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**CULTIVATING NUTRITION: A SURVEY OF VIEWPOINTS
ON INTEGRATING AGRICULTURE AND NUTRITION**

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Abstract

Over the past decade, donor-funded policies and programs designed to address undernutrition in the Global South have shifted away from agriculture-based strategies toward nutrient supplementation and food fortification programs. Given the potential benefits resulting from agriculture-based nutrition interventions, this study uses Q methodology to explore the views of a range of stakeholders from both developed and developing countries on the value of—and constraints related to—gender-sensitive, nutrition-oriented agricultural projects. The three distinct viewpoints that emerge from this exercise all support the use of agricultural strategies to improve nutrition and underline the importance of gender-sensitive approaches. The viewpoints differ, however, on the relative importance of nutrition education, the strategic use of nutrient supplementation and food fortification, and the degree to which agriculture-based approaches have an impact on nutrition. The findings indicate that there is common ground among a range of stakeholders—donors, researchers, policymakers, and program practitioners—on the benefits of agriculture and gender-sensitive strategies to improve nutrition. These areas of agreement can serve as a foundation for forging an effective integrative strategy to improve nutrition that includes gender-sensitive agricultural approaches.

Keywords: nutrition, agriculture, gender, Q methodology

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1. Introduction

Agriculture-based strategies have been proposed or used to address malnutrition by researchers, governments, international organizations such as the Food and Agriculture Organization of the United Nations (FAO) and the World Bank, and nongovernmental organizations (NGOs) for over two decades (Peduzzi 1990; Soleri, Cleveland, and Frankenberger 1991; Soleri, Cleveland, and Wood 1991). However, in the last 10 years, donors have increasingly favored approaches such as micronutrient supplementation and food fortification to address malnutrition. Despite the argument that agriculture-based approaches provide more sustainable nutrition outcomes and other development benefits than supplementation and fortification, it is unclear why there has not been widespread or sustained investment in agriculture to address malnutrition.

Changes in development discourse and practice, such as an increased focus on sustainable development and stakeholder participation, have also occurred in the last 10 years. For instance, there has been an acknowledgment that development interventions often have unintended gender impacts that undercut the effectiveness of policies and programs. This suggests the need—among other things—to develop gender-sensitive agriculture and nutrition strategies if programs are to effectively reduce malnutrition and achieve other development goals. Furthermore, to develop more effective nutritional interventions, the perspectives and priorities of many participants must be understood and considered.

The objective of this study was to explore the perceptions and beliefs of a diverse group of stakeholders on addressing malnutrition in the Global South. Specifically, the aim was to identify their views regarding the value of, and constraints related to, gender-sensitive, nutrition-oriented agriculture strategies. The authors were interested in exploring views on a broad range of agricultural approaches to address malnutrition, not only food-based approaches. This study aimed to elucidate the viewpoints of stakeholders and to facilitate dialogue on whether and how to effect cross-sectoral and institutional collaboration to improve nutrition.

2. Background

Chronic energy, protein, and micronutrient deficiencies, and poor growth continue to affect children in the developing world, particularly in Africa where rates of malnutrition have actually increased (ACC/SCN 2000). Also, in the developing world, there is the growing double burden of under- and overnutrition—sometimes found within the same household (Garrett, Ruel, and Hussain 2000). Undernutrition results from both direct causes such as inadequate care, insufficient food consumption, and poor health, and indirect causes such as household food insecurity, lack of employment opportunities, and low status of women (Kurz and Johnson-Welch 2001). It is often claimed that such diverse causes demand cross-sectoral and institutional collaboration to reduce rates of malnutrition. Popkin, Horton, and Kim (2000) have proposed that—particularly given the increasing prevalence of overnutrition in the developing world—nutrition policy be developed by systematically merging health and agricultural concerns.

Programs and policies designed to reduce malnutrition have employed various strategies, such as improved caregiving, health interventions, and increased access to food. One study estimated that up to 26 percent of observed declines in rates of malnutrition resulted from improvements in per capita food availability at the national level (Smith and Haddad 2000). However, efforts to address issues of food access, care, and health simultaneously are rare. For these to occur, multiple sectors must coordinate and direct their resources toward sustainably accelerating the rate of improvements in nutritional well-being.

Investments in agriculture in the developing world can have multiple benefits: small-scale agriculture is still essential for economic growth and serves as the main economic activity for most of the population. Agriculture produces food and on- and off-farm income, and agricultural development can result in lower food prices for all. Those benefits are “mediated,” however, by a number of factors (including gender). These factors are related to who makes decisions and controls access to and use of resources and benefits—within households and other institutions. Gender-sensitive agricultural

strategies are promising, as they may stimulate changes not only in household and national economies, but also in food security and human nutrition.

One study carried out in East Africa can serve as an example of the importance of multisectoral approaches to improve nutrition. In Kenya, new varieties of orange-fleshed sweet potatoes were introduced to women farmers (Hagenimana et al. 1999). The intake of calories and vitamin A-rich foods was significantly higher among children whose mothers received the full intervention package (education in agriculture, health, and nutrition, plus training in food processing and preparation techniques) than it was among children whose mothers received only the agricultural inputs (Hagenimana et al. 2001). These findings, in addition to those from four other action-research studies (Johnson-Welch 1999), indicate that food-based¹ interventions at the community level—as an example of an agricultural intervention—can yield timely nutrition benefits if they begin by addressing gender issues and making investments in women. These findings complement earlier findings of the value of using gender analysis in farming systems research and evaluation (Feldstein and Poats 1989), agricultural productivity (Mehra 1994), and institutional efforts to ensure food security (Johnson-Welch et al. 2000). However, despite this demonstrated potential, interventions have been isolated and small-scale, so the search for effective gender-sensitive agriculture-based nutrition interventions requires further attention.

