

Nepal Nutrition Assessment and Gap Analysis

**Final Report
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Nutrition Assessment Team ¹

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Executive Summary

The Nepal Nutrition Assessment and Gap Analysis (NAGA) was undertaken to provide the synthesis of information necessary to develop a detailed multisector Nutrition Action Plan for the next five years. The NAGA process was led by the Child Health Division/Ministry of Health and Population (CHD/MOHP) and supported by The World Bank, UNICEF, WHO, USAID, WFP and others. The reports build upon the strong situational analysis provided by the Nepal National Plan for Action on Nutrition, 2007, and reviews and makes recommendations on evidence-based and feasible interventions for health, agriculture, education and welfare sectors. The development of the NAGA was linked to the schedule for the overall Nepal 5-year development planning that also commenced in 2009. It was the intent of the NAGA development process that nutrition programming across multiple sectors could be included in the broader development planning being undertaken by the government.

The NAGA team first reviewed the primary determinants of undernutrition in Nepal. These included inadequate food availability, access and affordability, poor food- and care-related behaviors including hygiene and sanitation, inadequate food quality/nutrient density, and high prevalence of infections that reduce food absorption and utilization. The team then reviewed the systems supporting food and nutrition interventions and the opportunities for building capacity needed to deliver interventions likely to achieve MDGs in a cost-effective way. Finally the NAGA report recommended specific, evidence-based, feasible, interventions across the relevant sectors – health, agriculture, education, local development, gender, social welfare, and finance. This summary describes the gaps in information that need to be addressed by sectors that influence nutrition and makes recommendations for health sector interventions, including those endorsed by the 2008 Lancet Series on Maternal and Child Undernutrition, and that best fit the existing Nepali context.

To reduce undernutrition on a national scale, the sectors listed above will need to design and deliver interventions addressing nutrition in a coordinated manner. The National Planning Commission will take the coordinating role by reactivating the National Nutrition Coordinating Committee. This multisectoral coordination was initiated in the 1980's and early 1990's through the Joint Nutrition Support Program, but was not sustained. Valuable lessons have been learned from this previous experience and will be used in ensuring success in the future. The concept behind this 'nutrition architecture' is to enable a technical group, with representation from key ministries, to work as a team to facilitate implementation of interventions in each sector designed specifically to reduce undernutrition. The sector representatives will consider technical approaches from their sector, but with success measured by improvement in nutrition indicators rather than by the normal sector indicators. Establishing this architecture is critical for implementing the multisectoral approaches needed to improve the nutritional status of women and children.

The causes of undernutrition vary by geographic, economic, social, and household levels. Interventions will be most effective when targeted to address the most critical causes of undernutrition in communities and also when addressing the optimal window of opportunity for nutrition – pregnancy through 24 months of age. Targeting needs to be undertaken at several levels and work is ongoing to strengthen the targeting options currently available. These include use of the HMIS monthly report of underweight children from health facilities and the several

WFP surveillance systems, which provide information on a range of indicators including food prices and predicted food availability.

Nepal has done extremely well in scaling up and to date sustaining micronutrient interventions. The country has received justified global recognition for this achievement. These programs have had impressive impacts on child mortality (vitamin A supplementation) and maternal anemia (iron intensification program) and are on track. Fortification programs targeting the general population (salt iodization and iron fortification of wheat flour) are also largely on track. These programs will be sustained. The micronutrient programs provide a foundation upon which to strengthen the delivery of other health sector interventions addressing general undernutrition that are not on track – particularly those addressing feeding and care behaviors: in particular breast-feeding, complementary feeding, and hygiene and sanitation. Equally important are the multisectoral interventions addressing food availability and household economics that have not yet been effectively focused on reducing undernutrition.

These ‘lagging’ interventions require substantial changes in food and health care behaviors that are complex and deeply rooted in cultural customs and beliefs. Clearly these changes are more challenging to achieve and require larger investments than did the more straight forward supplementation programs. Multiple channels are required to communicate the messages on the needed changes, but interpersonal counseling is the most critical of these channels. The selected priority interventions can be delivered through a revitalized, truly community-based, nutrition program (CNP) utilizing existing community structures (e.g. FCHVs, mothers groups, credit and savings groups) using several community programs (e.g. antenatal care, growth monitoring and promotion) as the entry points. The community mobilization strategies, the educational materials, training, and supervision protocols of the CNP will be developed and systematically scaled-up following the proven model of the vitamin A program. The CNP will incorporate, where feasible, the new and proven technologies such as therapeutic zinc for diarrhea, micronutrient powders, and ready-to-use therapeutic foods. In addition, multisectoral approaches will be developed and tested to address food availability and affordability, with an emphasis on community-based approaches.

The NAGA team determined that the current capacity to deliver health-related nutrition programs at national, district, and community levels was inadequate. The team recommended the highest priority be placed on strengthening this capacity. The CHD/Nutrition Section monitors the nutritional status of population and leads the design, management, and evaluation of policies and programs to improve the situation. There is consensus that the current staffing level of the Nutrition Section should be strengthened. Further, this capacity needs to be complemented with a multidisciplinary approach that views their respective contribution from the perspective of nutrition improvement, rather than the indicators routinely used for their sector. Thus the structure for improving capacity must include several line ministries. In addition to strengthening capacity at the national level, newly created District Nutrition Officer staff positions are required to manage nutrition interventions at this key implementation level, and, as at the National level, these must have a mandate to work with other ministry staff. Integrated delivery models will be established at the community level through understanding and developing the capacity of existing structures, and through testing of different models for counseling, addressing food availability and affordability, and strengthening existing efforts that are vulnerable. In some instances, a feasibility model approach, as has been used for several other health interventions, may be useful.

Recommendations

Recommendations are summarized here. They are presented in more detail in the report.

1. *Establishing a multisectoral nutrition architecture:* Links need to be strengthened across the Ministries of Health, Agriculture and Cooperatives, Education, Industry, Local Development, Finance, Social Welfare, and the private sector.
 - The National Planning Commission will finalize a multisectoral Nutrition Plan of Action to guide the development and scaling up of a revitalized effort to reduce undernutrition in the country. The National Nutrition Coordinating Committee (NNCC) should be re-convened to provide the high-level commitment and coordination across different ministries that will be essential for effective action in nutrition.
 - The MOHP should explore structural mechanisms for a nutrition architecture that can facilitate implementation of the multisectoral Nutrition Action Plan.
 - A Secretariat (or Working Group) with representatives from the various ministries will likely be needed to support the NNCC and access/provide the technical support required to implement policy decisions and program priorities.
 - The Nutrition Section should provide guidance to districts on structural mechanisms to ensure nutrition consideration across various sectors, including reaching out to district- and community-based workers from agriculture and education.
 - A Nutrition Policy Review Board should be established and tasked with reviewing existing and proposed policies in key sectors that have implications for nutrition.
2. *Strengthening human resource capacity:* The human resource base dedicated to nutrition needs to be expanded—within the Nutrition Section, within other sectors, and at the district and community levels. This must be done in a collaborative and coordinated way to avoid recreating the difficulties with previous efforts to expand resources dedicated to nutrition.
 - Consideration should be given to establishing nutrition posts in selected Ministries, particularly in Agriculture and Education.
 - Capacity at the district level should be expanded from staff with nutrition responsibilities, to staff dedicated to implementing nutrition interventions.
 - The MOHP may need to mandate the establishment of a district-level process that reviews and approves (or not) project proposals that will result in an increased work load/responsibilities of FCHVs.
 - Review and strengthen the nutrition-related components of the curriculum for pre-service training of doctors and other health workers.
3. *Ensuring food availability, access and affordability:* An adequate supply of food that is accessible and affordable is fundamentally important to reducing undernutrition. The population without an adequate food supply is increasing in Nepal.
 - Through discussion with appropriate groups within agriculture, identify, develop and support selected, specific and feasible agricultural interventions that will enhance nutrition and also be able to demonstrate a benefit to agriculture. For example, provide technologies and inputs to increase productivity of staple food crops, particularly in marginal environments.

- Increase production by providing inputs such as fertilizer, irrigation and seeds. This will have maximum benefit on food and nutrition security when targeted to benefit small and marginal farmers.
 - Establish a Ministerial method to address transportation costs for food commodities
 - Monitor the nutrition impact of the Government's Child Grant program being piloted in the Karnali region, and other aspects of UNICEF's evolving non-conditional cash transfer program.
 - Since poverty is closely associated with undernutrition and the demographic changes in Nepal are likely increasing income disparity, it would be useful for the Government to develop mechanisms to monitor income disparity in relation to nutritional status, perhaps in a specific district, to help advise the Government on the implications of policies that may improve GDP, but worsen inequities in income
 - Extract key nutrition components from the DACAW experience, and review these to determine what elements might be further tested and brought to scale.
 - Food aid is needed in areas where food deficits create a humanitarian crisis. The current surveillance system appears excellent and should be continued. It may be useful to expand this system to areas that are less vulnerable. Chronic and emergency food insecure areas will require special policy decisions from the Government to avoid dramatic increases in undernutrition and an expanded surveillance system will provide the information needed to inform these decisions.
4. *Improving food- and care-related behaviors:* Ensuring adequate food alone will not address the problem of undernutrition in Nepal, and changing selected behaviors is critical.
- Counseling to improve infant and young child feeding (IYCF) and hygiene and sanitation needs to be made more available through both health centers and communities. Building capacity in these skills requires that current training programs be strengthened and expanded.
 - Effective behavior change requires relevant messages to be delivered through multiple channels. To inform feasible intervention design, undertake research to develop a more thorough understanding of the determinants of knowledge, attitudes, practices related to infant and young child feeding, including related family dynamics in selected target groups. In particular, community-based advocacy for simple messages to improve IYCF is needed and this may include mass media components.
 - The current initiatives of WFP and UNICEF introducing new technologies such as MN powders and ready-to-use therapeutic food (RUTF) should be supported while ensuring that they are used as an opportunity to strengthen counseling skills. These technologies should not be positioned as stand-alone interventions (or interpreted as medicines) but as components of comprehensive programs to improve child nutrition, health and development.
 - Strengthen both the community-based identification and management of severe malnutrition as well as improve the quality of its management in hospitals.
 - Explore interventions that will improve the status of women related to decision making for child-feeding and care behaviors. An intervention to enhance the status of new mothers in households (daughter-in-law status) is one option to consider.
5. *Ensuring food quality/micronutrients:* In general supplementation and fortification programs have been introduced and have been, or are being, scaled up effectively. These should be maintained and strengthened where possible.

- The MOHP should establish permanent mechanisms to oversee the VAS twice-yearly to ensure sustained high coverage. Declines in coverage should prompt an immediate investigation to determine the strength of logistics supply, supervision and FCHV activity.
 - The iron intensification program should continue to be brought to scale, and a monitoring system similar to that for vitamin A developed to ensure continued high coverage.
 - Continue to sustain universal salt iodization salt with attention to improving quality assurance monitoring and leakage of non-iodized salt in border areas.
 - The fortification of wheat flour at roller mills should be made mandatory as soon as possible.
 - A mechanism is needed to monitor the production and distribution of fortified foods and to provide evidence on the evolving contribution of fortified foods to adequate daily intake for each nutrient. The Department of Food Technology and Quality Control should be strengthened to enable it to implement this mechanism.
 - Financing for the program needs to be more sustainable (from regular government and SWAp/pooled partner budgets). At the moment the training is largely paid by MI, UNICEF and some other development partners.
6. *Improving food absorption and utilization:* The treatment and prevention of infections is important to reduce nutrient losses. Multisectoral efforts are needed to improve preventive measures, and improve management of simple infections.
- A great deal more needs to be done to reduce the risk of infection from unprotected water sources, and poor sanitation and waste disposal. Strengthening the link between the Ministry of Local Development and the Nutrition Section/CHD will help to underline the value and cost-benefit of these efforts with regard to nutrition improvement. Specific efforts may include promoting handwashing.
 - The MOHP and partners should support scaling up of zinc in the management of diarrhea to all districts, and provide adequate monitoring to assess coverage and compliance achieved. All related programs should strengthen messaging regarding appropriate feeding during and after infection, including strengthening the IMCI training and counseling efforts.
 - Mechanisms should be established to improve communication between programs on the nutritional impact from other infectious diseases (malaria, TB, HIV/AIDs) and to improve efforts to address the nutritional consequences of these and other diseases.
7. *Strengthening the design, targeting and monitoring of nutrition interventions:* Investments made to reduce undernutrition will be most effective and cost-effective when they are designed to address the primary causes of undernutrition in specific contexts, and are monitored to allow effective management.
- The nutrition indicators collected through the HMIS should be reviewed, and a mechanism sought to enable them to be reviewed in conjunction with related indicators from other sectors. Some addition to the current annual program review may be needed to establish this multisectoral perspective needed for nutrition. A special program may be needed to strengthen the data management capacity for nutrition among several sectors.
 - The sentinel system established by WFP should be expanded so as to provide data for all districts—thus providing evidence about non-emergency food insecurity that may be contributing to the persistent high undernutrition rates in all districts. Linking this database with other national data sources and surveys such as HMIS, DHS, and LNSS data will help

clarify factors differentially affecting nutrition among different populations and in different geographic areas.

- The Child Health Division should include in their information management systems the ability to track the implementation and evaluation of all initiatives that introduce these products and collate and disseminate programming experiences and results.

Table of Contents

I. Introduction.....	8
A. Global perspective	8
B. Nepal context	10
II. Methods.....	14
A. Partner engagement and TWG consensus process.....	14
B. Consultant areas of focus	14
C. Document review	14
D. Secondary analyses	14
E. Report development.....	15
III. Food availability, access and affordability	17
A. Agriculture-production and distribution	17
B. Poverty and Household economics.....	25
C. Emergency-food security and crises	30
IV. Interventions related to food behaviors	35
A. Breastfeeding, complementary feeding, management of acute malnutrition	35
V. Interventions related to food quality/ micronutrients	43
A. Vitamin A Supplementation	43
B. Maternal anemia control	45
C. Interventions to reduce anemia in children less than 24 months	47
D. Fortification.....	49
E. Food Safety	51
VI. Interventions related to food absorption and utilization at the individual level.....	52
A. Treatment of infection.....	52
B. Prevention of infection.....	57
VII. Strengthening systems supporting nutrition overall capacity building.....	60
A. Ownership, stewardship, strengthening of institutions	60
B. Establishment of nutrition architecture with multisectoral nutrition presence	66
C. Establishment of a nutrition policy oversight board	70
D. Harmonisation donor assistance and development of long-term financing.....	70
E. Delivery platforms	72
VIII. Priority investments, estimated costs, and options for targeting.....	75
A. Pre-pregnancy and maternal nutrition.....	75
B. Infant and young child nutrition	76
C. General multisectoral investments.....	77

I. Introduction

A. Global perspective

Nutrition has always been seen as a critical yet complex concern integrally related to overall development. High rates of undernutrition have persisted in the face of economic development and there is consensus that poverty reduction alone will not achieve the reduction in undernutrition set in the first Millennium Development Goal.² A great deal of effort has been directed toward undernutrition, including efforts several decades ago to improve crop production and so increase food availability. The consequences of undernutrition on health have commonly established nutrition programs within the health sector, yet some of the solutions are broader and multisectoral.

There is a strong rationale for developing a comprehensive approach for nutrition. Poor nutrition leads to lost opportunities in life. Good nutrition can contribute to economic growth. The benefits from a successful program are substantial -- for individuals they average at least 10% of lifetime earnings, and for economies they can make a difference of 2-3% of GDP. Benefit to cost ratios can be as high as 200:1. The positive economic impacts of improved nutrition include direct gains in productivity arising from improvements in physical stature and strength; indirect gains arising from improved nutritional status leading to better schooling and cognitive development and subsequent adult capacity; and savings that might otherwise be consumed by health care in disease treatment, and in other consequences of malnutrition.³

The current food-fuel-finance crisis is likely to have a significant impact on nutritional status among the poor. This crisis has helped raise global attention to the immediate actions needed to avoid marked increases in undernutrition, while at the same time helping global leaders recognize the importance of longer-term solutions to address nutrition in general. Since malnutrition in any form has serious consequences for population health, the costs incurred through inaction are significant. Countries moving toward achieving the MDGs are not likely to succeed without attention to nutrition programming.

The importance of nutrition interventions in reducing child and maternal mortality and morbidity in developing countries and hence contributing to achieving the Millennium Development Goals (MDGs 4 and 5) was highlighted in the 2008 Lancet Series on Maternal and Child Undernutrition⁴ (*See box 1 for summary of lessons from the Series*). Globally more than 3.5 million mothers and children under five die unnecessarily each year due to the underlying cause of undernutrition, and millions more are permanently disabled by the physical and mental effects of a poor dietary intake in the earliest months of life. By 24 months of age, if undernourished, they could suffer irreversible physical and cognitive damage, impacting their future health, economic well-being, and welfare. The adverse consequences of insufficient nourishment may continue into adulthood and be passed onto the next generation as these undernourished girls and women have children of their own.

² World Bank. *Repositioning Nutrition as Central to Development: A Strategy for Large Scale Action*. World Bank, 2006.

³ Personal communication from the Draft: *Global Action Plan for Nutrition*, 2009.

⁴ Black R. E., L. H. Allen, Z. A. Bhutta *et al.* 2008. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*. 371: 243-260.

The *Lancet* Series reviewed the efficacy of interventions that reduced morbidity and mortality resulting from undernutrition. Fourteen interventions were recommended for implementation in all high-need countries and another 11 interventions were identified as having sufficient evidence to be implemented in specific situational contexts.

From an economic perspective, nutrition interventions are cost-effective. The Copenhagen Consensus, a statement from prominent economists asked to rank development interventions, in 2008⁵ identified vitamin A and zinc supplementation as the first priority, and iron fortification and salt iodization as the third priority, among 30 interventions for confronting ten great global challenges.⁶

With these issues in mind, the international community is gaining momentum toward defining a unified case for nutrition, such as has been done for the other programs. Delineation of the *Lancet* set of investments now provides an opportunity to examine the determinants of malnutrition more closely, and develop a comprehensive approach across multiple sectors—something currently being attempted with the multi-partner effort to develop a Global Action Plan for Nutrition.

Box 1: *Key messages of the Lancet Series on Child and Maternal Undernutrition:*

- In poor countries globally maternal and child undernutrition is an underlying cause of more than one third of all child deaths under the age of 5 years, many of which are preventable through effective nutrition interventions operating at scale.
- Pregnancy to age 24 months is the critical window of opportunity for the delivery of nutrition interventions. If the proposed nutrition interventions are not delivered to children before the age of 24 months, they could suffer irreversible damage into their adult life and to the subsequent generations.
- Effective interventions are available to reduce underweight, stunting, micronutrient deficiencies, and child deaths. Among the currently available interventions reviewed, breastfeeding counseling, appropriate complementary feeding, and vitamin A and zinc supplementation have the greatest potential for reducing child deaths and future disease burden related to undernutrition. Interventions to reduce iron and iodine deficiencies are important for maternal survival and for children's cognitive development, educability, and future economic productivity.
- Intensified nutrition action can lead to the achievement of the MDG of halving severe hunger by 2015 (MDG 1) and greatly increase the chances of achieving goals for child and maternal survival (MDGs 4 & 5).
- Nutrition should be a priority at all levels- sub-national, national, and global - because it is a central component for human, social, and economic development. Undernutrition is a key factor in child development, maternal health, and productivity. The prevention of maternal and child undernutrition is a long-term investment that will benefit the current generation and their children.

Several related efforts contribute to building this global momentum. These are premised in the global effort to improve overall development assistance. The Paris/Accra accords defined a series of measurable actions to help reduce inefficiency in the application of donor/government

⁵ <http://www.copenhagenconsensus.com/Home.aspx>. Accessed 10 November 2009.

⁶ Horton S., H. Alderman & J. A. Rivera. 2008. Copenhagen Consensus 2008 Challenge Paper: Hunger and Malnutrition.

partnerships. These high level meetings have established normative guidance for overall development assistance (the Accra Agenda for Action) that includes attention to:

- Ownership and country-level policy dialogue on development capacity
- Enlarging the tent – welcoming all development partners
- Civil society engagement
- Fragile country situations
- Managing for results

Partners have responded to this guidance, and several more specific approaches have been developed. To harmonize efforts, a partnership between WFP, UNICEF, WHO, FAO, and USAID, along with a number of others,⁷ has created an approach for bringing donors together around issues of nutrition. The program, called REACH, assists with facilitated country action planning, knowledge management, communication and advocacy, and coordinated support. A similar approach, the International Health Partnership (IHP+), has been established for improving health systems. This approach, present in Nepal, helps with country compacts, and may expand to include more efforts for nutrition. WHO recently developed and launched a Landscape Analysis to review how well prepared countries were with respect to increasing their nutrition programming. This effort is ongoing, with WHO also helping to build a library of evidence around nutrition strategies.

National governments can take advantage of the momentum being built around the development of The Global Action Plan. This Action Plan is likely to recommend scaling up the *Lancet* Series interventions (adapted to fit the country context), while simultaneously developing strategies to address the multisectoral determinants of undernutrition. The Action Plan will also have recommendations on strengthening the systems needed to improve nutrition program implementation. The Action Plan will help with harmonization of partner efforts at both the global and national levels, and will help with advocacy efforts. If the plan is successful in representing a common voice among development partners, there will be momentum behind developing financing mechanisms to address the costs of improving nutrition strategies. The recent declaration at the G8 summit,⁸ on the need for increased funding for food security is a significant step toward the Action Plan goals, but needs to be accompanied by behavior change and economic approaches to address the determinants of undernutrition more completely. Well-developed national plans can both capitalize on the renewed global interest, and help mould the global interest into strategies most likely to benefit those in greatest need.

B. Nepal context

The Nutrition Assessment and Gap Analysis (NAGA) builds upon the strong foundation provided by the Nepal National Plan for Action on Nutrition, 2007 (NPNAN'07).⁹ This document was prepared by a group of leading Nepali nutritionists and public health experts with financial

⁷ Other UN (SCN, IFAD, UNV); NGOs & civil society (SCF, WVI, Rotary International, GAIN, Helen Keller Intl, CRS, JAM, Africare, MSF, ACF, plus many others over past two years); Academia: (Tufts, George Washington Univ, The Lancet); Private sector (BCG); and governments (Laos, Mauritania and others)

⁸ http://www.g8italia2009.it/G8/Home/Approfondimenti/Sfide/G8-G8_Layout_locale-1199882116809_SicurezzaAlimentare.htm. Accessed 10 November, 2009.

⁹ New Era 2007. Draft Nepal National Plan for Action on Nutrition, National Planning Commission, 2007

and technical support from UNICEF. NPAN'07 provides an excellent, comprehensive analysis of the nutrition situation in Nepal at the time and the approaches made to improve it.

According to the NPAN'07, six major nutrition issues face the country and together constitute an urgent problem with substantial negative consequences for the health and development of the population. These issues include high prevalences of low birth weight, childhood undernutrition, chronic energy deficiency in mothers, vitamin A deficiency, iodine deficiency disorders, and iron deficiency anemia. Undernutrition was described as being —...determined by availability, access to, and consumption of food by individuals, and the presence or absence of disease states that influence utilization of food.” The widely-accepted UNICEF nutrition framework describing immediate, underlying, and basic causes of undernutrition was used to structure the information presented. The authors of NPAN'07 concluded that this framework provided —due importance to adequacy of food security and environmental factors as underlying causes of malnutrition but points out that care practices are equally or even more important when it comes to the causation of malnutrition. Investments for improving food security and health services and healthier environment are important for preventing malnutrition and promoting good nutrition but these are not sufficient conditions for good nutrition outcomes. The third component of the underlying causes, —care for women and children”, is the most important component”.¹⁰

Box 2 summarizes the key information on trends over the last decade in general undernutrition. Similar information on the deficiencies of micronutrients vitamin A, iodine and iron are presented in Section V.

¹⁰ *ibid*

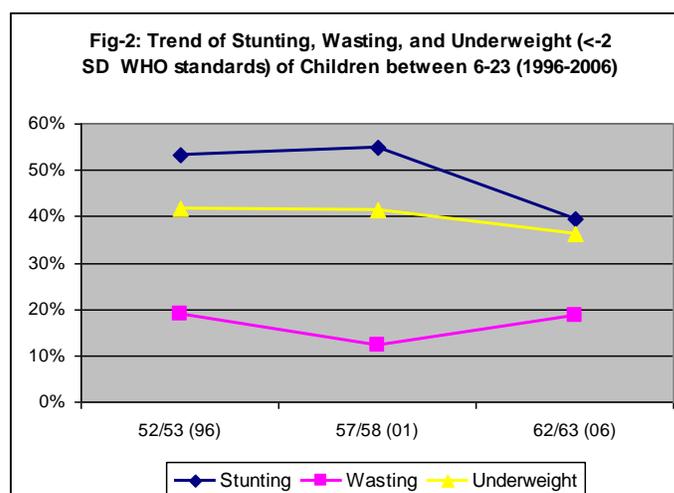
Box 2: Trends in nutritional status of mothers, newborns, and children 6-23 months in Nepal, 1996 to 2006, as described in NPAN'07.

Chronic energy deficiency in mothers: Weight and height of women of reproductive age were presented from national surveys in 1996 and 2001, and updated below for 2006. Both surveys reported quite consistent findings indicating a high prevalence of chronic energy deficiency among women of reproductive age group.

Indicators	FHS'96	DHS'01	DHS'06
Average weight	45 kg	46 kg	na
Average height	150.4 cm	150.2 cm	na
Mean BMI	19.8 kg/m ²	20.3 kg/m ²	20.6 kg/m ²
% with BMI <18.5 kg/m ²	28.3	26.7	24.4

Low birth weight (LBW): The prevalence of LBW babies in Nepal was reported as between 20-32% in hospital-based studies and 14-19% in community-based studies. A study of more than 3,500 mother-infant pairs from four major hospitals in different regions was cited as reporting a LBW prevalence of 27%, and a mean birth weight of 2.8 Kg. The majority of these babies (70%) were small for date, indicating intrauterine growth retardation. Factors associated with LBW were maternal undernutrition, birth of a previous preterm infant, and a birth interval of less than 2 years.

Stunting, wasting and underweight: The underlying growth of young children is often assessed by measuring their length and this, as reflected by prevalence of stunting, shows an improvement, at least in the period 2001 to 2006. On the other hand, wasting, which reflects more short-term undernutrition or increase in infections, became worse during this period. Underweight, which reflects a combination of both chronic and acute affects, showed a slight improvement. Nepal will not achieve MDG 1 for reduction in hunger without substantial improvements in the overall growth of young children.



