Food security and food and nutrition surveillance in Central America: The need for functional approaches

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Introduction

The specialized agencies of the United Nations launched the concept of food and nutrition surveillance (FNS) 15 years ago [1]. From the start it was broadly conceived and multisectorally focused [2]. At that time nutrition planning was seen as a tool to mobilize multisectoral development efforts with the goal of eradicating malnutrition. It was expected that FNS systems would provide information inputs into the planning process, particularly in identifying and giving priority rank to groups at nutritional risk, and that they could also be used to monitor interventions and to evaluate programme effects [3].

With the exception of Costa Rica, which has (for Central America) a relatively long history of social policies and programmes, nutrition planning efforts in Central America have largely failed to attract the needed political commitments for multisectoral efforts to reduce nutritional risks for the poor. Economic crises during the 1970s and 1980s, which produced sharply rising foreign indebtedness and inflation, saw a return to export-led development models and a low priority for the fulfilment of social needs, as public-sector resources available for social investment drastically declined. As the nutrition planning efforts failed to produce any significant effects, so did the FNS systems designed to support them.

The recent Field-Berg debate in the literature about the fate and contributions of multisectoral nutrition planning [4; 5] has brought to light relevant and valuable lessons for the implementation process of FNS systems in Central America. Whether nutrition planning is alive and well is not the issue here (it still appears to be alive in theory, but not necessarily well in practice). But there are points on which Field and Berg agree, thus adding strength to the arguments. These points relate to data requirements in the planning process and focus on simplicity of methods and the need to support bottom-up as well as top-down planning processes. They disagree on the question of how multisectoral nutrition planning should be. Again this point reveals an important consideration for FNS systems.

Borrowing from some of the lessons learned as listed by Field [4], we raise four points for thought here within the context of the recent FNS experience in Central America. These points relate to FNS's integration of decision making and data generation and interpretation, its multi-functionality, its multisectoral focus, and the process of implementing FNS systems. We feel that no simple recipes can be formulated. Instead, alternatives have to be considered by each country before settling on a system and an implementation process, with sufficient flexibility for continual adjustments in both.

The FNS experience in Central America

Up to 1986 FNS had been adopted in Central America virtually as the responsibility of the health sector alone. The first systems that were developed were based on anthropometric and morbidity measurements, applying the traditional epidemiologist's approach. Data collection was often organized through health-service units, with data periodically channelled through successively aggregated administrative units to a central processing and dissemination unit. These systems were basically designed to assess the magnitude of nutritional harm, to monitor its evolution over time, and to detect acute outbreaks of undernutrition early on [6; 7]. The basic purpose was to sensitize political decision makers and to increase resource allocations for the health sector. The FNS systems were not directly linked to any specific health-sector programmes or to any other programmes in

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food-related sectors. For example, since the mid-1970s a nutrition surveillance unit (Sistema de Información en Nutrición, or SIN) has operated in Costa Rica. Even though SIN eventually became part of the Central Office of Family Allowances (Oficina Central de Asignaciones Familiares, or OCAF), its data outputs have seldom been used in recent years in internal decision making in OCAF or any other government agency. Recently SIN has been assigned the task of monitoring OCAF-financed projects operationally, particularly in the housing sector, and the responsibility for FNS has been taken over by the nutrition surveillance unit of the Ministry of Health.

Efforts to conceptualize FNS systems and put them into operation have been undertaken largely in isolation from similar efforts and experiences in other parts of the developing world. Much emphasis is still placed on technical improvements in data-collection instruments, sampling designs, and building infrastructure for computerized data processing. The actual use of the outputs of the systems in decision making and in the management of resources related to food and nutrition is virtually nil. Some proposed systems would absorb substantial amounts of resources.

Since 1986 new efforts have been under way in Central America to rethink and implement FNS systems, emphasizing their functional aspects. These efforts have been undertaken under the aegis of a regional food-security programme supported by the European Economic Community [8]. FNS is viewed as an instrument of food security at the macro level as well as at the household and individual levels. Our purpose here is to reinforce this focus as well as efforts that some countries are undertaking on their own initiative.

