



Internationale Weiterbildung und Entwicklung gGmbH



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The Four Dimensions of Food and Nutrition Security: Definitions and Concepts

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1. Background

Food security, an important element of poverty alleviation, is a priority focus of German co-operation with developing countries.

Food and nutrition security (FNS) has evolved dramatically 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 agents involved in programs and projects to fostering policy and strategy development. It introduces the concepts of FNS and malnutrition 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 innovations.

2. The World Nutrition Situation

Figure 1: Estimated Prevalences (%) and Number (10^6) of Stunted Preschool Children from 1980-2005 (ACC/SCN 2000)

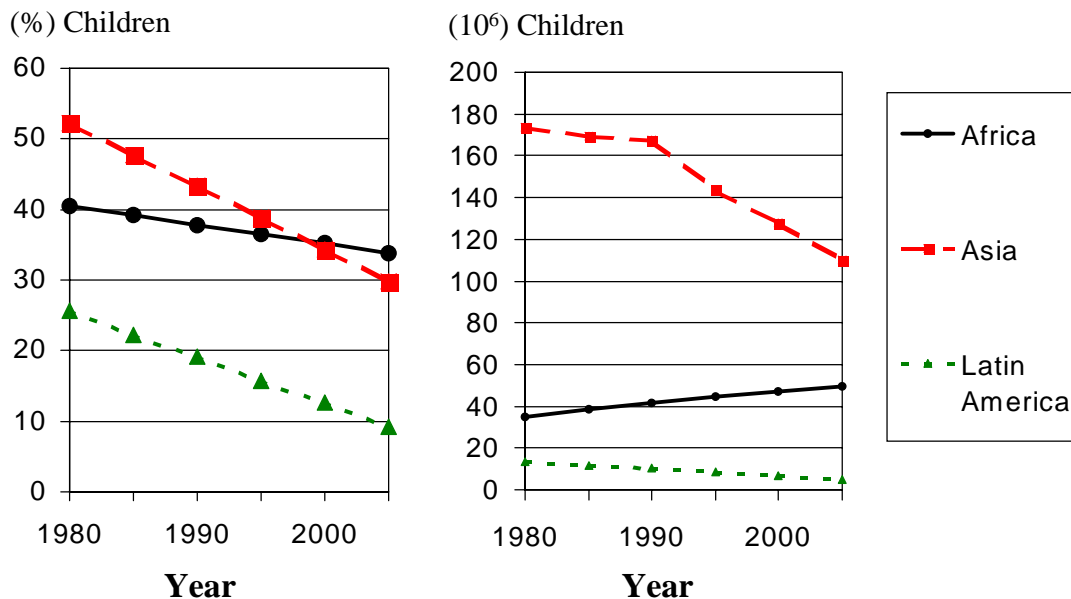


Figure 1 shows the trend in terms of prevalence of malnutrition and the absolute number of undernourished preschool children in the developing countries of Afrika, Asia, and Latin America. By the year 2000 it is estimated that about one third of the children under five years of age in developing countries will suffer from growth retardation (**stunting**) due to inadequate feeding and poor health. Although prevalence rates in all three regions are decreasing, the absolute number of stunted children is growing in Africa because of the high rate of population growth. However, within these regions there are considerable differences. For example, in Eastern Africa the percentage of stunting is increasing. Furthermore, despite improvements in Latin America, the total number of stunted children has remained constant in Central America in the period of 1980-1990.

Inadequate food and poor health are two direct factors contributing to undernutrition. Major achievements have been reached that most of the people in the world receive sufficient food to meet their energy requirements. However, energy is not sufficient to ensure good nutrition. Adequate micronutrients must also be available.

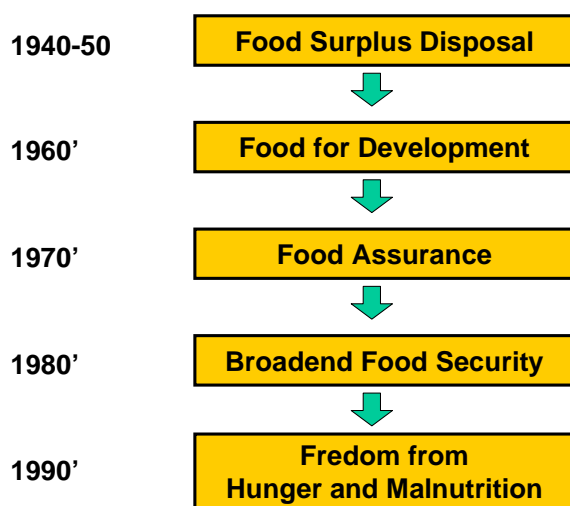
Among the most important micronutrients are: iron, vitamin A, and iodine. Indisputably, iron deficiency is a major public health nutrition problem. According to the estimation of WHO, about 5 billion people suffer currently from iron deficiency - about 80% of the world's population. In a recent evaluation (1999), a MI/UNICEF/Tulane University research team concluded that nearly two third of 78 studied countries have VAD of public health importance. In a joint effort WHO, UNICEF and ICCIDD recently updated the statistics on iodine deficiency diseases (IDD). Out of 191 countries that were classified, 130 had IDD as a public health problem. In 1999, about one third of the world's population is at risk for IDD.

