals:
– production based entitlement (food from own production),
– trade based entitlement (capacity to buy food in exchange of commodities and cash owned),
– own-labour entitlement (wages earned, cash wages resulting in trade based entitlements),
– transfer entitlement (food obtained through private or public transfers).
In analysing the food situation at micro-level, and in designing targeted interventions, the different sources of food entitlement need to be taken into consideration.

3 E.g. as part of a national poverty alleviation, safety-net or food security programme.

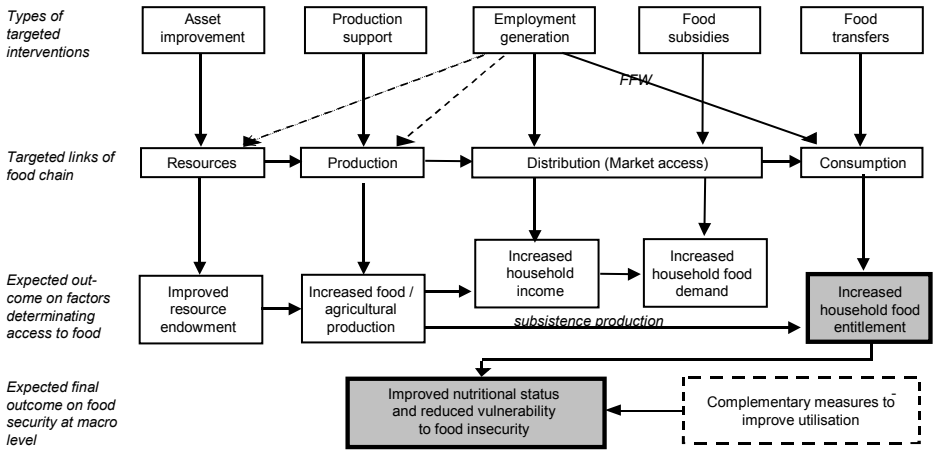
Table 1: Targeted Food and Nutrition Security interventions, main target groups, and impact on household food entitlement

	Type of interventions	Target groups	Impact on household food entitlement
Availability	1. Improvement of productive assets and targeted production support, e.g. – Land (tenure) reform – Natural resource conservation – Technology, water – Input supply, – Agricultural credit – Extension & training	– Small farmers – (Semi-)subsistence farmers – Tenant farmers – Victims of conflict, e.g. landless returnees	– Increased agricultural income = purchasing power = increased household food demand – Increased household food supplies from own production
Access	2. – Income generation schemes (e.g. training, micro-credit programmes); – Public works / employment generation schemes – Food-for-work (FFW) programmes	– Rural and urban poor un- and under-employed – Rural landless – Victims of conflict, e.g. landless returnees	– Increased cash income = increased purchasing power = increased household food demand & supplies; – Increased income in kind of food = increased household food supplies
	3. Targeted food subsidies, e.g.: – Food stamps – Fair price shops – Subsidies for inferior goods – Geographic targeting	– Urban poor – Rural poor – Specific vulnerable groups (see below)	– Increased real income due to lower food prices = purchasing power = increased household food demand
Use and Utilisation	4. Direct food transfers, e.g. – Relief assistance – Special/supplementary feeding programmes – Wet feeding – Nutrition and health education (hygiene)	Specific vulnerable groups, e.g. – disaster affected people, war invalids, landmine disabled, internally displaced people (IDP) – Undernourished children – Female headed households – Pregnant & lactating women – Elderly, disabled & sick persons	– Increased individual and/ or household food supplies through direct food transfers

Source: Thomson and Metz 1997

The following figure 1 shows the links of selected targeted interventions into the food chain and the main impact paths on the factors determining food and nutrition security.

Figure 1: Impact path of targeted intervention factors determining Food and Nutrition Security



Source: adapted from Webb, Braun, Yisehac 1992

2 Actions to improve availability of food

The improvements of productive assets and targeted production support are predominant the known agricultural support mechanisms.

Small and subsistence farmers constitute a – or even *the* – major vulnerable and food insecure population group in many countries. Enhancing their capacity to increase agricultural and food production can simultaneously mitigate problems of access, availability and stability. Although respective measures are part of overall agricultural sector development policies, there is a need to adapt and tailor targeted interventions to the specific needs, constraints and capacities of the target group of small and subsistence farmers. Depending on the situation, the following approaches may come under consideration (see table 2).

Table 2: Actions to improve availability of food and examples

Field of actions	Examples
Improvement of food production and agricultural productivity	– intensification and diversification of production, – improvement of access to land (land and land tenure reform), – appropriate technologies and improved agricultural input packages (improved seeds, fertilizers, etc.) – privatisation of farms, – crop protection, – introduction/promotion of perennial crops (often in combination with ecological stabilization of arable land), – development of agricultural extension services, – agricultural price policy, – agricultural research for the development of improved farming systems (including appropriate use of the potential of biotechnology) geared towards small and subsistence farmers
Development and introduction of appropriate technologies in the fields of livestock, forestry and fisheries	– adapted livestock, veterinary, animal husbandry improvements – artificial insemination, – animal health and vaccination, – promotion of agro-forestry, – aquaculture
Resource management	– construction of terraces, – afforestation and/or reforestation – soil and water conservation measures (e.g. soil and stone bunds, intercropping, vegetation strips)
Improvement and extension of rural infrastructure	– small scale irrigation systems (e.g. water harvesting, river diversion, ponds, small dams) – construction of food stores, support to appropriated store management (prevention of losses) – construction and maintenance of feeder roads, roads and bridges – construction of market places – micro-credit schemes for small farmers
Marketing of agricultural products	– price information system – quality control – advertising – liberalisation of markets (internal, export, import)
Promotion of fair trade regulations	– remove export barriers (tariffs) – remove import tariffs on inputs – eliminate non-trade barriers on inputs (e.g., approval of seeds and biotech products)
Promotion of agro-industry, food processing and food storage	– cereal banks, central and decentralised grain reserves, – food safety regulations and control systems, – food fortification
Organizational and institutional development	– promotion and support of self-help groups, cooperatives

To be effective, a combination and package of various of the measures mentioned above is generally required[4]. Selected measures with a nutritional focus are elaborated further next.

2.1 Nutrition-oriented agriculture and food diversification

Household food security is a pre-condition to achieving nutrition security. To improve the households and community's situation the efficiency of existing utilisation of resources should be improved. At the same time conserving and, where possible, enhancing the productive capacity

4 Reference is made to the abundant experience and literature on the subject.

of the resources can be an aim. The strategy should involve sound land-use planning and subsequent implementation of actions at community and household level to match demands with the potentials of both the land and its people (FAO 1996).

Increased production and diversification of food need to be promoted in such a way as to offer particular benefit to the rural poor. Measures should include targeted interventions to increase the productivity of small-scale farmers such as production incentives, development of an efficient marketing infrastructure for food products and improved seeds. In addition more research input would be required to improve the food production situation in rain-fed and disadvantaged areas, e.g. areas where shifting cultivation is practised. To ensure a proper impact of food production and diversification programmes, nutrition agricultural measures have to be accompanied by effective extension services, credit availability for men and women and encouragement in using inputs such as fertiliser and improved seeds. Technology combined with investment in people – especially education for men and women farmers, particularly on nutrition and health – can show high rates of return.

In some rural areas the overriding nutritional problems are not just associated with the shortage of food, but also with the lack of job and income. Poor households are more likely to contain malnourished members. Women and children are often the most severely affected. Producer incentives and new technologies that increase production and employment in the agricultural sector, including the establishment of small- and medium-scale food-processing facilities, can help augment incomes, alleviate poverty and improve food security at household level.

Incorporating nutritional considerations in production policies and programmes can avoid some of the negative effects sometimes associated with new technology. The health and nutrition risks of technological change must be mitigated through appropriate technology design. There is substantial scope for agricultural, public health and nutrition workers and researchers to collaborate on improving the designs of agricultural programmes.

In countries and regions that frequently suffer serious food shortages, such as those prone to drought, programmes in the agricultural sector are frequently complemented by public measures such as income and employment generation programmes and direct food transfers (e.g. food price subsidies, food rationing and food stamps) as a means of stabilising household food security and maintaining nutrition levels for the poorest. A cost-effective but organizationally more demanding alternative, however, is a system of direct nutrition interventions (FAO 1996).

2.2 Selected agricultural interventions to improve household food security

Improvement of staple food production is necessary to ensure sufficiency of staple food (such as rice, sorghum, maize, etc.) throughout the year. Measures recommended are ones to improve production such as irrigation systems, terraces, up-land farming systems, etc. Interventions in the field of land entitlements and management of water supply for agricultural production are also included here. Introduction of improved and more productive seeds, improved soil management, encouragement of marketing of seeds as well as the implementation of essential infrastructure may become necessary. In up-land areas measure to improve cultivation techniques including mixed cropping systems and improved seed varieties could increase productivity.

Promotion of food diversification to increase production of nutritious food items, with special emphasis on fat-, protein- and micro-nutrient rich foods. Examples are the increased production of mung, soy, and various other beans or seeds (sun-flowers, sesame, peanuts), various kinds of green leafy or yellowish coloured vegetables to increase consumption of iron and Vitamin A. Products have to be selected according to the production potential of the area, preferences of the population as well as the predominant nutrition deficiency found in the area. Specific measures

can be implemented in up-land as well as in lowland areas, home or village gardens. **Fruit tree** production is a valuable investment to improve the quality of diet in the long term.

Increase production of food from animals; animal raising programmes, including the introduction of new and more productive breeds, vaccination programmes and fodder production. Raising of big animals (cows, buffaloes, etc.) is mainly seen as a measure to increase household income, while poultry raising can contribute directly to food consumption within the family. **Fish raising** is also a valuable measure where appropriate places and water are available.

However, measures to be implemented at community and household level are not independent from higher levels, they need political commitment, support and structures through which the measures are implemented.

Recent evidence indicates that even **improvements in household food security**, as measured by adequate energy, do not necessarily translate into **improvements in the nutritional status**. An analysis of national trends in food consumption and the nutritional status of people in developing countries over the past two decades suggests that, while there has been some improvement in achieving greater household food security, this has not resulted in comparable reductions in malnutrition. One reason for persistent malnutrition may lie in the complex interaction between nutritional status and food as well as non-food determinants. Non-food determinants, such as quality of health care facilities and services, education, sanitation, clean water and effective mechanisms for delivering these services are equally important to improve the nutritional situation (IFPRI 1995).

2.3 Food production in urban areas

Feeding the growing population of cities in developing countries has become a major concern during the past decade. Food supply coming from rural areas is and in the future will continue to be the base to ensure food security in cities. But agriculture in and nearby cities has to play a very important complementary function to (DSE and ATSAF 1995, DSE-ZEL et. al. 2000):

- increase agricultural production by using available land, water and waste resources.
- improve quality and quantity of food supply (more food and fresh food rich in micronutrients, introduction of home gardens, or poultry raising).
- improve the socio-economic situation, creating jobs and income from food production especially of poor population groups,
- contribute to sustainable development of urban areas and to prevent food crisis of large population groups.

Basic principles and options

All kinds of agricultural activity to improve food security should be part of an urban development programme, combining infrastructure, food supply, income generation, industrial location planning and urban housing. Measures should not be confined to farmers only, but to the whole system of urban agriculture and urban development. Urban agriculture has to be placed between agriculture development and urban planning. At an early stage of programme planning all existing systems of urban and peri-urban production systems have to be considered. The institutional focus is one of the crucial points. Activities aimed at supporting this particular branch of agriculture have to be well co-ordinated with local government institutions. In urban settings it appears useful to co-operate closely or implement through NGO's. They are considered to have a closer relationship to urban target groups.

Programmes in urban settings have to follow a holistic approach, interdisciplinary is a precondition to find appropriate solutions and measures to improve the food security situation (DSE and ATSAF 1995).

Basic components to improve urban agriculture

- secure access to land and land use rights,
- improve transportation infrastructure,
- improve water supply and control water use,
- analyse urban agriculture with respect to environmental effects,
- offer low cost and low external input technologies for urban production systems,
- develop and improve appropriate credit and marketing facilitates, especially but not exclusively for peri-urban producers,
- help homeless people in cities to organise themselves and to find employment.

Since little information is available to improve the household food security situation in urban areas, agriculture research still has a major role to play. It consists mainly in developing, testing and diffusing concepts for land use and production systems appropriate for individual urban situations (DSE and ATSAF 1995).

Urban poverty and food insecurity are predominately structural problems that can be tackled through **structural change and empowerment of the poor**. Sustainable social **safety nets** provide some measure of relief. Some of the conclusions are drawn from the experience of urban programmes; food security can be enhanced by measures **that improve the status of women** – that is, improve their income-earning potential, organizational capacity and their decision-making authority in the home and community, and help them save time and energy. Urban women, who often lack extended family contacts and other social networks, have a special need for maternity leave and other benefits on the job and support measures to enable them to care for and feed their young children even if they work outside the home (UNICEF 1998).

Improved access to **basic social services** such as education and health have obvious benefits for household income, productivity, self-esteem and future ability to ensure the satisfaction of food needs in the family. Experiences and questions about urban agriculture are presented in Box 9.

3 Actions to improve access to food

3.1 Employment and income generation

3.1.1 Public works / employment generation / food-for-work schemes

An important form of targeted interventions to augment the incomes of poor un- and under-employed people in urban and rural areas are employment generation schemes. People involved in such programmes may be paid in cash or in kind of food (cash- or food-for-work)[5].

Four categories of public works / employment generation schemes can be distinguished:

1. Emergency relief projects, providing temporary (food) wage employment to supplement or replace a crisis-induced loss of income;
2. Seasonal projects, aimed at supplementing the income of poor households during slack agricultural seasons;
3. Regular (infrastructural) projects, designed to create or enhance productive assets by tapping available labour while providing employment opportunities for poor households;
4. Long-term employment-generation projects, designed to tackle chronic un- and under-employment by offering continuous job opportunities, particularly to the urban poor and the landless.

Main and particularly interesting features of public works / employment generation schemes are:

– The **dual objective** of providing **temporary relief** to food insecure population groups which lack other sources of food entitlement, and, at the same time, **creating or improving productive assets** which contribute to sustainable development and longer-term food and nutrition security.

– **Infrastructure works and natural resource conservation activities** which absorb a large number of unskilled labour are **particularly suitable** for employment generation schemes.

The programmes can be **self-targeting** in the sense that, if properly designed, they will attract only those people who have no alternative source of income and employment. Self-targeting is only effective if the wages for the people employed in the programme are below market wages. Otherwise, public work schemes may attract people other than the poor and unemployed, displacing private employment.

Employment schemes **prevent** people from becoming **dependent on assistance** in the form of free handouts.

In order to be effective, provisions have to be made to avoid the problems and constraints which are, according to past experience, typically associated with employment generation programmes. Such major constraints are:

– Often relief aspects are predominant, i.e. the possibility to earn some additional income is perceived as more important than the works executed, with negative implications for the

5 The preferable form of payment – cash wages versus food-for-work rations – depends, apart from the type of resources available to fund such schemes (funds or food aid), on a number of conditions in the country and the area where employment schemes are implemented (food market situation, food price level and fluctuations, surplus/deficit areas, transport costs, logistical and management capacities for food distribution, proneness to corruption, etc.); cf. Chapter 5, Section 3.3, Table 5.4 of Thomson and Metz 1997.

quality of works. This is particularly severe if the participants and the communities are not actively involved in project selection, design and management.