Information or decision: Which comes first?

All too often the outputs of FNS systems are not used in decision making and in resource management, but information experts and technicians continue to generate data with increasingly more sophisticated systems and methodologies. This is a general problem, which can be broken down into several dimensions.

First, information experts and technicians are removed from the decision-making arena. They second-guess what information is relevant for the decision maker, and operate on the assumption that information per se is an important ingredient in the decision-making process, about which they know little. This process is likely to be complex, and many factors besides information come into play, most prominently, political considerations. As Valverde et al. [9] pointed out, in Costa Rica the formulation of broad social policies emanated from social movements, political commitment, and society's values in general and was not based on data generated by multisectoral systems.

Second, the information experts often decide on the content of the information outputs without knowing whether they fall within the technical comprehension of the decision makers.

Third, these information outputs usually fall short of providing concrete decision options. For example, there is a significant gap between knowing what proportion of children are at nutritional risk and knowing what are the best programme options to reduce that risk.

Fourth, the information outputs are often not timely relative to the needs of the decision maker.

The utility of FNS systems' outputs in decision making is further reduced because they often are focused on only one sector and tend to measure static symptoms rather than dynamic causes that underlie chronic and acute food shortages and malnutrition. In Central America at least, FNS has not linked the effects of the long-term and widespread economic recession during the 1980s to food and nutritional outcomes in vulnerable population groups. By concentrating on technical improvements in data collection, processing, and analysis, FNS has progressively become an isolated field for information experts rather than an instrument for decision making and resource management related to food security.

Decisions related to food security are made and resources are managed at different levels, within and outside the public sector. In some Central American countries, notably Nicaragua, efforts are currently under way toward decentralization in the public sector, giving greater autonomy in decision making and resource management to individuals at regional and local levels. Popular organizations (co-operatives, organized communities) and non-governmental organizations in all Central American countries together manage substantial amounts of resources for development and food security. Clearly, then, there are likely to be information needs for those organizations operating at different levels in support of bottom-up development processes. It has been argued elsewhere that an FNS system designed, operated, and continuously evaluated by a community can be a powerful instrument for local, self-reliant development and food-security actions [10]. In one specific example now emerging, an FNS system being implemented in a northern region of Nicaragua which is novel for Central America, villagers participate in deciding what information to obtain and in designing the data forms. They are trained in data collection and collect and tabulate the raw data, which remains in the village while the tabulations are sent on to the next higher administrative unit. As a result, villages have begun to formulate community projects based on their own analysis and interpretation of the data.

The multiple functions of FNS

Food and nutrition surveillance in Central America is currently being approached very much as a system, with an unrealistic focus on a highly centralized, integrated information apparatus. As an alternative we propose a more functional approach: to look at FNS from the perspective of its specific functions, or the types of key decision areas that it should support, and the location where these are to be implemented. The main objective of and justification for FNS is to contribute effectively to the food security of all and to the eventual eradication of nutrition problems.

The implicit and explicit functions of FNS systems have been classified into three categories [11]: (a) support for national and sectoral planning, (b) monitoring of specific programmes in food-and-nutrition-related sectors, and (c) timely warning of impending food shortages. Two additional categories were later added: (d) advocacy, and (e) monitoring of the food and nutrition effects of structural adjustment policies.

The stated aims of FNS in Central America are advocacy and the support of top-down planning, primarily in the health sector. It is slowly being recognized in some of the countries that ministries and public agencies in other sectors (agriculture, education, commerce, economic affairs, labour, central planning, marketing) also maintain information systems for the purpose of supporting sectoral planning processes. In addition, the countries all have some sort of crop-forecasting system, albeit of varying quality. In fact, all are engaged in food and nutrition surveillance, although it has not received this label. There thus exist potential bases for a network of FNS systems for multisectoral food-security planning.