Undernutrition has severe consequences in the economic and social development of people and countries. According to the ACC/SCN, at least 50% of diseases are caused by malnutrition and the economic growth of the world economy is reduced by more than one percent due to malnutrition.

3. The Evolution of Food and Nutrition Security Concerns

Global FNS has a more than 50 years history and a sequence of definitions and paradigms (figure 2). 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 of donor countries such as the USA or Canada, which were created in the 1950s, started to dispose their agricultural surplus commodities overseas.

Figure 2: The Evolution of Food and Nutrition Security Concerns



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

The food crisis of 1972/74 marked a dramatic turning point from the past area of food abundance of donor countries to highly unstable food supplies and prices. 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 between donor organizations 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 by donor agencies reduced food aid to crisis management and prevention.

4. Definition of Food and Nutrition Security

The definition of FNS has evolved considerably over time. The starting point of '**Food Security**' was food availability to balance unequal food distribution regionally and nationally. However, it was rapidly accepted that availability, though a necessary element, is not sufficient for food security, because food may be physically existent but inaccessible for those most in need. According to the accepted definition, Food Security is "*adequate access to food for all people at all times for an active, 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.

Figure 3: Definition of Food and Nutrition Security

"Food 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."



As indicated in **figure 3**, food has to meet physiological requirements in terms of quantity, quality, and safety and to be socially and culturally acceptable. In the case of food aid, only food that does not change eating behaviors and is socially and ecologically adapted should be distributed to meet the physiological needs of the target groups.

The definition of food security stated above emphasizes '**Availability**', '**Accessibility**', and '**Utilization**' of food. The inclusion of utilization underlines that '**Nutrition Security**' is more than '**Food Security**.'

The concept of FNS has four dimensions:

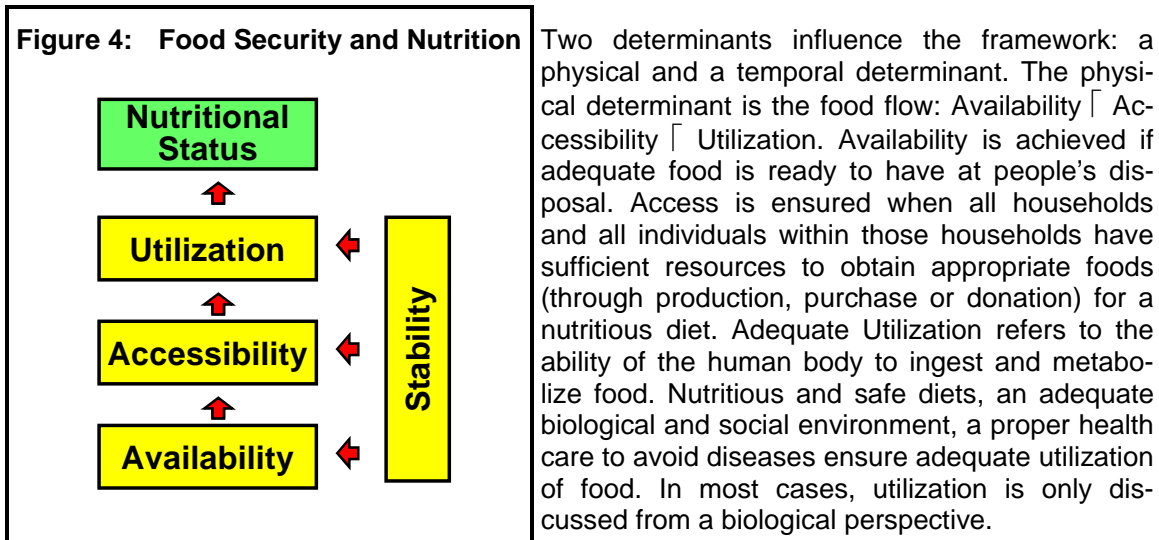
1. **categorical dimension,**
2. **socio-organizational dimension,**
3. **managerial dimension, and**
4. **situation-related dimension.**

Each is discussed below.

4.1 The Categorical Dimension

4.1.1 The Conceptual Framework of Food Security

Figure 4 illustrates the relationship among the categorical elements within the conceptual framework of *food security*.