Research and programs strengthening gender-sensitive agricultural strategies to improve nutrition have existed for over 20 years (Peduzzi 1990; Soleri, Cleveland, and Frankenberger 1991; Soleri, Cleveland, and Wood 1991). In the early 1980s, a U.S. Agency for International Development (USAID) policy paper on nutrition described nutrition as “a critical input as well as an essential output of development programs” (USAID 1982). It explained that multisectoral approaches engaging gender-sensitive

¹ Food-based strategies to reduce micronutrient malnutrition include agricultural programs to increase commercial and/or household production of micronutrient rich foods through research in agronomy and plant breeding. Food-based strategies also include postharvest technologies, nutrition communication, and behavior change communication to increase the consumption of micronutrient rich foods.

agricultural strategies to address nutrition were needed, and argued that such approaches should focus primarily on nutrition (USAID 1982). In the early 1980s, the World Bank explored the nutritional consequences of agricultural projects (Pinstrup-Andersen 1981). In 1984, the International Food Policy Research Institute (IFPRI) sponsored an international conference on international agricultural research and human nutrition. This conference focused on how agricultural research, food production, and farm incomes could improve nutritional status. One strategy that was promoted in the early 1980s was the inclusion of nutrition objectives in agricultural research projects (Pinstrup-Andersen, Berg, and Forman 1984; Tripp 1990). Efforts to strengthen agriculture and nutrition linkages in research, policy, and program planning continued into the early 1990s (Kennedy and Bouis 1993; Kennedy 1994).

In the last five years, a number of international conferences in Africa, Asia, and the United States have focused on promoting gender-sensitive agriculture and nutrition policies and programs.² These meetings addressed such topics as promoting food-based strategies to reduce micronutrient deficiencies and the connections between nutrition and development (e.g., see *Food and Nutrition Bulletin* 21: 4, December 2000). These conferences suggest an awareness among development professionals of the importance of using agriculture to address nutrition. While it is difficult to determine the degree to which these conferences have led to tangible actions, some donor organizations have begun to demonstrate an interest in the connections between agriculture and nutrition. Bilateral donors such as USAID and multilateral donors such as the World Bank have recently indicated an awareness of the opportunities agriculture offers to reduce hunger and poverty (USAID 2000). Yet the shift is slow and the implications of these views on resource allocations are still unclear.

Over the last decade, donors have placed increasing emphasis on using food fortification or nutrient supplementation strategies to address malnutrition, particularly

² These conferences included one organized by IFPRI held at the International Rice Research Institute (IRRI) in the Philippines, and another held in Ethiopia that was organized by USAID's Greater Horn of Africa Initiative (GHAI), both in 1999.

for micronutrient malnutrition. It is unclear why the donor community prefers these approaches, as agricultural strategies for addressing malnutrition are potentially more sustainable and have broader impact. Perhaps donors believe that community-based, integrated strategies are complicated, costly, and take a long time to yield results, and thus are difficult to evaluate over the short term. A nutrient supplementation project, on the other hand, can easily be evaluated for short-term impact using readily available biochemical indicators such as serum retinol. Another possible reason for the decreasing emphasis on linkages between agriculture and nutrition is the belief that such approaches are less cost-effective than food fortification or nutrient supplementation. Donors have consistently pointed to a lack of data to support the effectiveness of agriculture-based interventions, or they contend that the outcome indicators are not rigorous enough. There is much evidence to the contrary, however. For example, the International Center for Research on Women (ICRW) demonstrated how integrative approaches including agriculture-yielded beneficial nutrition impacts in Kenya, Tanzania, Peru, Thailand, and Ethiopia (Johnson-Welch 1999). Alternatively, structural changes in donor agencies may shift the focus from agriculture to other areas, such as health and family planning. For example, USAID transferred its nutrition division from the agriculture program to its population and health program in 1992. The clear shift in USAID's approach to addressing malnutrition can be seen in a comparison of USAID's 1982 Nutrition Policy Paper and its 1999 Strategic Plan for the Center for Population, Health and Nutrition (USAID 1982, 1999). In the 1982 document, USAID promoted gender-sensitive agricultural approaches to improve nutrition, while the 1999 document discusses ways to improve nutrition through decreasing infection (USAID 1999). In this instance, nutrition is still being addressed using a multisectoral approach, but one that pays no attention to agriculture.

A truly sustainable, multisectoral strategy should engage the areas of care, health, *and* agriculture, as the agricultural component can confer a range of other benefits in addition to improved nutritional outcomes. Given the multiple benefits of agricultural interventions, more information is needed to understand the reasons for the shift away

from agricultural strategies to food fortification and nutrient supplementation programs. This study can inform those interested in improving the nutritional status of people in the developing world of the ways in which stakeholders view multisectoral approaches to improving nutrition. This can lead to a better understanding of how these views shape the potential of future multisectoral initiatives to improve nutrition.

3. Methodology

This study characterized viewpoints regarding gender-sensitive, agriculture-based approaches to nutrition in developing countries. Stakeholders were drawn from a cross-section of disciplinary perspectives and global regions. Q methodology (Brown 1980) was used as it enables the researcher to identify viewpoints and to explore the nuances among viewpoints revealed in the study.

Q Methodology

As described in Brown (1980), respondents using Q methodology sort a set of statements that represents the discourse on the topic being studied. In Q methodology, the Q concourse is a set of statements that represents the range of views on a particular topic; in this case, stakeholders' views on the value of linking agriculture and nutrition.