This idea has been accepted conceptually in the planning unit of the Ministry of Agriculture, Livestock, and Food in Guatemala but has not been implemented: inter-agency sharing of data appears to be a formidable obstacle, primarily because (a) it is not clear how each agency will benefit from participation in the network, (b) food security is not a goal these agencies relate to, and (c) nutrition problems are seen as essentially a concern for the health sector. Similar problems are being encountered in attempts by the Secretariat of Planning, Co-ordination, and Budget to set up a multi-agency FNS system at the regional level in southern Honduras. Recent attempts by a planning unit of the Ministry of Agrarian Reform in Nicaragua to set up an FNS system that was to draw on data bases in several ministries and public agencies failed; the data sets were considered to be for in-house use only and are only disseminated in highly tabulated form. These experiences clearly point to the need for the participation of sectoral decision makers in designing and implementing an FNS network based on a thorough understanding of the functions of FNS.

It can easily be argued that it is unrealistic to expect an FNS system or a network of systems at its inception to effectively fulfil all five functions simultaneously. It is not our intention to advocate any one function over others. Ideally, it is the policy decision makers and the resource managers who, as users of the system's outputs, should set the priorities as to which functions to emphasize first. This requires, first of all, that the five main functions should be recognized as legitimately those of FNS, thereby substantially extending its potential effectiveness. Extensive dialogue with information specialists is also essential.

National and sectoral planning

Planning at the national level essentially consists of periodically defining the objectives of government policies and establishing medium- and long-range goals, and of designing and continuously adjusting policy measures. This requires a vision of food and nutrition problems beyond any one sector. The role of FNS then translates into a continuous process of analysis and *interpretation* of data from diverse origins. This analytical process should be both inductive and deductive and integrated, and should not merely culminate in the presentation of a compendium of multisectoral data. A systematic flow of sectoral and other data is essential for this process but may be difficult to achieve, as indicated above.

Sectoral planning consists of the development of policy objectives in accordance with national goals and of programmes that are the logical responsibility of each sector. Thus FNS supports decision making at high levels through a process of analysis and interpretation of sectoral data. Integration of decision making and data generation may be easier at the institutional level, but not necessarily at the sectoral level when more than one institution is involved.

Programme monitoring

Food and nutrition programmes can potentially make an important contribution to the food security of vulnerable populations. Such programmes usually enjoy a certain degree of financial and operational autonomy. In Central America they may address group feeding, crop diversification and commercialization for subsistence farmers, or integrated urban and rural development. The actual food and nutrition effects of such programmes are normally of interest at both the political and management levels. Thus, subsystems of data collection and analysis integrated with the operation of the programme constitute FNS, although some authors prefer to call these monitoring rather than surveillance systems.

Timely warning

In Central America, as in other parts of the developing world, high-risk zones are subject to substantial fluctuations in food production due to agro-ecological or other phenomena. The aggregate availability of basic foods is also subject to variations due to factors in the external sector, affecting the food insecurity of the most vulnerable groups. Timely warning systems may be powerful tools in preventing critical food shortages and sharply reduced access to basic foods. Timely warning requires an analysis based on a number of multisectoral factors (crop forecasts, market prices, stocks) that measure risk at the central and local levels. The effective integration of decision making and data generation is essential, as rapid actions are required. Without such integration there is little justification for timely warning systems.

Advocacy

Advocacy can be undertaken by sectoral groups within the public sector, by organizations such as co-operatives or labour unions on behalf of the poor, or by the poor themselves when effectively organized. In all cases the aim is to increase the flow of resources. Public ministries or agencies seek to increase their share of the national budget in order to cover operating costs. In Mexico, a semi-autonomous agency attached to the Department of Commerce actually managed to increase the flow of food resources for the urban poor on the basis of FNS data. Trends in consumer prices are used in Costa Rica by the Ministry of Labour, business-sector representatives, and labour unions in annual negotiations related to minimum wage scales. FNS data are also used internationally by governmental and non-governmental agencies in an attempt to increase food donations. It has been argued elsewhere [10] that FNS data can be useful to community groups and other popular organizations in attempts to increase their access to resources, by providing technical content for their politically expressed demands. An apparently successful example is the integrated surveillance system in northern Nicaragua which was previously described. However, other examples are hard to come by in Central America. Descriptive health and nutrition data are at present the most widely used for advocacy purposes, possibly because they are considered to be politically and ideologically neutral. The result may be, however, uni-sectoral "solutions" that are only short-term palliatives.