– Lack of skilled manpower, managerial and technical capacities often leads to inappropriate designs, poor technical planning, insufficient supervision during implementation, inefficient operation modes, and lack of follow-up and maintenance of the works after completion.

– The need for complementary inputs, apart from cash wages or FFW rations, like tools, building material, complementary machinery, required for effective implementation, is often not adequately perceived and catered for.

Although public works / employment generation schemes appear to be an appropriate approach to mitigate poverty and improve household food and nutrition security, they cannot be applied everywhere and in all situations where vulnerable groups need assistance. Public works can only reach those people who are able to work. They require suitable project designs to be developed. Complementary material and technical inputs, and an infrastructure with appropriate management capacity are needed to implement them.

3.1.2 Promotion of off-farm income and employment opportunities

Food and nutrition security of poor family households with only marginal assets of land or livestock, as well as particularly vulnerable population groups (female headed households, handicapped, young jobless people) can be enhanced through the promotion of off-farm income and employment opportunities. Major approaches in this field are education and skills training programmes, business promotion and micro-credit schemes.

3.2 Food subsidy and transfer systems

General and targeted food subsidy programmes, aimed at making essential food items affordable for low income households, have been implemented in many countries. Since such programmes are usually designed and implemented at national macro-level, they are not presented here in detail.[6] Here we will concentrate on **direct food transfers**, which comprise the distribution of free food relief rations and special feeding programmes.

3.2.1 Free distribution of relief rations

In all cases where people have lost their basis of subsistence, for example in the wake of natural or man-made disasters, free distribution of food rations may be required to bridge the period of destitution and maintain a minimal level of subsistence. Depending on the situation, the infrastructure and the means available, rations to cover all or part of the household food requirements may be distributed on a daily, weekly or monthly basis.

Targeting is usually best achieved if daily rations are distributed. This, however, involves high administrative costs and requires the beneficiaries to come to the distribution centre every day. If at all feasible, this can only be done in cases where the target group lives close to distribution centres, e.g. in refugee camps or urban areas.

Experiences show that relief food is most effectively distributed where it is channelled through established community structures, and least effective where it is provided in the framework of massive institutionalised relief operations. Therefore, efforts should be made to keep the people

6 As to the types, features and conditions of targeted food subsidies, reference is made to Chapter 5, Section 3.4 of Thomson and Metz 1997.

in their community environment by providing assistance there. This has the additional advantage that the beneficiaries can still apply their various coping strategies of which reliance on relief food distribution is only one. If people migrate to camps or distribution centres they lose alternative means of subsistence and become completely dependent on relief assistance. This involves a high risk of food insecurity due to delays and irregular supplies.

The sale of relief aid by the beneficiaries is a common phenomenon, particularly if weekly or monthly wholesale rations are distributed. There are various reasons why beneficiaries often sell part of their relief rations: to satisfy urgent cash needs, to buy other necessary commodities needed (e.g. salt, sugar, soap, clothing, etc.), to exchange the commodities received for preferred local or cheaper types of food, to avoid bulky transport if people live far away from the distribution centres, etc. For such reasons, the sale of part of relief rations is not necessarily an indication of excessive relief supplies. Relief food assistance can be considered as a type of real income transfer, comparable to food subsidies or FFW wages. The effectiveness of food relief assistance depends primarily on whether assistance is provided in time and volume according to the need which, again, requires an institutional mechanism to identify the needy persons and to distribute the relief commodities directly to them. Massive food relief distribution schemes require close monitoring in order to ensure proper targeting and to prevent market distorting effects and disincentives for local food production. Furthermore, in order to avoid dependence, direct food transfers should be stopped as soon as an emergency is over, and replaced by other forms of rehabilitation assistance.

3.2.2 Special/supplementary feeding programmes

Special feeding programmes are most effective when targeted to high-risk individuals, such as children, pregnant and nursing mothers, old and sick people.

In general, special feeding programmes are administratively intensive in terms of screening and reaching the eligible people, and they require a certain level of infrastructure and logistical support to be successfully implemented. Often existing institutions such as health centres or schools are used as a distribution network. Sometimes special food distribution or feeding centres need to be established. The food may be distributed as take-home rations or provided as wet-feeding on site. In the latter case, the administrative costs are relatively high but targeting and utilisation of the food by the eligible beneficiaries is most effectively achieved.

If the whole family is poor and exposed to food insecurity, certain leakage to other family members can be considered as effective, as the feeding programme will have nutritional benefits for the other household members, too. There are further potential benefits of feeding programmes. School feeding programmes can provide an effective channel for distributing food to children of low-income families and an incentive for such families to send their children to school. This can contribute to increased school enrolment and attendance among school-age children. Such programmes will, of course, be less effective or ineffective if the majority of the school children come from relatively better-off families, if the poorest families do not send their children to school, or if the crucial nutritional deficiencies are in under school-age children. In the latter case, health care or special mother and child care centres may be an appropriate channel to reach the target group.

4 Actions to improve the use and utilisation of food

4.1 Overview: Interventions to achieve nutrition security

In the first part of this chapter interventions to achieve nutrition security of individuals and households are summarised. Here the concept is adopted from UNICEF's strategy to improve the nutritional situation (UNICEF 1990). The goal of nutritional security is seen as one important determinant of the broader livelihood security concept developed in the late 1990's (Frankenberger, T.R., McCaston, M.K. 1998). A more detailed description of actions, their integration into programmes and approaches to implement them are presented in later sections. Examples of successfully implemented programmes are mentioned separately.

4.1.1 Interventions to address manifestations and immediate causes of malnutrition

When the nutritional and health status of the people has deteriorated due to an emergency situation severely malnourished children require institutional care in order to survive or recover. When such children are identified by a monitoring system, nutrition rehabilitation may become necessary, either at home or in the community. Depending on the severity of malnutrition **direct, supplementary or therapeutic feeding** is essential. **School feeding or school lunch programmes** may be a useful action to improve the nutritional status of school children and to encourage school attendance.

When the level of malnutrition is high there is also a need for **curative health services**, including the provision of essential drugs. The relation between diarrhoea and dietary intake, leading to serious malnutrition, is well known. **Oral dehydration therapy** is one of the most important actions needed to save lives. Furthermore, management of other diseases is essential; e.g. the treatment of malaria infections with anti-malaria drugs or serious respiratory or diarrhoeal infections with antibiotics. Deworming is also essential when curing malnutrition.

To combat micro-nutrient deficiencies on a large scale, the **distribution of micro-nutrients** can be a successful and cost-effective measure. **Food fortification** (e.g. iodisation of salt) and **supplementation** (e.g. iron/folate, Vitamin A, iodine) are appropriate where efficient delivery systems are in place (health services, immunisation programme).

4.1.2 Interventions that address the underlying causes of malnutrition

Within the scope of a FNS Programme actions at this level should address those underlying causes that have been identified as primarily responsible for the particular type of inadequate dietary intake and diseases.

Infectious diseases impede dietary intake and utilisation, resulting in malnutrition. Consequently one of the most important premises to improve nutrition is to control and prevent most common childhood infectious diseases by **immunisation**, e.g. expanded programme on immunisation (EPI). Additionally, other preventive health care measures are necessary. Examples are **prevention of diarrhoea** by measures of diarrhoeal disease control, **prevention of malaria** by measures such as bed-net impregnation, and prevention of other most common infectious diseases such as **acute respiratory infections** by reduction of in-door pollution, proper housing and better clothing. Each measure has to be accompanied by properly designed **health education**.

Improved **water supply** has to be a priority concern. This improves life in many ways (improves hygiene and living conditions, reduces water born and transmitted diseases and reduces labour

burden mainly of women and girls). Emphasis should be given to the maintenance of water supply systems, using local technologies and the hygienic use of water. **Environmental sanitation**, sanitary means of excreta disposal (e.g. latrine construction) and household waste disposal are important aspects to control communicable diseases.

Maternal and child care: Child caring practices are closely linked with the situation of households and the situation of women. A mother's knowledge about child care and her access to and control over resources determine child care. The establishment of community-based child care arrangements, income generating and labour saving measures especially for women, training and education for women are aimed at improving the care of women and their children.

Too many children, too closely spaced or born by mothers who are too young or too old are detrimental to the health of both mother and child. Furthermore, they contribute to enormous workloads. High population growth rates also require steadily growing demands of a size that families, communities and countries can not afford. Therefore **family planning or birth spacing** activities should be integrated in health, education and child-care activities.

Improved child feeding practices for young children is most important to ensure proper physical and mental development. Breastfeeding provides necessary energy and nutrients for the first four to six months of life. After that breast-milk must be complemented by food rich in energy and nutrients. Breastfeeding has to continue up to two years or longer. An appropriate frequency of feeding, use of balanced foods (containing sufficient energy, nutrients, micro-nutrients, such as Vitamin A) are important to ensure healthy development of children.

Health and nutrition education are important elements of all actions listed above. Health and nutrition education are required for all levels, families, communities, health and extension workers and non-formal as well as formal teachers.

Actions mentioned so far can be seen as part of a **Primary Health Care** approach (PHC). To improve the nutritional situation it is therefore necessary to expand the coverage and improve the quality of PHC services. Improved management at all levels, but primarily at district levels, training and the development of locally recruited community health workers, volunteers and birth attendants, the improvement of referral services, including hospitals and improved transportation are all potentially important interventions in a nutrition programme.

Non-formal and formal education and literacy have to be promoted to strengthen the self-help capacity and development of disadvantaged population groups. Education is an essential element to ensure sustainability of development. Emphasis should be given to the reduction of disparity between boys and girls. Educating adolescent girls and non-literate mothers provides them with useful knowledge about maternal and child care and other health care messages (prevention of diseases, healthy nutrition, family planning, prevention of sexually transmitted diseases, etc.) can be included in the curriculum.

Household food security is a precondition for achieving nutrition security. To achieve household food security all steps in the food chain should be considered: production of oil and protein rich foods, harvesting, storage, distribution, marketing, and preparation. Depending on the problem identified within the given areas emphasis may be placed on staple foods, legumes, vegetables or fruits and animal products. Food is obtained through production, purchase or barter. For many households, particularly in urban areas, the relationship between income and the price of food determines the level of household food security. Consequently, improving household economy and stimulating trade of food should both be given high priority. To **control and prevent micro-nutrient deficiencies** food-based action programmes are advisable. Measures are small scale community or home gardens, animal husbandry and large scale vegetable and fruit production.

When encouraging food production, preservation and trade or commercial production of foods, investments in **food safety** are necessary. Food analysis and food quality control systems ensure that processed and marketed foods are of good quality and are safe from chemical residues, adulteration and other possible sources of contamination. They also ensure the quality and safety of micro-nutrient-rich foods on the market, especially foods fortified with one or more micro-nutrients.

Intra-household issues have to be considered when planning and implementing Food and Nutrition Security Programmes. Intra-household dynamics relate to such aspects as: determining who does what to produce food, earning cash income for the purchase of food, purchasing the food and preparing it within households. The respective contribution of men and women in these aspects is an important factor. Hence, intra-household dynamics with gender role perspectives are significant factors in determining household food and nutrition security. In many countries intra-household food distribution is unequal; husbands and male children are generally favoured (FAO 1999).

Women are often more vulnerable to nutritional problems because of their lower social and economic status, as well as their physiological needs. **Gender equality** contributes significantly to efforts to improve the nutrition and health status of women, men and children. Improving women's knowledge of nutrition and food security can prevent illnesses, disabilities and premature deaths. Further, women who enjoy good health are better able to contribute to economic development.

A central challenge for nutrition specific and related programmes is a balance of approaches that work. Programme planning involving assessments, analysis and actions are essential for formulating appropriate 'bottom-up' solutions, particularly with respect to ways in which programmes are organised, managed and monitored. But there are some aspects of resolving malnutrition that can be appropriately formulated at higher levels. Past experience has shown that a combination of bottom-up and centrally planned actions may be best (UNICEF 1998).

4.2 Direct nutrition interventions

4.2.1 Feeding programmes

The following describes objectives and basic principles of feeding programmes in emergencies and relief situations. There are two mechanisms through which food may be provided: **General Food Distribution and Selective Feeding Programmes.**

General Food Distribution provides a standard general ration to the affected population and aims at covering food and nutritional needs (WFP 1999). General, non-targeted food distribution often lack food to feed the entire population and/or distribution of food may become unfair. Therefore, food distribution is mainly targeted to certain vulnerable groups who are at particular risk of becoming more seriously malnourished. Such groups are pre-school children, school children, pregnant and lactating women, elderly, handicapped, or socially disadvantaged groups (MSF 1995).

There are two forms of **Selective Feeding Programmes**: Supplementary Feeding Programmes and Therapeutic Feeding Programmes

Supplementary Feeding Programmes (SFPs) provide nutritious food in addition to the basic daily diet or to the general ration. They aim to rehabilitate malnourished people or to prevent a deterioration of nutritional status of those most at risk by meeting their additional needs, focusing particularly on young children, pregnant women and nursing mothers.

SFPs are short-term measures and should not be seen as a means of compensating for an inadequate general food ration. The objectives of the feeding programme should be realistic and should be achieved within a period determined in advance. SFPs comprise two different types:

Targeted SFPs: The main aim of a Targeted SFP is to prevent the moderately malnourished becoming severely malnourished and to rehabilitate them. These types of programmes usually provide a food supplement to the general ration for mild and moderately malnourished individuals and for selected pregnant and lactating mothers and other individuals nutritionally at risk (WFP 1999). Depending on the objective of the programme, targeting potential beneficiaries is achieved in a variety of ways. Care International also recommends maternal and child health feeding programmes (Care 1996). Means tests and vulnerability tests have been suggested by FAO (FAO 1996).

A commonly practised way to identify populations at risk is to screen the nutritional status of children. A quick method is to measure the mid-upper arm circumference (MUAC) of children 6 months to 5 years old, or of children showing a height less than 110cm. For further administration of feeding programmes the weight for height index of children showing a MUAC less than 13.5cm and/or the presence of oedema is recommended. Children whose weight for height is less than 70 to 79% (or less than 2 SD) will be selected for supplementary feeding (MSF 1995). A more detailed description for targeting potential beneficiaries, including pregnant mothers and school children, for supplementary feeding is presented in the WPF Guideline for selective feeding programmes in emergency situations (WFP 1999).

Blanket SFPs: The main aim of a blanket SFP is to prevent widespread malnutrition and to reduce excess mortality among those at-risk by providing a food/micronutrient supplement for all members of the group (e.g. children under five or under three, pregnant women and nursing mothers, etc.).

Supplementary food can be distributed in two ways:

On-site feeding or wet ration: The daily distribution of cooked food/meals at feeding centres. The number of meals provided can vary in specific situations, but a minimum of two or three meals should be provided per day.

Take-home or dry ration: The regular (weekly or bi-weekly) distribution of food in dry form to be prepared at home. It may be necessary to increase the amount of food to compensate for intra-household sharing. It is generally accepted that take-home rations should always be considered first as such programmes require fewer resources and there is no evidence to show that on-site SFPs are more effective.

Therapeutic Feeding Programmes (TFPs) are to rehabilitate severely malnourished persons. The main aim is to reduce excess mortality. Children having a weight for height index less than 70% and/or oedema and/or a MUAC less than 11 cm should be selected for therapeutic feeding (MSF 1995). In most emergency situations, the majority of those with severe wasting are young children. There have, however, been cases where large numbers of adolescents and adults have become wasted. In such situations, separate TFP facilities may be established for these groups (WFP 1999). Therapeutic feeding provides a carefully balanced and intensively managed dietary management with intensive medical attention to rehabilitate those with severe malnutrition and to prevent death (MSF 1995).