However, food also has an important **social** role keeping families and communities together. In situations of food insecurity, this role FNS can be achieved only when sufficient culturally adapted food is available within households and communities to meet its biological and social needs.

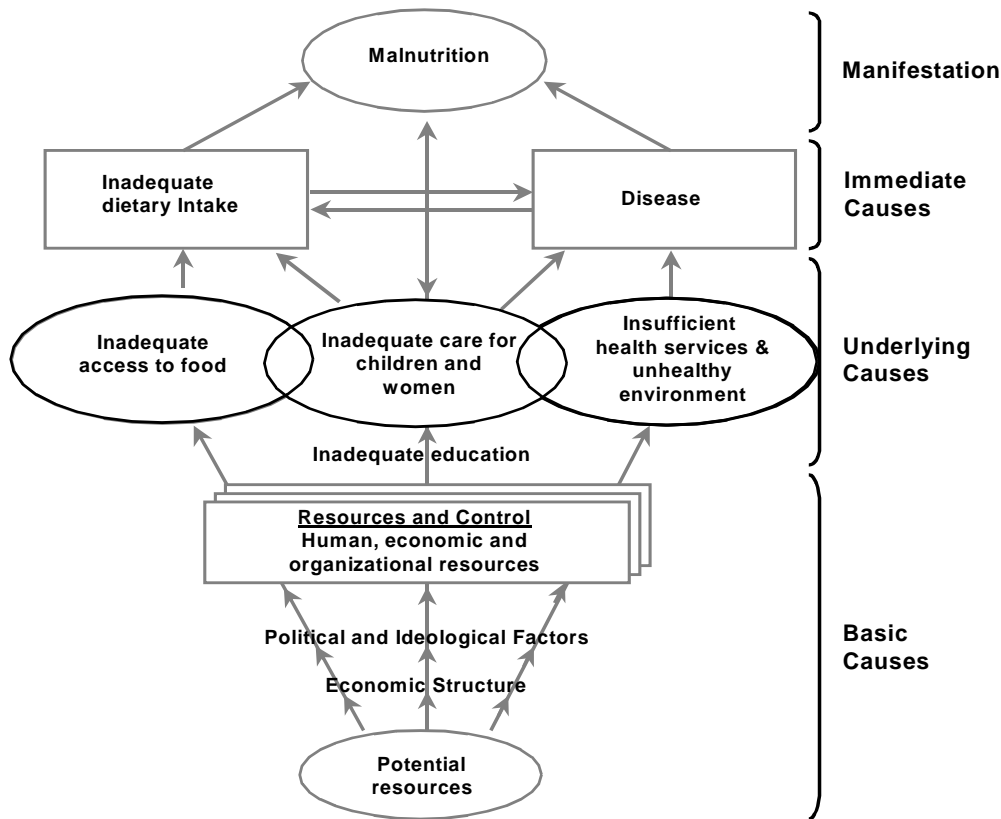
Stability refers to the **temporal determinant** of FNS and affects all three physical elements. It is important to distinguish between chronic food and nutrition insecurity (e.g. repeated food shortages before harvest "*seasonality*" or lack of caring during harvest) and transitory food and nutrition insecurity (e.g. due to natural and man made disasters).

4.1.2 The Conceptual Framework of Malnutrition

Figure 5 shows the conceptual framework of malnutrition, developed by UNICEF and widely accepted internationally. Although mainly used in the context of under-nutrition in rural areas of developing countries, it is also applicable to over-nutrition in an urban context. According to this framework, malnutrition occurs when dietary intake is inadequate and health is unsatisfactory being the two immediate causes of malnutrition. In developing countries, infectious diseases, such as diarrheal diseases (DD) and acute respiratory diseases (ARI), are responsible for most nutrition-related health problems.

Readily available food, appropriate health systems and a "healthy" environment are ineffective unless these resources are used effectively. As a result, the absence of proper care in households and communities is the third necessary element of the underlying causes of malnutrition.

Figure 5: Conceptual Framework of Malnutrition (UNICEF 1991)



Finally, this conceptual framework recognizes that human and environmental resources, economic systems and political and ideological factors are basic causes that contribute to malnutrition.

This model relates the causal factors for under-nutrition with different social-organizational levels. The immediate causes affect individuals, the underlying causes relate to families, and the basic causes are related to the community and the nation. As a result, the more indirect are the causes, the wider the population whose nutritional status is affected.