* Figure taken from Bishwakarma R. *Social inequalities in child nutrition in Nepal*, World Bank/Nepal, August 2009.

The NPAN'07 described three sets of plans that had been previously developed for implementing multisectoral actions to address undernutrition in Nepal. Intersectoral collaboration was proposed between health, agriculture, education, and local development, with a nutrition unit being established in each ministry. Proposed actions included improving household food security; food safety and quality control; reducing infection, malnutrition and micronutrient deficiency status; and improving nutrition education and training. The analysis noted that outside the Health Sector, which did achieve important successes with specifically focused programs, few of the proposed actions for the line ministries were implemented as planned. Implementation of proposed intersectoral nutrition programs in the country are described in greater detail below (Section VII).

The NPAN'07 proposed eight strategies to address the undernutrition situation described.

Four were short-term:

1. Improve child care practices
2. Improve care of women during pregnancy and post partum period by creating awareness among household members and community about the needs of pregnant and lactating mothers
3. Scale-up responsive health services
4. Enhance food supplementation for vulnerable groups of children under five years and pregnant women

Four were long-term:

5. Reduce household work burden for women
6. Improve women's status
7. Strengthen responsive health services
8. Increase food security especially in food insecure areas and groups

Activities were listed for each strategy.

The NPAN'07 was reviewed by the National Planning Commission (NPC), but not endorsed. The NPC considered that the plan of action component lacked specific and feasible interventions that could be implemented by the line ministries with responsibilities for intervening on factors influencing nutrition that were not the responsibility of Health.

The NAGA builds upon the work done on the NPAN'07 and, in particular, reviews and makes recommendations on interventions for health, education, and agriculture sectors that are evidence-based, feasible and costed.

II. Methods

This Nutrition Assessment and Gap Analysis (NAGA) is a collaborative effort between the Government of Nepal, Ministry of Health and Population (MOHP) and a number of partners, including the World Bank, USAID, WHO, UNICEF, WFP, and others.¹¹ As such, it is under the guidance of the Nutrition Section within the Child Health Division of the MOHP. The report is being developed in a series of steps, with periodic reporting to the Nutrition Section and its Technical Working Group (TWG). The following approach has been used:

A. Partner engagement and TWG consensus process

The gap analysis was designed and implemented by a multi-donor working group. This group met to discuss and agree on a collaborative approach with shared roles and responsibilities for developing the various multisectoral components of the report. The group met again on May 20, 2009 with the NAGA nutritionists. It defined the composition of the TWG and the roles of each partner agency for hiring the consultants needed for the development of various sections.

B. Consultant areas of focus

The NAGA was designed from the onset to review multisectoral elements in nutrition programming. A great deal has been, and is being done in various sectors to improve the nutritional status of the Nepal population, although these efforts are not always coordinated with regard to nutrition oversight and awareness. Thus, a number of consultants were hired to address several of these components, including two nutritionists sharing responsibility for the overall report; one agronomist to review food production, distribution, pricing and related issues; one anthropologist to review food-related behaviors and vulnerable groups; and one health economist to review costing for the final recommended investments. This overall team worked closely with the chair of the TWG, the Nutrition Section, and the partners engaged in the effort.

C. Document review

The team sought assistance from all stakeholders in identifying reports and publications concerning the determinants of nutrition status in Nepal and the interventions that have been implemented to address them. The NPAN'07 provided an invaluable resource that captures the history of nutrition efforts in Nepal, and the status of the majority of current interventions. A wide variety of other documents were reviewed, including academic publications, related articles in the international literature, local reports, and survey results.

D. Secondary analyses

In the interest of understanding the interplay between nutritional status and various known factors, several secondary analyses were completed. This included a review of 8 years of HMIS data on facility-based underweight data trends and distribution, and a review of the DHS surveys of 1996, 2001, and 2006. These analyses provided evidence on which to base discussions and recommendations for several parts of the report. In addition, the work done by WFP on food security, which includes detailed small-area assessment of poverty and nutritional status, was used in conjunction with these secondary analyses.

¹¹ Several organizations have been very helpful in the evolution of this document, including the USAID-funded Nepal Family Health Project, NTAG, MI, HKI, Tribhuvan University Teaching Hospital, among others.

E. Report development

The two lead consultants participated in a number of meetings during the initial visit in May, and completed further discussions September through November, when the report was being reviewed by the TWG and other partners.

The initial work to establish the framework for the NAGA, followed by developing the report, included a number of activities done by consultants and members of the team:

- In close collaboration with the Chief of the Nutrition Section, met with key stakeholders including: Director CHD, National Planning Commission, UNICEF, WHO, WFP, WB, USAID, NFHP/USAID, NTAG, MI, HKI, New Era, JHU/NNIPS.
- Attended and helped facilitate the initial EDP meeting at CHD on 20 May. This resulted in creation of a broad Technical Working Group and a smaller Task Force to guide day-to-day activities of the Gap Analysis team. Full descriptions of relevant reports were requested from all donors. Follow-up was undertaken with individual stakeholders as needed (NPC, Chair TWG, UNICEF, WHO, WFP, NFHP, NTAG).
- Prepared a preliminary draft framework describing causes of undernutrition; suggested interventions; an outline of NAGA report. On May 22, these were disseminated for review by the TWG and other interested stakeholders.
- With assistance from NFHP, undertook analyses to establish validity and usefulness of HMIS data to (ultimately), monitor, and manage nutrition interventions in Nepal.
- Developed TORs for secondary analyses on DHS data and presented these for review by TWG.
- Developed an intervention matrix – a framework to describe the nutrition interventions being currently carried out in Nepal, together with the interventions that will be recommended as a result of the Gap Analysis. This was further discussed in a July partner meeting in Nepal.

The draft report was developed to serve as a focus for discussion among the TWG members, and to be reviewed and edited by the Nutrition Section. This final report is resubmitted to the Nutrition Section for ongoing review as a working document that the authors hope will serve as a useful reference for policy and program development.

The development of the NAGA was linked to the schedule for the overall Nepal 5-year development planning, with the Health and other sectors submitting planning strategies beginning in September, 2009. It is the intent of the NAGA development process that nutrition programming across multiple sectors can be included in the broader development planning being undertaken by the government.

The NAGA should contribute directly to a more detailed Nutrition Action Plan that can be an integral component of the broader sector plans for the next 5 years. One component of this approach is to develop an appropriate ‘architecture’ through which to implement the multisectoral activities. This architecture needs active participation from several Ministries, but must address undernutrition as its mission—recognizing the importance of reduction in undernutrition rather than other sector specific indicators. It is anticipated that the National Planning Commission will take responsibility for motivating and coordinating the efforts the key sectors whose activities impact on nutrition, with the Health Sector being the lead agency for nutrition activities. The specifics of this architecture are critical, and require broad consensus

among the concerned Ministries (likely to be Ministry of Health, Agriculture, Education, and Local Development at minimum).

The report has been organized around a determinant framework approved by the TWG. The following sections include discussion and recommendations to address:

- Food availability, affordability and access
- Food behaviors, including breastfeeding and complementary feeding
- Food quality and nutrient intake, including micronutrients
- Factors affecting absorption, including infection and hygiene measures
- Advocacy, communication, capacity building and implementation mechanisms

III. Food availability, access and affordability

Reaching across multiple sectors to improve nutrition raises complex issues with regard to the factors contributing to undernutrition. This is clearly true with regard to food availability, access and affordability. If there is no production or import, there is no availability. Yet adequate production doesn't ensure access or affordability. Reasonable food prices also do not ensure adequate intake for very poor households, or caregivers with inappropriate behaviors or limited absorption because of infection. All these factors are interrelated, and sorting them out to enable a government to make decisions about priority interventions is very difficult. However, much can be learned from reviewing patterns in these contributing factors, as has been done in Nepal with regard to food insecurity.

The evolving Global Policy Brief on nutrition¹² notes that “Nutrition strategies should also include making programs in other sectors more nutrition friendly. This includes specific pro-nutrition interventions in other sectors (e.g. agricultural research or school curricula), making indicators of reduced undernutrition a principal metric of agriculture and poverty reduction programs, and generating “policy coherence” through government-wide attention to unintended negative consequences for nutrition (e.g. from subsidies for food exports or for bio-fuels).” Beyond the policy level, careful review of existing data should help guide different sectors toward a more integrated selection of interventions, sometimes targeted, that can contribute to reducing undernutrition.

A. Agriculture-production and distribution

Introduction

The Global Action Plan for Nutrition notes in the section on multisectoral approaches, that attention to food security and management of nutrition during emergencies are important strategies. Further, the Plan notes that “Broader measures to increase agricultural production are more difficult to assess with regard to their direct contribution to reducing undernutrition. The *Lancet* Series did not assess agricultural subsidies or land reform measures—both designed to increase food availability to vulnerable groups. Small-scale efforts to increase local production have been effective, but difficult to bring to scale, often because they have not been designed to bring to scale. Household investments to improve dietary diversification and small livestock production were felt to have insufficient or variable evidence, but have shown promise in some settings at limited scale.” This somewhat inconclusive summary reflects the complexity of agricultural approaches, and underlines the need for better coordination between agriculture and health with regard to nutrition, and improving the approaches used with regard to improving nutritional status.

Leroy et al.¹³ reviewed the evidence regarding the micronutrient impact of multisectoral programs that combine targeted nutrition interventions (i.e., addressing the immediate causes), with poverty-alleviation, food security enhancement, and/or income-generating approaches (the underlying causes). These authors found that agricultural interventions showed a more consistent

¹² Policy Brief for the Global Action Plan for Nutrition, draft, September 2009

¹³ Leroy et al. The Micronutrient Impact of Multisectoral Programs Focusing on Nutrition: Examples from Conditional Cash Transfer, Microcredit with Education, and Agricultural Programs. Prepared for the Innocenti Meeting of the Micronutrient Forum. 2008. <http://www.micronutrientforum.org/Innocenti/resources.cfm>, accessed 11 Sept, 2009.

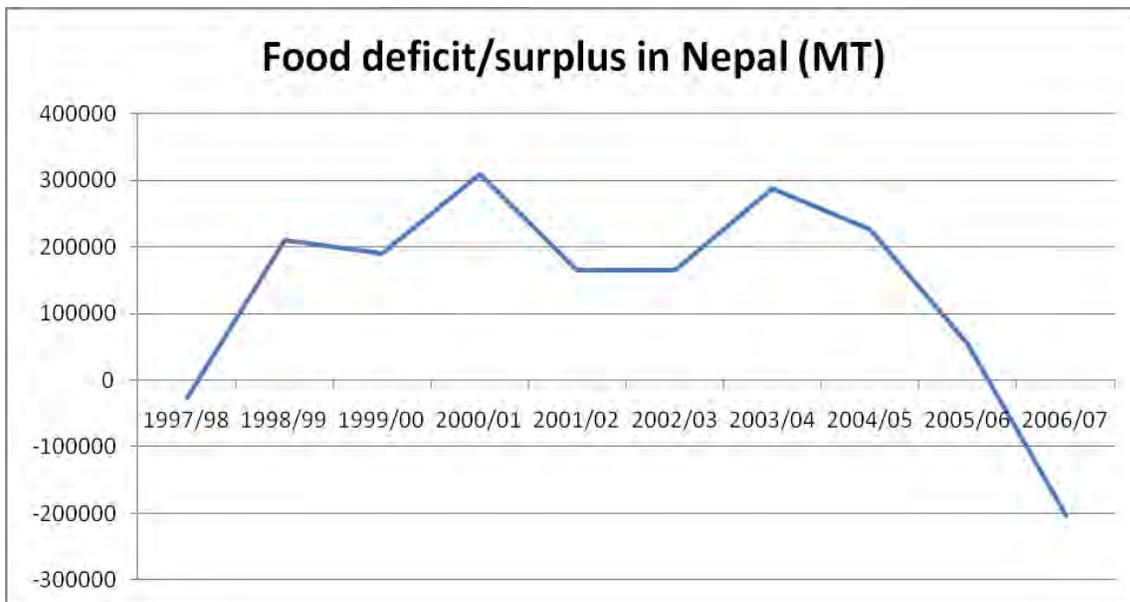
picture of impact on micronutrient status than did the programs involving conditional cash transfers and micro-credit with education. The impacts of agriculture programs impacted vitamin A in particular, as this was the nutrient targeted most often. The addition of animal production to home gardening programs to address the problem of low bioavailability of micronutrients in plant foods did not strengthen the evidence of an impact on either vitamin A or iron status. Few agriculture interventions assessed impact on child anthropometry, and of those that did, approximately half documented an impact on at least one indicator.

The current food, fuel, finance crisis is likely to have a huge impact on the more vulnerable populations, and provides an overall stress on the delicate balance between agricultural production and distribution and affordability. This crisis may precipitate the need for increasing the contribution from governments to avoid a dramatic worsening of the nutrition situation among the poor.

Current situation and trends

Nepal is currently experiencing severe food shortages with estimates of 3.4 million being food insecure throughout the country, with the situation being particularly severe in the Western and Mid-Western regions.¹⁴ The analyses of Bishwakarma undertaken for this assessment suggest that nutritional status has shown less consistent improvement in these regions than in other regions.¹⁵ This has not always been the case. Into the 1980’s, Nepal was considered food secure, although it was well recognized that more than sufficient production in the Terai covered deficiencies in the Hill and Mountain regions.

Figure 1: Food deficit and surplus in Nepal* (MT)



* Calculations based upon a minimum amount of cereals required to meet the 2247 Kcal as used in the Bulletin of Agricultural Information published by Department of Agriculture.

Available government data for the decade 1997 to 2007 indicate that production of food grain exceeded requirements in 8 of the ten years (Figure 1). The surplus ranged from 0.3 million to

¹⁴ WFP Food Security Bulletin #23. 2009

¹⁵ Bishwakarma R. Social inequalities in child nutrition in Nepal, World Bank/Nepal, August 2009.

0.05 million MT. In 2006/7, a substantial deficit of 0.2 million MT was noted. This deficit was attributed to drought, and significantly, this drought situation has continued to the present. The World Food Program, GoN (MoAC) and FAO have predicted that the food deficit in 2009 will worsen because of continuing decline in production of wheat and barley.¹⁶ This report further notes that:

- 66% of households in Nepal are experiencing food shortages
- 43% of households are skipping or reducing meals
- 30% of households in Hill and Mountain regions are forced to consume seed stock
- 23% of households took children out of school
- 73% of households in Mountain region send at least one member out (out-migration) for work

Adhikari¹⁷ presents data on surplus and deficits for food production by ecological and development regions. Although there are, as expected, substantial differences among these regions, the major deficit beginning in 2006/7 is seen in all. Data from the 1970s and 1980s¹⁸ have described regional variation within the country that is similar to the current situation. For example, food balance estimates made in 1970-71 showed that the country had almost 300,000 MT surplus food grain. This surplus resulted primarily because of greater production in the Terai, where population density then was relatively low. The food production in the hills and mountains was deficient even then. In 1970-71, 34 districts had food deficits – 6 in the mountains, 26 in the hills and 2 in the inner Terai – while 18 Terai districts had a food surplus. In 1974-75 there was an even greater overall food surplus in Nepal, 540,000 MT. But at the same time, 29 districts (11 mountain, 16 hill including Kathmandu, 1 inner Terai and 1 Terai districts) were food deficient in that year.¹⁹

Estimating the level of food production sufficiency at the district level is very difficult. The most recent available data is for 2006. A summary of the district-level analyses undertaken for this assessment is shown in Table 1. Of 75 districts, 49 did not produce sufficient food for the population. In general, more of the mountain and hill districts were food insufficient. But it is also interesting that more than half the Terai districts were unable to produce sufficient food.²⁰ This was attributed to increases in population density from in-migration from the Hills, and also to the civil conflict which impacted negatively through mechanisms described below.

The number of districts with deficit food production varies from year to year depending upon production conditions like rain and incidence of insects and pests. In 2003, 43 districts were deficient in food production. In general, the trend is that the number of deficit districts is growing, despite fluctuations from time to time.

¹⁶ *ibid*

¹⁷ Adhikari J. Food (nutritional) security in Nepal: from the perspectives of food availability. 2009.

¹⁸ Gurung, Harka. Food Systems and Society in Nepal: Dimensions of Development. Kathmandu: Saroj Gurung. 1989:203

¹⁹ *Ibid* p.206

²⁰ Calculations from Statistical Year Book of Nepal 2007. Kathmandu: Central Bureau of Statistics (CD obtained from there).

Table 1: Numbers of food deficit districts in 2005/06 by ecological zone and region (total number of districts in parenthesis)

Ecological zone	Eastern region	Central region	Western region	Mid-Western region	Far West region	Total
Mountain	0 (3)	2 (3)	2 (2)	5 (5)	3 (3)	12 (16)
Hills	5 (8)	7 (9)	5 (11)	5 (7)	4 (4)	26 (39)
Terai	3 (5)	4 (7)	1 (3)	1 (3)	2 (2)	11 (20)
Total	8 (16)	13 (19)	8 (16)	11 (15)	8 (9)	49 (75)

Source: Calculations based on production data from Statistical Year Book of Nepal 2007. Kathmandu: Central Bureau of Statistics (CD obtained from there).

The major overall factors limiting production of food crops in Nepal are described by Adhikari.²¹ These include: a) fragmentation of land resulting in inadequate holdings for many farmers; b) lack of infrastructure such as year-round irrigation; c) out-migration of labor; d) political instability/conflict; e) land degradation; f) lack of a crop insurance system or price supports; and, g) social issues of agricultural work being perceived as having low status. Issues of climate change compound these systemic problems and add enormous urgency to the need for solutions to be found.

Another important reason for declining agricultural production is the government's policy of reducing its involvement in developing infrastructure needed for agricultural production. At present, agricultural production is constrained by the lack of irrigation, availability and access to inputs like fertilizers and seeds, and mechanisms to control the quality of these inputs. Prior to the mid-1990s, the government subsidized some of these inputs, including deep tube-wells. Once these subsidies were stopped, production started to decline.

One of the important policies in Nepal regarding agricultural production was the Agricultural Prospective Plan (APP) 1996.²² This was a 20-year strategy to increase agricultural production through massive investment in irrigation, research, and input supply, but this was not implemented as planned because of lack of resources. In the 1970s, agriculture was the government's main priority and about one third of the budget was allocated to this sector. In the 1980s, the proportion of the budget allocated to agriculture was reduced to 16% and in the 1990s this was further reduced to 10-12%. In 2008, the allocation was about 2.5% (Rs 5.9 billion from a budget of 285.9 billion).

Donor investments in agriculture have also declined - from about 10% in the early 1990's to about 5% during the period 1995-2000 and about 4% in the early 2000s.²³ Intensification of seed, fertilizer, and other critical agricultural inputs is currently happening on a small scale with

²¹ Adhikari, *ibid*

²² APROSC and JMA 1995. Nepal Agriculture Prospective Plan (Final Report). Kathmandu and Washington DC: APROSC and JMC.

²³ Calculated from 'Economic Survey' of 1995, 2001 and 2007; published by Ministry of Finance, Government of Nepal.

support from International Wheat and Maize Improvement Center (CIMMYT), FAO and others, but this needs to be enhanced further, particularly in food shortage areas.

With the APP not being implemented effectively, the government developed another policy called the Agricultural Policy 2061 (2004). This aims to increase production by replacing the subsistence-based production system with a professional and commercial agricultural system. The main emphasis of the policy is to increase production and productivity, and to make Nepali farmers competitive with farmers of other countries. In the 7th item of the policy there is a statement that nutritious food technology will be promoted. Apart from this, there is little emphasis on nutrition and/or how to link production with increased nutrition for people. There seems to be an implicit assumption that increased food production alone can lead to better nutrition conditions. The Agro-biodiversity Policy 2006 aims to promote local and traditional crops and knowledge. The Maoists government (2009) tried to change the policy regarding deregulation of fertilizer (i.e., providing subsidy on it), but it has also not been implemented.

Moreover, these subsidies were being provided to Indian farmers, and “free trade” arrangements resulted in disincentives to Nepali farmers. The rice, vegetables and other grains produced in India became available cheaply in Nepal and this competition for market share further discouraged Nepali farmers. These disincentives became less important only in 2008 and 2009, when food production in India resulted in a reduction in their export of rice and other basic staples.

Because of lower productivity in Nepal, its export of food grain has declined, and since 2006 it has been a net-importer of these commodities. In 2006, the country exported only two-fifths of what it had to import (NRs 35 billion in value terms) resulting in a huge trade deficit.²⁴ In the last three years, food production has also been declining in India, from where Nepal used to import food grains. In the wake of food production decline and increase in food prices, India stopped export of food grains (except for fine rice) as a policy measure. This created food problems in Nepal.²⁵

At the household level, farmers are constrained by small farm size. As many as 60% of farm households can only produce food that is sufficient to meet requirements for about six months of the year.²⁶ Another 25% households are landless.²⁷ The overall land availability in Nepal is inadequate and in addition, that small land resource is distributed unequally. Improving access to land could also lead to increase in production, especially in the marginal, high-need households. Attention to land use patterns will certainly provide incentives to produce more at the small and marginal household level. There is emphasis at present on land reform in Nepal and it is a politically contentious issue. While there are debates within Nepal regarding the modalities of land reform, overall production will likely be improved when cultivators have security on the land they work and also the harvest they produce – i.e. they have incentives to invest in the land. A large majority of marginal farmers and the landless work as wage labourers, in types of semi-

²⁴ Karki, Madhab. 2008. Nepal Economic Growth Assessment: Agriculture. Page 13: (assessed 25 Oct 2009; http://209.85.229.132/search?q=cache:OaOFP2JQht0J:pdf.usaid.gov/pdf_docs/PNADN016.pdf+Donors+support+for+agriculture+in+Nepal&cd=4&hl=en&ct=clnk&gl=np)

²⁵ For detail see Adhikari, Jagannath. 2008. Food Crisis: how the Country will Feed its Poor. The Himalayan Times. 1 May. P. 4 (accessible on web by googling author’s name)

²⁶ National Planning Commission (NPC). 2008. The Three Years Interim Plan. Food Security (Chapter). Kathmandu: NPC, GoN.

²⁷ Adhikari, Jagannath. 2008. Land Reform in Nepal: Problems and Prospect. Kathmandu: Actionaid and NIDS.

bonded labor on the farms of others, or cultivate the land of others on rental basis. The rents are usually high (e.g. half the produce) and there is no security of tenure. These conditions do not encourage higher production.

Adhikari²⁸ described two departments within the Ministry of Agriculture and Cooperatives (MoAC) that focus to some extent on nutritional issues – the Agricultural Information and Communication and the Department of Food Technology and Quality Control. The former provides information through media about nutritious food and the latter is responsible for assuring the quality of food through establishing quality standards and monitoring compliance with these. This unit also generates and disseminates information about food quality in terms of nutrition and safety. Other units involved to some extent in nutrition issues include the Department of Agriculture, Department of Livestock, the Department of Cooperatives, and the Centers for Research and Seed, which also contribute in an indirect way to nutrition, but a major pre-occupation of the MoAC has been on increasing production.

While the Agricultural Policy 2004 envisions replacing traditional subsistence-oriented farming in Nepal, from the point of view food security and nutrition there are positive elements in the subsistence farming. The integrated, mixed (different crops and livestock) and diversified cropping system produces varieties of foods that are likely to be available for all times of the year—an approach used in Bangladesh to address the seasonal food shortage in parts of the country. If a subsistence farmer produces all required food, he/she is also spared from the problems that arise from an imperfect market system in developing countries like Nepal. While overall increases in national food production may be important for food security, the benefits to food and nutrition security in strengthening subsistence farming are also clear, and should not be underestimated.

A number of community-based efforts have focused on improving intake of vegetables and protein through home gardens and small-scale animal husbandry. HKI (Action Against Malnutrition through Agriculture), NCPS and others have been engaged in a number of districts, with varying success. Many of these efforts include both efforts to improve agricultural production for home consumption and substantial nutrition education efforts designed to improve energy, protein and micronutrient intakes among vulnerable age groups (described further in Section VII A). There is evolving experience with these approaches, which attempt to find a balance between household food production improvement and the workload for family members. Targeted food security measures may refine these approaches, and provide further evidence based on more rigorous monitoring.

Trade has become an increasingly important means of meeting the food needs of the country. For more than 10 years, Nepal has imported more than it has exported. In 1998, Nepal exported food and live animals worth Rs 5.3 billion and imported similar products worth Rs 7.7 billion. This trade deficit for food is growing and in 2007, Rs 9.1 billion worth of food were exported against Rs 18.6 billion being imported. Details of crops and food products imported and exported over recent years are presented in the Appendix of Adhikari's report.

Trade-related issues are complex and policies to facilitate trade carry important implications for both food availability and accessibility. These policies drive up domestic production of foods suitable for export over production of subsistence foods, but the exported foods provide the

²⁸ Ibid.

income to purchase the imported foods and so may benefit food availability at the household level. Trade in food also has implications for health and safety. Ensuring food products are not contaminated and meet reasonable standards requires a strong capacity to inspect and monitor products ideally at, or close to, the border.

Food aid has become a key source of food in many food-deficit areas. This is especially true in Far-West and Mid-West regions, where food crises have been occurring since 1972. Initially food aid was considered a temporary measure, but with continued shortages in some areas it has become a permanent feature of the food supply and as such dependence upon it is increasing. While the quantity of food aid is still small compared to local production, the growing food deficit has made food aid imperative in parts of the country. Some food aid programs target malnourished women and children, and are linked to conditions such as school attendance. Food aid has not always been delivered in ways that encourage increased food production through local means, raising some concerns about the net benefit of this approach. In some cases there may be a sense of psychological dependence on food aid, and a tendency toward reduced local production. While food aid will be required where people face chronic or emergency food deficits, attention should be focused on establishing stable local production capable of meeting basic needs.

WFP and other organizations are doing a significant amount of work in the area of food aid. WFP assistance is linked to labor-intensive food/cash for assets schemes that generate social capital for the communities, through the construction of critical rural infrastructure linking farmers to markets, increasing their agriculture production, and promoting alternative livelihoods. To enhance agricultural productivity, WFP-supported communities benefit from the strengthening of basic infrastructures such as the construction of irrigation systems, water harvest tanks, micro-hydro schemes, fish ponds, and storage facilities for agriculture products. WFP-supported farmer field schools based on the FAO model enhance cereal crop production and reduce post-harvest losses by building local knowledge and capacity. These programs, often linked to food aid, help balance food aid dependency, and offer potential for longer term solutions.