A table presenting objectives and criteria for selection and target group is given in Box 1.

School feeding programmes have the objective to improve the nutritional status of school-aged children, increase school attendance and enrolment and increase attention and cognitive development (Care 1996). Many countries operate such programmes effectively and combine them

with nutrition education and school gardening. However, in low-income countries where school enrolment does not include the entire population of school-aged children, school feeding may miss the most needy (FAO 1996).

A careful, case-by-case assessment of needs should precede the decision on objective priorities and possible interventions. Each intervention should be designed in line with its objectives, including targeting criteria, ration size and composition, type of meal to be provided (snack, lunch, both) as well as complementary activities, such as training of school staff and parents; other school health and nutrition interventions and interventions to address obstacles to enrolment and attendance, etc. It may not always be possible, or cost-effective, to attempt to achieve multiple objectives in one programme. For example, an early morning snack may be nutritionally sufficient for short-term hunger alleviation but not "financially" sufficient for stimulating enrolment and attendance. Where the emphasis is mostly on increasing access to schools, with no nutritional problems to be addressed, food could even be provided as take-home rations avoiding the need for cooking and food distribution at school level (WFP 1995).

The Food for Education Programme in Bangladesh has shown that school feeding programmes can be highly effective in terms of increasing school enrolment, promoting school attendance and reducing dropout rates, Thus they contribute to long-term nutritional effects through education, and at the same time can be a very cost-effective mechanism for food-based, targeted transfers (FAO 1996).

4.2.2 Programmes to combat micro-nutrient deficiencies

Most prevalent micro-nutrient deficiencies in developing countries are Vitamin A, iron and iodine deficiency. Considerable and successful actions have been taken in the past decade to tackle the problem of micro-nutrient deficiencies. Increased efforts are still necessary to overcome such deficiencies and their detrimental effects completely. A combination of actions needs to be adopted concerning the availability and access to micronutrient-rich foods, education related to food and nutrition, dietary diversification through production and consumption of micronutrient-rich foods, legislation and implementation of food fortification and supplementation and appropriate public-health measures (FAO/WHO 1992).

Food fortification

Food fortification is one of the food-based strategies for preventing micronutrient malnutrition. Fortification is the addition of nutrients to commonly eaten foods to maintain or improve the diet. The food that carries the nutrient is the vehicle; the nutrient added is the fortifier. Double fortification is the addition of two nutrients to a single food vehicle, e.g. iron and iodine to salt. Multiple fortification is the addition of more than two nutrients to a single food vehicle. Fortification should be viewed as part of a range of measures that influences the quality of food, in addition to other measures such as improved agricultural practices, better processing and storage methods and combined with consumer education.

In developing countries, fortification is increasingly recognised as an effective medium- and long-term approach to improve the micro-nutrient status of large populations. Fortification does not require changes in the dietary habits of the population, can often be implemented relatively quickly and can be sustainable over a long period of time. It is considered one of the most cost-effective means of overcoming micronutrient malnutrition (World Bank 1994, Unicef 1998).

The selection of the right vehicle is a pre-condition to assure success. Successful vehicles for **Vitamin A fortification** are sugar, margarine and hydrogenated oil. Tea, whole wheat and rice are under research. **Iron fortification** is technically more difficult than other micro-nutrient fortifica-

tions, here cereal based foods, rice (but not yet on a large scale), salt and sugar and fish sauce (the later only in Thailand) have shown good results. Chocolate cookies have been fortified in Chile and tested in a school lunch programme (World Bank 1994).

Since the 1930s, several methods of **iodine fortification** have been proposed to eliminate iodine deficiency disorders (IDD). A variety of food vehicles have been tried, including salt, bread, sweets, lactose and water. Iodisation of salt has become the most commonly accepted method of iodine deficiency prophylaxis in most countries of the world. Its advantages include uniformity of consumption, universal coverage, acceptability, simple technology and low cost (World Bank 1994).

During the past few years attention has been given to the possible high prevalence of **zinc deficiency** among children and its consequences. Results presented show that zinc has an impact on growth especially in severely growth retarded and underweight children and reduces morbidity (Roy et al. 1999). However, long-term zinc supplementation as well as fortification have not yet been tested sufficiently in field programmes to present final recommendations.

Food supplementation programmes

Supplementation programmes are targeted distributions of micro-nutrients to groups nutritionally at risk. Provided effective delivery systems are in place, supplementation can be an adequate short-term intervention. But it requires trained, motivated health workers who can communicate effectively with consumers to overcome their fears, misinformation and ignorance. Nowadays the supplements which are being distributed on a large scale in developing countries are the micro nutrients iron/folate, Vitamin A and iodine.

Options for distribution

- **Distribution** of Vitamin A to all pre-school children, targeting iron-folate tablets to all pregnant women, iodised oil for women in the reproductive age, or in some places to all school children.
- **Medical targeting** includes Vitamin A to children with xerophthalmia, chronic diarrhoea, severe acute respiratory infections, growth failure, tuberculosis or measles. Iron has to be given to all premature and low birth weight babies.
- In some **regions geographical or seasonal targeting** is required; Iodised oil is usually targeted to high altitude areas and places beyond the reach of commercial salt markets. Vitamin A supplements may be required only during the dry season or in semiarid areas. Iron may be targeted to regions of high prevalence of malaria or hookworm infections.

Where universal distribution is appropriate, the Expanded Programme on Immunisation (EPI) is useful to disseminate supplements (World Bank 1994).

When planning and implementing supplementation programmes, long term measures should be given highest priority to achieve beneficial and sustainable changes in dietary habits.

Diet and food based approaches

A food-based action programme is a comprehensive, sustainable and long-term action programme to control and prevent micro-nutrient malnutrition. It is designed to improve the diet and the overall nutritional status of all people at all times (FAO 1998) by increasing the availability and consumption of micro-nutrient-rich foods. In the long-term, such approaches are more likely to be sustainable. However, the benefit of such an approach is not immediate. If severe micro-nutrient malnutrition (xerophthalmia, goitre or cretinism, or severe iron deficiency anaemia) is

present, short-term supplementation programmes should be implemented in addition to food-based activities (FAO/ILSI 1997).

Small-scale community or home gardens, growing vegetables and fruits can play a significant role in increasing production of micro-nutrient-rich foods of both rural and urban households. Success requires a good understanding of local conditions. Community participation and the involvement of women is a key to achieving nutritionally beneficial changes. Land and water limitations are common constraints, which may require local government intervention or assistance. An example of a food based strategy of FAO is given in Box 2.

Production of small animals (e.g., poultry, fish, rabbits, pigs, goats), can provide excellent food sources of essential micronutrients, including bio-available iron and vitamin A. Efforts to promote small livestock and fishery projects require educating and supporting the producers. Efficient, **large-scale commercial vegetable and fruit production** increase the availability of micro-nutrient rich foods at reasonable prices. There may be greater availability of overall food and fortified food products in urban areas. However, limited access to food may hinder adequate consumption. Relevant measures to reduce poverty and increase people's access to sufficient food are advisable. Nevertheless, urban food production has become increasingly important in recent years. Promotions of home gardens and poultry production have been beneficial to improving people's diet, with special consideration to the consumption of micro-nutrients.

No matter what location, nutrition education activities strengthen and complement efforts to enhance availability and consumption of micro-nutrient rich foods.

School-based gardening programmes can be an excellent means of introducing new ideas about gardening and a useful channel for reaching others in the community, as children tend to be more open than adults to the adoption of new ideas. School-based programmes can reduce micro-nutrient malnutrition by:

- promoting consumption of fruits and green leafy vegetables,
- teaching students how to establish and maintain home gardens,
- introducing students to food preparation and storage techniques,
- providing nutrition information and encouraging adolescent girls to adopt more healthy dietary habits before their first pregnancy and
- enhancing the status of and student's interest in agriculture and nutrition as future occupations.

Commercial oil seed production is a major means of providing low-cost dietary fat which is necessary for absorption of vitamin A and beta-carotene. In some countries red palm oil cultivation may present opportunities for improving vitamin A status. Fruit and milk beverages, where appropriate, may also be accessible sources of micro-nutrients.

Post-harvest loss of micro-nutrient rich foods, such as fruits and vegetables, can be high because these foods tend to be perishable. Improving marketing, packaging, transport and cold storage facilities at higher operational levels can **reduce storage losses**. At the household level, practical **food preservation and processing methods**, such as solar drying or fermentation, can be improved to maintain the micro-nutrient content of foods (e.g. Vit. C) and to increase the availability of otherwise seasonal micro-nutrient-rich foods (e.g. mangoes, tomatoes, apples, wild forest foods, cabbage).

Plant selection and breeding to increase micro-nutrient levels

The levels and bio-availability of micro-nutrients in foods such as sweet potatoes, squash, plantain, green leafy vegetables, tomatoes and papayas vary greatly. Some varieties of tomato, mango and papaya have several times more beta-carotene than other varieties. It is therefore advisable to select varieties of these crops that contain higher levels of micro-nutrients, e.g. beta-carotene or vitamin C.

Although some research in plant selection and breeding has focused on crop varieties with high levels of iron or zinc, only small attention has so far been paid to opportunities for increasing micronutrient levels in commonly eaten foods, particularly staple food crops or vegetables cultivated in traditional home gardens (FAO/ILSI 1997).

Particular attention has also to be given to foraged foods. Forest lands, wet land, or fallow land and even 'weeds' in cultivated land traditionally supply high varieties of micro-nutrient rich foods. Many of these foods are unavailable at market. The destruction of natural resources can seriously reduce the access of people living in such areas. From both the environmental and the nutritional point of view, preserving these lands or encourage people to protect it advisable. However, food policies have to support a diversified food base. They have to encourage a varied source of nutritious food, including home gardens, protect foraging areas, and actively work against negative trends in quality of food supply (World Bank 1994).

4.2.3 Food quality and safety

Acceptable levels of food quality and safety can be achieved by implementing and monitoring quality assurance measures along the entire food chain. Food control measures are diverse and complex. The technical dimensions involved are different for nearly every food product, for the various technologies used in food preparation, processing and manufacturing and for the many types of facilities in which food is produced. The various measures range from good agricultural and good veterinary practices at the farm level to good manufacturing and good hygienic practices applied in food processing.

In view of the many concerns of consumers and the scope and dimensions of food quality and safety problems, technical assistance is often needed. Governments are expected to ensure that the food industry produces safe food and that the risks to human health and economic fraud or unfair trade practices are minimised.

Many developing countries do not have access to the latest information related to new technologies. They may lack technically trained staff, equipment, methods and facilities to analyse food for contaminants, toxins, chemical or drug residues or microbiological contamination. In some countries the legal framework related to food quality and safety needs to be revised and regulations governing food standards are lacking or outdated. Food control infrastructure may be weak and may not have sufficient financial support. Many countries need improved regulatory food inspection and laboratory services, development of a food control enforcement programme, and administration and co-ordination of food control activities.

Many developing countries rely on food exports for foreign exchange and thus have a particular interest in strengthening national food control systems, harmonising national food regulations with international standards and establishing import and export food inspection and certification systems to ensure conformity with the World Trade Organization's agreements regarding sanitary and phytosanitary measures and technical barriers to trade. (Whitehead 1999, FAO, Food and Nutrition Division). Some considerations on the importance of food safety are described in Box 3.

Micro-nutrient rich foods and the importance of food safety

When encouraging food trade or commercial production of micro nutrient rich foods (such as horticulture products, oil seeds, palm oil, beverages or natural nutrient supplements) investigations in food safety are necessary. Food analysis and food quality control systems ensure that processed and marketed foods are of good quality and are safe from chemical residues, adulteration and other possible sources of contamination. They also ensure the quality and safety of micro-nutrient rich foods on the market, especially foods fortified with one or more micro-nutrients. The role of the food industry is important in this respect. Governments should establish laws and regulations on food quality control and should inspect food production facilities to ensure that the required standards are enforced. Both the food industry and the government can establish information campaigns to raise awareness of health problems that may arise from improper food storage and food-handling practices.

4.2.4 Nutrition education and communication

Promoting better eating habits and positive health behaviour is one of the most challenging tasks in overall efforts to improve nutrition. In addition to access to a variety of safe and affordable foods, people need accurate information as to what constitutes a healthy diet and how to meet their nutritional needs. Besides education, strategies to promote healthy diets must include motivation and the creation of opportunities for people to change their behaviour while recognising individual preferences, lifestyles and constraints of time and resources (FAO/WHO 1992). **Dietary guidelines** give the recommended dietary allowances for an individual. They are most useful to serve as the basis and provide the guiding principles for the dissemination of nutrition education messages (Clay 1997, Morón and Calderón 1999). More recently, governments and private organizations have issued dietary guidelines reflecting growing concern about prevention of diet-related non-communicable diseases. Dietary guidelines for the public provide advice, appropriate to the country's population, about how to select a balanced diet and encourage related lifestyle behaviours to promote health, including breast-feeding. Because audiences and contexts vary greatly, a relevant framework has to be used. For example; addressing malnutrition in north-eastern Brazil, Guatemala and many other nutrition insecure countries is different than in dealing with obesity in the United States and in the Pacific Islands (FAO 1996, Cerqueira and Olson 1995).

Food and nutrition education aims to change unfavourable nutritional behaviour. In some settings households seem adequately nourished but individuals are not. In such settings, malnutrition may be caused by the misallocation of food in the household, inappropriate breast-feeding practices, inappropriate foods for children, insufficient feeding frequencies, diarrhoea or other health-related causes and child-care practices. Many of such problems can be changed through effective education.[7]

Principles and methods

A detailed analysis of nutritional behaviour, problems and constraints of the target group is necessary in order to plan and design methods and messages which will reach the group. A major factor of success is to involve the target group in these processes. The methods must be adapted both to the audiences and the type of message which is being presented. Individual or group discussion, demonstrations, role games, theatre, puppet shows etc. are possible methods to employ. Furthermore, the use of mass media (posters, films, radio messages or TV), can be successful in places where they are feasible (BMZ 1998).

7 The IFPRI study results in chapter 5 underline the importance of women education in this respect.

Nutrition education is most effective in combination with other nutrition relevant actions (Windisch-Stumpf 1994). For example, education on the importance of the consumption of vegetables could be combined with practical measures to implement and improve home gardening, or the relation between nutritional well being and infectious diseases could be demonstrated along with latrine construction.

Intervention areas of nutrition education are the following (BMZ 1998):

- access and proper utilisation of foods by households (examples are how to increase the access to micro-nutrient rich foods, improved food preparation, food safety etc.),
- general health status of the population (messages could be what is healthy food, prevention of diarrhoea, prevention of other infectious diseases, avoidance of food related diseases and malnutrition),
- direct nutrition education for specific risk groups and specially designed messages. Examples are importance of a balanced diet for pregnant or lactating women, importance of breastfeeding for infants, frequency and composition of meals for pre-school children, how to increase the nutritional status of malnourished children, importance of healthy food for elders, etc.

Factors of success in nutrition education

Generally, nutrition education has been successful if the following were considered (BMZ 1998):

- a suitable behaviour based analysis of the causes took place,
- campaigns and recommended products do meet the preferences of the target group,
- education was given not only to the primary target group but also to the decision makers within the households and to those groups influencing the target group (secondary target group; e.g. husbands, elders within the community),
- direct and frequent dissemination of messages which goes further than simply listening to the speakers and includes seeing, touching, and doing themselves,
- ensuring the utilisation of different channels and methods including mass media to communicate the messages ,
- regular training and supervision of the mediators was ensured,
- the education programme was designed as long term programme to achieve sustainable behavioural changes
- regular evaluation and plan adjustment took place (FAO/WHO,1992, Int. Conf.).