4.1.3 The Conceptual Framework of the Nutritional Status at Household Level

Figure 6 depicts a simplified causal model of linking nutritional status with ecological determinants 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 determinants** 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 determinants of food intake and health status are influenced by four determinants. In addition, each determinant has several contributing factors. For example, as shown further in **figure 6**, **Food availability** is affected by food production, purchase and/or 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*,

here illustrated as the small, dotted triangle. The latter refers to the entire relationships, depict in the large, lined triangle.

Figure 6: Conceptual Framework of the Nutritional Status at Household Level

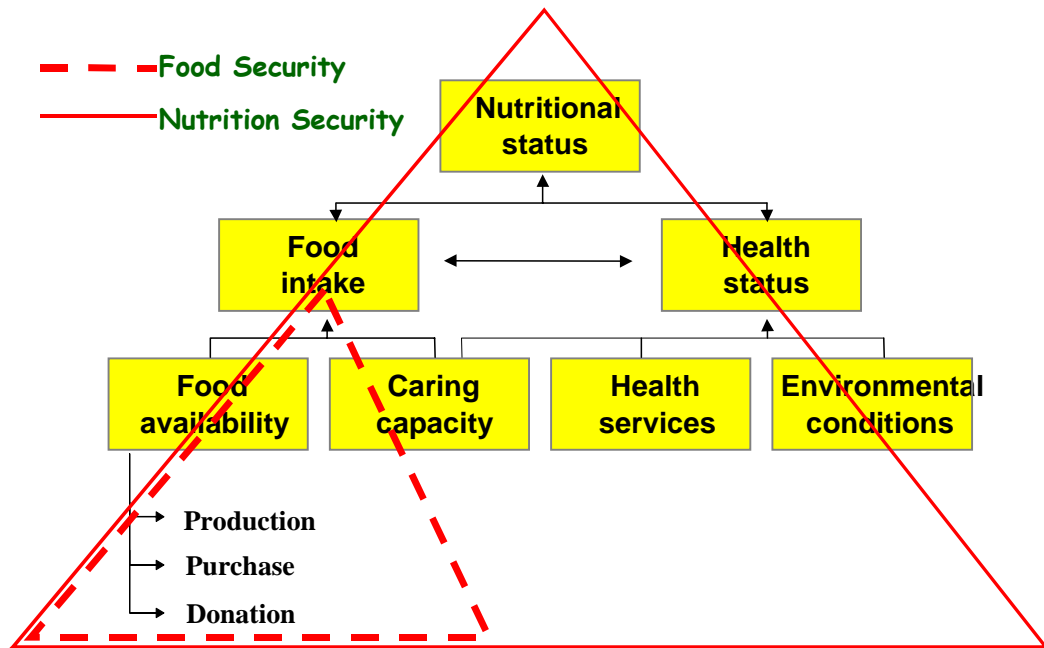


Figure 6 suggests a further important fact that should be taken into consideration when designing programs. The less direct the relationship between a causal factor of malnutrition and the nutritional status, the more time is required to improve the situation.

4.1.4 Food, Nutrition, and Health

The two most commonly used conceptual frameworks show significant differences. The food security framework emphasizes an economic approach in which food as a commodity is a central focus. The malnutrition framework adopts a biological approach in which the human being is the starting point.

Figure 7: : Food, Health and Nutrition



However, both frameworks promote an interdisciplinary approach to ensuring FNS in common. 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 7**).

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

4.1.5 Most Common Indicators of Nutritional Status

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 inadequacies of 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

Groups	Indicators	Brief Explanation
Children	Stunting	Growth retardation (poverty)
	Wasting	Low weight-for-height (hunger)
	Underweight	Low weight-for age
	MUAC	Thin mid upper arm circumference (hunger)
	LBW	Low birth weight (intrauterine growth retardation)
	Night blindness	Vitamin A deficiency
	UIE	Low urine iodine excretion (iodine deficiency)
Adults	BMI	Low Body Mass Index (hunger)
	TGR	Total goiter rate (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 upper arm circumference (**MUAC**). Due to the simpler and faster assessment procedure, this indicator is useful marker for under nutrition in emergency situations. Low birth weight (**LBW**) indicates that the pregnant woman is severely malnourished (quantity and quality of food) and/or in poor health and predicts future undernutrition for the child. Body mass index (**BMI**) is the most commonly used indicator to measure acute undernutrition of adults.

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 goiter. The total goiter rate (**TRG**) is an indicator of the duration and severity of iodine deficiency. However, a more accurate indicator of iodine deficiency in the community is the measurement of urinary iodine excretion (**UIE**) in schoolchildren.

4.2 The Socio-Organizational Dimension

4.2.1 Levels of Social Organization

As indicated in **table 2**, the categorical elements of FNS are relevant to all levels of the social organizations, from the individual and the household (**micro level**), to the community (sub-district, district and province) representing the **meso level**, the nation and the global level (**macro level**). However, the relative importance of each element of malnutrition changes with the level of social organization. At higher levels of social organization 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 of both the natural sciences as well as social sciences. As a result, the relevance of FNS at all socio-organizational levels and the interaction between these levels stresses the importance of an interdisciplinary approach of FNS.