Respondents are given a subset of statements from the Q concourse; this subset is known as the Q sample. Respondents sort the Q sample, indicating their degree of agreement or disagreement with each statement. The Q methodology offers the opportunity to explore views that may explain why the linkages between nutrition and agriculture have not been employed to address nutrition problems. This methodology also enables the researcher to explore why gender analysis and other gender methodologies may not have been used systematically to inform the development of agriculture and nutrition strategies. In Q methodology, the quality of the study findings is contingent on whether the statements are representative of the range of views held and on obtaining a diverse set of respondents. It is not, however, affected by the number of

people sorting the statements, because Q seeks to characterize the viewpoints themselves, not their distribution in the larger universe of stakeholders.

The Q concourse was developed from key informant interviews and a review of relevant literature, including conference proceedings and program reports. After reading through the Q concourse, thematic elements emerged from the entire range of statements and were condensed into categories. Eight categories emerged. The statements were grouped in a factorial design of these eight categories (impact, coordination, disciplines, gender, donor support, sustainability, economic benefits, and awareness), with each statement phrased to reveal three possible positions (strongly support, cautiously support, and strongly oppose). The Q sample was selected from among the statements in the Q concourse to represent all possible combinations of categories and positions. For each combination of category and position, two statements were selected, yielding a total of 48 statements in the Q sample. These are shown in Appendix 1.

Respondents were asked to sort the 48 statements into a distribution to reflect their levels of agreement and disagreement, encompassing seven possible responses, ranging from strongly disagree to strongly agree. Respondents placed the statements into a “forced distribution” according to a pre-established symmetric, quasi-normal distribution typically employed in the Q methodology. This is done by asking respondents to place four statements in each of the “strongly agree” and “strongly disagree” piles, six statements in each of the “agree” and “disagree” piles, eight statements in the “somewhat disagree” and “somewhat agree” piles and 12 statements in the “no opinion or mixed feelings” pile—a seven-point scale.

In instances where respondents felt their true views were not reflected using this forced distribution, they were allowed to sort the statements into piles according to their views. Studies in Q methodology indicate that the Q methodology is robust to such deviations, and that the results are not significantly affected if some respondents choose not to follow the forced distribution (Brown 1971).

The sorted statements (Q sorts) were analyzed to identify groups of people, or factors, that sorted the statements in a similar way. Using specialized software (PQ

Method, version 2.09a, 2000), the data were analyzed with the principal components method and varimax rotation. Initial analysis resulted in three possible models with two, three, or four factors. The three-factor model was selected after an inductive qualitative examination of the different models.

To characterize the viewpoints of each factor, the approach employed by Pelletier et al. (1999) and Wilkins et al. (2001) was used. An average score was calculated from the values assigned by respondents to each of the 48 statements (ranging from -3 for strongly disagree to +3 for strongly agree). Next, for each factor, each respondent's score for each of the 48 statements was converted to a Z-score to standardize the distribution across the 48 statements. The normalized factor scores were arranged from highest degree of agreement (positive Z-scores) to strongest degree of disagreement (negative Z-scores) for each factor. Finally, three separate narratives were developed using the top 10 agree and top 10 disagree statements for each of the three factors. This process enabled the identification of areas of both consensus and disagreement among the factors.

Selection of Participants

Participants were selected to represent diverse perspectives by disciplinary specialization, institutional affiliation, and type of work performed. Researchers, program practitioners, policymakers, and advocates in the areas of nutrition, health, gender, economics, and agriculture were selected. These individuals were based in national governmental agencies, multilateral agencies, international finance organizations, private institutions, private voluntary organizations (PVOs), and NGOs. The stakeholders were from Africa, Asia, Europe, Latin America, North America, and Oceania. There was a particular interest in the perspectives of African stakeholders; therefore, one-half of the surveys were sent to stakeholders based in Africa.

A list of potential participants was compiled from nutrition-, gender- and agriculture-related organization mailing lists, workshop participant lists, and through the identification of researchers based in the United States and Europe. Organizations

included the Organization for Social Science Research in Eastern and Southern Africa (OSSREA), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), the United Nations Administrative Committee on Coordination/Sub-Committee on Nutrition (ACC/SCN), the International Vitamin A Consultative Group (IVACG), and the Consultative Group for International Agricultural Research (CGIAR). Workshops represented were the 1999 IFPRI/IRRI workshop, a regional workshop in Ethiopia supported by USAID, and a workshop organized by Food Aid Management (FAM), Sharing U.S. Technology to Aid in the Improvement of Nutrition (SUSTAIN), and Food and Nutrition Technical Assistance (FANTA).

Survey packets were mailed to almost 600 participants, of whom approximately 310 were based in Africa. Two follow-up reminders were sent, one by regular mail and one by email. Individuals were given two months to complete and return their response forms by mail, email, or fax. In cases where individuals notified the working group that they had not received their packets, the survey packet was sent electronically. The packet included an explanatory cover letter, instructions on carrying out the Q-sort, a set of statement cards, and a recording sheet that could be returned by mail or fax.

4. Results

Respondent Descriptions

One hundred eighty-four respondents, representing a 31 percent response rate, returned their Q sorts. Six had to be removed because of recording errors. A total of 178 Q sorts, of which 78 were from African respondents (44 percent), were factor analyzed. All the stakeholder groups selected in the original 600-person sample were well represented among survey respondents. Only 7 percent of respondents did not comply with the forced-distribution request, though as stated above, this does not affect the factor results significantly.

Respondents came from major institutional and professional categories, and covered the fields of health, nutrition, and agricultural sciences. Respondent

characteristics were as follows: 30 percent work for academic institutions; 25 percent, for research organizations; 18 percent, for government institutions; 16 percent, for NGOs; and 10 percent, for donors.³ The remaining respondents classified themselves as “other,” which included some individuals from international financial institutions. One-half of the respondents indicated they were researchers; 16 percent, policymakers; 11 percent, planners; 17 percent, program implementers; 11 percent, administrators; 18 percent, project managers; and 10 percent, “other.” Fifty-two percent of participants were trained in a nutrition- or health-related field, 49 percent were from agriculture-related fields (including agricultural sciences and agricultural economics), and 5 percent identified themselves as sociologists.