Application to nutrition education and communication

In the conventional approach to nutrition education, the practitioner's role is to plan and implement surveys of infant feeding practices, to take anthropometric measures of infants and children and to give talks and demonstrations to teach mothers about the nutritional needs of infants and nutritious weaning foods. Often, standard information is given which may or may not be clearly relevant to the specific situation.

With the participatory approach, the nutrition educator becomes a partner with the community in identifying and examining the factors that influence malnutrition and cause infant mortality. She or he is a facilitator committed to social change rather than an outside expert providing tech-

nical information. The educator is not an authority figure who informs people about programme services but a co-participant in the decision-making process.

Commonly, knowledge comes from nutritional and medical science, and the content of messages focuses on individual behavioural change. In critical reflexive nutrition education the content is not a mere simplification or translation of science. Nutrition concepts are elaborated in terms that are useful to the community members and the nutritionist. Indigenous knowledge about local foods, health and illness is integrated into nutrition education activities, discussions, demonstrations and other events.

With the participatory approach, educational materials are not only illustrations of messages about food preparation; instead they help the groups to identify needs and problems, to envisage nutritional well-being for infants and children and to discuss appropriate decisions and actions. Materials are working documents that facilitate the critical creative process. Mass communication, especially using local radio and indigenous media, is also an important strategy. Rather than disseminating do and don't messages and broadcasting standard technical information, the main purpose of media and educational materials is to contribute to the analysis-reflection-action process. Stages within a participatory nutrition programme are described at Box 4.

A list identifying different groups of beneficiaries for nutrition education and a selection of appropriate themes for nutrition communication in agriculture are given in Box 5 and 6. Box 7 gives current information on the nutrition minimum package by USAID, Box 8 explains the concept of growth monitoring and nutrition promotion.

5 Success factors and programmes in FNS

5.1 Factors of success for nutrition programmes

There is no pre-defined package of inputs or services that will work. Instead, the community is constantly learning about the best mix of interventions, a mix that can change significantly over time. Community development means that desirable outcomes, such as good nutrition, are achieved through **participatory processes**. Assessment, analysis, action have to be carried out with the full and active participation of the families most threatened by nutritional problems and most familiar with their impact and causes. In addition full participation of the people concerned increases the sustainability of the measures (UNICEF 1998).

Planning and implementing projects cycles by doing assessments, analysis and action are logical steps to cope better. By understanding how nutritionally useful mechanisms work and where the weaknesses are, a nutrition programme can build upon and improve existing good practices, rather than establishing new systems and procedures that may be difficult to accept and adopt, and are therefore difficult to sustain. There are many components but an important component of all nutrition programmes is to improve **people's capacity to assess the problem** – whereas growth monitoring could be an appropriate measure – and thereby help them make better use of their resources to improve their nutritional situation.

A central challenge for nutrition programmes, as well as other development efforts, is finding **a balance of approaches** that work. Processes involving assessment, analysis and action are essential for formulating appropriate 'bottom-up' solutions, particularly with respect to the ways in which programmes are organised, managed and monitored. But there are some aspects of resolving malnutrition that can be appropriately formulated at higher levels, using wide and more 'top-down' application of appropriate strategies and technologies. UNICEF experience indicates that

for many problems, a combination of top-down and bottom-up actions may be best. BFHI was formulated as a global strategy, but its success has taken many forms, depending on the engagement of national and local institutions and groups. Vitamin A supplementation has been endorsed globally as a strategy, but its application has depended greatly on existing health measures and the involvement of community-based institutions. Salt iodisation has been enhanced by consumer advocacy and legislative change at the local and national levels and by the fact that communities previously affected by IDD can see and feel a difference.

Nutrition components work better in combination. Because malnutrition is the result of so many factors, it is not surprising that it has been attacked most effectively in situations in which several sectors and strategies have been brought to bear. Combining improved infant feeding, better household access to food overall and improved and more accessible health services and sanitation is clearly more effective in reducing malnutrition where food, health and care are a problem than when any of these measures is taken alone. In support of these various approaches that work, relevant **social services** – health, education, communication and social mobilisation – must be more clearly focused on nutrition. This is not done by creating new 'nutrition projects' in these areas, but rather by incorporating nutrition components in ongoing community-based activities. The integration of nutrition into social services can lead both to a better understanding of nutrition problems and to motivate policy makers, programme staff and communities themselves to increase their efforts to reduce malnutrition.

Communication plays a special role in nutrition programmes in arming parents, educators and other caregivers not only with basic nutrition information, but also with the ability to make informed decisions and the skills and knowledge needed to take action to support improved nutrition in their communities. Communication should be carried out simultaneously at various levels to include parents, other family members, teachers, volunteers and community leaders who in turn can teach and support good practices. In addition, personnel of provincial and district health offices, staff in agriculture, rural development and education itself, media representatives, researchers and persons in positions of power of any kind must be reached and their help enlisted. Outside support includes advocacy, information, education, training and direct service delivery (UNICEF 1998).

Government policies must reflect the right to nutrition. Some national policies affect nutrition directly, such as salt iodisation or immunisation programmes, for example. Others, like income and price policies, affect nutrition indirectly but nevertheless significantly.

With the ratification of the Convention on the rights of the children as well as the basic human right to adequate food and nutrition, governments have the obligation to respect, protect, facilitate and fulfil these rights. All policies should therefore be analysed and improved in terms of their real and potential impact on achieving these targets. The most important strategies for nutrition include those for food, health, breastfeeding, education, and water and sanitation. National nutrition information systems should be established to provide valid data about their achievements. Policies should be based on knowledge from relevant research and be constantly evaluated for their real impact on nutrition in communities. Nutrition information systems should be as decentralised as the existing administrative systems, starting with community-based monitoring.

Factors of success for community based nutrition programmes are listed in Box 11 in the annex. These success factors had been identified in Community Nutrition Programmes in South Asia: They include **context related factors** as well as **programme related factors**.

The importance of a good assessment and analysis of a particular situation before deciding on the relevant types of intervention becomes obvious ("triple A" concept). Likewise, considering the other elements of the conceptual framework (Paper I and II) into consideration is a factor that increases the likelihood of success.

Often, in order to be effective, a sequence and combination of different targeted approaches is required. Effective planning and implementation of targeted food security interventions require the following steps:

- Identification of vulnerable and food insecure population as target groups.
- Identification of the causes of vulnerability, and the constraints and potentials of the target groups in attaining food security.
- Design of appropriate interventions to address the causes of vulnerability, to overcome the constraints and to make full use of the potentials, applying participatory approaches for involving the target groups.
- Ensuring that the institutional and technical capacities as well as necessary complementary inputs for implementation are in place.
- Monitoring of the programme performance (are the target groups reached, do they benefit effectively, and do the interventions improve their food situation?)

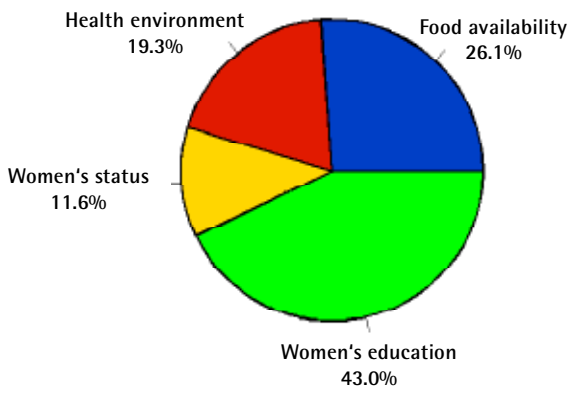
5.2 Nutrition and the status of women

A major conclusion of the United Nations report is that in countries where nutrition improvement has lagged behind economic growth, social discrimination against women is common. In Pakistan, for example, widespread discrimination against girls and women is behind high levels of illiteracy among women and girls, a very high fertility rate and lower female life expectancy. Child malnutrition rates in Pakistan are among the highest in the world, as is the proportion of low birth-weight infants, at 25 per cent. Some experts place the major blame for the very high child malnutrition and low birth-weight throughout much of South Asia on such factors as women's poor access to education and low levels of employment, compared with other regions. On the other hand, women in Thailand, where nutrition has improved remarkably in the last two decades, have very high literacy, high participation in the labour force, and a strong place in social and household-level decision-making (UNICEF 1998)

The empowerment of women is of central importance to improve nutrition of both women themselves and their children. This includes legislative and political efforts to combat discrimination against and exploitation of women and measures to ensure that women have adequate access to resources and care at all levels of society. Improving education for girls and women has shown great positive impact on the nutritional situation of all household members (UNICEF 1998).

In most countries women play the major role within the food chain. They are mainly responsible for the production of food, cultivation, harvesting, processing, storing and preparation of food. At the same time they have less access and control over food related resources and technol-

Figure 2: Estimated contribution of major determinants to reductions in child malnutrition, 1970–95



Source: Smith and Haddad 2000

ogy compared to men. Among resource control issues, access to even small amounts of land (e.g. garden plots for women) has remained an important component of household food security. It is necessary to give renewed consideration to women's control over resources and land. Advocacy of wide-spread access to home gardens, in peri-urban as well as rural areas, and appropriate agricultural services for women including the introduction of new technology and many other aspects within the food chain should be considered when implementing nutrition programmes (FAO 1997, Carr 1991). Box 10 presents the World Bank's agenda for women's health and nutrition.

The role of women in fighting malnutrition, not only in South Asia, is underlined at various points. Figure 2 is based on an intensive IFPRI study within their 2020 programme and covers more than 20 years of development co-operation experiences. Educating women in different fields of life and disciplines is the major contribution to successfully reduce child malnutrition.

5.3 Successful programmes

The ICN's Plan of Action for Nutrition (FAO/WHO 1992) called for implementation of **community-based nutrition education programmes**. The initiative **Get the best from your food** (FAO, 1994) is part of that effort. The limitations of nutrition education must however be kept in perspective. Many desirable behavioural changes require resources (including time) from households for appropriate response. Nutrition education may thus be most effective in combination with other poverty-reducing and nutrition-enhancing actions. Increased attention to the nutrition of young children is also an element of the WHO/UNICEF **Baby-Friendly Hospital Initiative**, involving over 15.000 hospitals in 128 developing countries (UNICEF 1999).

Other international strategies to deliver messages and implement services are the **Integrated Management of Childhood Illnesses** IMCI (BASICS 1997) or the **Safe Motherhood Programmes** (Safe Motherhood Interagency Working Group 1997). Some well known and intensively evaluated examples of successful national nutrition programmes with high external inputs are the **Tamil Nadu Integrated Nutrition Project** (India), **Iringa Nutrition Project Tanzania, National Family Improvement Programme Indonesia** (UPGK), and the **Nutrition and Primary Health Care Programme in Thailand**. Several more National Nutrition Programmes are ongoing, but information on their achievements and effectiveness is not yet widely published, examples are the **Participatory Nutrition Improvement Programme** (PNIP, UNICEF, Sri Lanka) or the **Poverty Alleviation and Nutrition Programme** (PANP, Vietnam). **Growth Monitoring and Nutrition Promotion** is mainly part of the above listed programmes. Examples of the above listed programmes are given in the following chapter.

5.3.1 A selection of international programmes and approaches

Get the best from your food

Following the International Conference on Nutrition, convened in Rome in December 1992, FAO launched a public information campaign entitled "Get the Best from Your Food" (See: Get the Best from Your Food, FAO Food, Nutrition and Agriculture 16, 1996). This ongoing initiative with its positive, simple and direct messages, includes food-based nutrition education materials that can be adapted locally for public information campaigns, school curricula and other training opportunities. The concept is intended to promote better dietary patterns among all age groups and to encourage sound, practical approaches to learning about foods and nutrition. The focus of the package, which has now been translated into 17 languages, is found in four key messages, important for urban as well as rural settings: "Enjoy a variety of food"; "Eat to meet your needs"; "Protect the quality and safety of your food"; and "Keep active and stay fit". This issue of *Food, Nutrition and Agriculture* No. 24, 1999 features authors from Poland, the Russian Federation and

Portugal who illustrate how the Get the Best from Your Food package is being used in schools in their countries. There are furthermore two articles in that issue – one on the FAO/World Health Organization (WHO) Expert Consultation on Carbohydrates in Human Nutrition and the other a review of the nutritional and health benefits of citrus fruit – that focus attention on the many components in foods that can affect health and well-being in a variety of ways. Because food imparts multiple benefits, international organizations should advocate food-based dietary guidelines rather than focusing on individual nutrients and non-nutrients in foods[8].

To promote this approach, FAO, in collaboration with the International Life Sciences Institute, has held a series of workshops in different regions, and in the issue of Food, Nutrition and Agriculture No. 24, 1999, FAO staff report on the development of these guidelines in nine South American countries.

A nutrition education strategy can only succeed if individuals have access to a variety of good-quality, safe foods in sufficient amounts to meet nutritional requirements within a hygienic environment and coupled with a healthy lifestyle. In this regard, the last article describes an FAO effort to assist women in raising food for their own consumption as well as to supplement their income.

The Baby-friendly hospital Initiative (BFHI) and its achievements (UNICEF 1999)

The initiative aims to ensure that all hospitals become centres of breast-feeding support. A hospital is designated baby friendly when it agrees not to accept free or low cost breast-milk substitutes, to use bottle feeding or teats and to implement ten steps to support breastfeeding. Achievements in selected countries:

- In **Kuba** the rate of exclusive breastfeeding at four month almost tripled in six years (from 25% in 1990 to 72% in 1996).
- In **Gabon** cases of neonatal diarrhoea fell by 15%, diarrhoea dehydration declined by 14% and mortality fell by 8%.
- In **China** exclusive breastfeeding in rural areas rose from 29% in 1992 to 68% in 1994, in urban areas from 10 to 48%.

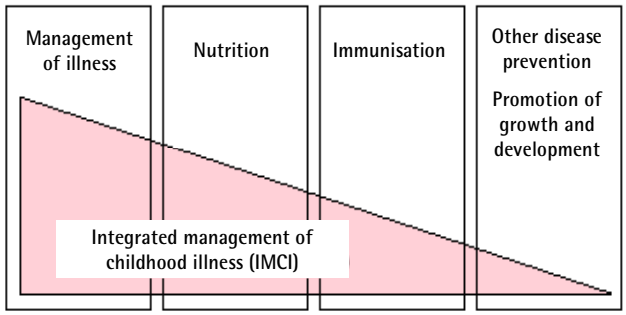
The messages are not restricted to hospital deliveries; they are also essential for rural communities were home deliveries are common. Here birth attendance or health workers in charge of natal care are responsible for spreading the message.

8 See: Clay 1997, Preparation and use of food-based dietary guidelines, Food, Nutrition and Agriculture 19, 1997

Integrated Management of Childhood Illnesses (IMCI)

The Integrated Management of Childhood Illness (IMCI) strategy gives priority to the management of conditions that cause death and ill health in children, especially among low-income populations. The WHO Department of Child Adolescent Health and Development (CAH) and Unicef have taken the lead in developing strategies to formulate guidelines and implement country activities. Many partners within WHO and in other agencies and institutions have joined forces in the effort.

Figure 3: Integrated management of childhood illness (IMCI) as a key for improving child health



Source: Smith and Haddad 2000

The main objective of the IMCI is to reduce death and the frequency and severity of illness and disability, and to contribute to improved growth and development. The IMCI strategy combines improved management of childhood illness with aspects of nutrition, immunisation, prevention of other diseases and promotion of growth and development.