Table 2: Levels of Social 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 Levels

Figure 8: Food and Nutrition Security at Different Levels

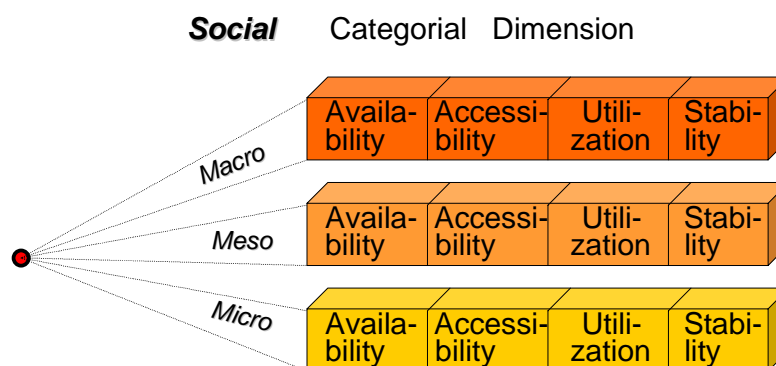


Figure 8 illustrates a merging of the categorical and the socio-organizational dimensions. *Availability, Accessibility, Utilization* of food and the *Stability* of these three elements differ in their nature, causes and effects at the *Macro, Meso* and *Micro* level. For example, food may be available in a country but not in certain disadvantaged districts or among discriminated population groups. The seasonality of food availability and utilization, due to cyclic appearance of diseases, may be a rural but not an urban phenomenon.

The same merger could be illustrated on the malnutrition framework with its categorical elements: *Food, Care, Health, and Environment*. However, these four categories have a different impact to the different socio-organizational levels

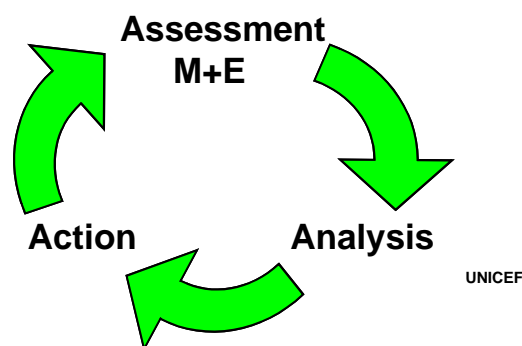
4.3 The Managerial Dimension

4.3.1 The Project Cycle Management

The third dimension is the **managerial aspect** of FNS projects and programs. As shown in **figure 9**, management follows the classical project cycle, which may have different names in different organizations (UNICEF: Triple A - Assessment - Analysis - Action; GTZ/DWHH: Project Cycle Management). However, all development agencies agree that program implementation follows a cyclic learning process consisting the following steps:

Assessment \leftarrow Analysis \leftarrow Planning \leftarrow Intervention \leftarrow Monitoring & Evaluation (or Re-assessment)

Figure 9: Concept of Triple A or Project Cycle Management

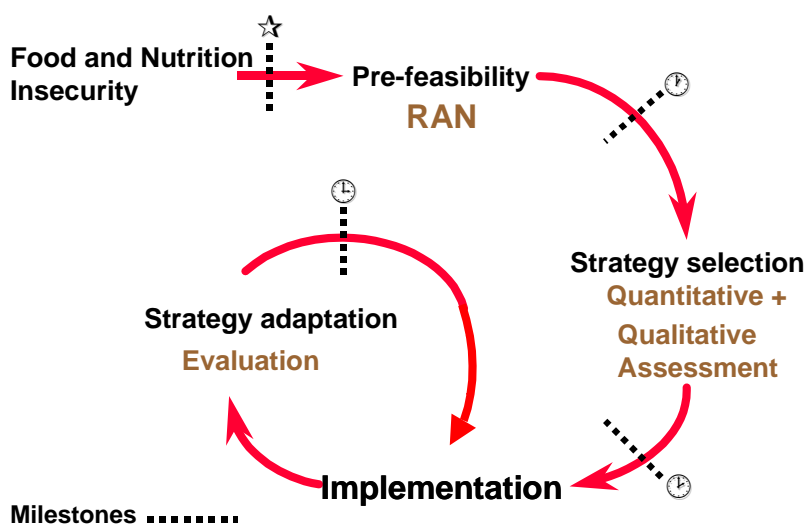


Problems and potential solutions are identified through assessment. With adequate information, the causes of problems and their causal relationship should be identified. Feasible solutions can then be elaborated through a comprehensive analysis that includes all program participants. This process is essential to implement the efficient, sustainable, and acceptable actions required to improve the FNS situation of the targeted risk groups.