Emergent Factors⁴

Three viewpoints are described using summaries of the top 10 agree and top 10 disagree statements from the Q sort; these are summarized in Appendix 2. The numbers following these summary phrases indicate the statement number (see Appendix 1); the subsequent three numbers indicate the rounded factor scores for Factors 1, 2, 3 in that order. This enables the identification of those statements that serve as consensus statements or distinguish viewpoints from each other.

Factor 1: The Multi-Benefit Viewpoint

The core of this viewpoint is the focus on development as its primary objective. Development and its related economic benefits emerge from the improved nutritional status of populations ([1: +3,0,0] and [2: +3,+2,+1]) that can result from the linkages between agriculture and nutrition. Food-based strategies are able to yield multiple benefits, and are therefore integral to development activities ([37: +2,+2,+2], [39: -3,-2,-3] and [8: +3,0,+3]). When developing food-based approaches to improve nutrition,

³ The figures sum to more than 100 percent because some respondents identified themselves as belonging to multiple categories.

⁴ In this discussion, the terms “factor” and “viewpoint” are used interchangeably.

gender is a critical element to be considered ([23: -3,-3,-2] and [24: -3,-3,-1]), and the linkages themselves can improve women's access to resources (37: +2,+2,+2). This viewpoint is confident about the potential and utility of food-based approaches, disagreeing with claims to the contrary ([17: -2,-1,-2], [41: -2,0,-2], and [42: -2,0,-3]). While it agreed that some contexts necessitate using traditional public health strategies for certain segments of the population (e.g., supplementation during pregnancy) (34: +2,+3,+1), this concern is largely overshadowed by the commitment to multi-outcome programs as derived from food-based interventions. Finally, this viewpoint believes that these linkages have not been implemented more widely because of a lack of political and administrative will (25: +2,+1,+1), but that this could change with increased funding allocated to such programs (26: +3,+2,+3).

Factor 2: The Context-Specific Viewpoint

Pragmatism is the fundamental characteristic of this viewpoint. In this viewpoint, poor nutritional status of populations is the primary theme addressed: in terms of its economic importance ([37: +2,+2,+2] and [2: +3,+2,+1]) and the high priority given to finding appropriate solutions ([33: 0,+3,+2], [34: +2,+3,+1], [31: +1,-3,+2], and [4: +1,+3,+2]). This viewpoint considers all possible strategies for addressing malnutrition, and stresses that the solution should be identified from among a range of approaches (33: 0,+3,+2). Specifically, it is not convinced that food-based approaches should be the primary focus for addressing malnutrition (31: +1,-3,+2), although it recognizes that it has a role to play (5: -3,-3,-3). This viewpoint perceives limits to the utility of agricultural approaches for improving nutrition ([33: 0,+3,+2] and [34: +2,+3,+1]). Yet, the agricultural approach is appreciated for the range of benefits it confers ([39: -3,-2,-3], [37: +2,+2,+2], [2: +3,+2,+1], and [44: +2,+2,+3]) as opposed to its specific contributions to improving nutrition. It acknowledges that poor nutrition affects communities from the household level (37: +2,+2,+2) to the national levels (45: +1,+2,0). While this viewpoint advocates increased funding to develop synergies between nutrition and agriculture (26: +3,+2,+3), it also acknowledges that this will not

happen without increased lobbying and awareness-raising (28: +1,+2,0). This viewpoint is particularly sensitive to gender issues, and expresses the critical role gender awareness has in terms of reducing malnutrition ([23: -3,-3,-2], [24: -3,-3,-1], [21: -1,-2,-2], and [20: +1,+3,+1]).

Factor 3: The Sustainability-Oriented Viewpoint

The focus of this viewpoint is using sustainable approaches to improve nutrition ([31: +1,-3,+2] and [8: +3,0,+3]). Agriculture is preferable to other possible approaches because it generates additional benefits to the communities employing these strategies ([39: -3,-2,-3], [37: +2,+2,+2], and [44: +2,+2,+3]). Agricultural interventions are also considered to be workable solutions to addressing poor nutrition ([5: -3,-3,-3], [35: -2,-2,-3], [36: -2,-2,-2], [17: -2,-1,-2], and [41: -2,0,-2]). However, the success of agricultural interventions is contingent on concurrent nutrition education ([32: 0,-1,+2] and [4: +1,+3,+2]). While one statement did acknowledge the potential of employing nonfood-based approaches when necessary (33: 0,+3,+2), the bulk of statements that define this factor actively promoted agricultural approaches in coordination with nutrition education strategies. This factor is also concerned that cross-disciplinary ignorance exists among people because of current structures in academic training (15: -1,+1,+3); therefore, curricula need to be developed to educate people across disciplines (13: +1,+1,+2), and funds should be allocated to do so (26: +3,+2,+3). While gender is less of a focus in this viewpoint as compared with the others, there is a degree of sensitivity to its importance in the process of improving nutrition ([23: -3,-3,-2] and [21: -1,-2,-2]).

Areas of Consensus

All three factors concurred that nutrition can be improved and economic benefits realized through incorporating nutrition objectives into agricultural research ([5: -3,-3,-3] and [37: +2,+2,+2]), and all three demonstrated the same general trends in support of

gender-sensitive approaches, as seen in the rounded factor scores for statements 19-24 (Appendix 1).

There was a high level of correlation between factors. The correlation between Factors 1 and 2 was 0.65; between Factors 1 and 3, 0.76; and between Factors 2 and 3, 0.67. An analysis of the overlapping statements for each pair indicated that most of the overlap was shared among all three factors, and the policy implications of this will be discussed below.