Preventive interventions include immunisation, nutrition counselling, complementary feeding and breastfeeding counselling, Vitamin A supplementation and periodic de-worming. Curative interventions include case management of ARI, diarrhoea (dehydration, persistent diarrhoea, dysentery), meningitis, measles, malaria, malnutrition, anaemia, ear infections.

The IMCI does not involve taking on full responsibility for these interventions and activities, which are usually managed by existing health institutions, but seeks to ensure that they are well co-ordinated and effectively implemented.

Figure 4: Interventions currently included in the IMCI strategy

	Promotion of growth Prevention of disease	Response to sickness („curative care")
Home	▪ Community / home-based interventions to improve nutrition ▪ Insecticide-impregnated bednets	▪ Early case management ▪ Appropriate care seeking ▪ Compliance with treatment
Health services	▪ Vaccinations ▪ Complementary feeding and breastfeeding counselling ▪ Micronutrient supplementation	▪ Case management of: ARI, diarrhoea, measles, malaria, malnutrition, other serious infection ▪ Complementary feeding and breastfeeding counselling ▪ Iron treatment ▪ Antihelminthic treatment

Source: Smith and Haddad 2000

The combination of interventions that makes up IMCI may be modified to include conditions that are important in individual countries and for which effective treatment and / or preventive practices have been identified.

Early experience of the IMCI has shown successes. There have been impressive increases in the ability of health workers to detect and manage the five greatest killers of

children under five. Furthermore, families taking their children for treatment were substantially more satisfied with the care the children received when they were looked after by IMCI-trained health workers, and studies have shown that doctors' current drug usage costs can be reduced by almost 80% using IMCI (SCN News, No. 15, December 1997).

Even though the IMCI strategy has strong curative components, it equally focuses on preventive measures, of which nutrition and development is an integral part. The advantage (and relevance to FNS Programmes) is seen in enforcing the importance of healthy nutrition, development and prevention of most common diseases at both the health service level and the community and household level.

The Safe Motherhood Initiative

The global Safe Motherhood Initiative was launched in 1987 to improve maternal health and cut the number of maternal deaths in half by the year 2000. It is led by a unique alliance of co-sponsoring agencies who work together to raise awareness, set priorities, stimulate research, mobilise resources, provide technical assistance and share information. Their co-operation and commitment have helped governments and non-governmental partners from more than 100 countries take action to make motherhood safer.

Essential Services for Safe Motherhood

Services for safe motherhood should be readily available through a network of linked community health care providers, clinics and hospitals. The integrated services include:

- Community education on safe motherhood;
- Prenatal care and counselling, including the promotion of maternal nutrition;
- Skilled assistance during childbirth;
- Care for obstetric complications, including emergencies;
- Postpartum care;
- Management of abortion complications, post-abortion care and, where abortion is not against the law, safe services for the termination of pregnancy;
- Family planning counselling, information and services;
- Reproductive health education and services for adolescents.

How to achieve Safe Motherhood?

Safe motherhood can be achieved by providing high-quality maternal health services to all women. Services to help make motherhood safer include:

- care by skilled health personnel before, during and after childbirth
- emergency care for life-threatening obstetric complications
- services to prevent and manage the complications of unsafe abortion
- family planning to enable women to plan their pregnancies and prevent unwanted pregnancies
- health education and services for adolescents
- community education for women, their families and decision-makers

Women's poor health is linked to their low status in society, their lack of education, and poverty. Efforts to reduce maternal death and disability must therefore also address these issues.

Four steps to save lives through Safe Motherhood

1. **Improved access to basic health, family planning services and adequate nutrition:** Prenatal care provides opportunities for women to learn danger signs, to be immunised against tetanus, to improve infant-caring skills and be treated for malaria and anaemia. Better nutrition for adolescent girls and pregnant women – appropriate vitamin and mineral supplements are important – can reduce maternal mortality as well as the prevalence of low birth weight, a major risk factor in infant deaths. Meeting the existing demand for family planning would reduce pregnancies by one fifth and lower maternal deaths and injuries even more.
2. **Attendance at birth by either a skilled midwife or doctor:** A number of life-saving interventions can be provided in health centres or small facilities. First aid can even be provided at home by a professional midwife or a physician before a woman reaches a suitable health facility. Traditional birth attendants – the most common form of help for deliveries at home – should receive training, work under supervision and have ready access to professional health staff.
3. **Essential obstetric care for complications and emergencies:** To provide life-saving obstetric care, developing countries must ensure that health centres and district hospitals have essential equipment, drugs and skilled staff.
4. **Post-natal and basic neonatal care:** A mother and her infant need health care soon after delivery, a period of great risk for them both.

Health-sector interventions, while essential for safe motherhood, will not solve the problem in isolation. Legal and policy reform is also needed to address the gender inequalities and discrimination that jeopardise women's health, particularly through expanding girls' access to quality education and training, promoting delayed marriage and childbearing and increasing women's income-earning abilities and opportunities. Social mobilisation is also vital, to build family and community support for the goals of better health and nutrition for girls and women, as well as for the social and economic changes central to securing gender equity.

Both because of the scale of the tragedy and because prevention is possible, safe motherhood is a morally-, socially- and economically-compelling investment that must be given international priority. A special focus of these efforts must be those African and Asian countries which bear the largest burden of maternal disability and death in the world.

The four essentials for safe motherhood could be provided for only about $3 per person per year in developing countries. This could effectively prevent the overwhelming majority of maternal deaths, half of all infant deaths and the excruciating disabilities inflicted on millions of women[9].

5.3.2 A selection of successful national nutrition programmes

Tamil Nadu Integrated Nutrition Project

The Tamil Nadu Integrated Nutrition Project (TINP) couples universal growth monitoring of young children and nutrition counselling for their mothers with targeted interventions, selective supplementary feeding, on-site feeding for children found to be nutritionally at risk, micro-

9 Source and more information, see: UNICEF 1999 (www.unicef.org, search for 'Safe Motherhood'), WHO 1999 (www.who.org, search for 'Safe Motherhood')

nutrient components, health checks and services communication, monitoring and evaluation. The project works through Community Nutrition Centres staffed by part time female nutrition workers, assisted by women's groups. The goals of TINP include reducing severe malnutrition among 0–36 month old children – by 50 percent in new areas and by 35 percent in TINP I areas – and helping to reduce infant mortality to 55 per thousand live births and to halve the incidence of low birth weights. The data indicate a statistically significant improvement in weight-for-age during 1982–90. They also indicate a steady drop in malnutrition rates for all ages included in the sample. These improvements were continuous over time; they did not follow the peak and decline pattern found in the service delivery indicators.

Conclusions drawn from a recent impact evaluation study (World Bank 1995) confirm the practicality of large-scale nutrition and health programmes based on growth monitoring and narrowly targeted short-term supplemental feeding. They confirm that:

- Women can be induced to bring their children in for weighing on a regular basis.
- Short-term feeding based on narrow targeting with clear entry and exit rules can be made to work as planned – keeping costs down, reducing dependence on feeding, and, along with growth monitoring, serving as a powerful educational tool.
- All this can be accomplished with acceptably small costs.
- Universal feeding is not necessary to achieve nutritional and health gains.
- Most important, the education provided can induce permanent changes in mothers' behaviour that positively affect their children's health and nutritional status. This may take more time than originally thought, but once made the progress is unlikely to be reversed.

The key to TINP's success has been the great care exercised in planning and executing its processes:

- careful selection and training of community nutrition workers,
- detailed work routines,
- heavy emphasis on supportive supervision and on the job training,
- efforts to gain community support,
- emphasis on accurate monitoring, and
- use of the data gathered in trouble-shooting and feedback.

Such attention to detail is not typical in projects and may reflect the fact that TINP was owned, developed, and executed by local authorities, rather than superimposed from afar. The areas where TINP failed – implementation of an effective health programme and integration of the nutrition and health components – were precisely those where less attention was paid to process issues.

Iringa Nutrition Project Tanzania

The Iringa Nutrition Project Tanzania included activities such as development of systems, communications, maternal and child health services, village based growth monitoring, and nutrition rehabilitation, water and sanitation, household food security, child care and development, income generation, research and management of staff. Institutions built up or supported were village health workers, village health committees, and similar committees at sub-district and district level and regional support team, working across sectors.

The main aspects of success were:

- the village based use of growth monitoring data for monitoring and targeting,
- creation of awareness among the community and their nutritional problems and of actions to overcome them,
- strengthening services with a decrease in incidents of diseases preventable through immunisation,
- establishment of community based child care system.

Results:

- reduction in total and severe malnutrition, from 50% to 35% and from 6% to 1.8%,
- from nil village health workers (VHW) to 2 VHWs in every village,
- full immunisation coverage, with increase from 50% to 96%,
- establishment of community based growth monitoring system adopted to other regions in the country,
- establishment of a village based rehabilitation system for severely malnourished children,
- multi-sectoral approach to the problem of malnutrition and child mortality, national decision to adopt the Iringa experience in other regions so as to deal with nutrition problems there (ACC/SCN No. 8, 1991).

Family nutrition improvement Programme Indonesia (UPGK)

The programme has the general objective to improve the nutrition and health status of the people, especially children under five years old and pregnant and lactating women, mainly through the modification of nutrition behaviour. The programme focuses on nutrition and health education through active community participation with several Ministries involved. Based on the theme that a healthy child increases weight every month, a basic package was formulated. It includes monthly weighing of children under five years, nutrition and health education, nutritional first aid (Vitamin A, iron and oral rehydration) and home gardening. The focus of these activities are weighing posts managed by community leaders and operated by volunteers using a growths charts as a monitoring tool.

The overall programme data of the activities shows that access is provided to 81% of all children under five years. Of these children about 77% received some services. 47% of all children were weighed regularly every month and 54% of the children who came regularly have shown consistent weight gain (ACC/SCN 1991).

Nutrition and Primary Health Care in Thailand

An integrated approach has lead to considerable success in Thailand. Important programmes in which nutrition was integrated were the following (ACC/SCN 1996[10]);

Primary Health Care: village health services, self help, information, (PHC Package), Training of Village Health Communicators and Village Health Volunteers.

10 ACC/SCN, No. 8, 1991

Poverty Alleviation Plan; rural job creation, village development projects (e.g. water, sanitation, livestock), provision of basic services (health, nutrition, water, education), agricultural production (incl. crops for supplementary feeding).

Basic Minimum Needs; Organizational processes for integration of activities, through sub-district Council Supporting Committee.

In 1982 a **national nutrition programme** was designed to improve the nutritional status of mothers, infants, pre-school and school children. Nutrition actions became an integrative part of the above listed development programmes. Three major components were:

- growth monitoring and nutrition surveillance,
- nutrition training and education,
- nutrition supplementation.

To achieve the targets a wide set of sub-programmes were supported:

- agriculture food production (Legumes and high protein and high fat crop production, dairy and poultry production, fish production, food processing and preservation),
- school nutrition Programme (school lunch, school agricultural food production, nutrition in school education, women's classes, maternal literacy campaigns, community nutrition education),
- community preparation Programme (generating community nutrition awareness, forming community nutrition organization, strengthening community planning, monitoring and evaluation capability,
- child care centres: group feeding of malnourished children, growth and development screening and monitoring,
- Other maternal and child care services: ORS and diarrhoeal control actions, immunisation, antenatal care, accessible health and medical services, actions to control parasitic infestation and acute respiratory tract diseases.

Thailand managed to reduce the incidence of malnutrition dramatically (from 15% to less than 1% for moderate to severe malnutrition) through application of an integrated approach to meeting minimum basic needs. Essential among the factors that produced this success were political commitment, health personnel development and concrete steps taken towards creating inter-sectoral collaboration and planning: nutrition was integrated into social and health development efforts, and programmes were designed to improve people's lives by involving community members as agents of change, not simply receivers of government services. Thailand was also facilitated by a favourable economic environment, but eliminating the nutrition problem was also seen as a prerequisite for development. The lessons learned from this and other successful integrated approaches to nutritional improvement suggest that narrow sectoral approaches that focus exclusively on health, agriculture or education cannot tackle the nutrition problem effectively. Other lessons include emphasis on working with local governments, which can best assess and adapt to local priorities; and integrated planning and staff training, with sectoral implementation (FAO 1996).

A community nutrition project in Vietnam: effects on child morbidity[11]

A nutrition improvement project benefiting 5 588 households with 3 716 young children was implemented in four communes of Vietnam. The project sought to reduce vitamin A deficiency

11 Source: FAO 1998, FNA, No. 22, by R. English and J. Badcock

by raising household garden production, particularly of carotene-rich fruits and vegetables, and by providing nutrition education for mothers of young children on breastfeeding, weaning foods, maternal diet during pregnancy and lactation and food preparation and hygiene. The project collected data to monitor vitamin A status, household garden production, food intake and growth patterns of young children. The project was followed by significant increases in the production of fruits, vegetables and other foods from family gardens; increased intake of nutrients including iron, vitamin C, carotene and protein among households with young children; and improvements in the nutritional status of young children and the nutritional knowledge of mothers.

A morbidity survey showed a highly significant reduction in the incidence and severity of acute respiratory and diarrhoeal infections. Children in the project commune consumed significantly more vegetables and fruits and more foods providing energy, protein, vitamin A and iron. In terms of growth, the project commune witnessed an increase in the number of children defined as normal and a significant decrease in those defined as stunted (low height for age). Mothers demonstrated a highly significantly better understanding of good nutrition and of vitamin A. There were also major increases in food available for consumption or for sale and in food intake.

6 Integrated Food and Nutrition Security programmes

Food and nutrition insecurity at different socio-organizational levels is caused by different factors and requires solutions reflecting the complexity. In consequence, an effective **FNS programme needs a holistic programme approach**.

Individual measures within one of the dimensions of availability of food, access to food and use and utilisation of food are not exclusive. Often, in order to be effective, an integrated combination of different approaches is required. Such combinations are a typical feature of so-called "Integrated Food Security Programmes" (IFSP), which have been initiated and experienced by GTZ/BMZ.

Integrated Food Security Programmes provide a framework in which people whose nutrition status is threatened can achieve sustainable food security through their own efforts.

Integrated Food Security Programmes aim at:

- availability of safe and socio-culturally acceptable food and water in adequate quantity and quality,
- ensuring sustainable physical and financial access to food and water,
- appropriate use and utilisation of food and water in the household,
- long-term stability of availability, access, and use and utilisation of food and water.

Two types of scenarios can be distinguished as starting points of an IFSP:

- IFSP in cases of temporary food insecurity following natural disasters, political or military crises, armed conflict and other emergency situations and
- IFSP in cases of chronic food insecurity in rural and urban areas. Caused by extreme poverty, they are characterised by insufficient food supplies over long periods, inadequate basic health care, lack of resources or access to services and basic infrastructure, decline in social status and low productivity.

While the first situation is mainly tackled by short-term emergency aid programmes, the second one has a rather long-term, development oriented strategic objective of enabling the affected vulnerable groups to cope by themselves with their structural food insecurity. Within the German bilateral and multilateral co-operation (through BMZ and GTZ), IFSP were promoted in the past. They were to be prepared and planned according to IFSP guidelines.[12] During project identification and planning specific methods for the Rapid Assessment of Nutrition (RAN) in project appraisals are undertaken. A systematic assessment of the nutrition, health and socio-economic situation through a baseline survey on nutrition can be the entry point of the start-up phase. A multisectoral approach to meeting nutrition challenges which takes their complex nature and causes into account was followed during the several years of implementation phase. As IFSPs often aimed at short- and long-term considerations in their objectives, different activities at various levels are implied which can be categorised in the following fields of intervention:[13]

– **Productive physical resources**; agricultural and communal infrastructure and natural resource conservation and management

– **Human resources**; community development workers and facilitators, active in the fields of nutrition, health, education, agriculture etc.