4.3.2 The Project Cycle Management in Food and Nutrition Programs

Figure 10 illustrates the Project Cycle Management (**PCM**) in more detail. A program starts by formulating a problem-solving idea, which, if accepted (Milestone ∂), will be challenged by a **pre-feasibility study**. In the German technical cooperation the study is called Rapid Assessment of Nutrition (**RAN**). If the findings indicate that a program should be launched, then a decision is required about the initiation (Milestone \bullet). To develop a program 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**) the perception of the community on its nutritional situation and living conditions can be collected. With this information available, the program strategy can be defined (Milestone \div) and **program implementation** can be initiated. In addition to on-going **monitoring** of the program activities, throughout the project cycle **evaluation** quantitative and qualitative survey methods should be conducted during and at the close of a program. This evaluation should go beyond a situation assessment since the strategy has to be analyzed as well. After this evaluation, a decision will be made on the future of the program (Milestone \neq).

Figure 10: Project Cycle Management in Food and Nutrition Security Programs

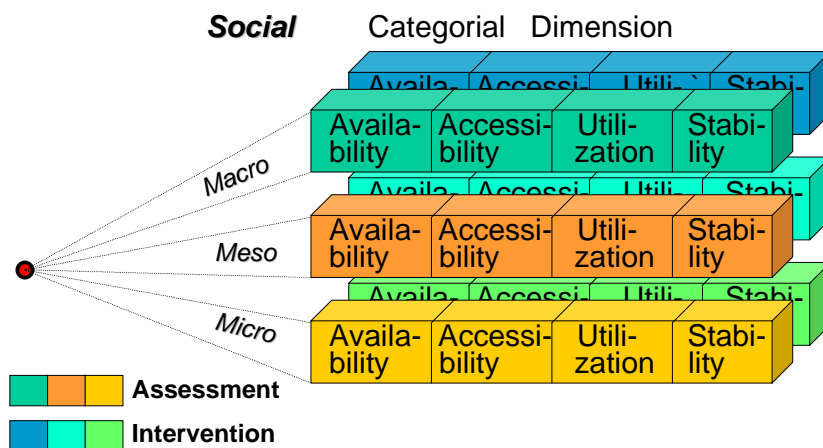


In reality, the PCM is not a cycle but a spiral. If *effectiveness* is introduced as an *additional dimension* in **figure 10**, a movement toward to a higher degree of performance should be evident, expressed as increased nutrition security.

4.3.3 Assessment and Intervention in Food and Nutrition Security in Different Social Levels

Figure 11 illustrates FNS in three dimensions (categorical, socio-organizational, and managerial). It should be noted that the instruments and processes selected for assessment. Assessment of the availability of food at the **macro** level is different from those used at the **meso** or **micro** levels. The same observation applies for instruments and processes selected for program implementation regarding 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 11: Assessment and Intervention in Food and Nutrition Security at Different Social Level



As indicated throughout, FNS is a complex system. Food and nutrition insecurity at different socio-organizational levels is caused by different factors and requires specific solutions. In consequence, an affective **FNS program needs a holistic program approach**.

4.3.4 Examples of Instruments to Assess Food and Nutrition Security at Different Social Levels

During all stages of the PCM there is a need for continuous information collection to define targets, to select appropriate interventions, and to monitor and evaluate program progress, process and impact. **Table 3** provides selected examples of assessment instruments sustaining to the different elements of FNS at macro, meso, and micro levels.

Table 3: Examples of Instruments to Assess Food and Nutrition Security Situation at Different Social Levels

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

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 analyze the vulnerability to food insecurity of target populations. A prominent part of VAM is related to food availability. The Demographic and Health Survey (DHS), funded by USAID, provides health data for many countries for national policy design. 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 selected diseases.

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, 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.

Finally, 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 **micro** level.

4.3.5 Most Common FNS Indicators at Different Social Levels

Table 4 shows examples of the most commonly used FNS indicators at different social levels according to the matrix found in table 3. 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 in children and adults, and low birth weight (LBW)

are FNS impact indicators that designate the extent to which food is adequately utilized and converted into an satisfactory national nutrition situation. Fluctuations in food prices and regional gaps of food availability or accessibility are sensitive indicators for national food and nutrition instability.

Table 4: Examples of Most Common FNS Indicators at Different Social Levels

Social Level	Availability	Accessibility	Utilization	Stability
Macro	Fertility rate food production 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 goiter anemia	Pre-harvest food practices migration

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 wasting (low BMI) of women indicate temporal food and nutrition insecurity.