Monitoring the effects of structural adjustments

A prolonged economic recession and growing foreign indebtedness during the 1980s have created mounting pressure for the Central American countries to implement a series of structural adjustment policy measures [12]. Although studies are available on the social effects of economic recessions among the poor in several Latin American countries, little empirical evidence is available for Central America. Some indirect evidence suggests that those effects are likely to be negative, while structural adjustment policies in the short term may actually aggravate those negative effects [13–16]. Clearly there is a need to monitor the effects on the food security of the poor in order to provide feedback to policy makers with the aim of strengthening positive effects and mitigating negative effects. Conceptually, FNS assumes here a combination of the four previously described functions, necessitating a continuous process of comprehensive multisectoral data analysis and interpretation.

Food security and food and nutrition surveillance

The FAO has defined food security as a state that assures that at all times all of the population have the material and financial means to obtain the basic foods that they need [17]. This concept has a number of dimensions: (a) it covers the whole food chain from production to biological use: (b) it applies at the national as well as the household and individual levels: (c) its aim is permanent security, combining stability with non-dependence on external factors: (d) it is dynamic, as food security is a relative and not an absolute goal: and (e) it is centred on the material and economic attributes of food.

When food security is seen as the ultimate goal of FNS, it becomes clear that food and nutrition problems should be tackled within the broad framework of socio-economic development, involving many sectors at different levels. The food-security concept gives FNS its conceptual and operational coherence, and can provide a rallying point for real political commitment and for mobilizing different sectors toward a common goal. The roles of some key sectors are highlighted here.

The agricultural sector

Adequate domestic availability of basic foods is a primary condition for satisfying the food requirements of the population. This confers on the agricultural sector a prominent role in the process of achieving greater food security and, consequently, in FNS. Besides food production, food security also depends on which food products (and other agricultural products) are stimulated, what types of farmers produce them, the economic returns to farmers, and so on. Basic grain production is not always the best technological and economic option for subsistence farmers. Agricultural production policies must be differentiated according to class of farmer. Production decisions at the farm level are strongly related to market conditions. Thus, agricultural policy contributes to the food security of vulnerable population groups when it deals with food production and distribution with special consideration for the poor. The agricultural sector should assume responsibility for the surveillance of food production and domestic commercialization, and the findings should be broken down in relation to the degree of food insecurity of the various population groups.

The social and economic policy sectors

No population group can achieve food security without permanently having sufficient purchasing power to obtain an adequate basic food basket. Marketing, consumer prices, employment, wages, and social protection policies and, consequently, the corresponding public policy sectors are all directly involved here.

The health sector

The health sector deals directly with the outcomes of the socio-economic insecurity (including food insecurity) of large segments of the population. In this sense, health and nutrition surveillance can provide a non-specific barometer of all factors that precede health and nutrition in the food chain. It can contribute to defining high-priority geographical areas and population groups in order to orient resource allocations in other sectors. Health-sector programmes that attempt to mitigate the effects of food insecurity, such as group feeding, health and nutrition education, and environmental sanitation, should also be subject to monitoring as part of food and nutrition surveillance.

Towards the implementation of a functional FNS system

No one operational blueprint for FNS systems or networks in Central America can be defined. The basic premise is that FNS data generation, processing, and analysis are justified when they result in food-security actions and directly or indirectly contribute to the food security of vulnerable population groups. From the point of view of operational efficiency, this means that the organizational structure of the system and the methodologies that it uses should aim at minimizing the time between data generation and decision/action (at least to the extent that information plays a role in the latter). This has a number of general implications.