Transportation of both locally produced and imported food provides a vital mechanism to ensure food security. Given the terrain in Nepal, transportation is always expensive, and in remote areas, often tenuous. The Nepal Food Corporation (NFC) provides a transportation subsidy to facilitate the delivery of food to selected rural and remote areas. The private sector maintains control of transport to some areas, and thus their prices, if exorbitant, impose what amounts to a tax on transportation of food and the inputs for increasing productivity. As noted by WFP researchers, “transport prices are by far the most significant determinant of food prices in the hills and mountains – as much as 60% in Mugu. Markets in the mountains are poorly linked to Nepalgunj, meaning food price decreases in the plains are not necessarily passed on, and supply is erratic.”²⁹

The armed conflict in Nepal taking place from 1996 to 2006 led to decrease in agricultural production, and this impact was probably greater in areas and in population groups that had been already experiencing some degree of food insecurity. The conflict resulted in destruction of

²⁹ Markets and Cash Research Project: Preliminary findings. WFP Nepal Food Security Monitoring and Analysis Unit, 10 Nov 2009.

basic infrastructure; the internal displacement of people; the death of about 15,000 people; regular strikes and blockades (*bandhs*) of transportation, schools, offices, industry and trade; restrictions on the movement of people, goods and commodities; the extortion of money, food and other things from individuals and businesses; and the conscription of young people to serve in the rebel army. The Nepalese people have long been impacted by violence of different types, including gender violence, caste violence and other violence ingrained in the society (i.e., structural and cultural), and this has adversely impacted food security, particularly of women, children and so-called lower caste groups.

Adhikari³⁰ presented a perspective of the added impact of the conflict on food insecurity based upon his visits to rural areas during the conflict. Acknowledging the challenges in attributing worsening food security situation to any one cause, he proposed that the conflict affected food security by causing: declines in production; decline in income and employment opportunities, particularly through development initiatives; loss of household members or their productivity; displacement; decline in food stock and other assets; reduced mobility of people, goods and services; increases in food prices; increase in child malnutrition; destruction of infrastructure and reduced basic services; decline in natural assets and income from common resources; decline in community trust and a social safety net; and reduced access to food and services from government and non-governmental agencies. These factors were likely not adequately offset by any increase in remittances from out-migration for work. Even as the situation improves, the direct impact of remittances on household nutrition security is not clear, and may not be adequate to ensure adequate food consumption.

Gaps in information and evidence

There is a need to understand more clearly the relative importance of factors that are limiting productivity in different districts, with priority on those districts facing the greatest food deficits. Combined with information on the feasible options for addressing low productivity and resources to implement those interventions, this understanding will help in establishing priority districts in which to target these interventions.

There is a gap in our information about the impact of existing agricultural, development, and financial policies and resource allocation decisions on agricultural productivity, food availability, quality, diversity and on the nutritional status of vulnerable groups. As noted above, the factors determining food availability are complex and interrelated, and thus a range of policies across different sectors may have impacts, even if unintended, on food availability.

Recommendations

Based on the complex situation with regard to agricultural production and food availability, it is difficult to make specific suggestions with regard to addressing these determinants of undernutrition. However, to ignore the role of food availability is to sustain the current situation that has shown limited ability to reduce undernutrition to acceptable levels. Clearly a strengthened coordination between the MOHP and the MOAC would be helpful in policy review and in assessing the potential positive or negative implications of policies related to production, land use, and trade. In addition, establishing a better ‘architecture’ through which to oversee nutrition interventions will improve coordination across sectors, and thus help to address these critical determinants. A number of other suggestions evolve from this assessment, including:

³⁰ Ibid

- Establish institutional links that will facilitate communication and coordinated action between Ministries responsible for agriculture and health. As a component of the development of the proposed multisectoral architecture for nutrition, all sectors, including agriculture, would ideally become responsible for achieving specified goals in relation to a nutrition indicator, e.g. reduction in undernutrition. Investments will be required to achieve goals based upon such an indicator through agricultural interventions.
- Through discussion with appropriate groups within agriculture, identify, develop and support selected, specific and feasible agricultural interventions that will enhance nutrition and also benefit agriculture. Potential examples could be a) Selecting local crops that grow well in marginal environments (dryness, slopes etc) and provide research to improve their productivity; and b) In targeted areas, increase subsistence food production of foods by providing access to infrastructures and support services such as fertilizer, irrigation and seeds. This will have maximum benefit when targeted to benefit small and marginal farmers.
- With the above interventions as models/examples, build awareness of the potential role of nutrition in agriculture and the benefits to be gained by embracing joint activities. This may require development of an advocacy document that notes the cost of poor nutrition to agricultural productivity, and highlights the national cost of policies that worsen the nutrition situation.
- Investigate the impacts of selected policies and resource allocation decisions upon food availability, and food and nutrition security.
- Strengthen the integration of the efforts of the MOAC and WFP with the MOHP with regard to food security mapping, linking indicators of food security and nutritional status, and using these data for targeting of different interventions.

B. Poverty and Household economics

Poverty has always been a primary factor contributing to undernutrition, and the data from Nepal confirm this association. However, as with food production, household economics are more complex with regard to nutritional status. As noted in the evolving Policy Brief, —...the evidence shows clearly that improvements in nutrition lag far behind income growth³¹. In addition, surprisingly high levels of malnutrition, coming from poor nutrition practices or lack of micronutrients, persist in families with ample incomes for adequate food intake.³² Third, as the effects of recent global crises in food, fuel and finance have clearly shown, it is the poor that suffer the most from these; the undernourished become even more undernourished and death rates rise. Thus, effective strategies for social protection, whether in the current or future crises, must address undernutrition.³³

Against this complex background, a number of interventions have been attempted to improve household economics specifically to improve nutrition. These include conditional or non-conditional cash transfers (the former noted as effective in certain contexts in the *Lancet* Series), and microcredit programs, among others.

³¹ Lawrence Haddad, Harold Alderman, Simon Appleton, Lina Song and Yisehac Yohannes, —Reducing Child Malnutrition: How Far Does Income Growth Take Us?” The World Bank Economic Review, Vol. 17, No. 1, 107-131, 2003 International Bank for Reconstruction and Development / The World Bank

³² A. Ergo, D.R. Gwatkin, and M. Shekar: What difference do the new WHO growth standards make for the prevalence and socioeconomic distribution of malnutrition? Food Nutr Bull 2009 Mar; 30(1):3-15

³³ Policy Brief for the Global Action Plan for Nutrition, draft, September 2009

A recent review by Leroy et al.³⁴ found only limited evidence of an impact of two types of poverty-alleviation interventions on nutrition status -- conditional cash transfer (CCT) and microcredit with education (MCE) programs. Five CCT programs in Latin America assessed impacts on children's micronutrient status. Three of the programs assessed impact on hemoglobin. Only one of them (Mexico) documented modest improvements in mean hemoglobin and in reducing anemia, which was also the only program that included the distribution of a fortified food to participating mothers and children. Positive impacts on child anthropometry, height in particular, were much more consistent across CCT programs and were of meaningful size. Given the low prevalence of energy deficiency in the Latin American countries included in the CCT review, the authors hypothesized that at least some of the positive effects of these programs on linear growth could be due to (unmeasured) improvements in growth-enhancing micronutrients such as zinc. A study in South Africa³⁵ reported substantial positive effects on growth of children and also school attendance when unconditional cash transfers were made to mothers, but these benefits were not seen when the grants were made to fathers.

Leroy et al. found a dearth of information on the impact of MCE programs on nutrition: none of the programs assessed had an impact on micronutrient status, and the few programs that measured child anthropometry showed little evidence of impact. Overall, insufficient information and the lack of rigor in the evaluation designs prevent any firm conclusion on the impact of MCE programs on child micronutrient status or anthropometry.

The experience with these approaches in Nepal, however, is limited. UNICEF's DACAW program provides some insight about community-level activities addressing household economics and nutrition (described further in next section of report). Other efforts have been more limited in scale.

Current situation and trends

Nepal remains a poor country. The Human Development Index for Nepal is 0.553, which gives it a rank of 144th out of 181 countries with data.³⁶ Further, it has a poverty measure, the Human Poverty Index, which is 38.1, giving Nepal a rank of 84th among 108 developing countries for which the index has been calculated.³⁷

Analyses of the DHS trends for stunting demonstrate the current association between stunting and wealth quintile.³⁸

³⁴ Leroy et al. Ibid

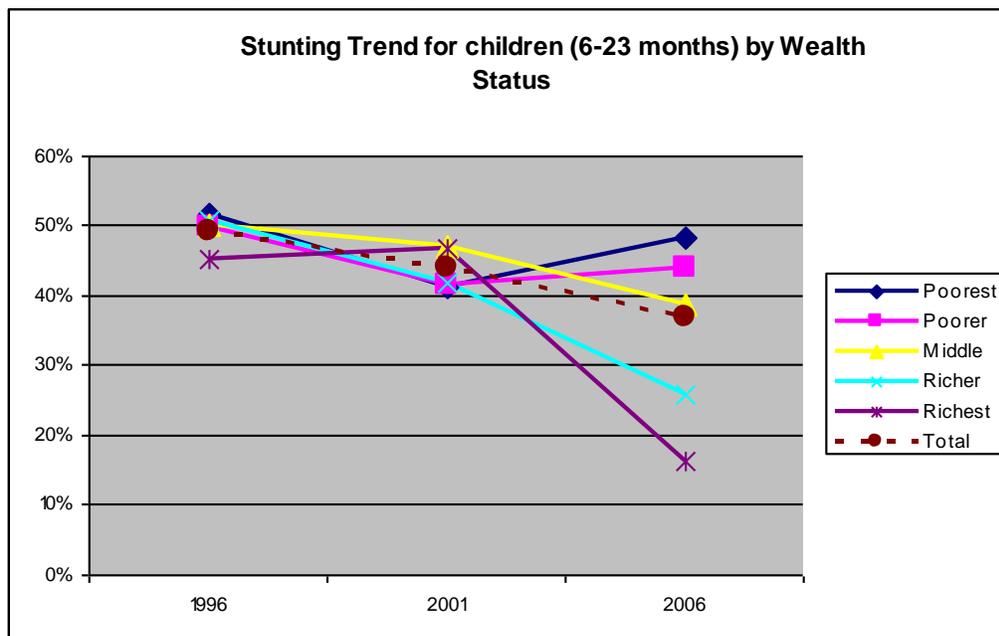
³⁵ Williams MJ. The Social and Economic Impacts of South Africa's Child Support Grant. Economic and Policy Research Institute, Research paper #40, Sept. 2007. <http://www.epri.org.za/rp40.html>, accessed 12 Nov. 2009.

³⁶ UNDP Report, 5 Oct 2009, http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_NPL.html, accessed 10 November, 2009

³⁷ Human Development Report 2007/2008: Nepal
http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_NPL.html

³⁸ Bishwakarma R, ibid.

Figure 2: Stunting and wealth quintiles



What is perhaps most striking about these trends is the widening of the gap in nutritional status across wealth quintiles in 2006. This suggests that the recent demographic trends in Nepal may be contributing to increasing income disparity, which is known to increase undernutrition. These findings appear to be similar across regions, although was not always consistent across all castes.

Poverty is reflected in food expenditures. However, household income may not always result in increased allocation of income for food, and increasing income may be a “double-edged sword” bringing adverse nutrition impacts in some contexts.

Similarly, the significant out-migration that Nepal has experienced has resulted in substantial inflow of externally earned income through remittances. However, how these remittances translate to household economics and nutritional status is not clear. Nepali farming households have often preferred out-migration for paid labor over selling the crops they produce.³⁹ The resulting cash income is then used to purchase the food grains to meet the requirements of the household. Clearly the pricing of those grain crops relative to the income that can be earned will be important in influencing the household decision making in this regard.

WFP and the Nepal Development Research Institute investigated the reasons for out-migration and the costs and benefits it brought.⁴⁰ This study was undertaken in the areas where food crisis usually occurs, mainly in Mid-Western and Far-Western Regions, from where migration is overwhelmingly to India. In the population surveyed in this study, food shortages

³⁹ Adhikari J. Decisions for Survival: Farm Management Strategies in the Middle Hills of Nepal: New Delhi: Adroit Books. 2000.

⁴⁰ WFP and Nepal Development Research Institute. Passage to India: Migration as a Coping Strategy in Times of Crisis in Nepal, WFP, 2008

and lack of employment were by far the two most important reasons for migration. For many poor and very poor migrants the main benefit of migration reported in the survey was reduced burden on family food stocks rather than remittances. Other factors reported to be driving up migration included conflict, poor crop harvests, natural disasters and its increasing ease.

For these areas the average financial benefit of migration to the very poor was only Rs. 4,350-5,120 per year, including in-kind remittances contributed to household assets. For the very poor in particular, the cost of migrating was a financial burden as was the extra work load left by the migrant, 94% of whom were men. However, the pattern of migration from other regions of the country is different, as migration to Gulf States and to other developed countries is common. The average income of a household taking part in migration in 2003-04 was Rs 34,698, and 31.9% derived such income (NLSS II 2003-04). Because of the increased contribution of remittance, poverty declined from 42% in 1996 to 31% in 2003-04. How this 'new found' wealth is invested is still unclear. But again this income is concentrated in the middle class, and not to the lowest income group.

Remittances resulting from this migration have become integral to both economic development and macroeconomic stability of the country. In 2006, official remittance flows were over US\$1.6 billion and made up about 15% of Gross Domestic Product. Official remittances increased 10-fold between 2000 and 2007, although much of this increase resulted from more highly skilled migrants and those working in the Middle East.

The UNICEF DACAW experience provides some information on community-based approaches to improve household income. In addition, this program delved into the role of women, and their importance in making sound household food expenditure decisions. In other countries it has been shown that the control of household income by women rather than men, results in improvements of the health and nutritional status of children in those households.

The objective of the DACAW program⁴¹ is to seek progressive realization of the rights of children and women through strengthening of community action processes, responsive service delivery and decentralized governance. The "DACAW process" is described as centering on creating synergism between outsiders with some knowledge of causes of undernutrition and some ideas about possible actions, and with the knowledge of community members of the local conditions and cultural context. DACAW works with community organizations usually consisting of 20-30 households. These are often village savings and loans groups. Village facilitators are trained on relevant technical issues and then pass knowledge and skills to locally selected community mobilizers. The four key strategies used include:

1. Community action processes – mobilizing existing groups to address issues relating to children and women through a variety of gender sensitive techniques.
2. Responsive service delivery – seeking to make local service providers more responsive to local needs by informing and motivating community members about their rights, and simultaneously helping to enhance the quality of services and increase access of disadvantaged groups.
3. Decentralized governance favoring women and children – strengthening the capacity of local bodies to prepare periodic plans and implement and monitor actions aimed at ensuring the wellbeing of women and children.

⁴¹ UNICEF. Decentralized Action for Women and Children: Building communities' voices for action. Unpublished summary, undated.

4. Policy support for decentralization – UNICEF supports the development of appropriate, locally-owned and operated, child and women friendly policies and programs.

More than 85% of caregivers of children under-three years of age participated in growth monitoring and promotion component of the program.⁴² Community-based monitoring data indicate that nutrition situation is better in areas with the program than in those without it.⁴³ Preliminary results of the independent evaluation to assess the impact of DACAW program approach in reducing malnutrition are promising, and the full results of this ongoing analysis will be released soon.⁴⁴

The Government of Nepal Ministry of Local Development is planning the launch of a cash transfer scheme under ‘Child Protection Grant’. The scheme aims to provide cash in a way that will improve nutritional status of young children of vulnerable families in the Karnali Zone and operational details are being finalized (e.g. whether or not the grants will be made conditional or not). UNICEF has also proposed a program to provide financial support to mothers of all new babies, without conditions other than registration of the birth. This registration process could itself provide a major benefit as the process of registration (e.g. formally at the VDC) could initiate preventive health services being provided to the infant. The introduction of these cash transfer programs offers an important opportunity to evaluate the impacts.

Gaps in information and evidence

There is a need to understand how the current government policies that impact on income will affect food consumption and nutritional status of young children and mothers and/or how they could be modified to do so in a positive manner. Given the known lack of direct improvement in nutritional status with improved household income, understanding the nutritional impact of poverty programs in Nepal is very important. Particularly in poor households, the relationship between cash availability and nutritional status, and the factors influencing this relationship need to be clarified. The proposed NLSS III survey will include a module on nutrition, which will help illuminate these relationships.

A clearer understanding of the determinants of the distribution of undernutrition across wealth quintiles and ethnic groupings will assist in better describing the causes of undernutrition. It was demonstrated that in some ethnic/caste groups but not in others, increasing availability of resources and presumably food, did not change feeding practices.

The nutrition situation in urban areas is poorly understood and needs further review. A 2008 survey of a slum area in Kathmandu by CARE⁴⁵ described a dire living situation in which almost 80% of those included in the sample existed on less than US\$1 per day. Illiteracy was widespread and the number of children under five was highest amongst the poorest families. Housing was insecure, inadequate, temporary, and overcrowded, with little or no access to safe drinking water or functional toilets. Most respondents lacked awareness about basic sanitation and reported drinking untreated water. Although no information specific to nutrition was collected, the nutrition situation in such living conditions will have been very poor.

Recommendations

⁴² Ibid

⁴³ Ibid

⁴⁴ P. Mathema, personal communication, November 14, 2009

⁴⁵ CARE (2008). Health problems among urban poor in selected slums along the Bishnumati River in Kathmandu, 2008 (unpublished report).

It is difficult to make specific recommendations with regard to improving nutrition through improving household economics. Clearly poverty alleviation programs are important in addressing one of the key determinants of undernutrition, but there is a time lag between income growth and nutrition status improvement and undernutrition can persist among groups whose income has increased. Poverty programs need to be designed with adequate nutrition input to increase the likelihood that improved income will translate to improved nutrition choices. It is likely that in Nepal, regionally specific and ethnically determined contextual factors will affect this dynamic.

The experience in other countries suggests that certain programs, such as cash transfers and microcredit programs, when they include attention to nutrition, can have an impact on nutrition indicators. Other approaches are likely to improve the situation for families, but may only result in nutrition change over a longer period.

From this analysis, several suggestions can be made:

- Establish a stronger nutrition link with poverty alleviation / social equity programs (Ministry of Social Welfare), and develop more systematic ways to include nutritional indicators as measures of impact of these programs.
- Identify key nutrition components from the DACAW experience, and review these to determine what elements might be further tested and brought to scale.
- Consider exploring, perhaps as feasibility models, targeted microcredit interventions, and include nutrition counseling and outcome measures
- Monitor the nutrition impact of UNICEF's evolving non-conditional cash transfers
- Develop a mechanism to monitor income disparity in relation to nutritional status, perhaps in a specific district, to help advise the Government on the implications of policies that may improve GDP, but worsen inequity
- Consider exploring further information about the nutrition situation of urban areas, particularly in slums.

C. Emergency-food security and crises

Current situation and trends

Over the last few years, severe food insecurity has become a constant concern for both the Government agencies such as the Nepal Food Corporation (NFC) and multilateral agencies such as the World Food Program (WFP). An increasing number of people are being affected. Stakeholders interviewed during the assessment noted that it was now not unusual to visit areas where no food was available, particularly in the west of the country. In estimating the severity of situation, WFP developed —a subregional hunger index for Nepal⁴⁶ which used globally accepted methods of FAO and also the International Food Policy Research Institute's hunger indexes to allow comparisons of severity. This analysis classified hunger in Nepal in the alarming range and ranked the country overall as 57th among 88 countries on the global hunger index score. The Mid-Western and Far-Western Mountain regions were classified as extremely alarming and ranked among the worst in the world.

An example of the worsening situation is illustrated with the winter drought of 2008/9 that was particularly severe, and described as —. one of the worst droughts in its (Nepal's)

⁴⁶ A sub-regional hunger index for Nepal, Nepal Food Security Monitoring System/WFP, 2009

history”.⁴⁷ Rainfall in Mid- and Far-Western Nepal was about 50% of that expected from November 2008 to February 2009, a major problem where about 75% of cultivated land is non-irrigated. Responding to this emergency, an assessment was undertaken by a joint MoAC, WFP and FAO team.⁴⁸ This team estimated 40 of the 75 districts were food deficient because of the drought and that the drought had reduced production of wheat and barley by 14% and 17% respectively. The team noted that the affected populations already had initiated coping strategies such as selling assets, migrating for work, and skipping meals. The report recommended increasing the number of people WFP should assist through a variety of Food for Work and Food for Training projects in the most food insecure areas of Nepal from 1.5 million to 2.2 million. At the same time, likewise, FAO should work with local communities to expand irrigation networks and distribute seeds for the next harvest.”

The Nepal Food Corporation (NFC) has also been providing food to the food-scarce areas, but its scope has been reduced since the mid-1990s. In the Interim 11th Plan (2008-2010), the NFC aims to provide about 29,000 MT of food to food-insecure areas. NFC also provides a transportation subsidy in some situations. NFC’s scope was reduced partly because of the expansion of road networks (it does not provide food in areas with access to roads) and partly because of the economic liberalization policy. The NFC has been criticized for its quota fixing being rather arbitrary and its poor targeting. The NFC is mandated to maintain food buffer stock for use in natural disasters or other problems but it is unclear if these stocks are currently maintained. For the current three years in 11th Plan (2008-2010), it aims to maintain a buffer stock of 42,000 MT of food and provide a transportation subsidy to 30 remote districts. The Government supplies salt, sugar, kerosene oil and clothes in remote districts through other parastatal organizations such as the Salt Trading Corporation, the National Trading Corporation, and the Nepal Oil Corporation. The Government also provides food to ‘fair price shops’, but at present because these are few, they are unlikely to have much impact in easing the food price and supporting a significant number of people. In the next three-year plan, it is proposed to have at least one fair price shop in each of the remote districts.

WFP, working under an overarching agreement with the Ministry of Finance, with operational agreements with other government agencies (Home Affairs, Local Development, Health and Population, Education, Agriculture) has become the major provider of emergency food to assist people facing food shortages. It is providing humanitarian food assistance to 2.2 million vulnerable people annually living in 42 of Nepal’s 75 districts.⁴⁹ The majority receiving this food aid are covered by the program entitled Food Assistance for Populations Affected by Conflict & High Food Prices. This aid assists directly people struggling with high food prices and the impacts of conflict and natural disasters to improve their immediate food security. WFP provides food/cash for assets schemes to construct critical rural infrastructure linking farmers to markets, increase agriculture production and promote alternative livelihoods.⁵⁰ Internally

⁴⁷ The Kathmandu Post May 28, page 9.

⁴⁸ MoAC/WFP/FAO report, 31 May 2009, <http://www.wfp.org/news/news-release/winter-drought-worsens-food-insecurity-nepal>, accessed August 15, 2009.

⁴⁹ MoAC/WFP/FAO report, 31 May 2009, *ibid*.

⁵⁰ Examples include construction of roads, trails and bridges to link farmers to markets, farmer field schools to enhance cereal crop production and reduce post-harvest losses, construction of irrigation, water harvest tanks and drinking water systems, fish ponds, micro-hydro schemes and agriculture storage facilities, and cultivation of cash crops (aromatic and medicinal plant cultivation in high altitude areas) where other types of agriculture production are not viable.

displaced people (IDPs) and children associated with armed groups and armed forces are also receiving food assistance to ease their return and reintegration into their communities. Additionally, WFP sponsored incentive programs encourage girls to attend school by providing them with take home rations of cooking oil when they maintain adequate levels of attendance.

A further WFP activity is its collaboration with MOHP to provide a maternal and child health care (MCHC) to 31,000 children in the age group of 6 to 36 months and pregnant and lactating women in 12 districts. The objectives of the MCHC program include: a) preventing or reducing prevalence of underweight among young children; b) reducing iron deficiency anemia among pregnant and lactating women and young children; c) increasing regular utilization of existing community-based/MCH outreach services; and d) raising awareness and knowledge of pregnant and lactating women on health and nutrition. In 2008, WFP also began a pilot program in two districts with Himalayan Health and Environmental Services Solukhumbu (HHES) to increased access to health information and services. As a result of the many advantages and successes observed under the new modality with HHES, the distribution and health service delivery system has being adapted in all MCHC districts.

The Nepal Food Security Monitoring System (NeKSAP) collects, analyzes and presents information on household food security, emerging crises, markets and nutrition from across Nepal.⁵¹ This system is based on 47 District Food Security Networks that monitor the food security situation and provides data for targeting food assistance at the VDC or sometimes Ward levels. This system produces quarterly Food Security Bulletins, Crop Situation Updates, Market Watch (food prices) and early warning information. WFP/NeKSAP also undertakes quarterly surveys of 10,000 households providing comprehensive information on wealth, ethnic, caste, morbidity, health behaviors including frequency of basic food consumption; and produces reports of detailed analyses of national surveys such as the development of sub-regional hunger index and small area estimations methods. These reports are disseminated to the Nepal government and throughout the donor and development community in order to provide critical information on food security and on rural livelihood conditions in Nepal. The NeKSAP was set up and supported by the World Food Programme but is being institutionalized by the Government of Nepal in collaboration with the Ministry of Agriculture and Cooperatives and the National Planning Commission to build its sustainability.

The Market Watch series is an excellent example of exploiting the potential of modern communication technology in addressing food security issues. Food prices in selected markets throughout the country are monitored by 30 field-based staff using personal data assistants (PDAs) and satellite telephones. They send real-time information to the unit in Kathmandu that then translates this into timely updates on household food security, crop production, and food prices from some of the most remote areas of Nepal. This information is analyzed and processed to develop reports, maps, and early warning bulletins to ensure decision-makers have the information they need to protect lives and anticipate and respond to emergencies. An example of this impressive system is presented in Box 3.

Box 3. Highlights from “Market Watch”⁵² June 2009

⁵¹ <http://groups.google.com/group/NeKSAP?hl=en>

⁵² Market Watch. Issue 14, <http://groups.google.com/group/NeKSAP?hl=en>, accessed June 15, 2009

Highlights from “Market Watch”, providing the latest update on food price developments across different markets in Nepal.

- Staple food prices across Nepal remain significantly higher when compared to the same period last year.
- Wheat, which normally decreases in price during this period of the year has risen in price over last month because of the winter drought. Potato prices, also very high, have increased by up to 28 percent.
- Food price inflation in Nepal remains of high concern. Compared to 18 months ago, the price of musuro (broken lentil) has increased by nearly 50 percent, soybean oil by 32 percent and rice by 25 percent.
- Compared to recent months, the supply situation improved across much of Nepal due to the lifting of bandhs in the Terai.