The lack of food storage and the consumption of wild foods are indicators for reduced food availability of the household. A reduced number of meals per day and increased rate of under or unemployment may indicate low food accessibility. Appearance of wasting, goiter or anemia 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.

4.3.6 Examples of Intervention Instruments of Food and Nutrition Security at Different Social Levels

Using the systematic approach outlined above, **table 5** shows some examples of interventions in the four categorical elements of FNS at different socio-organizational levels.

Table 5: Examples of Implementation Tools in Food and Nutrition Security Programs at Different Social Levels

Social Level	Availability	Accessibility	Utilisation	Stability
Macro	Family Planning Program	Food Stamps Program	Safe Motherhood Program	Saving and Loan Policy
Meso	Small-scale Irrigation Project	School-feeding Program	Measles Immunisation Campaign	Community Planning Committees
Micro	Use of fertiliser	Breast-feeding Coaching	Latrine Construction growth chart	Food storage

For example, in addition to a sound agricultural policy that boosts agricultural production, family planning programs may be important to insure food availability on a longer term. Food stamp programs can increase food accessibility for the most vulnerable groups. National safe

motherhood programs can reduce fetal malnutrition and therefore increase the utilization of food by small children. The formulation of a rigorous 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 programs, 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 **micro** level.

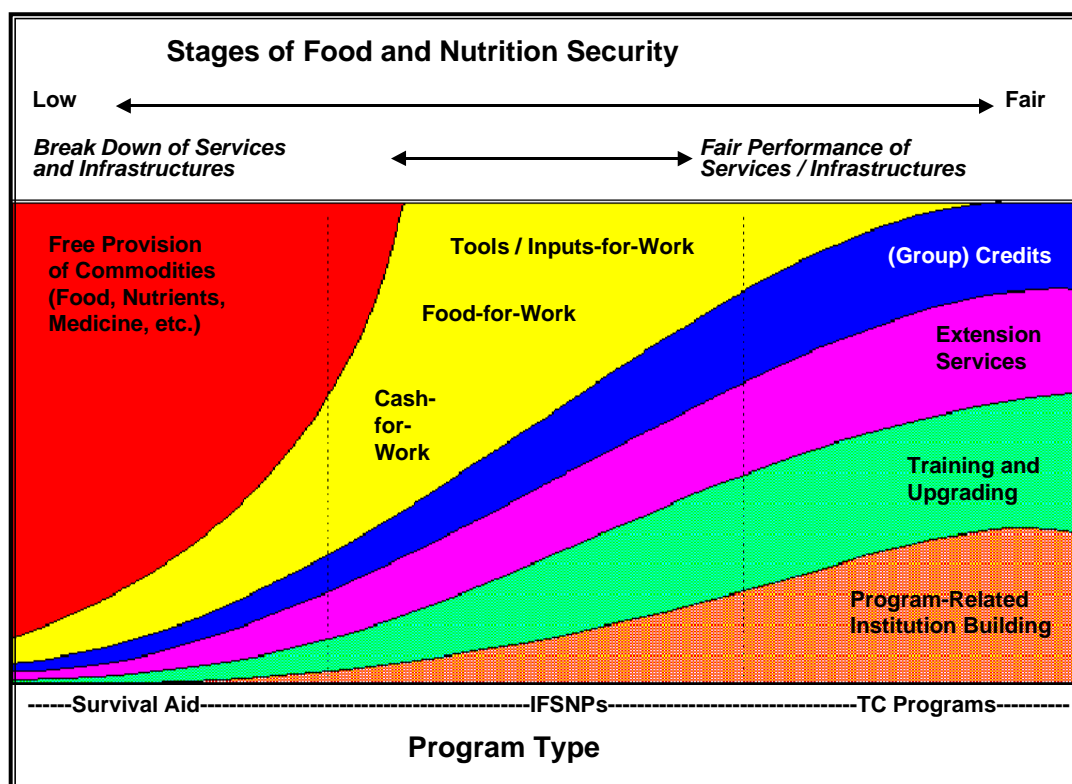
The systematic approach shown in tables 3 and 5 uses the same instruments and processes for assessment and intervention if the four categorical elements of the Malnutrition Framework (*Food, Care, Health, Environment*) are inserted in the table above. Therefore, it is of little relevance which framework -- Malnutrition or Food and Nutrition Security -- is used for the program design of FNS projects and programs.

4.4 The Situation-Related Dimension

4.4.1 FNS in Different Stages of Insecurity

The situation-related status of a program is the fourth dimension of FNS. As FNS effectiveness increases, the situation changes over time from an emergency to more secure conditions. **Figure 12** 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., emergency situation. In these circumstances, relief programs have to provide survival aid and to distribute widely basic commodities such as food or medicine. These programs need to react rapidly and flexibly to secure the survival of the people.