Data generation and decision making

To reach full and effective integration of data generation and decision making involves a process. We unequivocally advocate initiating this process at the decision-making end, because starting at the data-generating end involves a usually unproductive process of having to sell the information output to the decision makers. As a first step it requires an in-depth understanding by information specialists of the decision-making processes and the role that information plays in them. Only then can information needs in relation to different decisions be defined. When asked about their information needs, decision makers are often at a loss to answer. They may not have evaluated in a consistent way how they actually use information and what additional information could increase the effectiveness of their decisions. An additional constraint often is the lack of adequate and opportune access by information technicians to top-level policy makers. Outside assistance should aim at helping decision makers and information specialists determine their information needs on the basis of a clear and common understanding of the uses to which the information is to be put.

Information experts need to have a clear picture of what types of food-security decisions are made by whom at which levels. These decisions will be of a normative-political or an operational nature. The activities of data generation, processing, analysis, and interpretation should be located in time and place close to the decision-making processes; that is, they should parallel the structure of the food-security decision network. An FNS system should probably be thought of as consisting of a number of subsystems operating within different sectors and at different levels (central, regional, local, community). Each subsystem is likely to reflect different priorities for FNS functions and to support food-security decisions by different users. One may provide information inputs to another, thus forming a network in which information or data flow toward higher levels of aggregation. For example, a community-based system may provide certain informational inputs into a health-sector system, which in turn provides information for decision making at regional and national levels.

A decentralized system may have the advantage, in addition to shortening the time between data generation and decision/action, of reducing the burden of inter-institutional co-ordination and involving more sectors and more decision-making levels directly in solving food-security problems.

We offer a list of questions to be considered jointly, in implementing an FNS system or network, by those who will be using it and the information technicians who will operate it:

1. Who are the decision makers at the central, regional, local, and community levels, and what types of decisions related to food security do they make (or should they make)?
2. In light of the food-security problems at different

levels and in different sectors, how should the FNS functions be ranked at different levels?

3. How is information routinely used in decision making, and what additional information should be made available to decision makers (and in what form)?
4. What is the structure of the food-security-decision network: that is, how do decisions in one sector affect decisions and resource allocation in other sectors?
5. How can full participation by decision makers and resource managers in defining the informational outputs of the FNS system be assured?
6. By means of what mechanisms should continuous interaction take place between information specialists and decision makers in the implementation, operation, and evaluation of the FNS system?
7. How can the structure of the FNS system (and the possible subsystems at different levels and in the different sectors) parallel the structure of the decision-making network related to food security in order to ensure the efficient and timely flow of FNS information and its effective use?
8. What mechanisms will ensure flexibility in the FNS system so that it will respond quickly and efficiently to new information needs and discard information outputs that are no longer used?

Cost effectiveness

Some final points to be raised concern the cost effectiveness of the FNS system. We have stressed the effectiveness of the system in terms of improving food-security decisions on the basis of objective knowledge and making food-security actions more effective: however, it absorbs scarce resources that have alternative uses. Thus, minimizing real costs should be an important concern of users and technicians. Some relevant strategies to that effect may include the following.

A marginal rather than a holistic approach

There is a tendency in Central America to design complex FNS systems to generate a long list of indicators. This is based on a perceived need for a complete system, which in turn is related to the strong emphasis on multisectoral top-down planning. This has several drawbacks that may lead to a long period of inactivity before the system can effectively be put into place. Such an extensive system absorbs large amounts of resources that are normally difficult to marshal before the system has shown its effectiveness, and it requires a great deal of inter- and intra-institutional organization and co-ordination, which, as has already been pointed out, are formidable obstacles. Lack of experience with a complex system certainly raises the operation costs at the start. Long implementation delays also imply considerable economic costs in terms of missed opportunities to improve decision making related to food security.

An alternative may be the marginal approach. The FNS system is initially conceived in minimal terms, based on a short list of key indicators within each subsystem decided upon jointly by the users and information technicians and based on the priorities of FNS functions and key decisions that the system is to support. As experience is gained and people are adequately trained, the system can be expanded on a rational basis and the list of indicators augmented. Implementation delays are likely to be shorter and the learning costs lower. Such an approach also introduces greater flexibility into the system from the start.