Care is needed in interpreting the conclusions of reports using different types of data. For example, the use of different cut-offs for adequacy of energy intake in several reports is complex and a little confusing. Different analyses used a variety of methods to estimate both food/energy consumption and energy requirements and this probably explains the differences in the cut-offs used to classify inadequate energy intake. In the data on energy surplus/deficits presented in Section III A from the Bulletin of Agricultural Information published by Department of Agriculture,⁵³ a requirement of 2,247 Kcal was used to determine food deficiency. The Small Area Estimation Poverty analysis used 2,709 Kcal, and in WFPs description of a Nepal Hunger Index for Nepal, a cut-off of 1,810 Kcal based on FAO reference values was used. These differences in detailed methods do not invalidate any of the findings, but are noted because caution is needed in interpreting the findings and conclusions and that different results may be attributed to different methods used. However, all findings, by all methods used, point to food security situation that is totally unacceptable from any humanitarian or rights based point of view.

Gaps in information and evidence

The Government has established an excellent system to track food security, and identify emergency areas. This system, with partner support, provides a wealth of information to predict and define priority areas needing emergency attention. Climate change, and the current food, fuel, finance crisis all contribute to this worsening food security situation, and these do not lend themselves to clear new approaches or solutions. The current system provides the needed information, and to date, the Government has been able to respond. What is less clear is whether there are additional steps that the Government could take to anticipate these emergency needs, and address them as efficiently as possible. Additional input from agricultural economists with experience in other countries with significant food insecurity may suggest other options.

⁵³ DoA (Agri. Business Promotion and Marketing Dev Directorate) 2063 (2006). Agricultural Marketing Information Bulletin (Special Issue 2006). pp. 208-210. (Table No 20.3).

The current surveillance system provides good information with which to target interventions most effectively. Closer linkage with the MOHP, including the routine HMIS data on undernutrition may help with understanding the relative contribution of food production, availability and affordability to this emergency situation.

Transport costs add considerably to food costs and thus to food insecurity, and costs are highest in many of the most food insecure areas. Further information is needed on transport costs, their determinants, and on ways the Government might address these costs.

Innovations from other countries, such as introduction of subsidized silos for protected food storage, may need further exploration to determine potential applicability for Nepal.

Recommendations

The current surveillance system appears excellent, and should be continued. It may be useful to expand this system, perhaps in a more limited way, to areas that have not traditionally been vulnerable. This would provide ‘control’ information that may be useful in understanding the interplay between the various determinants contributing to food insecurity.

Although there are difficulties with the quality of HMIS data on underweight, the analyses undertaken in preparation of this report found some consistency in trends with survey information. Since the HMIS does provide district specific facility-based underweight information, it would be useful to strengthen discussions among those managing different data systems to strengthen the HMIS, and to review consistencies. While HMIS represents only those weighed in facilities, dramatic increases in severe wasting may reflect a growing emergency situation. Stronger linkage between these two systems, along with strengthening the HMIS, may allow HMIS to be a better source of information for all districts (and perhaps sub-district level in the future).

Chronic and emergency food insecure areas will require special policy decisions from the Government to avoid dramatic increases in undernutrition. However, for more marginal areas, more information is needed to determine the primary reasons for non-emergency nutrition insecurity—that is the household’s ability to provide adequate food either from availability, cost or behavioral reasons. Distinguishing these factors, using available data, will require more extensive ongoing data analysis through a coordinated approach across sectors.

The Government is also very responsive to the needs of vulnerable groups, and is developing poverty alleviation programs. Since poverty is so closely associated with undernutrition, these policies should contribute to the continuation of the improvement in undernutrition trends. However, the demographic changes in Nepal are also likely increasing income disparity, and this is perhaps more strongly associated with worsening nutrition—both over and undernutrition. It would be useful for the Government to put in place mechanisms to monitor measures of income disparity, and to raise concerns about policies in all sectors that may increase this disparity.

With an enhanced ‘architecture’ for integration of nutrition activities across sectors, the government may be able to use surveillance information to improve targeting of different combinations of interventions designed as preventive measures to reduce emergency crises.

IV. Interventions related to food behaviors

A. Breastfeeding, complementary feeding, management of acute malnutrition

Improving nutrition clearly depends on food availability and affordability, but child care practices, including feeding behaviors, particularly in South Asia and early in life are equally or even more critical. A range of care- and health-related behaviors are clearly critically important to nutrition and these are described in Section VI. In fact, while the push to improve agricultural production in the 1970's did result in improved production, there was not the expected improvement in nutritional status. The World Bank presents a table showing the relationship between per capita energy supply and percent underweight that suggests that food availability is not strongly related to underweight rates except in emergency situations. The conclusion drawn is ~~not~~ that food supplies are irrelevant, but that other factors, such as maternal knowledge, caring practices for young children, access to health services, and water and sanitation, have important roles to play.⁵⁴ Further, the World Bank report showed that the prevalence of undernutrition in young children of South Asian is disproportionately higher than other poor regions of the world given the levels of household food availability. Care and feeding behaviors, including breastfeeding and complementary feeding, and care-seeking relating to malnutrition are critical to achieving adequate nutrition in infants.

With nutrition interventions to be focused on the 'window of opportunity' during pregnancy and the first two years of life, improving infant and young child feeding (IYCF) behaviors in line with current WHO⁵⁵ recommendations play a central role in reducing undernutrition. Global partners have reached consensus on the principles of how to implement these programs⁵⁶ and with the indicators for monitoring progress.⁵⁷

Current situation and trends

Nepal has done extensive work on promoting exclusive breastfeeding, and much has been achieved. However, as described by NPAN'07, results of DHS surveys in 1996, 2001, and 2006 indicate that exclusive breastfeeding (EBF) of infants to 6 months of age is gradually declining. Reviewing these data by month of age shows that the decrease in EBF appears to have occurred only in infants after two months, i.e. EBF in infants less than 2 months remained at almost 90%⁵⁸ (Figure 3). Improving EBF rates will require better understanding the reasons for the decrease in older infants, and the government may need to modify their current strategies to address these reasons.

⁵⁴ The World Bank. Repositioning Nutrition as Central to Development, The World Bank, 2006, pg 54.

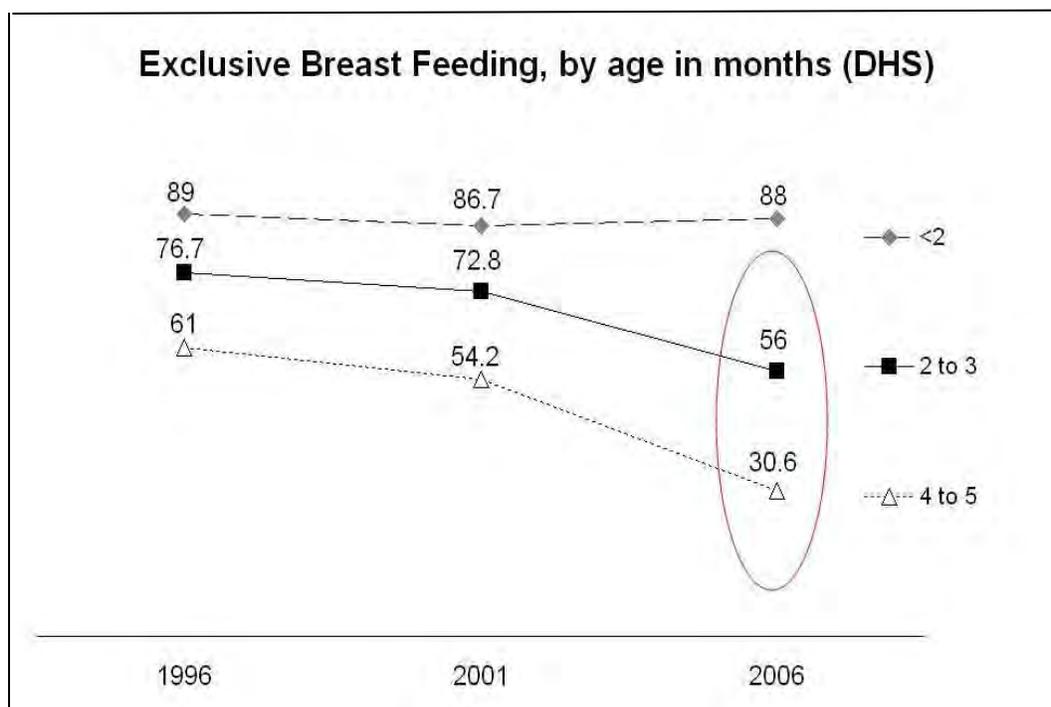
⁵⁵ UNICEF/WHO. Global strategy on infant and young child feeding, UNICEF/WHO 2003.

⁵⁶ UNICEF/WHO. Strengthening action to improve feeding of infants and young children 6-23 months of age in nutrition and child health programmes: report of proceedings, Geneva, 6-9 October, 2008. UNICEF/WHO 2008.

⁵⁷ World Health Organization. Indicators for assessing infant and young child feeding practices: report of a consensus meeting held 6-8 November 2007 in Washington DC, USA. WHO, 2008.

⁵⁸ Steve Hodgins, personal communication, May 2009.

Figure 3: Trends in exclusive breastfeeding by month of age, Nepal, 1996-2006.



Guidelines have been developed in Nepal for breastfeeding, nutrition, and essential newborn care and these are described well in Annex 1 of NPAN'07. However, implementation and monitoring of these guidelines were described in NPAN'07 as "weak". Most nutrition programs and many child health programs include education and counseling on breastfeeding and appropriate complementary feeding but the quality of the implementation of these activities is uncertain. For example, several stakeholders provided anecdotal reports questioning the quality and effectiveness of counseling provided by both health workers and volunteers. Counseling skills are reported to have been strengthened recently as a component of the IFA supplementation program (described in Section V B) and this would provide a potential platform for improving counseling in general.

Progress with complementary feeding has been slower. The recent DHS suggests that 56% of families use adequate IYCF practices.⁵⁹ Global partners now recommend using a standard series of WHO-endorsed indicators to describe complementary feeding behaviors for children 6-23 months.⁶⁰ One of these is a summary indicator that identifies the proportion who are receiving a diet that is sufficiently diverse and being provided often enough to meet the nutrient needs of this period of rapid growth.⁶¹ Bishwakarma⁶² used this indicator to describe a wide variation in

⁵⁹ Sub-analysis of DHS 2006 by Bishwakarma R. 2009

⁶⁰ World Health Organization. Indicators for assessing infant and young child feeding practices: report of a consensus meeting held 6-8 November 2007 in Washington DC, USA. WHO, 2008.

⁶¹ Summary indicator for minimum acceptable diet is calculated as = [Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day]/[Breastfed children 6–23 months of age]. There were very few non-breastfed children 6–23 months of age included in the DHS survey and so this group is omitted from these analyses (for detail refer to WHO 2008)

⁶² Bishwakarma R. Social inequalities in child nutrition in Nepal, World Bank/Nepal, August 2009.

complementary feeding behaviors across geographic, social and economic groupings. Understanding this variation will provide useful information for designing and targeting interventions.

Figure 4⁶³ shows that complementary feeding behaviors vary substantially across caste/ethnic groups and that even with these groups, the pattern of feeding across wealth categories varies. For example, 60% of Bahun/Chhetri in the poorest group, but 80% in the richest group provide a diet as recommended by WHO that meets nutrient requirements for their young children. It seems likely that higher income, or perhaps better education, in more wealthy groups allows them to provide a better diet. On the other hand, fewer than 40% of the young children of Dalits and Muslims, regardless of their wealth status, receive sufficient nutrients to support their potential for growth and development.

Figure 4: Complementary feeding patterns, ethnicity, and wealth quintile

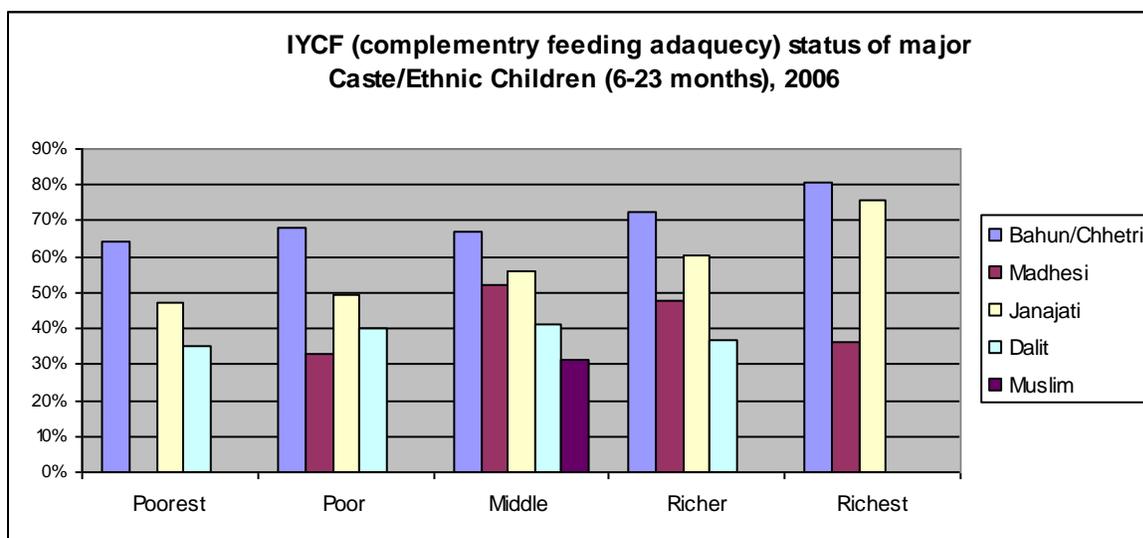
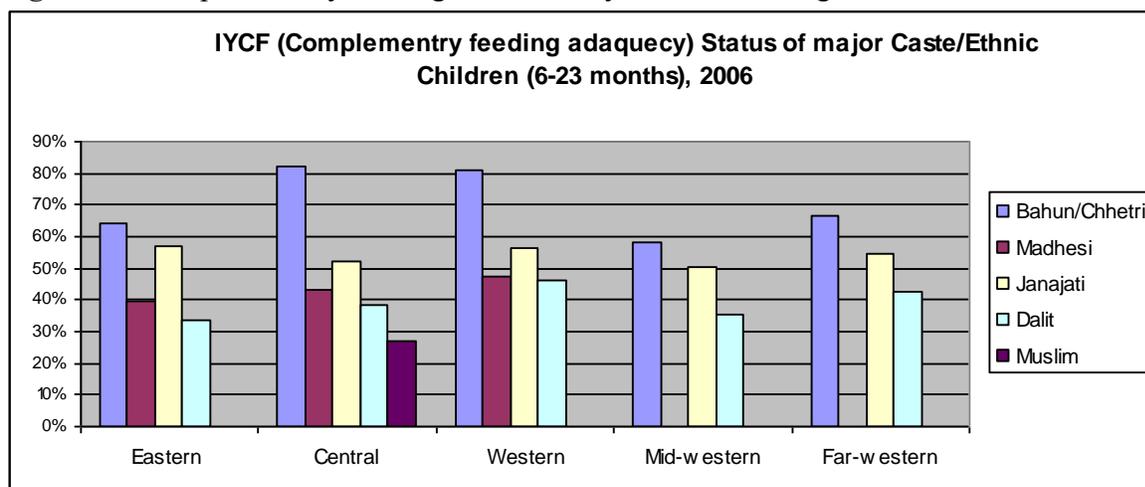


Figure 5⁶⁴ shows how complementary feeding behaviors of different castes vary across geographic regions. The strong disadvantages of lower castes and Muslims in terms of infant feeding remain clear when the data are presented this way. The Eastern region shows some surprising pattern of poor complementary feeding behaviors given the relatively good nutritional status and relative lack of food deficiency that is reported in this region (See Annex 1 and Table 1 Section III). These results highlight the complexity of the multiple causes of undernutrition, and this graph probably reflects a mix of ethnic mix and poverty.

⁶³ All ethnic groups are not represented in all wealth quintiles because there were too few for that quintile in the DHS sample.

⁶⁴ All ethnic groups are not represented for all geographic regions because there were too few in the DHS sample.

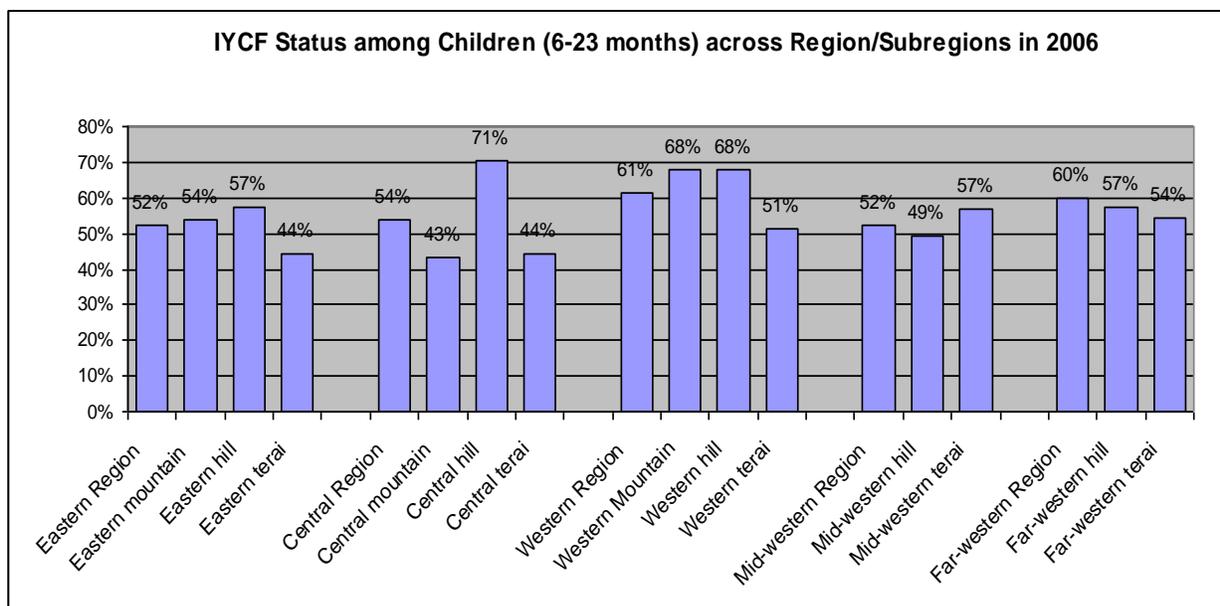
Figure 5: Complementary feeding and ethnicity for different regions



Bishwakarma found no clear direct correlations between nutritional status and complementary feeding behaviors at geographic levels (See Figure 6). This lack of association in the analyses presented is not surprising given the multiple factors determining nutritional status. For example, the Eastern region, which has the lowest stunting and underweight rate, had a relatively low proportion of infants (52%) complying with feeding recommendations, the same proportion as the Mid-western region where the prevalence of stunting and underweight is among the highest in the country. Similarly, Western Mountain and Western Hill regions have some of the highest prevalences of stunting and underweight (See also Annex 1) and also some of the highest proportions of infants being fed according to the recommendations (68%). Further information from other district surveys may provide insight into the reasons behind these differences, and the gaps in following feeding recommendations. It would be helpful to undertake a regression analysis of undernutrition against its multiple determinants: complementary feeding adequacy, caste, poverty, geographic location (sub-region), infection, to see what appears to be the strongest factor in the mix.

While the findings presented from this analysis suggest variation according to caste, socio-economic status and geographic region, more information is needed to determine how different groups respond to the government's effort in promoting appropriate complementary feeding, and how these programs might be modified accordingly.

Figure 6: IYCF status by geographic region



Two types of processed food products designed to enhance the quality (i.e., nutrient density) of the diet of infants and young children have been introduced in Nepal. First, a low cost, fortified blended complementary food (wheat-soy blend or *Lito*, with the brand name *Champion*) was promoted in collaboration with the MOHP through a social marketing campaign designed and implemented by PSI with support from MI and WFP. A feasibility study was undertaken with support from MI and this supported the viability of the commercial introduction of a low cost fortified complementary food.⁶⁵ However, at the time of writing, *Champion* was no longer produced. There are several other brands of blended but not fortified complementary food being produced and marketed by local manufacturers in Nepal. Maharjan⁶⁶ reports that these products cannot be promoted as complementary foods by any means by the producers and distributors because of Nepal's legislation concerning breastmilk substitutes that covers marketing of complementary food as well infant formulas.

Hence availability and use of these complementary foods are quite limited. It is likely that the use of these products would increase substantially if they were to be commercially promoted, e.g., similar to biscuits. There needs to be further discussion concerning advantages and disadvantages of amending the legislation to allow/encourage commercial promotion of these products, with appropriate guidelines to eliminate/ minimize the chances they would be used as a breast milk substitutes and fed to infants less than 6 months of age.

The second type of complementary food product being introduced in Nepal is micronutrient powders (MN Powders) such as Sprinkles.TM There is now strong evidence of the effectiveness of MN Powders in reducing anemia in growing number countries. The WFP and UNHCR introduced MN Powders in refugee camps in the East of the country in 2007. The food supplement was popular, but no impact on anemia or other indicators of MN status was noted in

⁶⁵ Feasibility of developing a low cost fortified complementary food for commercial introduction in Nepal, Final report, prepared for the Micronutrient Initiative, AC-Nielsen (ORG-MARG), January, 2004.

⁶⁶ Maharjan, Personal Communication, comments on preliminary draft of this report.

an evaluation undertaken by US CDC, perhaps due to implementation problems.⁶⁷ During 2009 WFP plans to launch a program that distributes MN Powders together with its emergency food aid to households identified as being in need. An estimated 114,000 children 6-59 months of in 35 Districts were expected to receive the product together with education on how to use it. The distribution of the powders will be monitored closely and their impact evaluated. In the second half of 2009, the Nutrition Section/CHD and UNICEF launched a joint multi-year initiative to introduce MN powders as a component of a comprehensive program to enhance infant and young child feeding.

Nutrition education promoting diet diversity (nutrient-rich foods especially animal-based foods) is commonly included in many nutrition and child health programs of both the government and NGOs throughout the country. Another major focus of nutrition education by groups such as the Nutrition Promotion and Consultancy Service (NPCS) is the use of locally produced grains as complementary foods such as Super-Flour (a locally prepared porridge of mixed grains). At this time there seems to be little standardization of how such educational program should be delivered, or the specific messages to use, and the assessment team found little useful evaluation of the effectiveness of these educational interventions. The complexities of feeding behavior and their determinants are important to understand when developing interventions to change feeding behaviors. These factors are well described by Gartoulla in his review of anthropological evidence for this assessment.⁶⁸ (See also Section VII A)

Acute malnutrition is now being largely managed in facilities, with referral done in the context of community-based (CB)-IMCI. The established protocol is for the FCHV to refer severely underweight children to the health center. Additional information is needed on the impact of these approaches in areas where they have been implemented. Traditionally children identified as being severely malnourished were referred to health centers or hospitals and admitted to nutrition rehabilitation units if these existed. At the rehabilitation unit children would theoretically receive additional amounts of specially prepared foods and mothers are usually required to stay with the child to learn how to better nourish their children. Nepal has experienced some success in this context with Super-Flour delivered together with education on child care practices and hygiene. Much of benefit can be learned from these experiences, and from experiences with more elaborate community-based treatment approaches.

The health-centre based approach has the disadvantage of requiring the mother to be away from her home and this can disrupt other important domestic or economic responsibilities. Evidence is now available that alternative community-based approaches where the child and mother receive support in their home have been more effective. Some children with complications will need to be referred to hospitals and the community-based approach will complement rather than replace the facility-based care. The development of Ready-to-Use Therapeutic Food (RUTF), e.g. —Plumpy Nut” among others has resulted in major advances in the community management of acute malnutrition.⁶⁹ Anecdotal reports from health workers in

⁶⁷ CDC/WFP/Sight and Life. Micronutrient powder use and outcomes in refugee camps in Nepal (Asia). http://www.sightandlife.org/images/stories/pageimages/content/Publications/nepal_briefing.pdf.

⁶⁸ Gartoulla R.P. Nutrition Assessment and Gap Analysis (NAGA): Subsequent Revision of Nutrition Action Plan in relation to under-nutrition in pre, pregnant, postnatal and children below 24 months. August 2009.

⁶⁹ Dewey KG, Adu-Afarwuah (2008). Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Maternal and Child Nutrition* 4: 24-85.

Jumla described incidents of children choking on —Plumpy nut” and this having resulted in mothers declining to use it.⁷⁰

For a substantial and increasing number of Nepalis, lack of food security and onset of acute malnutrition in children is reaching levels where a humanitarian response is required. In these situations the World Food Program provides 40 kg of rice and 5 kg of pulses for every 10 working days per month for their participation in food for assets schemes. Participants engaged in the combined food- and cash-for assets activities will receive an incentive of 50 percent cash and 50 percent food. Cash-for-assets participants receive their entire assistance transfer in the cash equivalent to the same food basket. On nutrition interventions, children aged 6-59 months are provided with individual sachets of micronutrient powders to complement the standard food basket of rice and pulses. A feasibility pilot integrating supplementary food for children and pregnant and lactating women is proposed for 2010 in the districts with the highest rates of undernutrition where WFP is already implementing food/cash-for-work activities. In a joint 12-district program with the MoH Maternal and Child Health Program, WFP provides supplemental foods (wheat soya blend), access to health services and education in health/nutrition to 31,000 pregnant and nursing mothers and their young children (aged 6 to 36 months).

Other approaches based on the Positive Deviance/Hearth model have been implemented with some success in small populations, but these approaches have proven difficult to bring to scale.

Gaps in information and evidence

The most urgent gaps information relate to an understanding of the determinants of infant and young child feeding practices, including delays in initiation of breastfeeding, continuation of breastfeeding, and quantity and diversity for complementary foods. These are needed to facilitate the development of culturally appropriate interventions. This will be most useful if collected in specific targets groups which are yet to be selected, but could be identified by geographic or perhaps social/economic criteria, e.g. districts with a higher lower caste population, and/or higher poverty rates. Developing this understanding will ultimately require fieldwork to collect further qualitative data. Further analysis of the 2006 DHS data may be helpful in guiding this rather expensive and time-consuming process. Given the variation identified across caste, economic, and geographic groups in complementary feeding behaviors, it would be useful to determine if similar relationships exist on other IYCF behaviors such as early initiation and exclusive breastfeeding. Regression analysis may help us to understand the relative importance of the multiple factors that are known to determine the outcomes of both breastfeeding and complementary feeding.