Figure 12: 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 Programs (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 an 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 programs, 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.

5. The three characteristics of a FNS Program

Figure 13: Characteristics of FNS Programs

A FNS Program must ensure that:

- the most nutritional vulnerable people are addressed (**adequate targeting**)
- the selected interventions are based on the identified nutritional problems of the target group and the available resources (**proper design**)
- the interventions can improve and secure the nutritional situation of the malnourished target group at the lowest costs (**high effectiveness and efficiency**)

As shown in **figure 13**, a FNS program has to meet three requirements.

First, a FNS program 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.

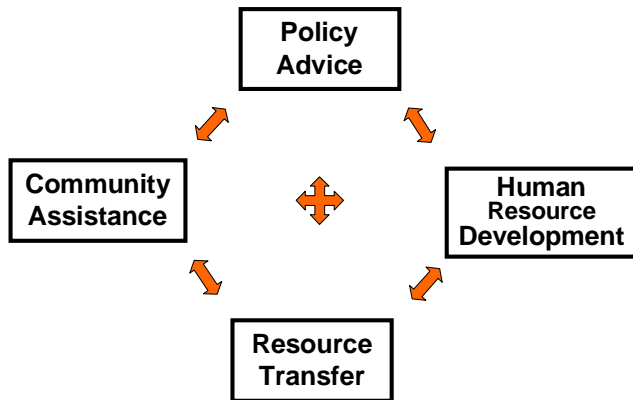
Second, the **interventions selected** should be based on the specific program strategy that addressed the identified nutritional problems of the malnourished target groups. This requires a careful quantitative and qualitative diagnosis of the nature, magnitude, causes and effects of the problems.

Third, the program must ensure that the interventions lead to an improved nutritional situation and to increased FNS. As a result, FNS programs require routine monitoring and critical evaluations that validate **high program effectiveness**. To achieve **sustainability** and **reproducibility**, after the end of external assistance, high effectiveness as well as high **efficiency** must be achieved.

6. Elements of Technical Cooperation in Food and Nutrition Security

Figure 14 shows the four strategic elements of technical cooperation in the field of food and nutrition security. The first element consists of projects and programs, 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.

Figure 14: Elements of Development Co-operation in Food and Nutrition Security



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 program. Finally, **Resource Transfer**, such as capital and information, is necessary to stimulate sustainable development. All four elements need to be linked.

7. Literature

7.1 Food and Nutrition Security in the Literature

Food security is a concept that has evolved over time. IFPRI (1999) listed approximately 200 definitions and 450 indicators of food security. The classical publication of Maxwell and Frankenberger (1992) lists 194 different studies on the concept and definition of food security and 172 studies on indicators. A review by Clay (1997), that updates this literature, provides an additional 72 references. Both publications are highly recommended to development practitioners who are interested in understanding the development of the concept and strategies of FNS. Other highly recommended reviews: Riely et al. (1995), Chung et al. (1997), and Christiansen and Tollens (1995). The recent Fourth Report on the World Nutrition Situation (1999) provides insights on the status of nutrition problems and the strategies required to solve the problems in different parts of the world. Finally the article by Gross et al. (1998) provides a synthesis of different concepts and the models of nutrition and FNS.

7.2 Selected Bibliography

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8. Abbreviations

Intentionally the most common abbreviations have been used in this paper to customize readers to internationally used terms in food and nutrition:

ACC/SCN	Administrative Committee on Coordination/ Sub-Committee on Nutrition
ARI	Acute respiratory diseases
BMI	Body mass index
DD	Diarrheal diseases
DHS	Demographic and Health Survey
FAO	Food and Agriculture Organization of the United Nations
FNS	Food and nutrition security
GIEWS	Global Information Early Warning System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)
ICCIDD	International Council for Control of Iodine Deficiency Disorders
IDD	Iodine deficiency disorders
IFNSP	Integrated Food and Nutrition Security Programs
IFPRI	International Food Policy Research Institute
IUGR	Intrauterine growth retardation
LBW	Low birth weight
MI	Micronutrient Initiative
MUAC	Mid upper arm circumference
PCM	Project Management Cycle
RAN	Rapid Assessment in Nutrition
TRG	Total Goiter Rate
UIE	Urinary iodine excretion
UNICEF	United Nations Children's Fund
USAID	United States Agency of International Development
VAD	Vitamin A deficiency
VAM	Vulnerability Analysis and Mapping
WFP	World Food Program
WHO	World Health Organization
ZOPP	Ziel-Orientierte Projekt Planung (Goal-oriented project planning)