Photo: Althea Pickering

ADDRESSING CHILD MALNUTRITION
School Health and Nutrition Interventions in Nepal

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HONOR PLEDGE: On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

Table of Contents

Acronyms

FAO: United Nations Food and Agriculture Organization
FRESH: Focusing Resources on Effective School
GoN: Government of Nepal
HPS: Health Promoting Schools
HGSF: Home Grown School Feeding
IFA: Iron Deficiency Anemia
IFA: Iron Folic Acid
NSL: Nutrition Sensitive Learning
NGO: Non-Governmental Organization
MoHP: Ministry of Health and Population
MoE: Ministry of Education
MoAD: Ministry of Agriculture Development
PTA: Parent Teacher Association
SDG: Sustainable Development Goals
SHN: School Health Nutrition
THR: Take Home Ration
UNICEF: United Nations Children's Fund
WASH: Water, Sanitation and Hygiene
WINS: WASH in Schools
WHO: World Health Organization
WFP: World Food Programme

Glossary

Malnutrition: Defined as a lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things, or being unable to use the food that one does eat.
Nutrition Sensitive Interventions: Refer to interventions of other sectors that incorporate nutrition objectives.
Nutrition Specific Interventions: Refer to those that address immediate and some intermediate causes of malnutrition (especially caring for children).
Sustainable Development Goals: 17 universal goals and a call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity.
Undernourishment: A state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements.
Undernutrition: the outcome of poor nutritional intake in terms of quantity and/or quality and/or poor absorption and poor biological use of nutrients consumed as a result of repeated disease.
Underweight: Defined as a BMI of less than 18.5, reflecting a current condition resulting from inadequate food intake, past episodes of undernutrition or poor health conditions for adults; I weight-for-age less than –2 standard deviations below the WHO Child Growth Standards median for children.
Wasting: Low weight for height, generally the result of weight loss associated with inadequate caloric intake and disease.

Executive Summary

Nepali school children suffer from alarmingly high rates of malnutrition as Nepal currently ranks 11th highest out of 136 countries for stunting prevalence globally. Malnutrition is typically calculated in children under five to measure growth in early childhood. However, school-aged children whose nutritional needs were not met in early childhood continue to suffer the compounded effects of poor nutrition: low weight for age and height, micronutrient deficiencies, and related disease. Despite recognizing the high social and economic costs of undernutrition, the Government of Nepal has been unable to comprehensively address the health and nutritional needs of Nepali school children. In collaboration with the United Nations World Food Programme (WFP) and the Government of Nepal (GoN), this report examines malnutrition in Nepali school children and analyzes the design and effectiveness of various school health nutrition interventions in order to improve the provision of school-based health and nutrition services.

Nutrition is fundamental to human well-being, and the consequences of food insecurity for health and development range from before birth to adulthood, including adverse effects on mental health and cognitive behavior. Though child malnutrition interventions typically focus on the first 1,000 days, interventions for children under five alone are not sufficient (Hunter et al, 2017). Given that the majority of children attend primary school in Nepal, school based interventions are an efficient platform for addressing stunting and undernutrition in children. National school health policies often have multiplier effects on economic and social development because they improve health and wellbeing, increase educational attainment, and support local agriculture (Rawson, 2017). Successful school health nutrition (SHN) interventions can act as a short term social protection safety net and a long term cost effective investment in the future of Nepal.

This report analyzes a set of policy alternatives that serve to address nutritional and health needs of Nepali school children. The policy alternatives include the following: establish a menu distribution program, establish the FIT for Schools program, establish school gardens, and establish a take home ration program. The policy alternatives were evaluated according to a set of criteria, including cost, effectiveness, feasibility, and most importantly, sustainability. Ultimately, this report recommends that the World Food Programme establish school gardens as the most cost-effective, feasible, and sustainable policy to address child malnutrition in Nepal. After careful analysis, it is recommended that WFP begin this policy as a pilot project that can be scaled up nationally following successful implementation after three years.

School gardens are a powerful nutrition education tool because through gardening, children have the opportunity to engage in small-scale agricultural practices and become responsible caretakers. In addition to providing direct nutrients, the benefits of school gardens extend to the wider community, contributing to an understanding of farming and nutrition principles among students, encouraging the development of home gardens, and developing broader life skills to maintain a healthy diet.