Salience of Categories by Viewpoint

All eight categories represented in the Q sample emerged as relevant categories for understanding views about the linkages between agriculture, nutrition, and gender. The salience of the categories by viewpoint can be seen in Appendix 3. In particular, all three viewpoints expressed some level of agreement with statements expressing views on impact, donor support, awareness, sustainability, economic benefits, and gender. Developing effective food systems through improvements in agriculture to improve both human health and generate economic benefits was considered important and possible by all three viewpoints (awareness, 44; economic benefits, 37; and impact, 5). There was a general agreement that food-based approaches have value (sustainability, 35, 36), but dissent emerged among the viewpoints regarding the extent to which food-based approaches should be relied upon to address the range of nutrition problems (sustainability, 33, 34). Yet all viewpoints strongly disagreed with the notion that direct nutrition interventions, such as micronutrient supplementation and food fortification, should be preferred over agricultural strategies, given that agricultural production strategies yield a variety of additional benefits (economic benefits, 39). While gender-sensitive strategies were valued across all viewpoints (gender, 23, 24), this category drew a particularly strong, positive response from the second viewpoint. All three viewpoints agreed that progress in the development of gender-sensitive agriculture and nutrition strategies requires lobbying efforts to increase the resources allocated to this agenda

(donor support, 26). In some instances, the salience of certain categories was greater for only two of the viewpoints. For example, viewpoints 1 and 3 agreed that linkages among agriculture, nutrition, and health were necessary to reverse the effects of previous policies and programs that had been unsustainable and did not address the underlying issues of malnutrition (coordination, 8).

While the categories serve as a useful framework for understanding the potential for promoting and engaging linkages between agriculture, nutrition, and gender, the viewpoint narratives themselves offer independent contexts for understanding the differences among the factors. Furthermore, respondent characteristics are particularly helpful in understanding the policy implications of these results.

Relationship Between Viewpoints and Respondent Characteristics

Of the survey respondents, 32 percent loaded most strongly on the multi-benefit viewpoint (Factor 1), 30 percent on the context-specific viewpoint (Factor 2), and 20 percent on the sustainability-oriented viewpoint (Factor 3), leaving 18 percent of respondents not significantly loading on any of the three factors. The breakdown of factor loading by academic discipline is seen in Table 1. Nutritionists are well-represented across all three viewpoints, while those who identified themselves as having been trained in the health sciences tended to load more significantly on the multi-benefit and context-specific viewpoints (Factors 1 and 2). Forty-four percent of agricultural scientists loaded on the multi-benefit viewpoint, whereas only 10 percent loaded on the

Table 1—Association of viewpoints with disciplines of respondents

Viewpoint (percent total sample)	Nutrition (N = 68)	Other health sciences (N = 25)	Agricultural sciences (N = 48)	Agricultural economics (N = 38)	Other (N = 29)
	(column percentages)				
1) Multi-benefit (32)	21	32	44	21	45
2) Context-specific (30)	32	40	10	47	38
3) Sustainability (20)	28	4	27	13	3
Non-loaders (18)	19	24	19	18	14
Total (100)	100	100	100	100	100

context-specific viewpoint. Among those trained in agricultural economics, 47 percent loaded on the context-specific viewpoint, with less than half of that percentage loading on either the first or third viewpoints.

The relationship between organizational affiliation and factor loading is shown in Table 2. A near majority of those reporting to be affiliated with a government or research institution loaded most strongly on the multi-benefit viewpoint. Those associated with academic institutions tended to be equally loaded on all viewpoints, while three-quarters of those connected to donor organizations loaded most heavily on the context-specific viewpoint, with none loading on the sustainability-oriented viewpoint.⁵

Table 2—Association of viewpoints with institutional affiliations of respondents

Viewpoint (percent total sample)		Government (N = 32)	Academic (N = 54)	Research (N = 45)	Donor (N = 19)	NGO/PVO (N = 29)
(column percentages)						
1) Multi-benefit	(32)	44	26	49	11	41
2) Context-specific	(30)	22	31	18	74	31
3) Sustainability	(20)	22	24	18	0	7
Non-loaders	(18)	12	19	16	16	21
Total	(100)	100	100	100	100	100

The association of African respondents to the three viewpoints was remarkably different from those of non-Africans, as seen in Table 3. Among African respondents, 59 percent loaded on the multi-benefit viewpoint, with far fewer loading on the second and third viewpoints. Among non-Africans, 46 percent loaded on the context-specific viewpoint, while only 10 percent of African respondents loaded on this viewpoint.

5. Discussion

This study has explored the views of a multinational cross-disciplinary group of stakeholders on the potential for gender-sensitive agriculture and nutrition strategies to

⁵ For the survey, “academic” institutions are distinguished from “research” institutions in that the former were defined specifically as universities and colleges.

Table 3—Association of viewpoints with nationality of respondents

Viewpoint	African (N=78)	Non-African (N=100)
	(column percentages)	
1) Multi-benefit	59	11
2) Context-specific	10	46
3) Sustainability	14	24
Non-loaders	17	19
Total	100	100

reduce malnutrition and achieve other development outcomes. Among the three emergent viewpoints, there was general agreement on the value of linking agriculture, nutrition, and gender, and on the other beneficial outcomes that result from these linkages. The agreement on the importance and relevance of these linkages was unexpected. Moreover, the strong correlation between the viewpoints indicates that designing and developing policies and programs that support gender-sensitive agricultural approaches to improve nutritional well-being may be possible. All three factors considered gender-sensitive strategies to have some role in improving nutrition, which indicates the need to demonstrate how, as opposed to why, gender can be used to enhance the contributions of agricultural approaches to nutrition.