More needs to be learned about the effectiveness of current Government, donor, and NGO programs. Are nutrition education messages effective in changing behaviors? What is the quality of counseling that is provided by both in health facilities and in communities? Depending upon the findings of this investigation, a comprehensive assessment of the curriculum and training process may be needed, with attention to consistency across sectors. Nepal has a long history of successful community-based programs, and the lessons from these experiences can be applied to the evolving nutrition interventions. Given the apparent variability in feeding behaviors, combined with the variability in food security issues, focused community-based approaches may prove to be very effective.

⁷⁰ Susanne Hutter, Personal communication, Nov 2009.

Recommendations

- Identify an organization/institution at the national level with the technical skills and experience that will enable it to lead in advising the government on how best to enhance IYCF behaviors and to assist in coordinating the initiatives to achieve behavior change. A first step in this work may be to review the findings of analyses reported here, verify that trends aren't reflecting methodologic issues, and determine what additional analyses may be useful.
- To inform feasible intervention design, undertake research to develop a more thorough understanding of the determinants of knowledge, attitudes, practices related to infant and young child feeding, including related family dynamics in selected target groups. Explore childcare and support practices from family members, especially among poor households.
- To reverse the drop in exclusive breastfeeding coverage noted above, investigate the factors driving this change (including differences in measurement) and develop a feasibility study of specific behavior changes strategy/ies. This will likely include the need to strengthen and expand training programs on counseling skills to make these more available through both health centers and communities.
- Support current initiatives to introduce and scale up micronutrient powders and RUTF, provided that these efforts are monitored closely to identify and disseminate useful lessons.
- Explore potential interventions related to status of new mothers in households (daughter-in-law status). Although this is a long-term endeavor and one that is unlikely to demonstrate short-term impact, it is very likely of fundamental importance to facilitating the desired behavior changes.
- Undertake qualitative research to better understand how mothers can be better able to ensure good nutrition and health for their infants and young children.
- Develop and test community-based advocacy for simple messages to improve IYCF. This effort would require a simple message promoting food with higher energy density (such as add *_a* teaspoon of ghee' to your young child's food) or *_eachday* feed your child an extra meal' for infants and children 6-23 months of age. This may best be targeted to geographic areas or ethnic groups with demonstrated adequate food availability and affordability, but persistent undernutrition. Such an effort may include a mass media component, though evidence for mass media impact on behavior for IYCF is limited.
- Encourage / support all organizations working in this area to standardize the messages they are promoting to those determined by the CHD, and also the program indicators they are using/reporting to the current WHO revised indicators (2008).⁷¹
- Strengthen community-based identification and management of severe malnutrition as well as improve the quality of the hospital-based management.
- The scope of need for and the effectiveness of programs to manage severe malnutrition need to be clearly defined.
- Review and strengthen the nutrition-related components of the curriculum for pre-service training of doctors and other health workers.

⁷¹ World Health Organization. 2008, *ibid*.

V. Interventions related to food quality/ micronutrients

A. Vitamin A Supplementation

The history of Nepal's vitamin A supplementation program for pre-school children is well documented. Since its inception in 1993, the program has achieved high, sustained coverage in every district once the program is initiated. The program used a phase-in approach, adding 10-12 districts each year, reaching national geographic coverage in 2001. The program follows the WHO recommended doses for all children 6-59 months old, and uses a twice-yearly approach. There are several aspects to the program that are unique:

- The program is implemented through the government health system—with distribution done by Female Community Health Volunteers (FCHVs).
- The program was provided technical assistance, which included training, community-mobilization, monitoring and supervision, by a Nepali NGO, the Nepali Technical Assistance Group (NTAG).
- The program used a twice-yearly approach independent of NIDs from the beginning, stressing the importance of high coverage to FCHVs and health facility staff, and building awareness among mothers of the importance of vitamin A to child survival.
- The program used district level 'mini surveys' to monitor coverage—and allowed these to include other health program information to share costs.

The expansion of the VAS program was associated with a marked decrease in under-5 mortality. Although causality cannot be proven, one paper reviewed mortality with regard to receipt of VAS, suggesting a plausible association.⁷²

Current situation and trends

The program underwent a strategic review in 2007, in part to review issues of sustainability. The review included discussions at multiple levels, and a review of both coverage achieved, and the levels of support from NTAG, donors and the MOHP. Since the program had achieved high stable coverage in all districts for over 5 years, the review was designed to provide a mechanism for discussion and make recommendations for future planning. The recommendations at that time included:

- Increasing the MOHP financial contribution to the program, and expanding the capacity of the Nutrition Section to ensure adequate oversight, while continuing a scaled-down oversight role for NTAG over the following 5 years.
- Coordinate FCHV refresher training to ensure that these are useful for distribution of logistic supplies prior to the distribution, and to ensure that adequate training is done to ensure continued high coverage. Supervision capacity at the district level should be expanded, as NTAG supervision is phased out.
- Vitamin A capsules should continue to be supplied by UNICEF (from CIDA through MI), but the MOHP should procure for treatment and post-partum programs, and begin to budget for pre-school child doses. Rapid withdrawal of external support for capsule procurement

⁷² Thapa S., Choe, MK, Retherford, R. *Effects of vitamin A supplementation on child mortality: evidence from Nepal's 2001 Demographic and Health Survey*. Tropical Medicine & International Health, Vol 10, No. 8, pgs 782-789, 2005.

was felt to potentially threaten the program—though the expectation is that the Government will take over procurement.

- District capacity for coverage surveys should be expanded, while the HMIS is strengthened so as to provide adequate district level coverage estimates.
- Mass media promotion should continue, and there should be an ongoing advocacy effort for senior Ministry officials to ensure continued support at all levels.

The overall vitamin A program includes several other elements, including high-dose supplementation of post-partum women within 6 weeks of delivery; clinical use of high dose supplementation for xerophthalmia, prolonged diarrhea, measles, and severe malnutrition; fortification of ghee (butter), cereals and cooking oil with fortificants including vitamin A; and promotion of vitamin A rich foods. In addition, based on new evidence, the government has a permissive policy on low-dose treatment of nightblind pregnant women, and is undertaking feasibility testing of supplementation of newborns.

Post-partum supplementation coverage has improved with increases in post-natal visits, reaching a reported coverage of nearly 50% by 2007. Exact figures on vitamin A in the treatment of measles, xerophthalmia, prolonged diarrhea and severe malnutrition, are derived from HMIS data, and provide a limited picture of coverage for these conditions.

Fortification remains a promising strategy for vitamin A deficiency, and may at some point prompt a review and reduction in the VAS program. Fortification is mandatory for vegetable ghee (hydrogenated fats), and voluntary for cooking oil. There is little known about the effectiveness of the fortification of vegetable ghee and vegetable oil is not being fortified.⁷³ As early as 1997, a feasibility study found that about 75% of urban households and 43% of rural households consumed commercially produced branded vegetable oil in Nepal,⁷⁴ and these figures are likely to be increasing with the market changes Nepal is experiencing. Flour is also fortified with vitamin A, as well as with iron and folic, and this is described below in Part D of this Chapter.

Gaps in information and evidence

The major gap for the VAS program for 6-59 year old children is in understanding the degree to which the program is vulnerable to changes in the FCHV program, in MOHP commitment to VAC procurement in the future, and to loss of momentum following a decade of well-deserved global attention for this very successful program.

Both the post-partum and newborn VAS programs have suffered from the questions raised about their efficacy. In 2005, CIDA interpreted emerging global evidence on postpartum dose negatively, and no longer provides capsules for post-partum dosing. The MOHP does so, but the program may no longer be seen as a high priority. Similarly, in spite of robust evidence in Asia for newborn dosing, questions have been raised by the recent WHO Consultation. The feasibility modeling will provide the Ministry with an optimal delivery method, but newborn dosing may not be expanded rapidly until there is clarification from WHO.

⁷³ Maharjan, personal communication

⁷⁴ New ERA. A fortification feasibility study for the control of micronutrient deficiency II. Consumption and market study of food vehicles, 2002.

For treatment doses, the main gap is in the quality of information on coverage. HMIS does record cases justifying VAS treatment, although these represent cases that seek care at health facilities. Many of these cases receive VAS, but recording provision is irregular.

The main gap with fortification is again with evidence of market penetration and household use. As rural areas are increasingly using centrally produced foods, fortification may be able to make a greater contribution to required daily intake of a number of micronutrients, including vitamin A. With this transition, it may be possible to modify the VAS program, if needs are met through the diet.

Recommendations

The overall program is continuing to evolve. District capacity has expanded, and FCHVs have continued to achieve high coverage with each twice-yearly round for children. The MOHP has gradually increased their contribution, and in spite of political disruption, the program for children remains relatively stable. The following actions are recommended:

- The MOHP should establish permanent mechanisms to oversee the VAS twice-yearly program to ensure sustained high coverage. Declines in coverage should prompt an immediate investigation to determine the strength of logistics supply, supervision and FCHV activity.
- HF staff training should continue to emphasize VAS in the treatment of measles, xerophthalmia, prolonged diarrhea and severe malnutrition. Districts should consider periodic audits to ensure completeness of recording of VAS doses for these conditions.
- The Ministry of Industry publishes annual report ‘Industrial Statistics’ which reports production of key products including wheat flour at roller mills. In the case of mandatory fortification of wheat flour at roller mills, this report will provide some information on production and distribution of fortified wheat flour. The Government should establish a mechanism to monitor the production and distribution of fortified foods to provide evidence on the evolving contribution of fortified foods to adequate daily intake for each nutrient.

B. Maternal anemia control

Maternal anemia is highly prevalent throughout South Asia and is the second most common cause of maternal mortality in the region.⁷⁵ The *Lancet* Series recommends universal maternal iron folic acid supplementation (IFA) as an intervention to be implemented in all high-need countries.

Current situation and trends

The Government has had a longstanding policy to address maternal anemia as part of a national anemia strategy. The Nepal maternal IFA program is now well established with coverage higher than 80% and compliance more than 70% in program areas.⁷⁶ The Government, UNICEF, MI and WHO initiated the Integrated Iron Intensification Project in 2003 in 5 districts and through effective collaboration, scaled up this program systematically to 52 districts by 2008. The program is on track to achieve full national coverage in 2010. Nationally, the coverage

⁷⁵ Kahn KS et al. WHO analysis of causes of maternal death: a systematic review. *Lancet* 2006; 367:1066-74.

⁷⁶ Pohkarel RK et al. Nepal drastically reduced the prevalence of anemia in pregnant women in the past seven years- from 75% to 42%. Presentation at Micronutrient Forum, Beijing China, may 2009.

of IFA supplementation in pregnant women increased from 23% in 2001 DHS to 60% in 2006 DHS. The prevalence of maternal anemia decreased from 75% in 1998⁷⁷ to 42% in the 2006 DHS and this decrease may well be attributable in large part to the successful implementation of this program.

The standard WHO policy of supplementing pregnant women daily with IFA during pregnancy and the postpartum period has been ‘on the books’ in Nepal for a long time, as it has been in most other countries. As in most other countries, the program was not implemented as designed. The usual barriers to IFA programs were common -- IFA stock-outs, health staff and community members not understanding of the importance of either anemia or of iron, not addressing all causes of anemia. The Iron Intensification Program focused on addressing these barriers.

The causes of stock-outs were identified and addressed, evidence-based communications strategies increased awareness and knowledge of anemia through multiple channels, FCHVs were trained by NTAG, and communities were mobilized. One innovative strategy implemented in some districts involved using schoolchildren as community advocates and to identify pregnant women to assist FCHVs in their role of ensuring all pregnant women attended antenatal care and in counseling them in complying with IFA supplementation. These efforts appear to have changed the perceptions about IFA, as evidenced by the improvement in demand and compliance.

The program has gone beyond only IFA. Intestinal parasitic worms have been identified as a major cause of maternal anemia in Nepal and the program increased deworming by the third trimester from <5% in 2001 to >50% in 2006. Promotion of fortified flour (produced in roller mills in the country) has increased intake of iron in the population consuming this flour, not just in pregnant women, although little is known about coverage. Fortification of flour through chakki mills has been initiated⁷⁸ and an innovative approach to achieving financial sustainability of this approach is being studied. Lastly, intensive monitoring and supervision has been effectively established, but part of the business strategy needs to be to find systems for monitoring that are more cost-effective.

The Iron Intensification Program provides a further example of how in Nepal, an important public health intervention has been scaled up to national coverage through successful collaboration between Government, donors, and local NGOs. The availability of a community-based platform provided by motivated FCHVs was critical to the success of this program.

Gaps in information and evidence

The program is on track and there seem to be no gaps in information. A substantial reduction in maternal anemia prevalence was observed in the 2006 DHS survey and the program probably played an important role in this reduction, but as yet scientific evidence of this link has not been presented. It is currently proposed to introduce calcium supplementation for all pregnant women in Nepal and there is a lack of information about how this will impact the IFA program, both from the operational point of view (adding another daily supplement), and also from the biological point of view (whether the calcium will affect the absorption of iron). There is a need

⁷⁷ MOHP, Nepal micronutrient status survey 1998. Ministry of Health, Child Health Division, HMG/N, New Era, Micronutrient Initiative, UNICEF Nepal, and WHO. Kathmandu, Nepal, 1998

⁷⁸ MOHP. Five year plan of action for the control of anaemia among women and children in Nepal 2062/63-2066/67 (2005/06-2009/10), 2005.

of focus on monitoring of coverage and compliance in districts where the program has already implemented is crucial.

Recommendations

The maternal iron supplementation program in Nepal has been developed with an evidence-based approach and implemented in an impressively systematic way that is currently on track to reach effective national coverage. We are aware of very few other countries in the world who have achieved this success. This achievement can be expected to have a significant impact on maternal and perinatal mortalities. The following actions are suggested:

- The National Anemia Strategy may need review and updating to reflect current successes.
- The current direction and progress of the program should be maintained until national coverage is achieved.
- The MOHP should establish permanent mechanisms to oversee the maternal IFA and deworming program to ensure sustained high coverage. Causes of any reported reduction in program coverage using protocols that would be similar to those for the VA supplementation described earlier should be immediately implemented.
- There should be a regular IFA supplementation program review activity, integrating with other programs.
- The MOPH should develop an evaluation protocol to estimate to the extent possible, the role of the maternal IFA program in reducing the prevalence of maternal and young child anemia, as well as reductions in maternal and perinatal mortality. Adequate data for this evaluation will likely be provided in the upcoming 2010 DHS. As a preliminary step for this, an analysis of existing DHS 2006 data could determine if areas covered by IFA program at the time of this survey had substantially lower prevalence than areas not covered.
- Financing for the program needs to be more sustainable (from regular government/SWAp /pooling partner budgets). At the moment the training is largely paid by MI, UNICEF and some other development partners.
- A review of opportunities for fortification of foods with iron and folic acid in Nepal should be conducted. One existing possibility that could be seized in the short-term is to change the subsidized salt that is provided to remote areas from the current simple iodized salt to a double-fortified salt (iron and iodine). This is a well proven technology that is being introduced in several countries and is available in India where the Nepal salt is sourced. Costs for such double fortification currently make broader market distribution difficult without subsidy.

C. Interventions to reduce anemia in children less than 24 months

Almost one in two Nepali children aged 6-59 months are anemic.⁷⁹ But far higher proportions of younger children are affected (>80% in infants 6-12 months, >70% in children 12-23 months). The very high prevalence in younger children is particularly important because the adverse effects of that anemia in the younger groups carry greater consequences for those

⁷⁹ 2006 DHS

affected, their families and the future health and economy of the country as well. Anemic children, particularly those less than 24 months of age, are more likely to suffer delays in their cognitive development that may be irreversible. Increasing evidence suggests that developmental delays in early childhood result in adverse effects through the adolescent years. These adverse effects reduce the potential for children to learn in school and so decrease the benefits of investing in education.

The interventions addressing young child anemia recommended by the *Lancet* Series for all situations included promotion of breastfeeding and improved complementary feeding, vitamin A supplementation; and for selected contexts, deworming, iron supplementation and fortification (although with young children eating so little, they are unlikely to benefit from staple food fortification) and bednets where malaria is a problem. The *Lancet* Series does not endorse supplementation or other programs for school-age children because the greatest impacts of all nutrition interventions are found in the younger age groups of the ‘window of opportunity’.

WHO policy is to provide daily iron supplementation, syrup is recommended, to children 6-24 months at risk of anemia, but to our knowledge, no program anywhere in the world has been able to implement such a program successfully at scale. As described in Section IV on complementary feeding, the introduction of micronutrient powders (MN Powders) such as Sprinkles™ and low-cost fortified and blended complementary food in Nepal are promising options to address young child anemia.

UNICEF/WHO/WFP policy recommends distribution of micronutrient supplements in critical or emergency situations, and though not an emergency intervention for WFP in Nepal, their distribution includes children 6-59 months. The process of distribution of the powders is being monitored closely and the impacts measured. The information from this evaluation study will provide useful information to inform policy development on these products, and will be able to determine the relative benefits of micronutrient powders for children over 6 months of age.

Gaps in information and evidence

Because these micronutrient powders are a relatively new product, little is known about how well they will be accepted in Nepal. For WFP-activities, children aged 6-59 months in households participating in the food/cash for asset programme are provided with micronutrient powder to complement the food basket of rice and pulses.

Questions to be answered include issues of formulation, production, availability, packaging, price, and the balance between public and private distribution channels (e.g., through health facilities, community-based micro-credit, and/or private sector).

Recommendations

Nepal’s IFA program and deworming appear to be successful in addressing anemia in women. Further work is needed to better understand the dynamic for anemia in young children. The following suggestions may be useful in strengthening these programs further:

- Micronutrient powders provide a useful option for intervening to reduce micronutrient deficiencies. As with any single product interventions, MN powders should be positioned not as a stand-alone program, but as one component of a comprehensive program including counseling on feeding behaviors, hygiene and sanitation, and other child health interventions such as deworming, diarrhea treatment, VA supplementation,

immunization. The large pilot being currently implemented by WFP will provide useful operational information and should be followed closely so that the information provided can inform future programs using these products. Of particular interest should be determining whether or not children over 24 months should be targeted in these programs. Further work may be needed to explore optimal delivery mechanisms.

- Further evaluation is needed to assess the impact (and by implication the cost-benefit) of other interventions directed toward anemia in children. While the impact of deworming of children 12-59 months was demonstrated during the introduction of deworming with VAS twice-yearly distribution, such evaluation has not been done for other supplement or deworming efforts, or for malaria efforts in malaria endemic areas.
- The Child Health Division should include in their information management systems the ability to track the implementation and evaluation of all initiatives that introduce these products and collate and disseminate programming experiences and results.

D. Fortification

Fortification is an important component of all comprehensive nutrition programs complementary to supplementation – each providing advantages in certain contexts. In improving the intake of vitamins and minerals in deficient populations, fortification provides small amounts of nutrients daily, avoids the need to change eating behaviors, uses a sustainable delivery mechanism through the private sector, and for populations consuming adequate quantities of centrally processed foods, can achieve high coverage at relatively low cost. There is strong evidence demonstrating the effectiveness of large-scale programs adding iodine to salt, vitamin A to sugar, and folic acid to wheat flour. Large-scale fortification of flour with iron has been shown to be effective when absorbable forms of the mineral are used.

Fortification is not a panacea, however. For target populations who are not consuming, or consuming little, centrally processed staples or condiments, alternatives to fortification may provide a more cost-effective and feasible option. Young children are one such population. Success with fortification may depend on the market structure, including the number of producers and distribution of market share. Small-scale fortification is feasible, but presents difficulties in assuring adequate quality assurance. Where there are hundreds of small factories, the economies of scale available in large factories are likely to be lost and the responsible government unit may have difficulties in monitoring and enforcing compliance standards. Small-scale community-based fortification may work well as a social program when supported by external sources of funds, but has not yet been shown to be viable as a market-driven program.

Current situation and trends

The national universal salt iodization (USI) program is well described in NPAN '07 as “on track”. The Nepal IDD status survey 2005⁸⁰ reported 95% of households using salt with some iodine, 58% using adequately iodized salt, a median urinary iodine excretion in school age children of 188 microgram/l; and the “virtual absence of visible goiter”. One known localized problem is that some unfortified salt is brought into Nepal across the borders from India and China. Reasonable efforts are in place to reduce this trade.

⁸⁰ Nepal Iodine Deficiency Disorders Status Survey, 2005 (Revised Print). Kathmandu, Nepal. Ministry of Health and Population, Child Health Division, The Micronutrient Initiative, and New ERA.

The Micronutrient Initiative (MI) has lead efforts to fortify flour. An MI funded study undertaken in 2000 by New Era⁸¹ explored the feasibility of fortifying biscuits, instant noodles, and wheat flour. This study provided high quality, widely representative data on consumption of these foods in 6 districts across 3 ecological zones. The survey found 50% households in urban areas and 22% in rural areas consumed some amount of commercially processed wheat flour directly or indirectly (i.e., through biscuits and instant noodles) every day. With the rapid urbanization and change of food habits, it is likely that the use of commercially processed wheat flour will continue to increase.

Of the three potential vehicles, wheat flour consumption was highest, but >95% of this flour was processed locally in small mills. This finding is important, as a large-scale fortification program would need to be delivered by thousands of community-based mills. Such a program was recommended in 5-year plan for anemia⁸² and has been successfully introduced with financial support from MI. This program has won recognition for innovative use of water powered community-based mills. Ensuring adequate quality control of the fortification process being undertaken in many small mills is a major challenge for this program. A further important and as yet unresolved operational issue is building the capacity of the DOAC DFTQC to adequately monitor this program.

The Ministry of Industry publishes annual report ‘Industrial Statistics’ which reports production of key products including wheat flour at roller mills. Because fortification of flour at roller mills is mandatory, this report should provide useful information on production and distribution of this product.

Changes in food habits related to centrally produced foods may have some negative impact on local food production and on allocation of household funds for food. These changes, particularly if endorsed or promoted by the Government, need to be monitored closely to reduce these potential problems, and maximize the potential benefit of fortification. Several manufacturers in Nepal are producing a low-cost blended complementary food.⁸³ This product has high nutritional value for 6-23 month old children but its commercial marketing is reportedly restricted by existing legislation regulating the marketing of breast-milk substitutes. As a result, the availability and use of these products are limited. A social marketing campaign was developed and implemented in 2007 through a joint effort of MOHP, MI, WFP and PSI. This public sector nutrition education campaign has achieved only limited impact in terms of consumption. The possibility of linking promotion of this product to the Government’s current pilot of a conditional cash transfer program in the Karnali zone could be usefully explored.

As noted above, vegetable ghee must be fortified, and cooking oil is voluntarily fortified with vitamin A, although comprehensive data on distribution, use and quality assurance are lacking.

Gaps in information and evidence

With the USI program performing well overall, there is a need to determine the amount of non-iodized salt coming across the borders with India and China and the extent to which this is displacing iodized salt. The effectiveness of various promotion efforts should be assessed,

⁸¹ A Fortification feasibility study for the control of micronutrient malnutrition-II: Consumption and market study of food vehicles. Prepared for Micronutrient Initiative, Kathmandu, Nepal, New Era (undated).

⁸² MOHP. Five year plan of action for the control of anaemia among women and children in Nepal 2062/63-2066/67 (2005/06-2009/10), 2005.

⁸³ Maharjan, personal communication.

including the UNICEF 2-child logo. The monitoring and regulation of the fortification initiatives is the responsibility of the Department Food Technology and Quality Control (DFTQC) of Ministry of Agriculture and Cooperatives. Further information is needed on factory-based quality assurance procedures and data on enforcement at retail level for fortification of all vehicles (salt, cooking oil, flour, vegetable ghee). Given the limitations in quality assurance monitoring, the capacity of regional laboratories of DFTQC should also be reviewed.

A further gap is understanding how changes in food consumption patterns, particularly in a time of severe shortages, impact consumption of commercially processed staples such as flour and cooking oil and the percentages of the respective markets that are fortified.

Recommendations

Fortification is recognized as playing a vital role in a comprehensive strategy to address undernutrition. With increasing urban populations it is likely to play an increasing role and mandatory fortification of wheat flour with iron, folic acid and vitamin A at roller mills will give this important public health intervention and important boost. At the same time, it is important to recognize the limitations and difficulties of small-scale efforts, in particular the need to assure quality and the capacity of the DFTQC to monitor thousands of these operations and the cost-benefit losses with economies of scale.

E. Food Safety

Food safety in Nepal is the responsibility of the DFTQC of the MOAC and the history of this agency is described in Annex 2 of NPAN'07.⁸⁴ This is the sole government agency responsible for implementing legislation to ensure safety in food and also animal feed supplies. In performing its mandate, the DFTQC monitors food quality/contamination/nutrient value at all stages of the processing and distribution steps at a limited scale, which is an issue of concern. Food safety may be an important intervention to reduce the risk of infection from contaminated food, and to limit unsafe food production practices. However, with the high rural population with limited use of centrally processed foods, and the limitations of the food safety inspectors to service rural areas, the overall impact on undernutrition from such interventions is likely to be low at this point in time.

⁸⁴ NPAN'07 Annex 2 page 35.