– **Institutional capacities**; supporting local and regional, public and private institutions to strengthen the access to the named physical and human resources.

A mix of the stated fields of intervention which complement each other characterises a good IFSP. The specific outline will depend on a given situation and its dynamics. The conceptual location of IFSP between emergency aid in acute situations and "normal" technical co-operation is shown in Paper VIII, chapter 8.3.

Two critical aspects of IFSP are

– the difficulty to distinguish it from other concepts like Regional Rural Development (RRD) or Integrated Rural Development Programmes (IRDP), which also focus on a multi-sectoral approach, and

– the difficulty to handle and manage the complexity of different sectors (and related departments as service providers) within a holistic programme approach vis-à-vis the individual interests of actors. It may overload people's expectations and the capacities of development agencies.

12 See BMZ, 1997

13 Source: SLE, 1999: Food Security and Conflict, pp. 27–28

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Annexes

Annex 1: Nutrition related programmes: Box 1 to Box 11

Box 1: Supplementary feeding programmes, objectives, criteria for selection and target group (Source; WFP 1999)

Programme	Objectives	Criteria for selection and target group
Targeted FSP	– Correct moderate malnutrition. – Prevent moderately malnourished from becoming severely malnourished – Reduce mortality and morbidity risk in children under 5 years – Provide nutritional support to selected pregnant women and nursing mothers. – Provide follow up services to those discharged from therapeutic feeding programmes	– Moderately malnourished children under 5 years: – between 70% and 80% of the median weight-for-height or: – between -3 and -2 Z-scores weight-for-height – Malnourished individuals (based on weight-for-height, BMI, MUAC or clinical signs): – older children (between 5 and 10 years) – adolescents – adults and elderly persons – medical referrals – Selected pregnant women (from date of confirmed pregnancy) and nursing mothers (until 6 months after delivery), for instance using MUAC < 22 cm as a cut-off indicator for pregnant women – Referrals from TFP
Blanket SFP	– Prevent deterioration of nutritional situation. – Reduce prevalence of acute malnutrition in children under 5 years – Ensure safety net measures – Reduce mortality and morbidity risk	– All children under 3 or under 5 years – All pregnant women (from date of confirmed pregnancy) and nursing mothers (until maximum 6 months after delivery) – Other at-risk groups
TFP	– Reduce excess mortality and morbidity risk in children under 5 years – Provide medical/nutritional treatment for the severely malnourished	– Severely malnourished children under 5 years: – < 70% of the median weight-for-height and/or oedema or: – < -3 Z-scores weight-for-height and/or oedema – Severely malnourished children older than 5 years, adolescents and adults admitted based on available weight for height standards or presence of oedema. – Low Birth Weight babies – Orphans < 1 year (only when traditional care practices are inadequate) – Mothers of children younger than one year with breast feeding failure (only in exceptional cases where relactation through counselling and traditional alternative feeding have failed

Box 2: Preventing micronutrient malnutrition: the food-based strategy

Source: FAO http://www.fao.org/WAICENT/FAOINFO/ECONOMIC/ESN/NUTRI.HTM, Food and Nutrition Division (ESN), Posted 12 November 1998

Home gardening is often an effective means of combating household food insecurity and malnutrition. It is especially helpful in alleviating micronutrient deficiencies. ESN has developed a training manual entitled, "Improving Nutrition through Home Gardening. A Training Package for Preparing Field Workers in Southeast Asia". This training package was developed and field tested in Indonesia for the instruction of agricultural extension, home economics and community development staff working with households and communities in Southeast Asia to promote home food production for better nutrition. It is a practical tool for field workers, which integrates food production and nutrition issues and provides a comprehensive set of information materials for trainers, field staff and farmers. It aims to provide field staff with the technical, extension and planning skills necessary to help rural households identify problems and opportunities for improving home food production and to attain better nutrition for the entire family. It is proving to be very useful and has been adapted for use in field programmes in Vietnam, Bhutan, India and the Maldives. It is currently being adapted for Sub-Saharan Africa and Latin America in French, English and Spanish versions, respectively.

Box 3: Why food safety is important?

Fresh and clean foods are important to good nutrition. Preventing food from becoming moldy or otherwise spoiled reduces waste. Taking steps to see that food does not become contaminated with food poisoning bacteria also reduces losses and illness. Spoilage organisms such as bacteria and molds in food can both reduce the food's nutrient value and cause disease

Disease causing (or pathogenic) bacteria can contaminate food and water and cause food poisoning. This can take the form of diseases such as typhoid, cholera and hepatitis. In some circumstances, mold growing on food can form poisons known as mycotoxins, which can cause illness and sometimes even death. Internal parasites can be transmitted through foods that have been contaminated with parasite eggs or cysts, and in some cases the infective stage of a parasite can be transmitted in foods such as meat and fish.

Bacteria, molds and parasites can contaminate food in different ways, including the following:
- from the soil or water where it is grown;
- from handling at harvest, during processing or marketing, or during storage; and
- by human or animal sewage from hands, flies, rats or other pests, or by contaminated air or water.

In many countries serious diseases such as cholera and typhoid are rare, though food poisoning of other types remains a common problem. Losses from food spoilage and contamination are also very common.

The symptoms of food poisoning commonly include nausea, vomiting, abdominal pain, diarrhoea and fever, though not all of these may occur in every case. Symptoms vary depending upon the cause. They usually start between one and 36 hours after eating the contaminated food, and may last for a number of days. Food poisoning may be fatal, depending upon the cause and the overall fitness of the sick person.

Some bacteria, for example most salmonella bacteria, can increase in numbers in food very rapidly under some circumstances. Food that is contaminated with large numbers of bacteria can be a source of contamination of other foods. This cross contamination of foods can happen when food contaminated by hands, flies or other insects or pests touches a clean food or when clean foods touch a contaminated surface or implement.

Cross contamination of foods is a common cause of outbreaks of food poisoning. It is important to remember that bacteria in foods can increase in number very rapidly in certain circumstances. Under conditions that favour their rapid growth, such as the right temperature, one bacterium can increase to 100 million bacteria within 9 hours. Even with such large numbers, they cannot be seen without the use of a microscope.

The risk of food poisoning and of losses through spoilage can be greatly reduced if some basic rules are followed. These rules are designed to kill bacteria and molds where possible, stop them increasing in numbers, and stop them being transferred or spread. They should be followed at all times and at all stages in food production, preparation, storage, marketing and serving. These rules will prevent food related illnesses and reduce the wastage of food (FAO 1996, Get the best from your food).

Box 4: Stages in a participatory nutrition education programme – an example from FAO

Identifying and assessing issues of greatest interest to the community is the first stage of a participatory programme. The nutrition educator visits all the households with children under five years of age and meets with parents and others to develop a programme to improve infant and child nutrition. Group discussions are organised with community members and the participatory approach is explained. The nutrition educator listens to the community members and lists the major issues, needs and problems related to infant and child malnutrition, infection and mortality. Included in the list of topics for discussion are food and nutrition issues such as breast-feeding, weaning practices, access to health care, mother's employment and household income.

During the second stage, the nutrition educator facilitates a dialogue about the social, economic and cultural conditions underlying the nutrition problems. To present critical issues, photographs, role-play, songs or puppets can be used. Community members describe the problems they see in health and nutrition of infants and children and discuss how they feel about them. They are asked to describe income, job and resource problems as well as the political situation and to relate these conditions to the health of children. Talk about food habits and beliefs is encouraged. They share personal experiences of household food insecurity (e.g. hunger, not enough money to buy food or little land and water to grow food), child malnutrition, infectious diseases (e.g. diarrhoea) and death. Community members are encouraged to ask themselves if hunger and malnutrition exist in their community and why. They are asked which people are most affected. The group develops an action plan to help people resolve this situation and to prevent infant malnutrition (Cerqueira, In: FAO, Food Nutrition and Agriculture No. 4).

Box 5: Identification of different groups of beneficiaries for nutrition education

For the prevention of protein-energy malnutrition, the beneficiary groups may be defined as follows.

- Vulnerable group: children under five years
- Target population: persons caring for these children
- Primary group: mothers of the children
  - Segment A: illiterate mothers living in rural areas
  - Segment B: illiterate mothers living in urban areas
  - Segment C: literate mothers
- Secondary group: health workers, social workers, teachers in secondary school, journalists from the local radio station
- Tertiary group: administrative and technical officers from the various sectors concerned, fathers of the children

Source: Adapted from FAO, 1994

Box 6: A selection of appropriate themes for face-to-face communication with participants in agricultural and rural development

Nutritional communications play a key role in development since improved nutrition is not an automatic consequence of increased food availability. Food marketers know that it is cost-effective to invest in consumer education and promotion. Without nutritional communications, development project outputs such as seeds or food supplements tend to have little or no effect on the food practices of the groups for whom they are intended.

The common themes of nutritional communications can be divided into those related to agriculture and those related to health and child development.

The agricultural themes concern the following:

- household food cropping and purchasing patterns, with special regard to the adoption of new varieties and to the nutritional consequences of cash cropping;
- consumption of nutritious foods produced with the assistance of the project;
- home production and consumption of vegetables and other protective foods that are not the primary focus of the agricultural project;
- food storage and preparation, using appropriate local construction materials, fuel, etc.

Themes relating to health and child development concern the following:

- special nutritional needs of vulnerable groups, including pregnant and lactating women, infants and growing children, and especially breastfeeding and weaning practices;
- adequate diet and how to achieve it with available foods;
- feeding during illness, especially the need to rehydrate and nourish young children who have diarrhoea.

Source: FAO 1983

Box 7: The USAID nutrition minimum package – an example for nutrition interventions and education messages

Those interventions that target the six primary nutrition behaviours have been called the Minimum Package of Nutrition Interventions. They are seen as the core action to be implemented by all programme aiming to improve nutrition. The minimum package is not a vertical or free standing programme. Each action needs to fit into other maternal and child health programme activities. The minimum package contains:

1. For infants: exclusive breastfeeding for infants up to 6 months
2. For infants and children: from about 6 months, provide appropriate complementary feeding and continue breastfeeding until 24 months.
3. For women, infants and children: obtaining enough micro-nutrients:
   consume Vitamin A rich foods, and/or take Vitamin A supplements.
4. For all sick children: Administer appropriate nutritional management:
   – continue breastfeeding and increase fluids during illnesses
   – increase feeding after illness
   – give two doses of Vitamin A to measles cases
1. For all pregnant women: take iron/folate tablets
2. For all families: Use iodised salt.

Source: USAID, BASICS 1997

Box 8: Growth monitoring and nutrition promotion

Since nutrition problems have multiple causes, it seems logical to design policies and programmes in a multifaceted way to achieve effective nutrition improvement. One of the most effective methods of identifying and targeting nutrition and health interventions is to monitor children's growth. The ICN has called on governments to develop and strengthen growth monitoring and health care systems. While growth monitoring alone does not necessarily change nutritional status, it does provide important information to be used in actions such as food supplementation, nutrition education and medical referral, when needed. Integrated nutrition projects typically couple growth monitoring of young children found to be nutritionally at risk and nutrition counselling for their mothers with targeted interventions (on-site feeding, health checks, immunization, family planning, etc.). Emphasis is also placed on intersectoral collaboration, as narrow sectoral approaches that focus exclusively on health, agriculture or education cannot tackle the nutrition problem effectively (UNICEF 1994a; Miller Del Rosso 1992, Valayasevi, A., et al. 1995, FAO 1997).

Box 9: Urban Agriculture – Experiences and Questions

Home-based food production in urban Jamaica, by A: Valstar, FAO 1999

Home gardening provides a low cost, sustainable strategy for increasing household food security by providing direct access to food. This strategy is not limited to rural areas, but can also benefit for the poorest of urban populations. This was illustrated by a home gardening and small scale poultry production project implemented in 1997 in urban and peri-urban communities. The programme additionally focused on strengthening women's groups, training in team building, economic self-sufficiency, women's role in community development and developing positive self-esteem and co-operation between urban and poor women.

Urban agriculture in Havanna, A contribution towards food security in times of crisis by Seiler, E., in: Entwicklung und Laendlicher Raum, 1999.

Since 1989 the urban agriculture in Havana has taken a significant role to improve food security of the 2.2 Mio. citizens of Havana. Nearly 26,000 private gardeners and co-operatives produce almost 30,000 to 45,000 tons of vegetables on 2,400 ha in urban areas. Compared to other developing countries Cuba's urban agriculture has a strong political support from government authorities. A separate Department section was created promoting food production and farmers receive the land with legal land use rights.

Are Urban Poverty and Undernutrition Growing? Some Newly Assembled Evidence Lawrence Haddad, Marie T. Ruel, and James L. Garrett, May 1999

The population of the developing world is becoming more urban. Are poverty and undernutrition beginning to relocate to urban areas as well? We use survey data on poverty (from 8 countries) and on child undernutrition (from 14 countries) to address this question. Using data from the past 15–20 years, we find that in a majority of countries the absolute number of poor and undernourished individuals living in urban areas has increased, as has the share of poverty and undernourishment coming from urban areas. Given these trends and the current stock of knowledge as to the levels, determinants, and solutions to urban poverty and undernutrition, we argue for more research on these issues.

Full-text in PDF (Adobe Acrobat 3.0 or above required).

To order a copy of a discussion paper, send requests to B. McClafferty, Food Consumption and Nutrition Division, IFPRI, 2033 K Street, N.W., Washington, D.C. 20006, USA.

Box 10: A New Agenda for Women's Health and Nutrition
The World Bank, Washington, D.C. 1997

- In Africa each year, an estimated 2 million young girls are subject to genital mutilation (removal of parts or all of the external female genitals).
- In many countries of South Asia, Africa, Latin America, and the Middle East, one-third to one-half of women are mothers before the age of 20. In a few countries, as many as one in four girls is married before her fifteenth birthday.
- Women are at greater risk than men of contracting the human immunodeficiency virus (HIV) when exposed to an infected partner, and young girls are the most vulnerable. Of all women infected, 70 percent are between the ages of 15 and 25.
- Anemia is highly prevalent throughout the developing world and appears to be worsening in South Asia, for example, where it affects at least 60 percent of all women aged 15–49.
- Worldwide, one in four pregnancies is unwanted. Abortions outnumer live births in parts of Eastern Europe and the former Soviet Union. Complications from unsafe abortion are a major cause of maternal death.
- While infant mortality rates have fallen by one-half in the past thirty years, maternal mortality ratios have lagged behind, with little evidence of progress in the least developed countries.
- Cancer of the cervix, which peaks in women aged 40–50, accounts for more new cases of cancer each year in developing countries than any other type of cancer.
- Domestic violence, rape, and sexual abuse are a significant cause of disability among women.

Essential Services for Women

Most of the leading causes of death and disability among women in developing countries can be prevented or treated through highly cost-effective interventions. Any national package of interventions designed on the basis of cost-effectiveness and the disease burden would include the following essential services for women:

- Prevention and management of unwanted pregnancies.
- Safe pregnancy and delivery services.
- Prevention and management of sexually transmitted diseases.
- Promotion of positive health practices, such as safe sex and adequate nutrition.
- Prevention of practices harmful to health, such as less food and health care for girls than boys and violence against women.