Given public pressure and global recognition of the need for comprehensive and multi-sectoral interventions, now is a critical time to integrate SHN into the core of the education system in Nepal through the establishment of school gardens. In order to achieve the United Nations' ambitious goal of zero hunger by 2030, Nepal must commit to these comprehensive and innovative solutions that simultaneously address both the underlying root causes of malnutrition and the immediate need to ensure that all school children receive adequate nutrition to live a healthy and balanced life.

Introduction

Nepal is a heterogeneous country in terms of topography, climate, ethnicity, and culture with a population of approximately 23 million. Nepal is currently undergoing a prolonged transition to peace and stability following decades of political instability and violent conflict that concluded with a peace agreement between the Maoists and the government. Though the Nepalese civil war ended in 2006, long-term consequences of the conflict persist today, and in 2016, 25% of Nepal's population lived below the national poverty line. As a least developed and low-income country, Nepal faces many challenges to economic growth and social development. Weak governance, political uncertainty, high susceptibility to climate change, low productivity, and limited market access further hinder economic development.

Similar to Nepal's political history, its complex geography poses challenges to sustainable growth and economic development. Nepal is commonly divided into three physiographic areas, Himal, Pahad, and Terai, representing the lowland plains, the mountain region, and the high mountains, respectfully. Nepal experiences five seasons, summer, monsoon, autumn, winter and spring and is one of the most disaster-prone countries in the world due to its topography and climate. Frequent natural disasters, such as earthquakes, landslides, and floods, exacerbate food insecurity. The 2015 earthquake devastated Nepal, killing thousands and destroying a large amount of infrastructure throughout the country. Almost 80% of the population relies on subsistence farming as the main occupation. Food prices in Nepal are high, particularly in the remote, mountainous regions, which also pose challenges to achieving food security. Challenging geography, civil unrest, and poor infrastructure complicate efforts to improve livelihoods and address malnutrition.

Women and children are typically the world's most vulnerable, which is why this policy analysis focuses primarily on school interventions to address malnutrition in school-age children. Given the agrarian nature of Nepal's economy, policies attempting to improve child nutrition should prioritize women's empowerment in agriculture. Women's low social status in Nepal exacerbates the negative consequences of child undernutrition; therefore, involving women in the supply chain for nutrition interventions is particularly important in breaking the cycle of poverty and improving overall wellbeing of Nepali children (Cunningham et al, 2016). Furthermore, improving the nutritional status and awareness of adolescent girls contributes to improved future maternal, infant, and young child nutrition (WHO, 2013).

The Nepalese government fails to prioritize school health and nutrition services, and as a result, the nutritional status of school children is not well understood among the population. The 2006 National School Health Nutrition Strategy in Nepal was developed to increase access to fundamental health and nutrition services and improve the physical, mental, and educational status of Nepali school children (SHN, 2006). As part of this strategy, Nepal already implements a successful large-scale nutrition program, *Suaahara*, that aims to reduce undernutrition among women and children in the first 1,000 days (Cunningham, et al., 2017). *Suaahara* was particularly successful in reducing undernutrition among women and children in the first 1,000 days because of the multiple delivery platforms that addressed exposure, knowledge, and practical barriers to achieving nutritional wellbeing (Cunningham et al, 2017). The effective scale and reach of this program can provide guidance for the development of an integrated SHN program.

Though child malnutrition interventions typically focus on the first 1,000 days, interventions for children under five alone are not sufficient because the nutritional health of school children is essential

for sustainable community development (Hunter et al, 2017). Schools and parents play an essential role in improving the health and nutritional status of school children. Nepali school children spend approximately six to seven hours a day in school, 200 days a year, therefore the school environment plays a critical role in shaping their mental and physical health (SHN, 2016). Schools are an important community institution and there are more schools than health care centers in Nepal. The World Food Programme and the Government of Nepal already operate a school meals program and a deworming campaign as well as several small-scale health and nutrition services. However, Nepal lacks a comprehensive and coordinated nutrition and health services program that is necessary to create a more enabling environment that improves the health status of school children.

Health and nutritional wellbeing are key determinants in school enrollment, retention, and educational attainment of students. Health and education are interdependent in Nepal providing schools a unique opportunity to improve the health and education status of school-age children. There is a wide consensus that a healthy school environment leads to improved cognitive, physical, emotional development of the child and contributes to educational and health goals. An integrated school health and nutrition program, with delivery of high impact, evidence-based, and cost effective interventions, is essential for achieving the national goals of food security, education, and health for all.