VI. Interventions related to food absorption and utilization at the individual level

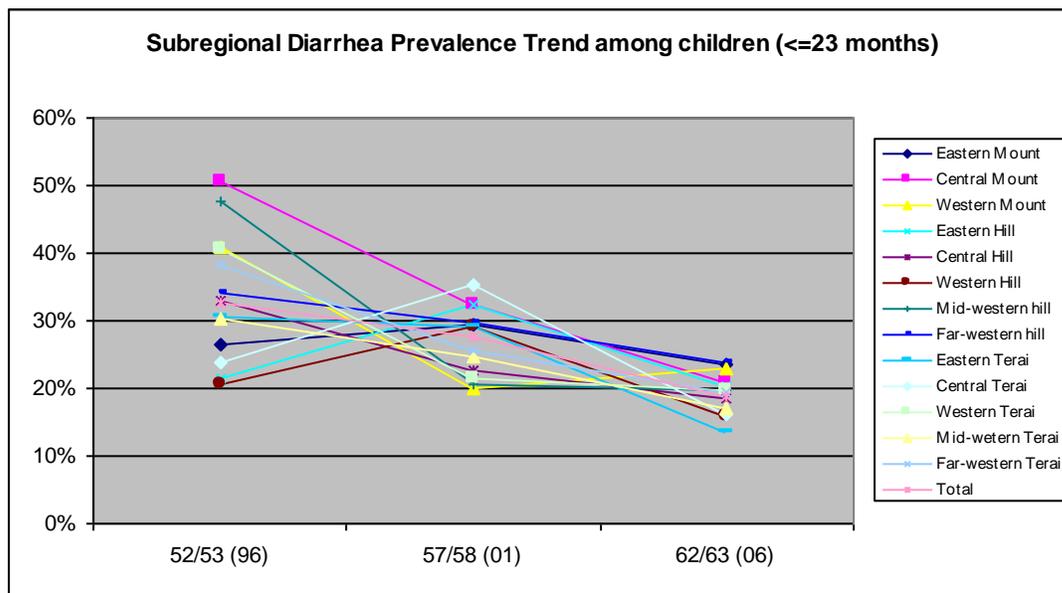
A. Treatment of infection

Current situation and trends

Over the past decade, Nepal has experienced a number of demographic, sociologic and economic changes that have had both positive and potentially negative effects on child health. Improvements in health service delivery and facility logistics supplies, implementation of community-based programs, and refinement in the technical aspects of services provided have resulted in greater use and benefit from these services. These factors, in addition to reductions in rates of population growth, have contributed to the marked reduction in under-5 mortality. Similar improvements in basic water and sanitation have reduced the risk from the cycle of infection and child frailty that was so prominent in much of rural Nepal in the past. These changes have been accompanied by an increasing income disparity that is likely to have a negative impact on health indicators over time, if not corrected. The Government's renewed focus on poverty alleviation and lower SES populations and vulnerable groups reflects concern for this growing disparity.

There is limited information on overall trends in the prevalence of infection. According to DHS data, diarrhea 2-week point prevalence has declined over the past decade. Pneumonia prevalence shows similar results.

Figure 7: Trends in diarrhea prevalence



Trends from HMIS data for pneumonia and diarrhea, based on facility visits, show a stable or slightly increasing estimated annual incidence (perhaps reflecting greater facility use), but a marked decline in severity.

Figure 8: Trends in severe dehydration among diarrhea cases

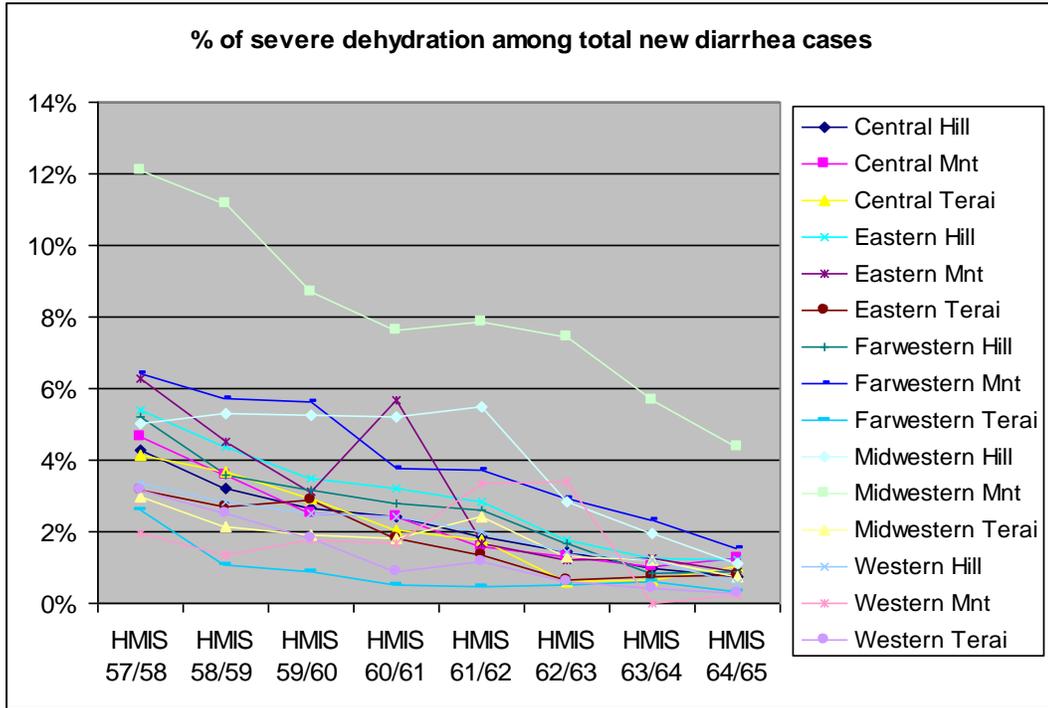
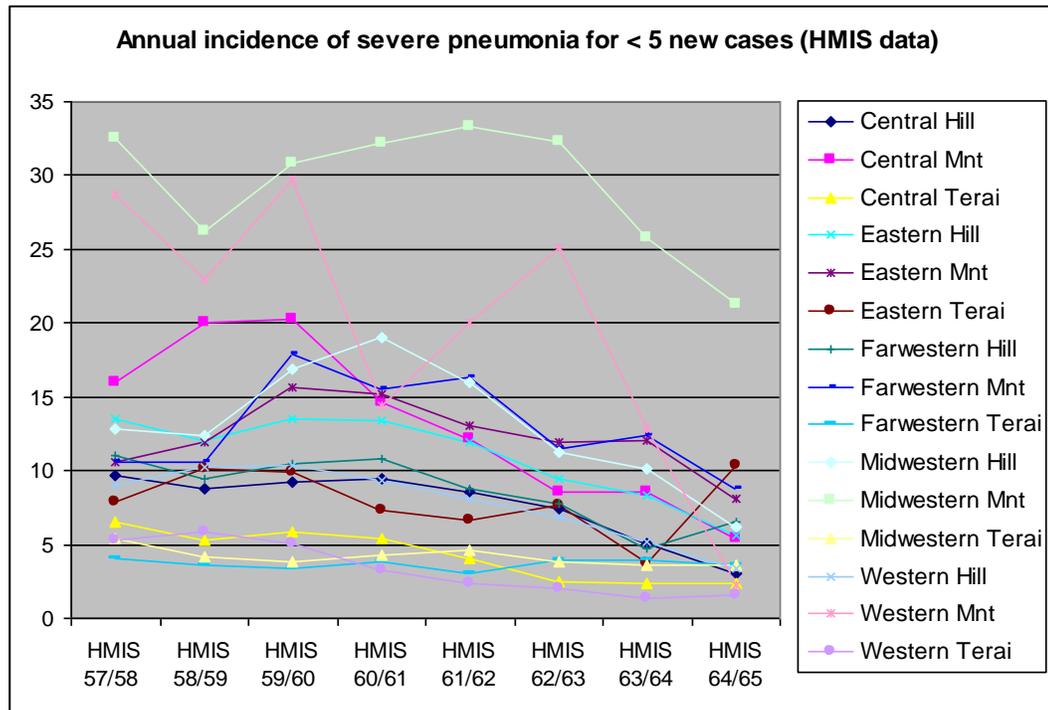


Figure 9: Trends in incidence of severe pneumonia

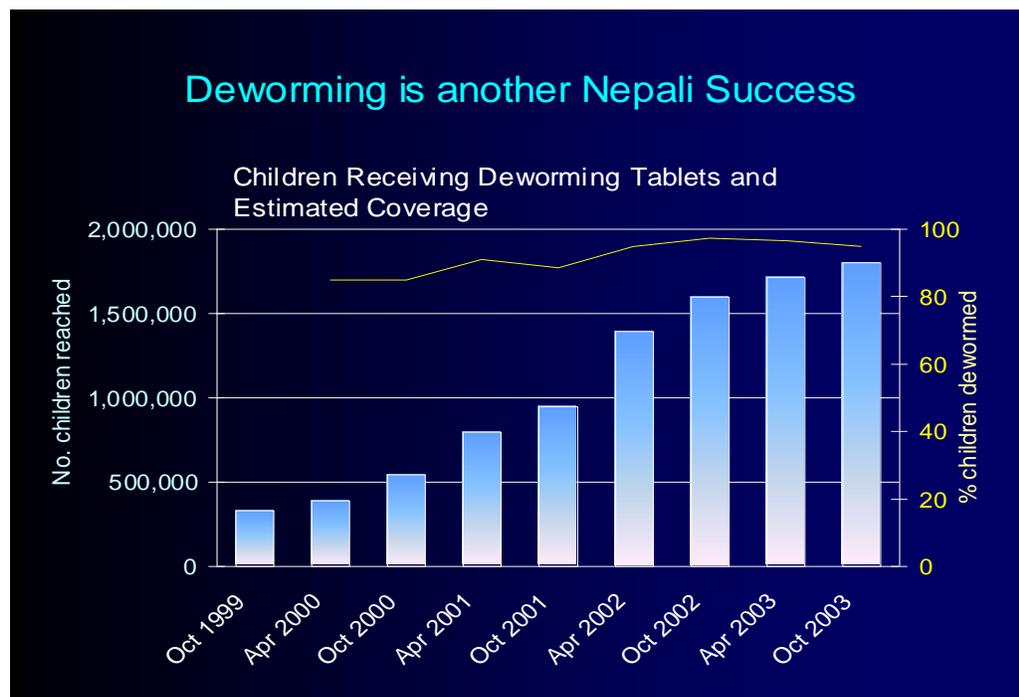


This evidence suggests that the incidence of two most common infections affecting younger children may be declining and thus making a smaller contribution to undernutrition. These improvements likely reflect the initiation of community-based management of pneumonia, community-based ORS distribution, and the more recent introduction of zinc in the management of episodes of diarrhea. The MOHP in Nepal was one of the first in the world to adopt and implement the revised WHO/UNICEF recommendations for the treatment of diarrhea that were published in 2004. With donor support, the combination zinc and ORS treatment has been introduced in 30 districts through both public and private sector channels.⁸⁵ Local pharmaceutical manufacturers quickly recognized the marketing opportunity and at least have produced and are marketing high quality and affordable dispersible zinc tablets. Extensive use of mass media promoting the new treatment has been critical to the success of the introduction, although information on coverage is limited. In addition, the twice-yearly VAS has likely reduced the severity of infections, and use of vitamin A in the treatment of xerophthalmia, prolonged diarrhea, measles, and severe malnutrition has likely reduced the severity of these conditions—thus again lessening the impact on nutritional status. Except for facility-based treatment, community-based interventions have been very successfully implemented through the FCHV program. Several evaluations of this program, as well as evaluations of coverage achieved through community-based programs have almost universally been positive.

In addition to these illnesses, progress has also been made with parasitic disease, primarily with intestinal helminthes. Deworming for children 12-59 months was added to the twice-yearly vitamin A distribution in 1999, and phased in to reach all districts by 2003. Once established in a district, deworming coverage is high, and that high coverage has been sustained since reaching full scale. The Government currently procures all needed deworming tablets. The program has been associated with a reduction in anemia prevalence and worm burden, according to surveys done by UNICEF in 2003. The successful high coverage for this program is likely to have had a significant impact on the ability of dosed children to adequately absorb and utilize the food consumed.

⁸⁵ Pouzn/USAID. Introducing zinc through the private sector in Nepal for the treatment of childhood diarrhea: results and lessons learned. Pouzn Country Brief. April, 2009.

Figure 10: Impact of deworming on anemia



(From presentation made by UNICEF, 2003)

Deworming is also done presumptively for pregnant women. While there is little evidence on the coverage or impact from this intervention, coverage is likely to have improved with the improvement in antenatal care visits, which have increased from 42% to 76% over the last decade.⁸⁶ Presumptive treatment for malaria is also done for pregnant women living in malaria areas of the Terai, but coverage is not known.

Children and mothers are exposed to, and affected by a wide range of other diseases, including tuberculosis and HIV/AIDs. Progress has been made with these diseases as well, accompanying the overall strengthening of health facilities and logistics supply.

Gaps in information and evidence

Evidence from DHS and HMIS reports suggest substantial improvements in the management of many infectious diseases. DHS data analyzed by sub-region suggests not only reduction in prevalence, but narrowing of the differences between sub-regions. The HMIS data, on the other hand, continues to show some variation in incidence across districts—likely reflecting a variety of differences in SES, ethnicity and access to basic services. Further secondary analyses of these datasets may help understand the contributions to the variation that remains between districts and sub-regions.

The declines in severe pneumonia and severe dehydration from diarrhea suggest that treatment programs are working. While there may be some selection bias for use of health facilities, community-based services provided by FCHVs have been shown to be equitable—with vulnerable populations being served in proportion to their distribution. It would be useful to

⁸⁶ DHS 1996, 2001, 2006.

confirm that the programs noted above have reached the more vulnerable populations in all districts.

Community-based pneumonia management is based on passive case detection—mothers are expected to contact the FCHV when their child is sick. Initiation of this program has resulted in a dramatic increase in the proportion of expected cases (based on prevalence) that receive treatment of a known standard. It is possible that further community-mobilization would increase these rates further. Community-based management of diarrhea, and distribution of ORS through health facilities has achieved reasonable use rates—41% of children received ORS or increased fluids for an episode of diarrhea according to the DHS 2006. While this rate was higher for higher SES, there may be a limit to the percent of episodes treated with ORS because of mothers' assessment about the severity of the episode. Further understanding of this assessment, particularly in vulnerable populations would be useful. The introduction of zinc for the management of diarrhea is relatively recent, and further information is needed on perceptions and use. Further work is also needed to ensure adequate feeding during and after episodes of infection, particularly diarrhea.

Addition of deworming to the VAS distribution has resulted in excellent coverage, and significant impact—as assessed in 4 districts in 2003. It seems likely that this impact has increased, in the face of sustained high coverage. The key issue facing the deworming program is sustainability—which currently does not seem threatened. Further evaluation of the program of deworming in pregnancy, including the potential impact on anemia, would be useful.

HIV/AIDs and TB are ongoing concerns in Nepal, and the nutritional implications of these epidemics are well known. Nutrition counseling is included with the Nepal HIV/AIDs programs, and to a lesser degree with TB programs. The quality has not yet been evaluated to the knowledge of the authors. A national strategy that incorporates nutrition concerns is being developed. It would be useful to have further information on the impact of these programs, particularly on mothers and children.

Recommendations

Further work can always be done on the management of infections. However, for the major infections affecting children, much has been done, and currently the key programs do not have major problems with implementation. The following general recommendations are suggested:

- The MOHP and partners should support scaling up of zinc in the management of diarrhea to all districts, and provide adequate monitoring to assess coverage and compliance achieved. Achieving high coverage for diarrhea episodes in children is likely to reduce the impact of those infections, and thus contribute to improved nutrition.
- All related programs should strengthen messaging regarding appropriate feeding during and after infection, including strengthening the IMCI training and counseling efforts.
- Monitoring for provision and use of deworming during pregnancy should be strengthened to determine coverage and coverage trends, and potential association with reduction in anemia prevalence.
- Mechanisms should be established to improve communication between programs on the nutritional impact from other infectious diseases (malaria, TB, HIV/AIDs) and to improve efforts to address the nutritional consequences of these and other diseases.
- Discussions on the current and future role of FCHVs, should include review of their role in activities that have a direct impact on nutrition (VAS, IFA, deworming, nutrition counseling,

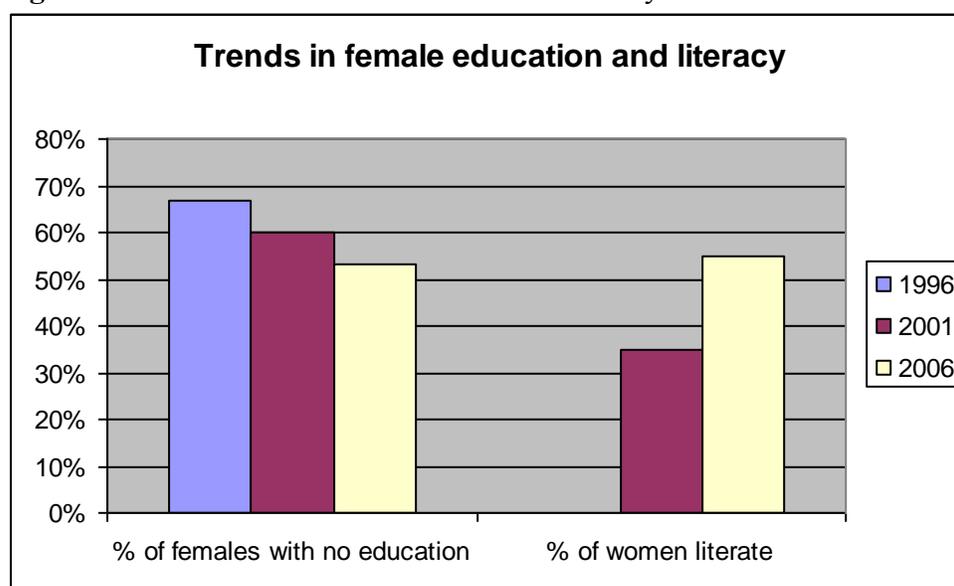
diarrhea and pneumonia), and whether there are other activities that could strengthen the Government's effort to improve the management of infection.

B. Prevention of infection

Current situation and trends

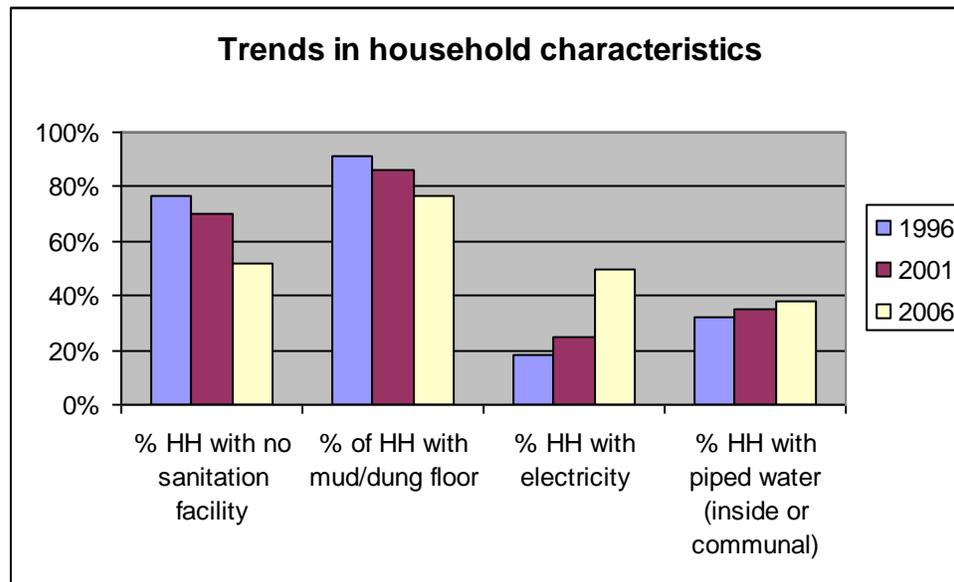
Nepal has a legacy of Government and partner efforts to improve basic sanitation, particularly in rural areas. In addressing the MDGs, the Government of Nepal has a stated goal of provision of sanitation services for all by 2017.⁸⁷ However, in spite of these goals, and inclusion of basic hygiene as a right in the interim constitution, there are significant funding shortfalls for achieving these goals. Thus, lack of clean water, and lack of basic waste disposal, combined with family proximity to livestock, likely continue to contribute greatly to the risk of infection. Other factors, including women's education, rural electrification, roads, and overall economic development have reduced the relative isolation experienced by many rural villages. Basic household amenities have changed over the past decade, as evidenced by DHS reports.

Figure 11: Trends in female education and literacy



⁸⁷ From: Dahal D. *Handwashing with soap and water saves Rs. 3.5 billion*. NGO Forum on Water and Sanitation (<http://www.ngoforum.net>), 2009.

Figure 12: Trends in selected household characteristics



The Government has also undertaken several other preventive measures. In malaria areas, there has been a significant effort to promote the use of insecticide treated bednets. While this only affects those living in malaria endemic areas, nearly three quarters of the Nepal population lives in such areas. Similarly, there have been efforts to reduce the risk of pneumonia by reducing the level of indoor smoke from cooking and smoking. These efforts, combined with changes in cooking fuels (from wood to kerosene), and increased use of stoves rather than open fires in households, have likely decreased the risk of lung disease, including pneumonia.

Finally, in addition to basic water and sanitation measures noted above, there has been a renewed effort to promote handwashing through many programs. A study in Nepal showed that handwashing by birth attendants and mothers reduced neonatal mortality by 41%.⁸⁸ The new maternal and neonatal strategy includes a focus on handwashing related to deliveries and neonatal care. Similarly, handwashing is being promoted in schools, and through community-based messaging. These efforts, if successful, should reduce the risk for diarrheal disease further. To date, there have not been evaluations of such programs with regard to coverage and impact.

Gaps in information and evidence

In the past, studies were done on the cultural acceptability of basic water and sanitation efforts. With these efforts progressing slowly, it would be interesting to have updated information on current beliefs and practices. This would be of particular interest with regard to use of latrines in rural areas.

Similarly, the current promotion of handwashing may face some cultural hurdles, and it would be helpful to have more information on related beliefs and their geographic and ethnic

⁸⁸ Rhee V, Mullany LC, Khatri SK et al, *Impact of Maternal and Birth Attendant Hand-washing on Neonatal Mortality in Southern Nepal*, Arch Pediatr Adolesc Med. 162(7): 603–608, July 2008.

distribution. Filling these information gaps would be helpful in developing revised behavior change efforts.

Recommendations

Given the current figures for basic water and sanitation, a great deal more can be done to reduce the risk of infection from unprotected water sources, and poor sanitation and waste disposal. However, the geography and rural nature of Nepal, coupled with cultural and religious belief systems, make change in this area slow. Progress is being made, and a number of steps may contribute to further reducing risk by preventing infection. Suggestions include:

- Strengthening the link between various ministries, including the Ministry of Local Development and the Nutrition Section. Strengthening this link helps to underline the value and cost-benefit of these efforts with regard to nutrition improvement. Messaging by multiple engaged Ministries on nutrition improvement may help with behavior change efforts.
- Strengthening the coordination of efforts to promote handwashing—across multiple sectors and programs may help increase this important (and *Lancet* endorsed) practice. A report on progress to date, and the methods used to change handwashing behavior would be useful.
- It may be useful to design and implement a feasibility study of handwashing in 1-2 districts, to help understand the barriers to this practice, and ways to overcome them. A well designed and monitored feasibility study could provide better information for guiding scaling up across multiple ministries.
- Basic research is still needed on interventions to reduce indoor smoke pollution (as is being planned by NNIPS). Such studies should strengthen the evidence base for fundamental interventions, and help the Ministry with design of interventions.

VII. Strengthening systems supporting nutrition overall capacity building

A. Ownership, stewardship, strengthening of institutions

The Nutrition Section of the Child Health Division of the MOHP is tasked with oversight of nutrition planning and programming. Many of the successful approaches have been established by this Section. However, the capacity within the Section is limited, and there are few dedicated nutrition staff. Thus while ownership for nutrition is well established, with a growing interest in other sectors, capacity needs to be strengthened. The evolving Global Action Plan notes that “Evidence from a seven-country study”⁸⁹ showed that leadership and capacity, rather than a lack of financial resources, was the major obstacle and lifting it requires attention to both mid-level actors and their effective organizational relationships. Two things are needed:

- Expert and qualified public health nutritionists supported by an adequately trained staff team (for leadership and programming), and
- Administrative positioning of nutrition, for example within the Ministry of Health at a level equivalent to the Expanded Program of Immunizations (EPI) with adequate staffing and operational budget and a national multi-sectoral coordination mechanism.”

Strengthening Nutrition Section capacity

The current momentum for a more comprehensive strategy for nutrition, and the historic context for nutrition programming justify an investment in capacity at multiple levels. At the national level, the Nutrition Section has limited full-time staff, some of whom have been supported by partners. There is a nutrition specialist within the Ministry of Agriculture, and several senior Ministry officials with nutrition training. However, the total manpower dedicated to oversight of nutrition at the national level is distinctly limited.

At the district level, there is a staff member assigned to nutrition programs, although they may not have a strong nutrition background. Many facilities suffer from chronically unfilled positions, thus having fewer staff available to be assigned nutrition responsibilities. Furthermore, nutrition staff are managed as general staff, sharing responsibilities for the multitude of programs and services provided by health facilities. Thus, the outreach and interaction with community workers that is possible by nutrition staff is again very limited.

The current nutrition activities implemented directly by the MOHP are extensive. Several require attention to logistic supplies managed outside the normal LMIS system (e.g., vitamin A capsules). Others have significant behavior change components that require review and improvement on a regular basis. Others, such as fortification, require interaction and oversight of independent parastatal or private enterprises, working across sectors. Experience with other programs clearly demonstrates that for community-based efforts, supportive supervision is critical to sustain program momentum—and many nutrition efforts depend on community-based implementation.

These programs need greater human resources to sustain the achievements made. In addition, in order to establish nutrition thinking within other sectors, and to assist with ensuring that nutrition is considered in both policy and program implementation in these other sectors, further manpower is needed. These multisectoral programs need to be established, strengthened, and mechanisms developed to ensure communication and coordination across many sectors.

⁸⁹ World Bank financed, in Bolivia, Peru, Guatemala, Bangladesh, Vietnam, Pakistan and Uganda

Without adequate human resources to do this, addressing the multisectoral determinants of undernutrition is likely not possible.

Strengthening nutrition monitoring and evaluation

Nepal has several established monitoring systems that provide information relevant to nutrition. The HMIS provides information on staffing for each health facility level, and on a wide variety of related services statistics (such as antenatal visits and immunizations). It also captures a variety of nutrition indicators in a section dedicated to nutrition. These include:

- Weight-for-age among children < 3 years weighed at health facilities; including % malnourished (< 3 SD for new cases and revisits).
- Vitamin A used for treatment
- Post-partum vitamin A
- Deworming in children 12-59 months
- Iron/folate distributed to pregnant women

In addition, the HMIS provides information on infections, Safe Motherhood, morbidity for a variety of conditions, and hospital admissions. This system provides a good foundation for nutrition monitoring, although it reports only on facility visits. The HMIS is being revised to capture the efforts of community workers, including FCHVs.

As noted earlier, this information is complemented by periodic surveys, including the DHS and NLSS. The DHS reports on many nutrition indicators and determinants—as reviewed in the sections above. Secondary analysis of DHS information is not commonly done, and has potential to clarify the variation in determinants and how this variation affects nutritional status. The reasonable correlation between DHS trends and HMIS trends for weight-for-age suggests that more can be gleaned from further analysis of HMIS data as well. However, the capacity for this analytic approach is limited again—both by staff time and expertise.