In even the poorest countries, governments can help to establish and ensure access to these essential services by financing the health interventions for the poor and the behavioral change interventions for the entire population.

Services beyond the national package should be financed from private sources. Where resources permit a more comprehensive national package of interventions, the essential services could be expanded and upgraded to include:

– A wider choice of short- and long-term contraceptive methods.
– Enhanced maternity care.
– Expanded screening for and treatment of sexually transmitted diseases.
– Nutrition assistance for vulnerable groups.
– Cervical and breast cancer screening and treatment.
– Increased attention to early prevention of disease.
– Increased policy dialogue and strategic efforts to reduce gender discrimination and violence.
– Greater attention to the health problems of women beyond reproductive age.

What Actions are Needed ?

Governments can improve women's health by promoting gender-sensitive policies and strengthening women's health services. Efforts to redress socio-economic inequities must complement health sector reform. Existing services can be improved, extended, and tailored to fit local conditions.

For example, where cultural norms discourage women from receiving care from men, governments could recruit and train more female health providers.

Collection and analysis of gender-specific information on health care utilisation and health status can guide these efforts. Finally, education can promote positive health behaviours and change harmful attitudes.

By working closely with the private sector to deliver information and services, governments can help derive the greatest benefits from national health resources. Non-governmental organizations that are well respected in the community can be helpful in reaching and representing disadvantaged women. Private, for-profit providers can supplement government programmes by offering a broader range of services to those who can afford to pay for them.

– By increasing policymakers' awareness of the real social and economic gains emanating from improvements in women's health, foreign assistance agencies – including the World Bank – can have an impact far beyond their monetary contribution. International agencies can help by informing country decision-makers about lessons leaned from worldwide experience and by supporting interventions proven to be cost-effective. External inputs may be particularly helpful in the design of demonstration projects and the expansion of women's health programmes to the national scale.

Box 11: Success factors in community based nutrition programmes

(Source: Jonsson, U., 1995, published at; ACC/SCN No. 15, 1996)

Contextual Success Factors:

- Political commitment at all levels of society.
- A culture where all people, particularly women are involved in decision making.
- The presence of community organizations.
- A high level of literacy, especially of women.
- Infrastructure for the delivery of basic services, including committed and capable staff.
- Empowered women.
- A 'local culture' with a 'first call for children', including favourable child care practices.
- Charismatic leaders in the community, who can mobilise and motivate people to do more for themselves in a genuinely self-reliant way.
- The parallel implementation of poverty-reducing programmes, particularly where the nutrition oriented programme is integrated with these.

Programme Success Factors:

- The creation of awareness of the high prevalence, serious consequences and available low-cost solutions of the nutrition problem.
- The initiation, promotion and support of a process where individuals and communities participate in assessing the nutrition problem and decide on how to use their and additional resources for actions.
- Community based monitoring was essential for the above listed factor.
- Clear identification and definition of time bound goals (target) at all levels of the programme/project.
- Strengthening of the awareness and understanding of the causes of malnutrition, including the hierarchy of immediate, underlying and basic causes and the need to address causes at all three levels.
- The identification and support of facilitators and community mobilisers.
- Community mobilisation and participation.
- Both, the community and the population felt ownership of the programme/project.
- Income generating activities, supported by low-interest credit arrangements for the poor, particularly women.
- Good management of the programme/project, including effective leadership, supervision and co-ordination.
- Increased cost consciousness and capability to estimate resource requirements.
- The involvement of NGO's.

Annex 2: A source of further methodological details: methodfinder.de

The following action and intervention related methods within the category of "Food Security" are explained in more detail

- Food for Work
- Integrated Food Security Programmes
- Nutrition Education
- Strengthening local self-governance through Community Unions

Home	News	Our idea	Products	Methods	Contact
Methods	Categories	Find Method	Find example		

Find a method by Category

Analytical Methods	**Development Strategies**	**Organisation Development**
Analysis [26] Monitoring & Evaluation [11] Participatory Approaches [12]	Development Strategies/Policy [10] Economic Development [12] Food Security [13] Poverty Reduction Strategies [3]	Human Resources Development [10] Organisational Development [10]
Management	**Planning**	**Translated Methods**
Decision Making [16] Gender [6] Implementation [3] Natural Resources Management [6] other Management Methods [6]	Community Planning [19] National Planning [9] Regional Planning [10] Sub-National Planning [20]	Arabic [15] Khmer [9] Russian [9]
Technical Methods	**Working "IN" Conflicts**	
GIS/RS [9] other Technical Methods [5]	Conflict Assessment	

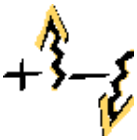
The Approach

We document methods and make them available on the Internet. Each method includes:

Brief description of the method:
The brief description of the method is basically a short summary of the method. Information is given on what the method is and what can be basically done with the method.

Proposed main users:
Who could potentially use the method has been documented in the second short section of each method.

Purpose of the method:
A more detailed description is provided of the main purpose of the method: An explanation is provided as to where and how the method can and should be used.



Advantages and limitations of the method:
In order to be able to use the method correctly the user must have a good understanding of the advantages and the limitations of the method. In some cases references have been made to other methods that overcome some of the limitations that are mentioned.

Principles and general procedures:
This section describes some of the main principles that underlie the method and also describes the main steps (e.g. step-by-step) procedure needed to apply the method. In some cases the steps have had to be simplified to avoid presenting too much detail. The references provide more information as to where a more detailed implementation guideline on using the method could be found.

References:
Finally, where references were used these have been listed at the end of each method.

Example:
For each method at least one example has been provided by a project. In some cases more than one example has been included in the method.

Acknowledgements:
Clear references are provided as to the organisation and project that provided the examples and/or the necessary steps to utilise the method. This way methods and examples from different countries and organisations can be effectively combined in the MethodFinder.net.

Paper VIII

Developing Appropriate Strategies for Food and Nutrition Security[1]

Georg Bokeloh

1 This paper draws upon elements of the following paper: Gross, R. et al.: The four dimensions of food and nutrition security: definitions and concepts. April 2000.

Table of Contents

1 Introduction

The theory and practice of FNS have undergone a dramatic evolution in the past decades. The definition of food security used by now emphasizes '**Availability**', '**Accessibility**', and '**Use and Utilization**' of food. The dimension "use and utilization' has been added to stress the fact that '**Nutrition Security**' encompasses more than mere '**Food Security**' The dimension of '**Stability**' refers to the time component in the other ones and can be seen as a cross cutting one. Causes of food and nutrition insecurity vary at the different levels of social organization.[2] While each specific cause has to be analysed individually, a holistic approach is nevertheless essential to assure a successful FNS programme. The analytical distinctions which have been made (different dimensions and levels) are helpful for understanding a given situation (assessment and analysis) as well as for targeting suitable and effective intervention instruments (action). In the real world, however, all aspects have to be seen and practiced in a holistic FNS programme strategy.

This paper focuses on important managerial aspects for the elaboration of such appropriate strategies for food and nutrition security programmes.

2 Project and programme cycle

Food and nutrition security, an important element of poverty alleviation, is a major priority of German cooperation with developing countries. Similar to other fields, certain planning and management procedures have been developed over the past decades and have been modified based on experiences and the requirements of specific projects.

2.1 The Project Cycle Management

Within FNS projects and programmes the managerial aspect refers to the structuring and management of processes, people and resources. Management normally follows the classical project cycle, which may have different names in different organizations (UNICEF: Triple A: Assessment – Analysis – Action; GTZ/DWHH: Project Cycle Management). Two examples in figure 1 and figure 2 show different designs of important sequential steps in a project life time. The difference is basically in the degree of detail. However, all development agencies agree that programme implementation should follow a cyclic learning process consisting of the following steps:

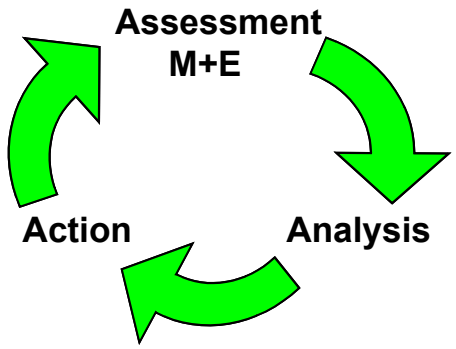
Assessment ➞ Analysis ➞ Planning ➞ Intervention ➞ Monitoring ➞ Evaluation (or Reassessment)

Problems and potential solutions are identified through proper assessment. With adequate information, the causes of problems and their causal relationship should be identified. Feasible solutions can then be elaborated through a comprehensive analysis that includes all programme participants. This process is essential to implement the efficient, sustainable, and acceptable actions required to improve the FNS situation of the targeted risk groups.

This sequence in the "triple A-concept" is also visible in the steps for effective planning and implementation of targeted food security interventions:

1 See Paper No. I, 4.3 on conceptual issues

Figure 1: Concept of Triple A or Project Cycle Management (PCM)



Identification of vulnerable and food insecure population as target groups.

Identification of the causes of vulnerability, and the constraints and potentials of the target groups themselves in attaining food security.

Design of appropriate interventions to address the causes of vulnerability, to overcome the constraints and to make full use of the potentials, applying participatory approaches for involving the target groups.

Ensuring that the institutional and technical capacities as well as necessary complementary inputs for implementation are in place.

Monitoring programme performance (are the target groups being reached, do they benefit effectively, and do the interventions improve their food situation?

Objectives-oriented Project Planning (ZOPP)

In the 1980s, the GTZ developed and introduced objectives-oriented project planning (ZOPP), a planning approach based on management by objectives. It initially included various methods of communication (workshops, moderation, visualisation) and planning (participants analysis, problem analysis, objectives analysis, project planning matrix). In the 1990s the methodological canon of ZOPP was made more flexible, and ZOPP – while maintaining the principles of communication – was defined as a quality-based understanding of planning. This understanding is based on a participatory and transparent approach to the planning process which is oriented towards the needs of partners and target groups. At each stage of a project key elements are agreed on jointly in teams with those concerned, and the results are recorded transparently.[3]

For GTZ commissions, the use of ZOPP as a planning approach or as an understanding of the planning process is no longer obligatory[4]. Nevertheless, it is recommended that the principles and elements of ZOPP be incorporated into planning work, in line with the demands of the specific situation.

The new commissioning framework is called AURA (entwicklungspolitischer Auftragsrahmen) and was introduced in 2003. Doubts about the effectiveness of bilateral development cooperation, a broad international debate on gearing project implementation to outcomes instead of inputs trig-

3 See GTZ glossary webpage

4 It is replaced by AURA since September 2003

gered the focus on impacts[5]. For the German bilateral cooperation it means a change in form and procedure for government arrangements (between BMZ, GTZ and Federal Foreign Office).

Besides a more clear separation of BMZ and GTZ competencies, AURA aims at
- Putting more emphasis on impact
- More flexibility for implementation
- Enhanced **quality** of offers

The new offer headings read: brief description of project or programme, binding elements, key information (required by BMZ for assessment) and other information (financial planning). The seven binding elements are[6]

- Overall objective, indicators
- Objective and indicators for the phase under review
- Target group and intermediaries
- Commission value of phase under review
- Lead executing agency
- Agreements on cooperation
- Declaration by the GTZ

Project Planning Matrix (PPM)

The PPM (also termed "logical framework", "logframe") is used by many development cooperation organisations.

	Logframe matrix structure		
Project Description	Indicators	Sources/Means of verification (MOVs)	Assumptions, risks
Overall Goal	Indicators	MOVs	
Project Purpose	Indicators	MOVs	Assumptions
Outputs, Results	Indicators		Assumption
Activities	Milestones specified in activity schedules and scope of services	Work plans and management reports on physical and financial progress	Assumptions

The PPM documents the outcome of *Objectives-oriented Project Planning* (ZOPP). It contains 16 cells with project relevant information: the description of project objectives, the outputs (results, major activities and resources required for their implementation), assumptions and indicators. At the same time, the matrix shows how these elements are logically interlinked. Essential for all GTZ-TC projects / programmes is the continual working together with their partners to describe the assumed impact chains (or more complex impact structures) and indicators, and to analyse the obstacles, which hinder achieving mutual objectives

Although the format may look slightly different in various organizations, the logic behind it remains the same as do the terms used for distinguishing different levels of objectives in the first column. The distinction made between results, project purpose and overall goal is nevertheless very essential.

5 A similar discussion in Welthungerhilfe also led to a concept paper on "Impact-oriented evaluation of German Agro Action overseas activities", 2003, and the development of PRIME by InWEnt.

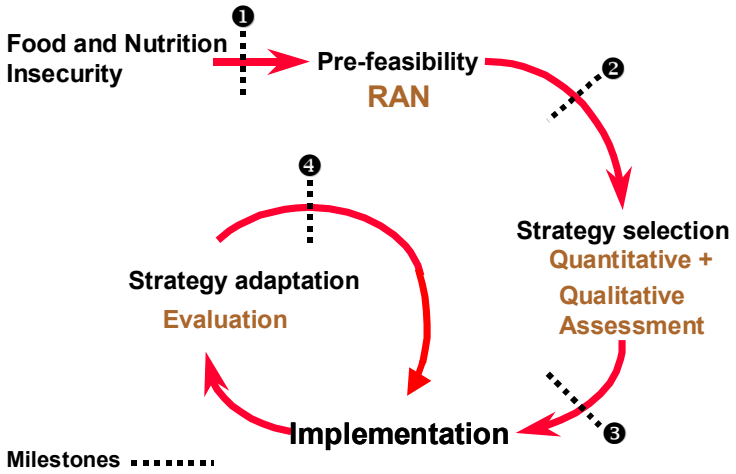
6 The logframe matrix format is replaced by a blotting text.

2.2 The Project Cycle Management in Food and Nutrition programmes

Figure 2 illustrates the Project Cycle Management (**PCM**) in more detail. A programme starts by formulating a problem-solving idea, which, if accepted (Milestone ❶, will be challenged by a **pre-feasibility study**. In the German technical cooperation this study is called Rapid Assessment of Nutrition (**RAN**). If the findings indicate that a programme should be launched, then a decision is required about its initiation (Milestone ❷). To develop a programme strategy, more detailed information has to be collected. With a quantitative household survey (**BASELINE**), a representative picture of conditions of the community can be collected. With qualitative methods (e.g. **Community ZOPP**) a survey of the perception of the community about its nutritional situation and living conditions can be made.

Once this information is available, the programme strategy can be defined (Milestone ❸) and **programme implementation** can begin. In addition to on-going **monitoring** of the programme activities, quantitative and qualitative survey methods should be conducted during and at the close of a programme for purposes of **impact-evaluation**. This evaluation should go beyond a situation assessment since the strategy has to be analysed as well. The future of the programme (Milestone ❹) is based on this evaluation.

Figure 2: Project Cycle Management in Food and Nutrition Security Programmes



In reality, the PCM is not a cycle but a spiral. If *effectiveness* is introduced as an *additional dimension* in figure 2, a movement to a higher degree of performance should be evident and be expressed as increased nutrition security.

2.3 Indicators and impacts

The importance of indicators as yardsticks for measuring a given state of the art and changes is underlined by the extra column within the logframe systematic. They should characterise named targets more detailed and specific. While objectives can sometimes be stated rather general, indicators focus the attention on core issues to be achieved or tackled.

Indicators are markers chosen to depict a certain complex situation that is often difficult – if not impossible – to measure directly. Generally valid are direct indicators, mostly quantitative and to be found on the output or result level. Indirect indicators on the other hand depend on specific situations and are not transferable automatically to other circumstances.