Increased political stability in Nepal following the civil war and a growing awareness of the importance of health and nutrition standards for school children have increased demands and expectations for improvements to the National School Health Nutrition Strategy. As part of the commitment to the United Nations Sustainable Development Goals (SDG), the World Food Progamme (WFP) is working with the Government of Nepal to develop a new School Health Nutrition (SHN) Strategy to reduce stunting and malnutrition in school-aged children. SDG goal number two is composed of eight target goals that unite hunger, food security, nutrition, and sustainable agriculture under an integrated approach, calling on countries to end hunger and achieve food security by 2030 (FAO, 2017).

The new SHN strategy must include a comprehensive and coordinated approach to education and health services in order to improve learning achievements and increase health and well-being of school children because investing in school nutrition simultaneously enhances social and economic development. In addition to reviewing and providing suggestions for the new School Health and Nutrition Strategy, this project evaluates alternative school health nutrition interventions for the new SHN Strategy in order to reduce stunting and malnutrition in school children. Integrating education and health services is critical for achieving the Sustainable Development Goals and reducing malnutrition in Nepali schools. The Government of Nepal is committed to reducing malnutrition through school-based interventions because by investing in the health and nutrition of school-aged children, a country can increase the human capital of younger generations, achieve sustainable economic growth, and further human development.

Problem Statement

Nepal ranks 11th highest out of 136 countries for stunting prevalence globally and malnutrition remains a serious problem for Nepali school children.

Rationale for Problem

Child malnutrition is a global challenge and as one of the world's poorest countries, Nepal faces extraordinarily high levels of undernutrition and stunting in children under five and school children. Nepal ranks 11th highest of 136 countries globally for stunting prevalence; 37 percent of children under five in Nepal are stunted, 30 percent are underweight, 11 percent suffer from wasting, and 59 percent of Nepali's suffer from intestinal parasitic infestation (WFP, 2016). Micronutrient deficiencies are widespread through the population.

Almost all countries in the world experience multiple forms of malnutrition simultaneously, for example, stunting, wasting, intestinal worm infestation, and anemia. According to FAO (2017), malnutrition refers to abnormal physiological condition caused by inadequate, unbalanced, or excessive consumption of macronutrients and micronutrients, including undernutrition and over-nutrition as well as micronutrient deficiencies. Anemia is primarily caused by iron deficiency and undernutrition, which is the most common form of micronutrient deficiency in school-age children, caused by inadequate diet and infection. Its negative impacts include impaired cognitive development. Malnutrition is not only the result of a lack of access to sufficient, nutritious, and safe food, it also derives from a series of interlinked factors related to inadequate access to resources and services, such as quality healthcare, education, drinking-water, sanitation, and hygiene (FAO, 2017).

Malnutrition has significant long term consequences and costs to individuals and society hindering economic and social development. Nutrition is vital for health at all ages and inadequate nutrition intake has significant consequences on global health. Malnutrition slows economic growth, reinforcing a cycle of poverty due to low productivity, poor cognitive function, and increased health costs. Stunting and wasting hinder children's' ability to learn, diminishing attention spans, reducing cognitive development, and decreasing school attendance (SHN, 2006). In addition to reducing educational capacity, child malnutrition increases the rate of child deaths and slows national economic growth due to low levels of workforce productivity (World Bank, 2016).

Child stunting and malnutrition are national challenges in Nepal and 41% of the population is under the age of 16 (SHN, 2006). Nepal's level of stunting is significantly higher than similar countries in the same geographical region and income level (World Bank, 2016). Many African countries with similar per capita incomes demonstrate significantly lower rates of child stunting, indicating the ability of countries to improve nutritional status despite low national income (World Bank, 2016).

Diseases related to poor hygiene and malnutrition are still the leading causes of death for children in Nepal and other countries in South Asia (FAO, 2017). High burden of childhood diseases has a signification impact on educational and health goals of school children through pain, morbidity, and mortality. Nepal faces a high number of childhood diseases, which include diarrhea, respiratory tract infections, worm infestations, malnutrition, and oral diseases and these preventable diseases burden school-age children, due to poor coverage of school health and nutrition services and poor hygiene and sanitation facilities.