Despite general agreement among the viewpoints on the value of linking agriculture, nutrition, and gender, there seems to be less consensus and sustained commitment on how to promote such strategies. The reasons for a lack of linked agriculture and nutrition programming and supportive policies for addressing malnutrition may result more from different priorities across the three viewpoints than from a general lack of interest in agriculture. Each viewpoint emphasizes different policy and program objectives and methods to achieve them. While the multi-benefit viewpoint (Factor 1) and the sustainability-oriented viewpoint (Factor 3) indicate a commitment to using agriculture to improve nutrition, Factor 2 favors context-specific strategies for improving nutritional status. While those who significantly load on Factor 2 recognize that agriculture/nutrition-linked approaches potentially have multiple benefits, they feel that other approaches are more effective and should be given higher priority. The multi-

benefit viewpoint (Factor 1) is a strong promoter of multisectoral development, and so is committed to agriculture-based, multi-outcome strategies that improve nutrition. Factor 3 considers that the only truly sustainable methods to improve nutrition are food-based strategies, and therefore focuses on using agriculture to address malnutrition. Factors 1 and 3 demonstrate a strong commitment toward agriculture-based approaches, while those loaded on Factor 2 are more balanced in their views of the potential of a range of options to improve nutrition.

Notwithstanding the apparent loyalty toward agriculture-based approaches, a gap remains between existing evidence that demonstrates their effectiveness and efficiency, and support for them. One explanation for the lack of sustained commitment to agricultural strategies to address malnutrition may lie in the sorting of the “donor support”-related statements in the three factors. All three factors agreed that

There are political and economic influences that affect the allocation of resources...and to ensure progress in this area, lobbying efforts are needed to secure resources to strengthen agriculture and nutrition linkages (donor support, 26).

This indicates that donor preference may be largely responsible for the lack of substantial adoption of programs engaging these linkages.

The donors, though few in number relative to the total survey sample, loaded overwhelmingly on the context-specific viewpoint (Factor 2). Donors may see direct nutrition interventions as the fastest way to achieve measurable results. This may explain why resource allocation to agricultural interventions, including food-based approaches, has not been a high priority. Without the support of donors, it is difficult to acquire the resources necessary to implement agriculture-based nutrition interventions and to measure the multiple benefits associated with such programs. If, among donors, there is continued preference for direct nutrition programs such as supplementation programs, they will be funded at the expense of agriculture-based approaches.

In addition to the differences in priorities expressed in the three factors, the sustainability-oriented viewpoint (Factor 3) indicated that the absence of linkages might stem from a lack of cross-disciplinary education and training (disciplines, 13) and other institutional factors. Although those who loaded on the sustainability-oriented viewpoint (Factor 3) felt more strongly about this, the other factors agreed with this statement, which may indicate that all factors consider improved curricula to promote cross-disciplinary methods important for effectively enacting these linkages. The evidence from the five-country study, described in the introduction, demonstrated the effectiveness of linked strategies. Further successes such as these may require improved educational curricula and training to minimize operational constraints for using agricultural strategies to improve nutrition. The agreement across the three factors for linked approaches indicates that an extensive network of supporters exists and strategies should be developed that build on these common views and beliefs.

It is likely that the survey results are reflecting both the intuition and beliefs of the respondents on the potential of agriculture-nutrition linkages, as well as the respondents' knowledge from field experience of the effectiveness of these linkages on improving human nutrition. While broad general support for integrative agriculture-nutrition strategies is advantageous for their actual implementation, knowledge of their effectiveness would also be important for moving them forward in the development agenda. A review of the peer-reviewed literature by Ruel and Levin (2000) indicated that there remains insufficient evidence to confirm the efficacy and sustainability of agriculture-based strategies to improve micronutrient status. The focus of only one agricultural approach affecting one parameter of nutritional wellbeing—food-based approaches on micronutrient status—may not reflect the true potential of the linked agricultural-nutrition strategies to improve nutrition. These respondents' support of a broad range of agricultural approaches might arise from evidence based on field experience, such as what is being reported in the “grey literature” found in unrefereed sources, such as the program and project reports of international development organizations and in peer-reviewed journals (Bonnard 2001; Faber et al. 2001).

African respondents loaded most significantly on the multi-benefit viewpoint (Factor 1), which may demonstrate that they see nutrition within the broader context of development. Therefore, developing agriculture-based strategies to improve nutrition appears to be consistent with the goals and interests of African professionals because of the additional benefits that come from agricultural interventions. For African professionals, a regionally focused team of development workers could be assembled to develop an advocacy strategy to increase investments in and use of linked strategies.

While the range of statements for this analysis included topics that explored how respondents perceived the linkages between agriculture, nutrition, and gender, there were few statements addressing the range of reasons why these linkages have not been employed to address malnutrition. The “donor support” and “disciplines” categories enabled the researchers to begin to elucidate some reasons for the lack of relevant programs and policies, and further research in this area may be helpful in explaining why these linkages have not been more heavily pursued. Such research is currently underway in five Sub-Saharan African countries (SCN 2002).

The evidence from this survey has demonstrated that among a range of stakeholders, there is potential to develop interventions that cut across disciplinary boundaries to improve nutrition. While the sustainability of agriculture-based approaches is not clear, it is likely that those interventions based on good development practice will last. Further advocacy and promotion of these strategies should be pursued to both improve nutrition and to enable communities to benefit from the array of positive outcomes that are associated with agricultural strategies.