As indicators are meant to measure the degree of achievement of expected results, effects and impacts of a project/programme they form the base for monitoring and evaluation (M + E) for the project management.

Essential aspects of good indicators are statements on

- Quantity – How much is expected to change?
- Quality – What exactly is expected to change?
- Time – Within which time period are change processes to happen/materialize?
- Location – Where are change processes foreseen to take place?
- Target Group – Who precisely is expected to participate, benefit?

An overview on most important indicators for food and nutrition security (specially the nutritional status) is given in Background Paper No. II (The food and nutrition situation) and in No. III and IV on the common indicators for different dimensions and different levels.

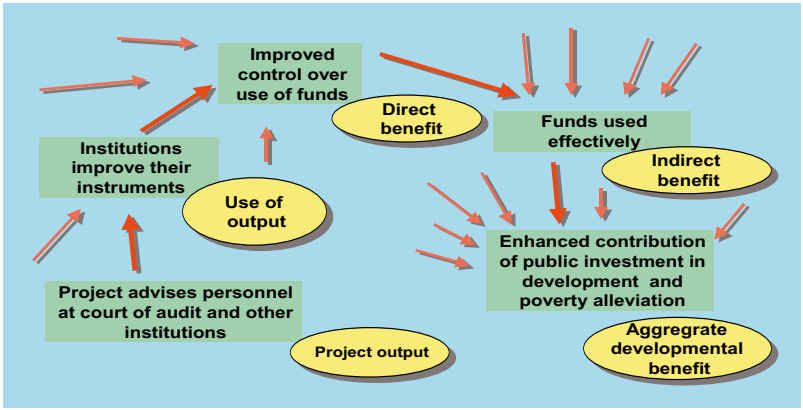
Impact-oriented Monitoring[7]

Impact-oriented monitoring focuses on observable impacts, and the achievement of project/programmes objectives. It monitors implementation status, and is therefore an important basis for project/programmes steering and reporting to the client. At the same time, it offers partner organisations and target groups a forum in which to assess the services of a project/programme.

The sequence from project outputs to direct and indirect benefits and rather aggregated developmental benefits (like "poverty reduction") is shown in this impact chain (figure 3).

The increasing number of arrows indicate the growing influence of the frame conditions ('side–effects'). Along with this goes an attribution gap on whether the benefits can really be attributed to the project activities and outputs.

Figure 3: Impact chain



Source: GTZ 2003

7 See GTZ glossar webpage

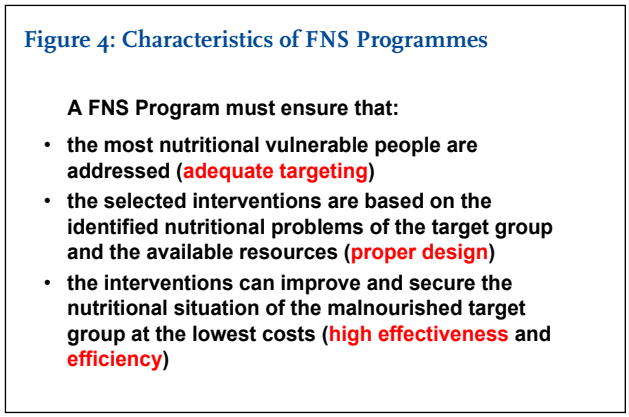
Impact-oriented monitoring revolves around the utilisation of project/programmes services, and the immediate benefits derived from them. Further indirect benefits are monitored regularly, and linked to the measurable impacts of the project/programmes on the basis of plausible inferences.

3 Criteria for selection

3.1 The three characteristics of a FNS programme

As shown in figure 4, a FNS programmes has to meet three requirements.

Figure 4: Characteristics of FNS Programmes



First, a FNS programme must be **targeted** to reach the most nutritional vulnerable population groups. Malnutrition is most prevalent in the poorest segment of society. However, FNS is not identical to poverty alleviation since poverty is far more comprehensive than malnutrition.

Adequate targeting may differ in conflict and acute emergency situations from otherwise more chronic (but stable or "normal") situations.

Second, the **interventions selected** should be based on the specific programme strategy that addresses the identified nutritional problems of the malnourished target groups. This requires a careful quantitative and qualitative diagnosis of the nature, magnitude, causes and effects of the problems.

Third, the programme must ensure that the interventions lead to an improved nutritional situation and to increased FNS. As a result, FNS programmes require routine monitoring and critical evaluations that validate **high programme effectiveness**. High degrees of both effectiveness and efficiency must be achieved in order to achieve sustainability and replication after external assistance ends.

3.2 Criteria for selecting interventions of a FNS programme

The choice of actions to be undertaken depends on a number of different factors. There is no standard answer about what to do. The following list of important criteria can help in the selection process.

According to situation:
- disaster/emergency
- conflict/crisis/post-war situation
- chronic
- agro-ecological zone
- existence of facilities
- availability of infrastructure
- security for all actors

Outreach, coverage:
- number of people
- area which can be covered

Level :
- macro/meso/micro
- acceptability at different levels

Impact:
- short term results visible?
- medium – long term
- scope of impact. Small – big change
- risk of negative side effects (on local market e.g.)

Management requirements:
- easy to organise and control
- required capacities + training

Legal and political framework:
- existing – or not?
- political stability – favourable or counter productive?

Complexity:
- number of components
- close to/far from existing knowledge + tradition
- number of actors involved
- need and possibility for coordination

Time:
- acute – chronic
- "starter-instruments" – "follow-up instruments"
- long-term instruments

Target group:
- degree and extent of food insecurity
- degree and extent of poverty
- gender culture
- degree of affectedness of violent conflicts

Effectiveness:
- degree of achieving the goal
- degree/danger of failure (risky measures)

Efficiency:
- resources involved (esp. financial)
- cost benefit / cost effectiveness
- human right perspective
- compatibility of instruments

Implementing organisation:
- comparative advantage
- requirements/regulations of implementation organisation
- donor policies and regulations

Contribution to self reliant food security
- danger of creation of dependency
- existing coping strategies + safety nets
- adapted to knowledge and skills of target group
- capacity building
- initiation of changes and processes
- motivation and willingness to change
- self-help potential
- sustainability
- ownership

4 Linking relief, rehabilitation and development

4.1 Linking Relief Rehabilitation and Development (LRRD) approach

Since the mid 1990-ies a discussion has started especially within the European Commission and its aid institutions on how to fill the gap between humanitarian aid and development aid. Whilst the former is provided by NGOs and international organizations according to the immediate needs of individuals, the latter relates to development policies and strategies in the form of partnerships between countries. By focusing on the interdependence of the two policies, the Commission emphasized that better development could reduce the need for relief, that better relief could contribute to development and that the transition between the two is facilitated by rehabilitation. The EC distinguishes three categories of crisis, natural disasters, armed conflicts and structural and other types of crisis.[8]

The objective of LRRD is to assess the measures aimed at filling the gap that exists between short-term relief and long-term development assistance. LRRD has been acknowledged as one of ECHO's priorities[9] and further:

- LRRD has been recognized as an issue of strategy and planning rather than simply one of financial resources and administrative procedures.
- A clarification of ECHO's general criteria for phase-out and hand-over has been achieved.
- There are plans to set up an LRRD toolkit to ensure successful handovers, and plans to issue country strategy papers mainly focusing on LRRD.

The inadequacy or lack of a strategic framework is seen as the greatest obstacle to LRRD implementation. There are no ready made blueprints on how to act or to address LRRD. Flexibility and creativity are essential to the effective delivery of aid because – specific events call for country-specific approaches. In the immediate future the focus for LRRD will be on disaster prevention and preparedness, better coordination and management among involved agencies (through information sharing e.g.) and mainstreaming LRRD within the organisation.

4.2 Food and Nutrition Security in different stages of insecurity

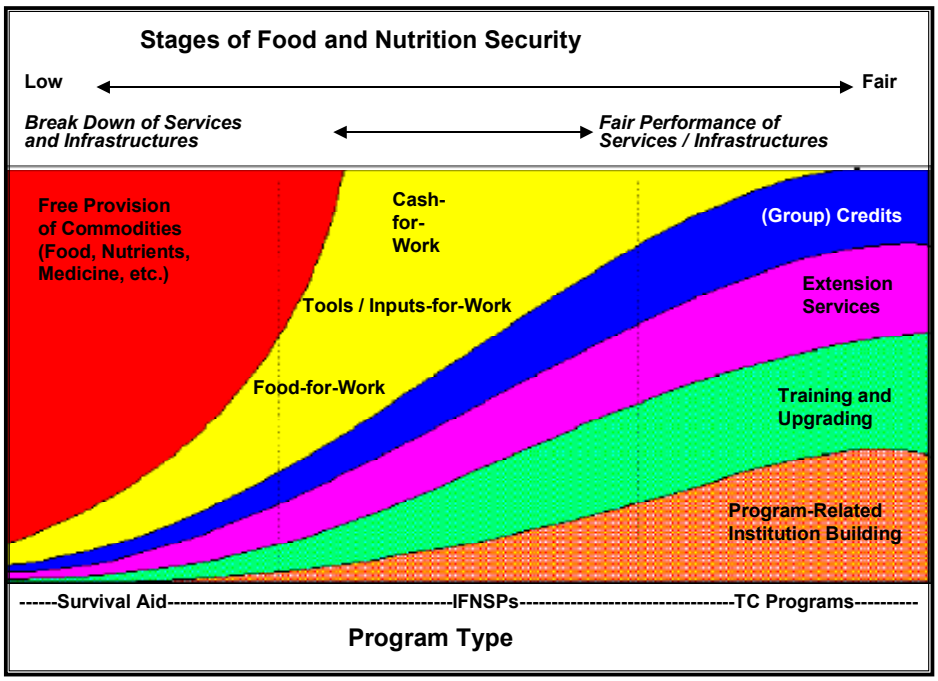
The existing types of projects and programmes in the context of relief aid on the one hand and development assistance on the other hand has been elaborated above (LRRD).

The situation-related status of a project/programme is another aspect of food and nutrition security. As FNS effectiveness increases, the situation begins to change from one of emergency to more secure conditions. Figure 5 depicts an example of different interventions at the **meso** level according to the level of food and nutrition security. The left side of the figure shows very high food and nutrition insecurity, i.e. an emergency situation. In these circumstances, relief programmes have to provide survival aid and assure wide distribution of basic commodities such as food or medicine. These programmes need to react rapidly and flexibly to secure the survival of the people.

8 EC 2001

9 See ECHO website

Figure 5: Significance of implementation tools at meso level in different stages of Food and Nutrition Security



Once survival of the most vulnerable is ensured, measures can be implemented to build a basis for sustainable development that relies on the capacity of the people. In this phase Integrated Food and Nutrition Security Programmes (IFNSP) are required. Self-help measures such as cash-for-work, food-for-work, tools or inputs-for-work can be used to construct basic infrastructure (drinking water supply, latrines, small irrigation channels, reforestation, health posts, etc.). At this point, the people may have adequate energy but the quality of food may still be insufficient. As a result, specific micronutrient interventions may be required.

The right side of the figure reflects a much improved nutritional situation that allows the implementation of the classical instruments of technical cooperation (TC), e.g. the implementation of credit and saving programmes, training and upgrading of technical expertise, institution building.

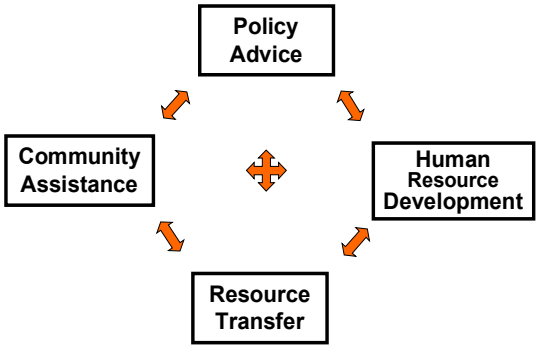
Depending on the stage of FNS at national level, different strategies and measures have to be implemented to increase the FNS situation within a whole country.

4.3 Elements of Technical Cooperation in Food and Nutrition Security

Figure 6 shows the four strategic elements of technical cooperation in the field of food and nutrition security. The first element consists of projects and programmes which strengthen the self-help capacity of communities to improve their nutritional situation. **Community Assistance** may show relatively rapid effectiveness if food and health measures are addressed accordingly to the needs of the vulnerable groups. However, the self-help capacity of communities can be sustained only if the structural conditions at meso and macro level are supported. This can be achieved through **Policy Advice**, the second element of cooperation.

Experience has shown that the sustainability of policy advice is more effective if human and technical expertise is created in the countries themselves. As a result, **Human Resource Development** should be the third element of an integrated national food and nutrition security programme. Finally, **Resource Transfer**, such as capital and information, is necessary to stimulate sustainable development. All four elements need to be linked.

Figure 6: Elements of Development Co-operation in Food and Nutrition Security



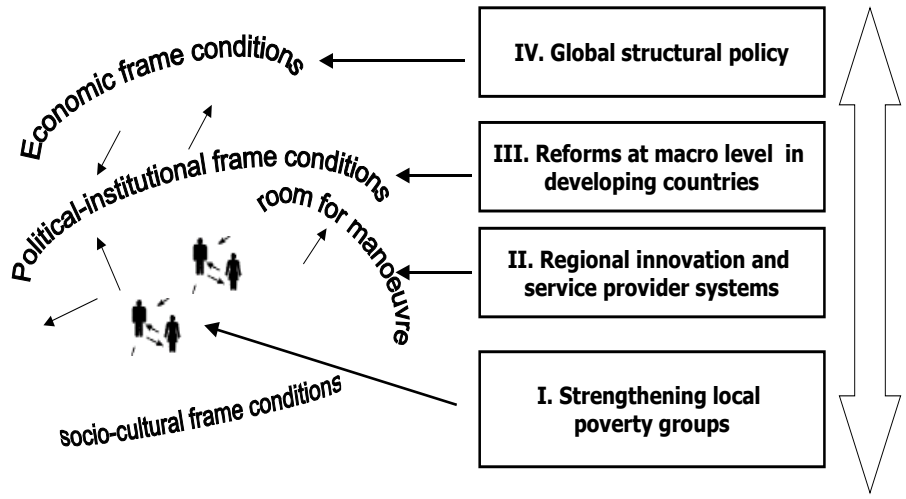
A programmatic approach to food and nutrition security also promotes the combination of the various levels (ups and downs are referred to as the "elevator principle") as shown in figure 7.

Not only are frame conditions an important field of intervention, but their link to local project activities should reduce likeliness of isolated projects at meso-level ('islands of happiness").

For example, in addition to a sound agricultural policy that boosts agricultural production, family planning programmes may be important to insure food availability on a longer term. Food stamp programmes can increase food accessibility for the most vulnerable groups. National safe motherhood programmes can reduce fetal malnutrition and therefore increase the utilization of food by small children.

The formulation of a saving and loan policy, within the national banking system, can assist small enterprises and help to reduce seasonal food insecurity (**macro** level). Small-scale irrigation projects, school feeding programmes, measles immunization campaigns, or the creation of community planning organizations are instruments to achieve food security at the **meso** level. Finally, increasing the area of agricultural production through the use of fertilizer, breast-feeding coaching for young mothers, and the construction of latrines and food stores are examples of FNS interventions at the **micro** level.

Figure 7: The multi-level approach for development interventions



Source: Rauch 2003

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Index

G

H

I

L

M

N

O

P

Q

R

S

T

U

V

W

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