A further valuable source of information on nutrition and factors affecting it will be provided by the NLSS III survey. The sampling frames of this survey and that of components of the census (proposed to be undertaken in the near future) are being designed to allow subsequent linkages. This will provide a powerful tool for analysis and targeting food security and nutrition interventions.

Some interventions within the MOHP have required special systems for monitoring. For example, FCHVs do not have a consistently reliable way to report their vitamin A distribution, and the program initially relied on ‘mini surveys’ to ascertain coverage. Currently, monthly meetings are used to record distribution, although these do not always happen, and the supervisory mechanism at the district level limits the ability to actively visit FCHVs and collect these data. Similarly, the HMIS has no capacity to report household use of iodized salt—thus this critical indicator relies on DHS or other survey data.

More related to the Agriculture Sector, the Ministry, with assistance from WFP, has a well-established sentinel monitoring system for food security. This impressive system tracks production, food prices, distribution and nutrition indicators, and provides the Government with excellent information on areas at risk for food insecurity. One component includes a quarterly survey of 10,000 households in areas targeted for food insecurity (see Section III C). The program has undertaken small-area poverty estimation down to the Ilaka level, and produces

reports on the food security situation on a regular basis. The system covers the majority of districts in historically food insecure areas (mostly Western Nepal), and is thus not nationwide.

Other data are derived from special surveys (e.g. UNICEF Multiple Indicator Survey), and district specific monitoring of specific programs. There is also a great deal of qualitative information buried in reports from NGOs, donor partners, and within different sectors of the Ministry.

Unfortunately, there has not been good overall coordination and optimal use of this information, nor attention to ways to strengthen systems that are proving fruitful. It has been difficult to modify the HMIS to accommodate data not immediately derived from facility registers. Expansion of sentinel systems has been inhibited by scarce resources. And even secondary analysis and use of existing data has been limited by lack of human resources. These limitations present opportunities to strengthen the broader multisectoral monitoring of nutrition programs, linking this to information on determinants. Such analyses are made easier by the fact that districts are computerized, and there is a rapidly growing expertise in data management.

Capacity to change feeding practices through nutrition education and nutrition counseling

Nutrition education includes a broad range of activities designed to improve feeding practices. This may be provided to entire populations through mass media, to groups, or provided to individual clients. The process may involve no more than providing information. Nutrition counseling is a more intense and personal form of nutrition education. It starts with a detailed discussion between the counselor and the client about feeding behaviors, negotiation about specific, realistic changes in those behaviors, and then follow-up to check on progress.⁹⁰ The complexity of the targeted behavior/s, the resources available, and likely barriers to change will determine whether nutrition education and/or nutrition counseling will be the more appropriate intervention for a specific purpose and context.⁹¹

Within the MOHP system, the health contacts in which nutrition education and/or counseling are designed to be presented include antenatal care, postnatal checkups, child growth monitoring, VAS, increasingly proposed MN powders, and sick child/CB-IMCI visits including those for acute malnutrition. Nutrition education is provided extensively by health workers (MCHW/VHW) and FCHVs, but this education is almost always presented at a rather general level (e.g. exclusively breastfeed your infant for 6 months, eat green leafy vegetables). More targeted messaging is done for IFA, which has shown success. The content of the messages promoted through MOHP is mostly appropriate and has been developed based upon national guidelines for breastfeeding, complementary feeding and other age/context specific feeding practices, and essential newborn care. These are described well in Annex 1 of the NPAN'07. Further, these guidelines have been incorporated into the curriculum for in-service training programs for health facility staff and volunteers.

However, global experience indicates that providing general nutrition information may increase awareness and knowledge, but has little impact on changing feeding practices, particularly complex ones such as those for infants and young children where tradition, culture and economic factors have important influence. Changing these practices is notoriously difficult. To be effective in changing behaviors, the messages must be relevant to the client, seem sensible,

⁹⁰ IMCI training manual, WHO.

⁹¹ Gartoulla RK, *ibid*.

and be seen as coming from a trusted source, e.g., from health workers, teachers, respected community members. Clearly behavior change will be more likely to occur if the messages being promoted to the population by different groups are consistent. It would be helpful if there were an effective system in place to ensure that consistent nutrition messages were promoted by government and non-government groups.

The quality of nutrition counseling currently provided in Nepal is uncertain. Theoretically, counseling is provided extensively, particularly for improving IYCF practices. Training in counseling for breastfeeding and complementary feeding is included as a component of CB-IMCI training for health facility staff. Generally, the time allocated for training FCHVs has not allowed sufficient practice of counseling skills. Training to provide effective counseling requires at least one full day with additional time to practice the skills. The initial training in counseling must be followed-up by supportive supervision for coaching and at least one opportunity for refresher training. Certainly a ‘one-time training’ is not adequate for either health workers or volunteers to develop the skills and confidence required to counsel effectively.

Growth monitoring and promotion (GMP) interventions have been a major entry point for nutrition education and counseling -- a mainstay of community-based nutrition programs. At this time GMP programs are somewhat controversial. Little evidence is available that GMP interventions at scale reduce undernutrition and the *Lancet* Series did not include them among the priority evidence-based programs.⁹² However, valid questions have been raised about this judgment. The primary concern is that the programs evaluated in the *Lancet* Series process may not have been implemented as designed,⁹³ it is unclear that counseling was implemented effectively, if at all, and thus the programs could not have been expected to show a positive impact. The GMP interventions likely failed to demonstrate impact because they were poorly implemented, i.e., they lacked effective counseling, and not because this intervention is ineffective when implemented well, leaving it an open question whether such programs can be effective at scale.

Highly relevant to this controversy are the lessons from the Decentralized Action for Children and Women (DACAW) project launched in 1999 and supported by UNICEF. The DACAW project was a comprehensive, community-based, participatory intervention implemented in about one third of the VDCs of 15 districts. Growth monitoring and promotion was one of several component of this program and the evaluation of its impact was in process at the time of writing. Information gathered already indicates that the process used in this project was highly valued by communities. The evaluation of this project will identify other specific components of the project that warrant consideration for scale up.

Health and nutrition education takes place in schools and is part of the formal curriculum, but this information is general in nature and places a priority focus on basic hygiene and sanitation. The NPAN‘07 stated that —The nutrition section in the Ministry of Education has ceased to function and the programmes outlined in the NPAN (1998) strategy have not been implemented.”⁹⁴

⁹² Bhutta ZA, T Ahmed, RE Black, S Cousens, et al. What works Interventions for maternal and child undernutrition and survival. *The Lancet*. 2008; 371: 417-40.

⁹³ Little detail concerning the implementation of GMP programs reviewed is provided

⁹⁴ NPAN‘07 page 13.

However in some districts, strong links between schools and nutrition interventions have been established. For example, in selected districts school students identify pregnant women and list them in a register established at the school to assist FCHVs in providing postpartum vitamin A supplements. Building on this effective system, the Iron Intensification Program was designed to exploit these school registers to help FCHVs identify newly pregnant women. This enabled FCHVs to encourage their attendance at ANC clinics and support/motivate them in adhering to recommended regimen for reducing anemia. Such links with the formal education system provide exciting opportunities to build upon.

Other links have been established with informal education activities such as adult literacy classes. By engaging the District Education Officers, initiatives such as the Health Education and Adult Literacy (HEAL) project have established models of community-based platforms that may be available for extending the reach of nutrition information to their family members and neighbors. These types of district and community participatory interventions are well suited for adoption by any existing group in the community that finds value in their empowering activities. They are well suited to include all nutrition-related issues including agriculture, sanitation, hand-washing, as well as the more traditional nutrition education messages.

In some districts agriculture extension officers assist farmers in increasing the production of nutrient rich crops and with animal husbandry. One example of this linkage is the Helen Keller International project called —Actin Against Malnutrition through Agriculture” being implemented in two Far Western Districts. This pilot project integrates homestead food production with priority health sector nutrition interventions with a ‘model farm’ concept that is supported by FCHVs.

Engagement of the private sector

There have been good examples of engagement of the private sector in Nepal, including involvement with production and sales of zinc for diarrhea management, and similar social marketing approaches for family planning commodities. As noted in the evolving Global Action Plan, “the private sector can be a valuable partner in improving nutrition, even for the poorest. While government leadership is essential, corporate leadership can be harnessed to mobilize partnership approaches that are essential to have a demonstrable impact on malnutrition. Existing partnerships are already delivering encouraging results and demonstrating the potential to end debilitating deficiencies in a cost-effective way, but there is potential to greatly increase the scale and impact of public private partnerships for improved nutrition.” Clearly the private sector is critical for food production and distribution. The private sector also influences behavior—sometimes to the detriment of nutrition as has been seen in developed countries, but often to stimulate use of products that may improve nutrition as in the case of fortified breakfast cereals in the US. The difficulty lies in finding the right balance between government oversight, consumer needs, and the private sector need for a profitable business model.

More constructive engagement of the private sector may be useful in addressing issues such as food distribution, food fortification, and collaboration in monitoring and communication. Based on food security information and transport costs, it may be possible to ameliorate food prices through negotiations on transport costs. Similarly, although currently fortified foods predominantly reach wealthier families, similar discussions may help expand the reach of these fortified staples. Collaboration with monitoring, for example applying better food production and distribution data in relation to undernutrition, treads on proprietary issues, but would be

useful in increasing knowledge about undernutrition determinants. Greater engagement may help capitalize on these potential activities. More information is needed on the optimal entry points for engaging the private sector.

Civil society, including local and international NGOs, is also technically private sector. NGOs have a long history in Nepal, and have been responsible for pioneering a number of critical interventions. The strategies used by NGOs have also shifted over the years, from relatively autonomous small-scale efforts, to better collaboration with Government systems and adding monitoring overlay to test intervention feasibility. NGOs are likely to continue to play a critical role in the evolution of nutrition programming. NGOs provide technical assistance to the government for evolving programs such as maternal and neonatal health, and are likely to continue to provide assistance for nutrition efforts.

Recommendations

With regard to strengthening stewardship, institutional and human capacity to improve nutrition, a number of suggestions evolve from the limitations described above:

- The human resource base dedicated to nutrition needs to be expanded—within the Nutrition Section, within other sectors, and at the provincial and district levels. This must be done in a collaborative and coordinated way to avoid recreating the difficulties with previous efforts to expand resources dedicated to nutrition.
- Attention should be given to nutrition expertise through review and expansion of nutrition training within and beyond the health sector. Strengthening nutrition education in the curriculums of training programs for doctors and other health care workers is a high priority.
- The nutrition indicators collected through the HMIS should be reviewed, and a mechanism sought to enable them to be reviewed in conjunction with related indicators from other sectors. Some addition to the current annual program review may be needed to establish this multisectoral perspective needed for nutrition.
- The sentinel system established by WFP should be expanded so as to provide data for all districts—thus providing evidence about non-emergency food insecurity that may be contributing to the persistent high undernutrition rates in all districts. Linking this database with both DHS and HMIS data will help clarify factors differentially affecting nutrition among different populations and in different geographic areas.
- The small area estimation methods will be applied to the 2009 Living Standards survey and 2011 National Census. The merging of data from these surveys will enable enhanced targeting and prioritization of nutrition efforts. Coordination of this data with data from other sources may make nutrition programming more efficient.
- Learning from the surveillance methods used for food security, sentinel systems to monitor other nutrition indicators should be explored. For example, facility-based surveillance of anemia in pregnant women could help direct intensified efforts to improve IFA use.
- A special program may be needed to strengthen the data management capacity for nutrition among several sectors. This is particularly important given the broad array of potential determinants of nutrition, the wide range of nutrition interventions, and the need for coordination across sectors.
- More needs to be learned about what happens in the nutrition education events and nutrition counseling sessions occurring both in health facilities and in the community. Depending upon the quality of these activities, it would be useful to assess the effectiveness of

implementation of the training programs and follow-up support/supervision being provided to health workers and volunteers as these processes are essential in enabling them to do this work.

- Through discussion with relevant staff in Ministries of Education and Agriculture, a consensus is needed on a small number of key nutrition messages that should become the focus of interventions in each of these ministries. This may require review and updates of educational materials, curriculum and training programs in each sector.
- Establish mechanisms at both national and district levels to standardize the nutrition messages that are being promoted by Government, donors, and civil society.
- It would be useful for the Nutrition Section to consider launching a major media campaign to promote nutrition as one component of a comprehensive approach to behavior change. This should promote a simple and feasible message, one that makes sense to a poor rural population, and that will improve the quality/frequency of complementary feeding practices, e.g. —feed your child an extra meal each day”, or —feed your child an extra tablespoon of ghee each day.” Such a campaign would need to be carefully developed and field-tested before being launched.
- The Nutrition Section should strengthen the link to overall education programs, with a focus on adolescent girls and nutrition preparedness for pregnancy and child feeding (Ministry of Education); this might include exploring options to have VHWs/MCHWs discuss nutrition in schools, directed at girls in the highest grade.
- Continue to invest in reinvigorating the Health Education Adult Learning (HEAL) project, e.g. strengthening through incorporation of participatory strategies.
- The Nutrition Section should strengthen the link to units in the Ministry of Agriculture and Cooperatives, in order to coordinate efforts to improve practices at the household level between food production behaviors and feeding practices.
- Mechanisms for maximizing the engagement of the private sector and the role of markets in nutrition programming should be developed to find a good balance between business, government oversight, and public good.

B. Establishment of nutrition architecture with multisectoral nutrition presence

National:

Multisectoral nutrition planning has been proposed in Nepal several times over the last three decades but implementing these proposals has not been successful. A number of lessons can be learned from these previous experiences.

1. A National Nutrition Coordination Committee (NNCC) was established within the National Planning Commission (NPC) in 1977 with a mandate to fund and manage multisectoral efforts to address malnutrition. Actions to address the problem of malnutrition by health, education, and agriculture sectors, and local government agencies were proposed in the Nutrition Strategies of 1978 and 1986. The NPAN'07⁹⁵ described the main thrusts of these strategies as seeking to increase production of nutrient-rich food, to improve food distribution and to promote education in nutrition by including nutrition in curricula of different educational programs. —The responsible sectors identified by these strategies were

⁹⁵ New Era 2007. Draft Nepal National Plan for Action on Nutrition, 2007

health, agriculture, education and local development; and nutrition units were established in each of these ministries. A Joint Nutrition Support Programme (JNSP) was launched as a joint activity of the government (ministries of agriculture, health, education and local development) supported by WHO/UNICEF in five districts in order to bring a positive change in nutritional status. JNSP was coordinated by NNCC. However, the programme was abandoned midway due to various problems in its implementation.” No information on the specific barriers/challenges to this implementation was provided by the authors of NPAN‘07.

2. The second major attempt to implement multisectoral nutrition actions came with the creation of the National Nutrition Policy Coordinating Committee (NNPCC) in 1993. As with the NNCC this new committee had representation from Ministries of Agriculture, Education, Health, and Local Development, university, research councils (health and agriculture), social welfare council and nutrition experts. The Member Secretary of the committee was the Joint Secretary, Social Service Division. The Gazetted objectives of this committee were: —to improve nutritional status of the Nepalese people through the assessment and evaluation of the nutritional status, to use relevant nutritional indicators in assessing the development of the country, to develop and coordinate multisectoral nutrition policy and programmes, to mobilize national and international non-governmental agencies and communities in the implementation of nutrition related activities and to translate international commitments to improve nutrition through the development of a National Plan of Action on Nutrition. ... However, the support mechanisms for creating an enabling environment for proper functioning of the committee did not seem to exist.”⁹⁶ No specifics were provided by the authors of NPAN‘07 to clarify the barriers to establishing the necessary support mechanisms.
3. A third effort to create momentum to address malnutrition was the development of the 1998 NPAN. Similar to the prior strategies, this stressed action on increasing food production, improving the food distribution mechanisms, and nutrition education. It proposed intersectoral collaboration between health, agriculture, education, and local development with a nutrition unit being established in each ministry. Proposed actions included improving:
 - Household food security (Agriculture)
 - Food safety and quality control (Agriculture – Department of Food Technology and Quality Control; Central and Advisory and Coordination Bodies, among others)
 - Infection, malnutrition and micronutrient deficiency states (MOHP/CHD; others)
 - Nutrition education and training (MOHP, Education)

But outside of health, which did achieve important successes with specifically focused programs, few of the proposed actions for the line ministries were implemented as planned. The NPAN‘07 described the proposed implementation as follows... —At the central level, National Nutrition Coordination Committee (NNCC) was to coordinate the actions of different line ministries and nutrition units in agriculture, education, health and local development were to develop and implement the sectoral programmes. At the district level, District Development Committee and its sub committees on natural resources, environment, population and social welfare were to be responsible for coordinating the nutrition activities in the district. At the village level, health posts/ sub-health posts in health sector, agriculture services center/ sub

⁹⁶ ibid

center in agriculture sector and schools in education sector were to implement the nutrition programmes through community mobilization for community owned programmes. Local NGO's, mothers' groups were to be formed for planning, decision-making and ultimately owning the nutrition programmes at the community level. There is no evidence of implementation of these policies.” No details of the barriers to implementation of these proposals were provided in the NPAN'07,⁹⁷ although the NNCC may not have been able to function optimally.

The proposed activities — were included in the 5th five year plan (1997-2001) and the NNCC was to form technical sub-committees to assist in monitoring and coordinate the implementation. ... The Nutrition Section of Child Health Division had constituted a team of health professionals, nutritionists, academic professionals and non-governmental agencies to develop a national guideline for improving nutrition. This task force had developed the objectives, strategies and programmes which required a multisectoral involvement.”

In 2004, the National Nutrition Policy and Strategy was prepared and published by MOHP. This document provides a comprehensive description of policies and the rationale for recommending broad action to address the causes of LBW, PEM, IDD, IDA, VAD, intestinal worms and life style related problems. Figures are included that describe the causes of each of the nutrition problems to be addressed, but no priorities were set to identify the more feasible interventions, and the document is more a full list of options potentially available for addressing nutrition problems. In attempting to address all the causes of each problem as recommended, it seems likely that a) available resources will be stretched too thinly to make action feasible, and, b) the CHD is not staffed or resourced adequately to lead and manage the implementation of the recommended actions.

Clearly nutritional thinking is needed for a variety of initiatives that are likely to affect some of the key determinants of nutritional status, across many sectors. Hence, initiatives designed to empower women, including educational efforts, can have a large impact on mothers' awareness of nutrition during the 'window of opportunity' if this thinking is built into such initiatives from the beginning. Similarly, poverty alleviation programs will also improve nutritional status, but would be enhanced if some nutritional indicators were included in poverty or vulnerable group mapping, for example.

Specific approaches to strengthen initiatives that can be used by managers of nutrition efforts might include:

- Review by the technical working group, of new or established government initiatives that are likely to address determinants of undernutrition, and establishing a mechanism to review the nutrition implications and develop a strategy that enhances the nutrition perspective for these initiatives.
- Including in policies related to these initiatives, links to the national nutrition strategy, and the ways in which the initiative will contribute to that strategy.
- Inclusion of initiative leaders in periodic nutrition review meetings that highlight progress being made, and program data supportive of that progress.

⁹⁷ ibid

- Development of cost-benefit aspects for the initiative of including nutrition considerations—for use in advocacy among those leading the initiative who are most likely outside the nutrition community.

Currently in Nepal, coordination across sectors is not formalized, and there is no existing mechanism to ensure this coordination. Although there is often good communication for specific issues, there is no ‘architecture’ that makes this process institutionalized. Thus activities in the Education or Agricultural sectors, for example, may evolve to include specific nutrition activities (e.g. revision of the curriculum for nutrition or expansion of nutrition education among agricultural extension workers) and do not benefit from integration and coordination with Nutrition Section activities within the MOHP. Most countries struggle with finding the optimal positioning of nutrition to allow this sectoral coordination.

Within the MOAC several groups are responsible for improving nutrition. These include the Departments of Food Technology and Quality Control (DFTQC) responsible for ensuring food safety and promoting new food technologies; the horticulture unit, responsible for identifying and promoting nutrient dense foods; animal husbandry, responsible for increasing production and consumption of domestic animals; and a unit promoting kitchen gardens.

At the district level, the problem of coordination is similar, although district staff may find ways to formalize coordination for different areas. All districts should have a nutrition officer, and most health facility staff have had basic training in nutrition, and in the elements of nutrition programs. However, this is mainly done within the policy framework of the MOHP, and may not include training among other sector staff, such as extension workers in Agriculture. It is then up to the district offices to build the mechanisms for this coordination, and this may or may not be done effectively from district to district. Examples of efforts being made at the district level to coordinate the activities of staff from health, agriculture and education sectors within districts are trainings that are undertaken to support adult literacy initiatives such as the Health Education and Adult Literacy (HEAL) project, and the Helen Keller International project being implemented in two Far Western Districts described in the section above.

Recommendations

In the interest of improving nutrition activities and coordination across sectors, a number of suggestions can be made to address the gaps noted above:

- At the national level, the MOHP, as the lead sector for nutrition, should explore structural mechanisms for a nutrition architecture that can facilitate a multisectoral Nutrition Action Plan that ensures coordination across sectors. Further discussion is needed to determine whether such a function might fit within the Ministry of Planning
- Consideration should be given to establishing nutrition posts in selected ministries. However, thorough discussion about previous attempts to do this are needed, and clear roles and responsibilities need to be discussed and defined for each sector position. Expansion of nutrition capacity and expertise within Agriculture is particularly important
- The surveillance system for food security supported by WFP is an excellent resource for overall nutrition planning. It would be useful to strengthen the overall coordination with the Nutrition section, and consider a modified expansion of the system to provide information for all districts to address chronic undernutrition.

C. Establishment of a nutrition policy oversight board

When a new initiative such as a poverty alleviation initiative is introduced, it is done within the context of existing or newly established policies. The responsible sector may craft new policies to guide the activities to be implemented under the initiative. These policies can directly address nutritional considerations, or can be supportive of the inclusion of nutrition coordination and cooperation across sectors. Policy development in multiple sectors can be enhanced by nutritional considerations, even for existing programs. For example, policies directed at empowering women can assess the nutritional implications, and include these benefits in modeling the cost benefit of such policies. Bringing nutrition expertise into the discussion of policies in multiple sectors will uncover benefits from inclusion of the implications for nutrition—benefits commonly overlooked or not taken into consideration.

On the other hand some policies may present a benefit for the sector, but have negative nutrition implications. For example, an agricultural or trade policy that may benefit that sector may adversely affect food prices or distribution among the more vulnerable, incurring a nutritional cost. Discussion and cooperation with regard to nutrition implications will ultimately both save lives, and make programs more efficient, even if there may be some short-term sectoral consequences.

All sectors will benefit from understanding the basic nutrition situation for the country, and the implications that undernutrition may have with regard to achieving the sector's goals. For example, undernutrition in mothers and infants carries longer-term implications for the ability of those infants to be educated—and thus improved nutrition will improve school attendance and achievement. With these considerations in mind, a policy review to assess the nutrition consequences of policies in key sectors should ultimately be cost-effective for the country.

Recommendations

- The MOHP should consider working with senior ministry officials to establish a nutrition policy review board that would be tasked with reviewing existing and proposed policies in key sectors (Agriculture, Education, Local Development, Finance, Women's Development, Social Welfare) to provide an objective assessment of potential nutrition implications for the proposed policy
- The Policy Review Board should have clearly defined roles and responsibilities, and be granted some authority for elevating the discussion of any proposed policy with a potentially negative nutrition impact, to allow resolution on its acceptance
- The Review Board should also be tasked with following up on proposed policies with a potential positive impact on nutrition to ensure adequate nutrition monitoring, coordination with the Nutrition Section, and developing advocacy activities that benefit from the expected nutrition improvements.
- The Review Board could also be tasked with preview of proposed legislation and regulation that may have unexpected nutrition consequences, such as legislation to limit use of breast feeding substitutes being used to erect barriers to —fortified complement food”

D. Harmonisation donor assistance and development of long-term financing

There are many models for harmonizing government and partner efforts, and there has been a recent increase in efforts to improve donor efficiency through these harmonization efforts. At a

global level, the Paris/Accra accords were designed to identify specific actions that would help harmonize donor and government efforts. These accords defined mechanisms to promote joint strategy development, alignment of budgets with these strategies, use of national systems for implementation, results-orientation, and donor support predictability. Similar approaches were built into various donor strategies and regional strategies reflected similar needs. Much of the basis for global strategy development, including the Global Action Plan for Nutrition, is premised on these accords.

At the national level, there are a number of new mechanisms designed to improve coordination and harmonization. The International Health Partnership (IHP+) process is designed to improve health systems related to the Millennium Development Goals (MDGs)⁹⁸ and universal access commitments through more predictable and sustainable funding, as well as improved coordination and better delivery of essential health services. Specific country compacts are developed, although these don't currently address nutrition directly. Nepal is an IHP+ country—reflecting high-level agreement on coordination among key donors and the government.

More specifically related to nutrition, the REACH process has been implemented in a number of countries. REACH is a broad-based partnership including WFP, UNICEF, WHO, FAO, and USAID among others, designed to harmonize and align efforts in nutrition at the national level. REACH has defined specific actions to achieve these harmonization goals, including facilitating country planning, providing technical input for implementation, assisting with communication and advocacy, and helping with coordinated support for nutrition programs.

WHO has also developed mechanisms to help with coordination and understanding across sectors of nutrition strategies. Their Landscape Analysis was designed to assess a country's preparedness for expanded multisectoral nutrition programming, and has been implemented in several countries. WHO is currently developing tools to help assess donor activities in nutrition, and 'good practices' for nutrition programs. These tools should help establish a solid information base that can help guide countries in their attempts at harmonization.

In Nepal, there has been good harmonization between government and key donor efforts in many areas, including nutrition. The evolution of this Assessment and Gap Analysis is an example of that harmonization, with all partners contributing to the conceptual basis and construction of this report. However, further work is still needed to ensure harmonization of efforts for nutrition, and to improve coordination across sectors.

Recommendations

Harmonization between the Government and various partners has been traditionally very good in Nepal, and this likely also benefits from the IHP+ agreement. Similarly, there has been reasonable harmonization among partners, including donors, and this has resulted in reasonable consistency in financing for key interventions, including nutrition interventions. However, this has not resulted in structural mechanisms to strengthen communication and coordination across sectors, which is needed to strengthen all the multisectoral components for an integrated Nutrition strategy. Improving capacity in engaged sectors, and establishing a strong architecture for nutrition will help with this harmonization. In addition, several other actions are suggested:

⁹⁸ MDGs 1b, 4, 5, and 6.