**Appendix 1: Forty-eight Q-sort statements, by effects (category and agreement)
and factor sort values for each group**

Category	Strongly Support (SS)	Cautious Support (CS)	Strongly Oppose (SO)
Impact (I)	1. Agricultural development contributes to economic growth, food self-sufficiency, livelihood security, and improved nutritional status of populations. Among these contributions, the most critical to development is improving the nutritional status of populations (+3,0, 0).	3. Agricultural research should devote more attention to reducing poverty than to achieving improved nutritional outcomes (-1,-1,-2).	5. Agricultural research has its hands full in just helping smallholder farmers and countries grow more food. Incorporating nutrition concerns into agricultural research is difficult and ineffective in actually improving nutrition (-3,-3,-3).
	2. Improving the nutritional status of children and adults is a highly effective way to increase economic productivity in agriculture and other sectors (+3,+2,+1).	4. Without going the extra step to promote consumption of quality diets, increasing agricultural production of food crops will not necessarily lead to improved nutrition (+1,+3,+2).	6. Including nutrition objectives in agricultural research agendas has seldom moved agricultural research closer to addressing human needs (-1,-1,-1).
Coordination (C)	7. Intersectoral coordination requires additional effort, but in recent years agricultural systems have become so overextended (i.e., they have to provide sufficient energy from cereals, as well as more vitamins and minerals from nonstaple foods—while at the same time protecting the environment) that we can no longer afford the luxury of ignoring linkages with human nutrition needs (0,0,0).	9. Taking an interdisciplinary approach to agriculture-nutrition linkages has clear potential benefits, but may introduce problems in achieving consensus and managing coordination among institutions (0,+1,0).	11. Organizations are most productive if they focus on doing a few things well. Trying to link agriculture and nutrition undercuts their comparative advantages and abilities to function efficiently and effectively (-1,-2,-1).
	8. Forging linkages between agriculture, nutrition, and health is necessary to reverse adverse effects of past policies that fostered short-term, unsustainable solutions to malnutrition and contributed to underdevelopment, and population growth (+3,0,+3).	10. Many observers feel the inability of nutrition planners and advocates to mobilize other development sectors for nutrition purposes led to self-contained nutrition interventions. Assuming this is true, the positive result in many countries has been programs that the nutrition community has been able to carry out on its own without the need for elaborate intersectoral collaboration (0,0,0).	12. Professionals within distinct disciplines, such as agriculture and nutrition, generally prefer to do the type of research that is rewarded and expected by their disciplines and organizations. Therefore, there is little incentive for multidisciplinary collaboration (0,+1,+1).

Disciplines (D)	13. Promoting cross-fertilization of different methodologies used in agriculture and nutrition disciplines can occur if curricula are developed that promote cross-disciplinary methods and integrated approaches (+1,+1,+2).	15. Nutrition and health scientists are not trained in the linkages between agriculture policies with nutrition outcomes. And agricultural scientists often lack an adequate understanding of interactions between food availability, health care, and nutritional intake. These differences lead to different approaches that have little common ground (-1,+1,+3).	17. I don't believe that agricultural interventions to increase dietary diversity are an effective means to improve nutrition because they've rarely demonstrated their nutritional impacts (-2,-1,-2).
	14. "How-to" guidelines that simplify the application of integrated approaches can strengthen agriculture and nutrition linkages (0,0,+1).	16. Discussions about linking agriculture and nutrition need a dynamic, new, and compelling format, or no one will spend the time or resources to make this happen (0,0,0).	18. Agriculturalists are best trained to contribute to the increased productivity of specific crops, and their training provides them with skills to work with commodities, not people (-2,0,0).
Gender (G)	19. Gender provides an opportunity for agriculture and nutrition specialists to come together, because all of these approaches focus on people -- who does what, with what resources and for whose benefit (+2,+1,0).	21. While gender should guide the development and adoption of technologies, until someone shows me how to do that and demonstrates its effects, I'll just do what I've been trained to do (-1,-2,-2).	23. "Gender" is just about women and therefore discriminatory and exclusionary. For that reason, I have strong reservations about using a gender approach to resolving malnutrition, whether that is through food-based strategies or others (-3,-3,-2).
	20. Without explicit attention to gender, agriculture and nutrition specialists will miss critical factors in the design and operation of programs, undercutting their expected results (+1,+3,+1).	22. The problem we face worldwide is not agricultural production or nutrient consumption; it is distribution of food. This is highly dependent on open market and trade policies. While gender may be relevant at a household level, it is not relevant at the macro level (-1,-2,-1).	24. Because gender differentials can be strongly rooted in social systems and norms, it is not something I think I should get involved in to strengthen agriculture or nutrition interventions (-3,-3,-1).
Donor support (DS)	25. There have been numerous small-scale successes in fighting hunger and malnutrition, but these problems persist because of a lack of political and administrative commitment to applying the lessons learned more widely (+2,+1,+1).	27. I feel a more balanced mix of short-term solutions, such as supplements, and long-term approaches, such as food-based strategies, should be pursued only if there is compelling evidence from cost-effectiveness studies that shows nutritional impact of long-term solutions (0,-1,-1).	29. Donors do not want to fund the effort it takes to build or maintain partnerships between agriculture and nutrition specialists (-1,0,-1).