This marginal approach was applied a few years ago in the initial design of the minimal food and nutrition surveillance system which is now being developed and implemented by the nutrition surveillance unit of the Ministry of Health in Costa Rica. It is to consist of four subsystems—food availability, food access, food intake, and nutrition—each with just a few aggregate indicators at the start. However, some of the same difficulties are being experienced in implementing it as a multisectoral network of FNS systems as in Guatemala, Honduras, and Nicaragua.

Building on existing information systems

Many sectors have information systems and are in effect undertaking food and nutrition surveillance, without its being identified as such. Examples are crop-forecasting systems that exist in one form or another in all five Central American countries. Related to the marginal approach is the aim of building an FNS network based on existing information systems when appropriate rather than installing new and duplicate ones. Investments should be geared toward improving existing systems and adjusting their informational outputs to support high-priority decisions in a timely and effective way.

Simple, low-cost indicators

Cost concerns also bring the selection of indicators into focus. The same phenomenon can normally be measured by means of different indicators. The level of precision of measurement that is required depends on the FNS function within which the indicator falls and the type of decision it supports. Information specialists have an inherent tendency to carry precision too far, thereby driving up the costs of data generation, processing, analysis, and interpretation. The aim should always be to identify indicators that require a minimum of data to construct, that are easy to interpret, and that can be applied with a minimum frequency without jeopardizing their usefulness to decision makers. In general, the FNS functions do not require indicators with very high measurement precision. As Berg [5] has pointed out, qualitative data may also have their place in the planning process.

Final thoughts

Given the present political realities in Central America, basic physical survival constitutes the first priority for large segments of the region's population. Social and economic conditions are such that food security for all is only a far-off goal. Food-and nutrition surveillance outside the health sector is still in an infancy stage in Central America. This fact, however, provides each of the countries with room to consider carefully what FNS system or systems are likely to be most effective and to learn from FNS experiences in other parts of the developing world.

We strongly advocate an interdisciplinary, well coordinated, and multisectoral approach to FNS to reflect the complex and interrelated causes of food and nutrition problems in Central America. This does not have to involve a highly centralized data-processing and analysis unit, as supporting top-down macro-level planning is not the only function of FNS. Instead, the operational approach should probably be more pragmatic, starting at the decision-making end, taking existing information systems as a starting point, and finding mechanisms at each level of decision making that promote the integration of multisectoral data whenever the decision area to be supported calls for them. This last process is likely to be a great deal more effective when those who use the information participate fully.

External assistance can strengthen these processes by (a) facilitating the transfer of appropriate technology; (b) providing training opportunities (not limited to data-collection methods but including data analysis, interpretation, and dissemination methods), including ones that involve horizontal knowledge transfer; (c) disseminating FNS lessons from other parts of the developing world; and (d) providing resources to bring together political, normative, and operational decision makers, information specialists, and information users at the grass-roots level so that the FNS can support bottom-up planning processes. Local research institutions also have a significant role to play by (a) undertaking methodology development work related to FNS indicators, population coverage, and so on; (b) participating continuously in the interpretation and dissemination of FNS data; and (c) strengthening the technical capacity of data-gathering, processing, and analysis units at macro and micro levels. External assistance should aim at strengthening these local institutions' capacity to assume the above role, while at no time creating dependency on external resources for FNS.

Although this paper provides few answers, we have intended to raise many questions and to provide some basis for discussing alternatives for FNS in Central America. Relating FNS directly to food security as a goal imbues it a priori with a functional quality. This is particularly important within the Central American context because earlier efforts have essentially been limited to nutritional surveillance, with resulting narrow intervention responses by the public health sector. Food security at the macro, community, household, and individual levels links FNS directly to all aspects of the food chain and a broad set of underlying causes of food insecurity, including poverty, thereby significantly increasing the range of actions that may result.

As an operational instrument, FNS must ultimately justify its existence by contributing effectively toward bringing the goal of food security for all closer to the present.

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