- Completion of an assessment of nutrition activities across multiple sectors using the REACH or WHO Landscape Analysis tools would be useful to help identify structural mechanisms to improve coordination across sectors at the national level.
- Technical working groups addressing nutrition issues should include representatives from all engaged sectors (e.g. policy review board, nutrition technical working group).
- The Nutrition Section should provide guidance to districts on structural mechanisms to ensure nutrition consideration across various sectors, including reaching out to community-based workers from agriculture and education.

E. Delivery platforms

Nutrition interventions have a variety of delivery platforms, but traditionally they have relied primarily upon the health care system. This system was described in NPAN'07⁹⁹ in general, as weak and lacking responsiveness. These weaknesses were seen as resulting from inadequate —organizational structure, physical facility, personnel and budgetary allocations; weaknesses in strategic planning” and further, constraints such as —absence of health care workers in adequate number and with appropriate skills, lack of credibility of weak outreach services, training opportunities for front line workers ...” Further, lack of progress on addressing undernutrition was attributed to underutilization of services because of —illiteracy, topographical remoteness and lack of monitoring and evaluation.”

In spite of this discouraging picture, Nepal has done exceedingly well in implementing many of the *Lancet* Series recommended interventions, and has several globally recognized programs such as the vitamin A supplement program. In addition, Nepal has implemented the WHO health system strengthening IMCI system, including a community component—which has improved facility-based management of illness, including acute malnutrition.

The strong bridge linking health facilities and communities that has been built in Nepal through the cadre of FCHV is recognized as a model in global health. If the trust in the health system enjoyed by communities and the motivation of the FCHVs can be maintained, delivery of nutrition interventions in Nepal has a platform available to reach much of the priority and hard-to-reach target populations. Without a motivated and supportive cadre of FCHVs, however, this community delivery option will be lost.

Current threats to sustaining this cadre include the practice of some short-term projects providing financial incentives to FCHVs in selected areas to take on responsibilities for the duration of the project beyond what is reasonable for the longer term. Alternatives should be explored to engaging and training other community members, especially within the mothers groups, to take on this work.

Because factors under the authority of sectors such as finance, social welfare, agriculture, and education cause undernutrition, effective approaches to reducing undernutrition will include interventions in these sectors. As mentioned above, there are few established models that we are aware of for delivering nutrition interventions through these sectors. All previous NPAN's in Nepal have proposed action across these sectors, but none has been successful in implementing them successfully. In addition to having concrete and specific recommendations for action,

⁹⁹ New Era NPAN'07 Annex 1 page 63

implementation will likely be achieved only with the highest level support and adequate resource allocation.

The private sector plays a central role in producing and delivering food and nutrition related products. Food processors have demonstrated fortification capability, making fortified products available to the rapidly increasing urban population. Entrepreneurial members of the pharmaceutical industry in Nepal quickly recognized the marketing opportunities in producing dispersible zinc tablets. They enabled Nepal to be one of the first countries in the world to implement at scale the new recommendations for treatment of diarrhea and have positioned themselves well to win contracts to provide for the international need for these products. Creating public private partnerships has now become an accepted strategy for effectively addressing many health and development issues – efforts to reduce undernutrition in Nepal will be more effective if such opportunities are exploited.

The health service system in Nepal has improved, and the pattern of use both for government health facilities and private facilities is changing. The Government is also aware of the difficulties with access for more vulnerable groups, and is assessing programs with regard to their equity. Many community-based efforts have been shown to be very equitable, and have been designed to bring services closer to communities through the use of FCHVs. While wealthier segments of the population may increasingly turn to private services, particularly in urban areas, the majority of the population uses government facilities and is demanding improved services. This suggests that the Government has found a good balance between strengthening facilities, and provision of community-based services—a feat that has escaped many countries.

Recommendations

Nepal has had very good success with delivery systems for many health interventions, and their community-based services are some of the best in the world. Thus, for many of the nutrition specific programs administered through the health sector, the delivery systems are relatively strong. However, as with most countries, coordination of efforts across sectors has proven difficult, and this includes development of integration and coordination of delivery systems. It is not completely clear how this situation can improve. However, with this gap analysis, a number of observations lead to several suggestions:

- Establishing a nutrition architecture should result in improved communication across sectors, and this should be directed to more focused messaging for nutrition that helps to empower communities to find solutions to negative determinants of nutritional status.
- Exploring the feasibility of a new position of District Nutrition Officer would be useful. This staff position would be responsible for advocating and coordinating nutrition activities across sectors at the district level. Introduction of this position would be done in a phased manner with appropriate training, support and supervision from the Nutrition Section/CHD.
- To assure the sustainability of the community volunteer network of FCHVs, the ministry may need to mandate the establishment of a national and district-level process that reviews and approves (or not) project proposals that will result in an increased work load/responsibilities of FCHVs.
- FCHVs should be made aware of nutrition related activities done through schools and through Agriculture. They can then be trained to support these activities more actively.

- There may be opportunities to use the health facility management committees to build coordination with other sectors at the district level and below. If this is done in conjunction with a national effort at coordination, community-level coordination should improve activities across sectors

VIII. Priority investments, estimated costs, and options for targeting

This section is designed to provide a summary overview of priority interventions that are either being implemented by the Government, or which might be considered based on the assessment of the current situation. Some of these interventions are well-established through the *Lancet* review. Others are endorsed by that review for specific country contexts. Still others either have not been included, or are not amenable to the same type of efficacy/effectiveness analysis (e.g. policy interventions). The summary is organized according to the type of intervention: a) measures primarily affecting mothers, b) measures primarily affecting infants through 2 years of age, and c) general multisectoral measures designed to address food availability and affordability. The first two represent the ‘window of opportunity’ for nutrition, reflecting the period of greatest risk, and thus the investments with the greatest impacts, and these also have more available costing information. Several established interventions affect populations outside these two groups (such as VAS for children 6-59 months), and there is no recommendation to change the current approaches. The latter multisectoral interventions have less information on costing, and may be difficult to cost.

The summary is not meant to be exclusive, but rather includes interventions that remain a priority for the country based on their proven effectiveness, existing success in Nepal, or likelihood of addressing some of the probable determinants of undernutrition in Nepal. Other interventions may also be important, and these may need further discussion.

The global cost estimates for some of the interventions mentioned here are from a recent Costing Study done by the World Bank.¹⁰⁰ These global estimates are based on a review of a number of country programs, and provide a cost per target for many of the *Lancet* series priority interventions. An attempt has been made to provide a contextual analysis of these costs for Nepal, based on the work of a consultant.¹⁰¹ However, less information is available on global costs for multisectoral approaches, for establishing a nutrition ‘architecture’ to guide implementation, or on capacity building in nutrition, and further discussion is needed to understand these costs for Nepal.

It should be noted that the costs noted here are crude estimates based on stated current expenditures, current commodity costs, and estimates for opportunity costs. More exact figures would need to be derived from further review of actual implementation costs for each intervention, with projections for inflation, increasing populations, and for increasing coverage. As with most countries, the relative proportion of funding from all sources directed toward nutrition is small, and will need to be increased if progress is to be made with reducing undernutrition in Nepal.

A. Pre-pregnancy and maternal nutrition

Intervention	Current status in Nepal	Global cost estimate	Nepal cost estimate
Maternal protein/calorie supplementation	Targeted to most vulnerable or emergency populations	Not available	TBD
Iron folate supplementation	Current program successful	US\$2.00/pregnancy	Estimated at \$5.89/pregnant

¹⁰⁰ Horton S, Shekar M, McDonald C, and Mahal A. *Scaling Up Nutrition: What will it cost?* World Bank 2009.

¹⁰¹ Pant, Kiran. *Nutrition Intervention Cost and Gap Analysis—Nepal.* Consultant Report for USAID/NFHP. 2009.

			woman/yr, assuming 112 days at 2 tabs/day at Rs. 2/tab
Multiple micronutrient supplementation	Consider for feasibility testing among most vulnerable groups		Not assessed for pregnant women
Salt iodization	Current program successful, further attention to special needs during pregnancy	US\$0.05/person/year	Estimated to be \$1.20/person/year for family to purchase iodized salt. Government cost for oversight and regulation not assessed
Post-partum VAS	Program established	Not available	Not assessed
Deworming during pregnancy	Component of ongoing Iron Intensification Program	Not available	Not assessed
Malaria control: Use of ITNs in malaria areas	Program initiated	Not available	Not assessed
Promotion of gender equity related to nutrition	Explore issue of status of new wives/mothers in husband's household	Not available	TBD

B. Infant and young child nutrition

Intervention	Current status in Nepal	Global cost estimate	Nepal cost estimate
Promotion of early and exclusive breastfeeding	Program established, recent decrease in infants 2-5 months old	Included in community nutrition program: US\$5-US\$15/participant/year	\$17.87--Includes PHC outreach cost estimates for all FCHV and HF staff costs
Behavior change to improve complementary feeding through interpersonal communication and counseling	Program established, may need targeted intensification; feasibility model for specific local approaches needed	Included in figure above, w/ community nutrition program	Included in PHC outreach exclusive of supplements
Behavior change to improve complementary feeding through media	Efforts established, need further strengthening	Not available	Not assessed
Vitamin A supplementation	Current program successful, needs to be sustained	US\$0.60/child/round, i.e. US\$1.20/child/year Capsules cost US\$0.02 each	Based on twice yearly distribution, cost sharing, and Nepal capsule cost of Rs 3.5/capsule: \$1.52/child/year. Includes an opportunity cost for staff
Therapeutic zinc supplementation	Program established, needs expansion and impact assessment	US\$1/child/year	Based on 2 episodes of diarrhea/year/child, supplement cost estimated to be \$0.60/child/year. This is exclusive of opportunity costs, and costs for program initiation and scale-up
Multiple micronutrient powders	Being explored through large-scale feasibility studies	US\$1.80/year/child 6-24 months of age excluding distribution: estimate US\$3.60 including distribution	Estimated start-up costs for initial 50,000 children < 2: \$17.41/child/year
Salt iodization	Current program successful	US\$0.05/person/year	See above

Newborn VAS	Feasibility model ongoing	Not available	TBD
Management of acute malnutrition (emergency situations)	Food security program extensive	US\$40-80/child/year; for prevention/treatment of moderate malnutrition, children 6-24 mo. using complementary foods US\$200/child/episode, for treatment of severe acute malnutrition w/ CTC	Estimated Nepal cost based on pilot in 4 districts: \$67.72 per moderately malnourished child
Facility and community-based management of acute malnutrition	Programs established	Not available	TBD
Hygiene measures and hand washing	Feasibility model for handwashing may be needed	Included in community nutrition program counseling	Included in community nutrition program counseling
Deworming	Current program successful (12-59 mo. twice yearly)	US\$0.25/child 25-59 months/round/year (less if done with VAS)	Assuming distribution with VAS, estimated cost is \$0.11/child/year
Malaria control: use of ITNs	Program established	Not available	TBD

C. General multisectoral investments

Intervention	Current status in Nepal	Global cost estimate	Nepal cost estimate
Establish a 'nutrition architecture' that can oversee nutrition activities across sectors	TWG established; preliminary discussion with Planning Ministry	Not available	TBD
Establish Nutrition Policy Review Board	Not established	Not available	TBD
Strengthen link between MOHP and MOAC to improve coordination for nutrition related strategies	To be developed	Not available	TBD
Food security (surveillance, food distribution, management of malnutrition)	WFP program established in vulnerable areas	See below	See above
Food fortification	Difficulty with vehicle reaching most vulnerable groups; Current program initiated	US\$0.20/person/year (wheat flour with iron, folic and perhaps zinc, or other staple) US\$3.27/person/year (oil/sugar with vit A)	Costs available for small pilots only
Strengthen link with poverty alleviation programs	Not established	Not available	TBD
Cash transfers (conditional and non-conditional)	UNICEF initiation of non-conditional cash transfers; further feasibility model to be developed	US\$156-432/household/year, for conditional cash transfers	Program details yet to be finalized; yearly non-conditional cash transfers for women with child < 2 years anticipated at Rs 200/person, or \$2.63/person
Microcredit and community-based integrated	Need distillation of DACAW experience;	Not available	Some costs from DACAW experience available

approaches	consider feasibility model		
Strengthen nutrition monitoring of multisectoral programs and their impact (e.g. on income disparity)	Not established	Not available	TBD
Strengthen link between Nutrition Section and MOHP sections engaged with management of infectious diseases to improve coordination for nutrition related strategies	Not established	Not available	TBD
Interventions to reduce smoking and indoor smoke pollution	Research effort underway	Not available	Research pilot underway
Strengthen Nutrition Section capacity, nutrition capacity in other sectors, and nutrition monitoring	Under discussion	Not available	TBD
Improve nutrition education and counseling at all levels	To be strengthened	Not available except as nutrition counseling (see below)	See above
Strengthen link between MOHP Nutrition Section and MOE, with regard to coordination of nutrition activities	Links established, more formal coordination and integration needed	Not available	TBD

The World Bank report notes that *–Based on 356 million children in the 36 countries, our estimates translate to a cost of US\$30/child. This compares to a cost of US\$47/child estimated by REACH (2008) (including delivery costs, but excluding the CCTs which REACH also considers). However, the assumptions here and in REACH regarding the more expensive items (feeding programs) are somewhat different. In particular, we assume that if the micronutrient, education, and complementary feeding programs are phased-in, they will have a substantial effect in reducing SAM.*¹⁰²

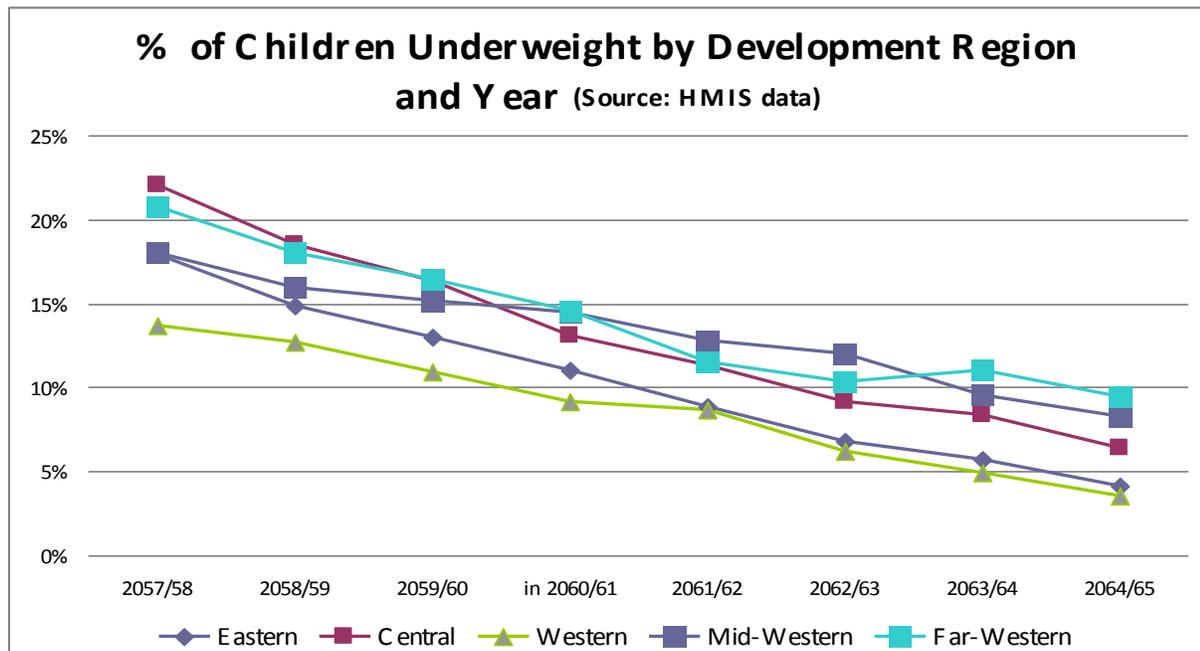
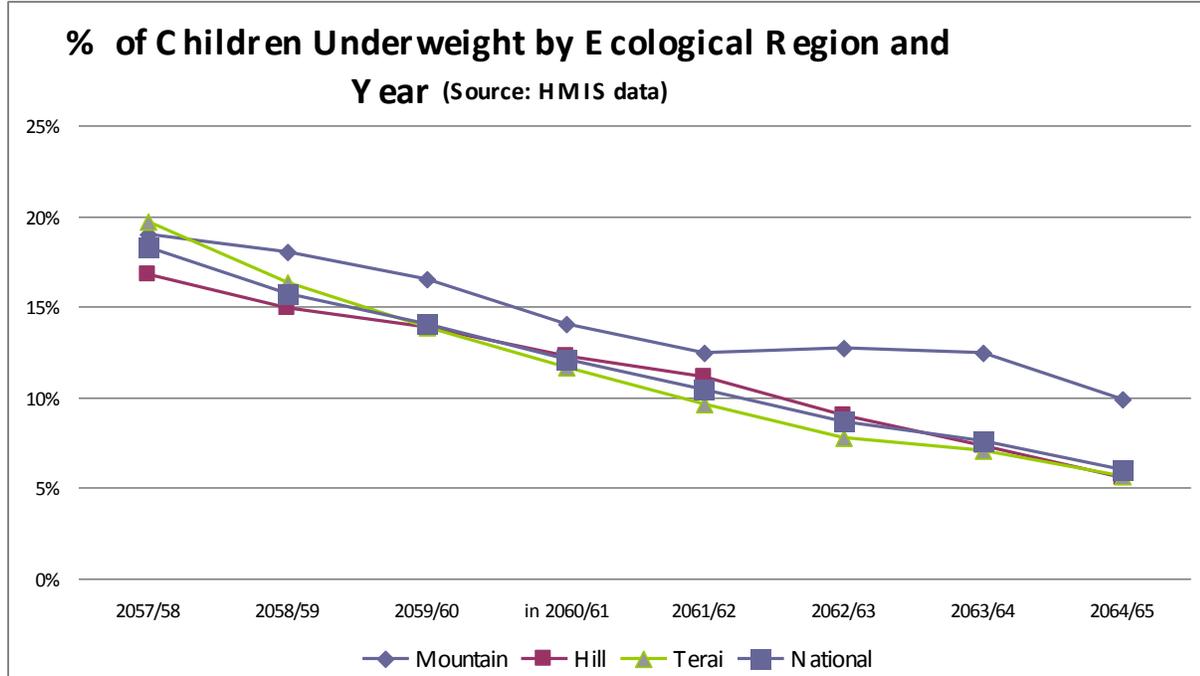
This \$30/child cost compares to an estimated expenditure in Nepal, for both mothers and children, for currently implemented interventions, of \$3.79/target population/year.¹⁰³ Given the costs for strengthening established interventions, scaling-up existing interventions and achieving adequate coverage, and improving capacity and the architecture through which to improve multisectoral approaches, the current expenditure will clearly need to be increased.

¹⁰² Horton et al, Scaling up Nutrition

¹⁰³ Pant, Kiran. Nutrition Intervention Costs

Annex I: Selected Data Analyses

The following graphs have been developed through secondary analyses of both DHS and HMIS data.¹⁰⁴



¹⁰⁴ Taken from analyses done by NAGA team, including Ramu Bishwakarma

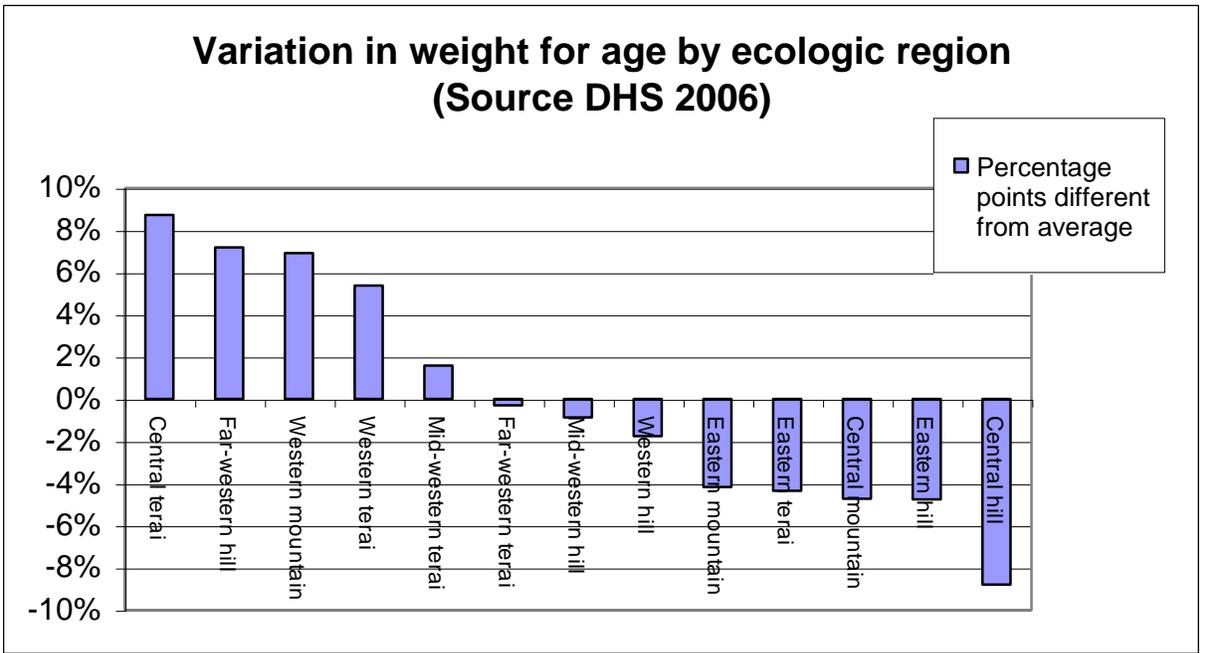
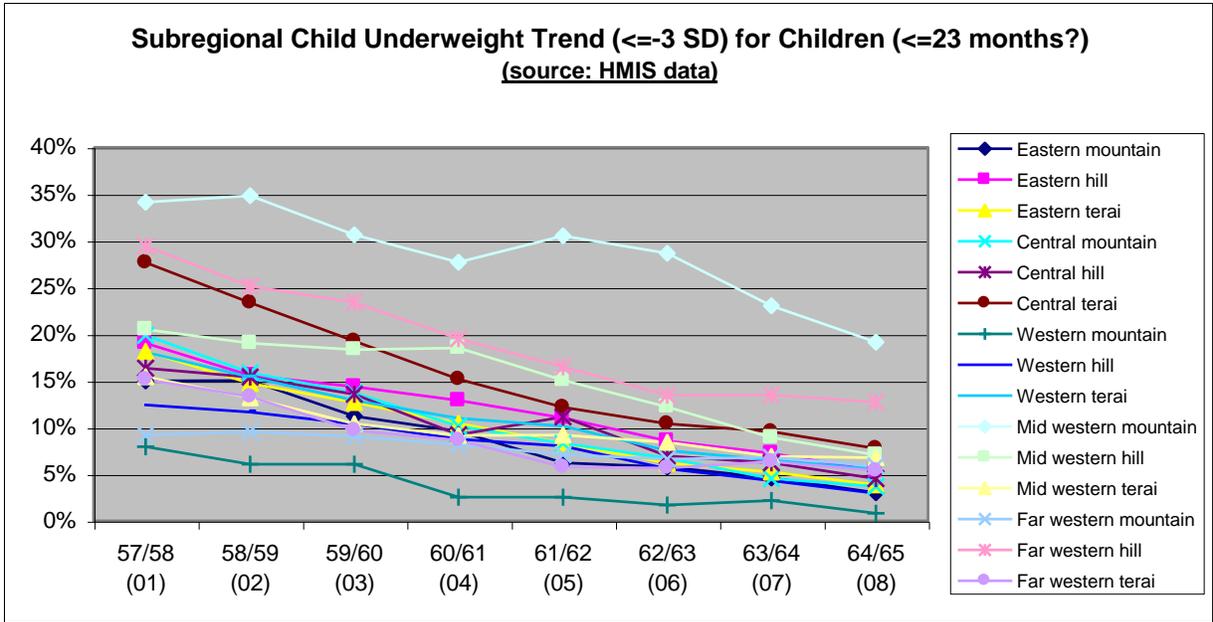


Fig-3: Caste/Ethnicity specific stunting and food consumption status of children between 7-24 months
 (Source: Nepal Demographic and Health Survey Data, 2006)

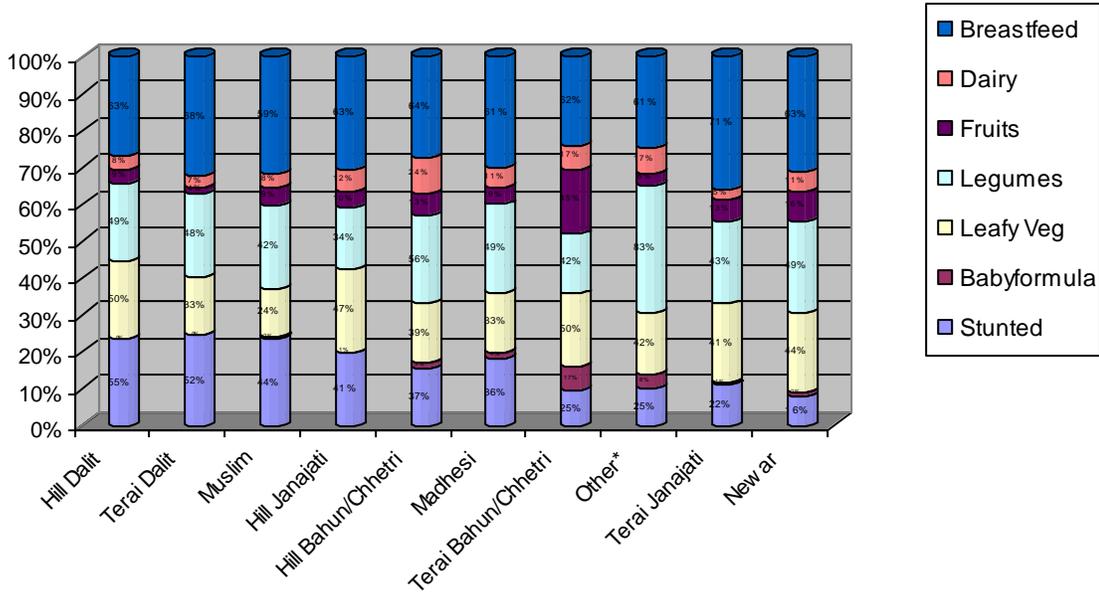


Fig-4: Sub-region specific stunting and food consumption status of children between 7-24 months
 (Source: Nepal Demographic and Health Survey Data, 2006)