	26. I recognize the importance of exploiting the synergies between the nutrition and agriculture sectors, and I feel that more funding should be available for programs that seek to do that (+3,+2,+3).	28. Budgets for development are declining, and there are political and economic influences that affect the allocation of resources. Without a constituency to lobby for increased resources to strengthen agriculture and nutrition linkages, we will not see any progress in this area (+1,+2,0).	30. The problem of coordinating across the technical sectors of nutrition and agriculture activities begins with the organizational structure of donor agencies. Donor agencies are not set up to promote cross-sectoral initiatives (0,+1,0).
Sustainability (S)	31. Food-based strategies to increase the production, availability and access to food are the only truly sustainable solutions for improving nutritional status (+1,-3,+2).	33. Some situations where nutritional status is poor call for food-based solutions, others nonfood solutions. It is not the solution, but the situation that is the deciding factor (0,+3,+2).	35. Food-based strategies are too difficult to start up and take too long to show an effect (-2,-2,-3).
	32. Agriculture production strategies, combined with nutrition education to promote dietary diversification should be pursued, as the alternatives for reducing malnutrition are not sustainable (0,-1,+2).	34. Food-based strategies can improve overall nutritional status of a population, but they may not be enough to meet peak requirements at certain stages in the life cycle, e.g., for iron during pregnancy. In that instance, other approaches must be used (+2,+3,+1).	36. Food-based interventions require substantial behavioral change and/or time investment. Program beneficiaries may change their behavior temporarily but then revert to old habits and customs, so why bother? (-2,-2,-2)
Economic Benefits (E)	37. Linking agriculture and nutrition to promote dietary change and improve nutritional status can generate wide economic benefits, such as increased agricultural production, greater household income, and greater control of resources by women (+2,+2,+2).	39. Direct interventions, such as micronutrient supplements and food fortification, are cost-effective and should be preferred over agriculture production strategies (home gardens, small ruminant production, plant breeding), even though agriculture production strategies may have a variety of additional benefits (-3,-2,-3).	41. Investing in agriculture strategies to improve nutrition does not have as high a return as investing in public health strategies to improve nutritional status (-2,0,-2).
	38. We do not need to spend any more time on research to demonstrate that food-based strategies are worthy investments. We do not need to use economic justifications to support the notion that no one should go to bed hungry (-1,-1,-1).	40. To date, evaluations of food-based strategies (including home gardens, small ruminant production, nutrition education, and improved postharvest processing) are not rigorous enough, are too unstructured, and rely mainly on anecdotal information (0,0,0).	42. Strategies to reduce micronutrient deficiencies through increased production, availability, and access to micronutrient-rich foods are not as cost-effective as other interventions, such as food fortification and capsule supplementation (-2,0,-3).

Awareness (A)	43. There is overwhelming evidence, based on actual field experience in developing countries, that community-driven, food-based approaches can be extremely effective in solving the problems of undernutrition, including micronutrient malnutrition, in developing countries (+2,-1,+1).	45. National-level efforts, such as agricultural policies to bring down the price of staple and nonstaple foods, are just as important as community and household-level interventions to increase dietary diversification, for both farm and nonfarm households (+1,+2,0).	47. Because population growth increases demand for food well beyond current production levels, agricultural research is essential to develop technologies that increase yields. Advances in plant breeding such as drought-resistant crops and high-yield seed are likely to be our only hope of feeding the people of the world during the coming decades (+1,-1,-1).
	44. We must consider ways that agriculture can contribute to reducing food system failures by linking agricultural production to improving human health, livelihoods, and well-being (+2,+2,+3).	46. There needs to be a reorientation in the objectives and methods of agricultural planning. The current focus on production technology, and neglect of the consumer's perspective, has severely limited the contributions of agricultural planning to long-term improvements in nutritional status (0,+1,+1).	48. The most critical elements in reducing hunger and other forms of malnutrition are ensuring a policy environment that supports responsible, fair, and transparent trade, fiscal and monetary practices; secure property rights and access to financial services; and citizen participation in decisionmaking (+1,0,0).

Appendix 2: Statements with highest level of agreement and disagreement, by viewpoint (factor)

	Viewpoint 1		Viewpoint 2		Viewpoint 3	
	Statement	Z-score	Statement	Z-score	Statement	Z-score
Agreement (top 10 statements)	1	1.63	34	1.58	44	1.72
	2	1.58	20	1.58	26	1.49
	8	1.39	33	1.48	15	1.36
	26	1.22	4	1.40	8	1.22
	43	1.20	44	1.28	4	1.20
	25	1.19	2	1.25	32	1.19
	37	1.18	37	1.10	37	1.08
	34	1.10	26	1.05	13	0.96
	44	1.06	45	1.04	31	0.94
	19	1.05	28	1.03	33	0.91
Disagreement (top 10 statements)	23	-1.86	23	-2.05	39	-1.98
	24	-1.62	24	-1.74	42	-1.86
	5	-1.54	31	-1.62	5	-1.63
	39	-1.46	5	-1.60	35	-1.61
	41	-1.39	21	-1.34	36	-1.55
	17	-1.39	36	-1.27	17	-1.47
	18	-1.29	11	-1.27	23	-1.15
	42	-1.24	35	-1.24	21	-1.14
	36	-1.10	39	-1.02	41	-1.12
	35	-1.03	22	-0.93	3	-1.11

Notes: See Appendix 1 for the text of each statement. Boldface type indicates a “distinguishing statement.” Distinguishing statements are those in which the average factor score for one viewpoint is significantly different from the average factor scores of the other groups. That is, they are the statements that help the most in differentiating between the factors. Z-scores in this table are not normalized to the seven-point scale.

Appendix 3: Saliency of categories for viewpoints of each group, by statement number and agreement category

	Issue categories								
	Factor 1			Factor 2			Factor 3		
	SS	CS	SO	SS	CS	SO	SS	CS	SO
Agreement									
Impact	1, 2			2	4			4	
Coordination	8						8		
Donor support	25, 26			26	28		26		
Disciplines							13	15	
Awareness	43, 44			44	45		44		
Sustainability		34			33, 34		31, 32	33	
Economic benefits	37			37			37		
Gender	19			20					
Disagreement									
Impact			5			5		3	5
Coordination						11			
Donor support									
Disciplines			17, 18						17
Awareness									
Sustainability			35, 36	31		35, 36			35, 36
Economic Benefits		39	41, 42		39			39	41, 42
Gender			23, 24		22, 21	23, 24		21	23

Notes: SS: strongly support; CS: cautiously support; SO: strongly oppose.

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