Malnutrition affects education and cognitive development of school-age children and has a direct impact on health and education goals. Children with low socio-economic status or those living in remote regions are disproportionally affected by malnutrition, especially in areas where resources are limited and access to healthcare services is restricted (SHN, 2006). Children from minority groups, rural areas, and girls are afforded fewer educational opportunities, making them particularly vulnerable to undernutrition and stunting. Further, malnutrition is exacerbated by frequent natural disasters, especially in the remote mountainous regions where challenging terrains, high food prices, and lack of access prevent children from achieving nutrition security. The multifaceted challenge of malnutrition is a direct impediment to achieving the ambitious sustainable development goals by 2030. This adverse effect of malnutrition on economic growth reinforces a national cycle of poverty, further diminishing cognitive functions, and increasing burdens on the nation's health system (WFP, 2016).

Literature Review

Health and Nutrition Interventions

In addition to preventing malnutrition, it is essential to treat acute malnutrition and address micronutrient deficiencies. The most common international strategies for tackling malnutrition promote a combination of direct, nutrition-specific interventions with broader, nutrition-sensitive programming and policies (Harris and Drimie, 2012). The majority of nutrition policies focus on infant and young child feeding, undernutrition, and vitamins and minerals malnutrition in children under five (WHO, 2013). These interventions typically include breastfeeding promotion, complementary feeding, deworming, distribution of vitamin and mineral supplements and complementary food. For example, Nepal's *Suaahara* project integrated its programming across nutrition, health services, family planning, water, sanitation and hygiene (WASH), and agriculture production, facilitating coordination among national and district level stakeholders (Cunningham et al, 2017). *Suaahara* was one of the few programs worldwide that attempts to reduce nationwide undernutrition while simultaneously facilitating social change by specifically targeting marginalized groups. An inclusive and impactful policy must ensure that the benefits reach the majority of the population, particularly the most vulnerable groups.

Despite the importance of treating malnutrition early on in life, stunting and micronutrient deficiencies in school children have harmful effects on individual children and broader society. Hunter et al. (2017) argued that the most successful school health interventions are evidence-based and focus on behavior change through education and active participation of students, school staff, and community members. USAID (2014) refers to interventions that address the underlying conditions, related behaviors, and the broader enabling environment that lead to malnutrition are defined as nutrition-sensitive while interventions that address immediate causes and related behavior, such as providing immediate conditions for adequate dietary intake and low disease burden, are defined as nutrition-specific. Hossain et al (2017) found that that the combination of nutrition-specific and nutrition-sensitive approaches is necessary in order to have the largest effect on reducing malnutrition because interventions that focus solely on nutrition are likely to be insufficient in themselves in many contexts.

School-based nutrition interventions can act as catalysts for community-wide development, providing a social safety net, empowering previously marginalized groups, and stimulating local economies. Best et al (2010) found that nutrition interventions in school aged children provide important health

benefits that were found to reverse physical and mental deficits created by malnutrition. These strategies have the most impact when they are integrated with other interventions to simultaneously address individual nutrition, health, and hygiene behaviors and improve the quality of health services. SHN strategies based on national dietary guidelines can increase dietary diversity and reduce micronutrient deficiencies. Well-designed school nutrition interventions can influence agricultural production systems by increasing demand for healthy and nutritious foods, stimulating agricultural diversification, and supporting smallholder farmers (Hunter et al, 2017).

Designing School Health Nutrition Strategies

Health policy experts have examined various structures of SHN strategies and emphasize the need for capacity, accountability, and responsiveness in local governments (Acosta and Fanzo, 2012). Comprehensive strategies typically include multilevel partnerships between the national government, local community, and the health system. Benson (2008) argues that nutrition is critical to poverty reduction and sustainable growth and that successful nutrition policies require multi-sectoral collaboration in order to integrate and mainstream nutrition interventions. He further argues that nutrition programs play an integral role in sustainable development given the extraordinarily high economic costs of malnutrition in children (Benson, 2008). Local ownership of the policy is essential for success; however, this must be complemented by sufficient government support at the national level. Acosta and Fanzo (2012) argued that a decentralized structure is better situated to deliver SHN services because local ownership holds government officials accountable to the outcomes by linking implementation of nutrition programs directly to their electoral success. Gelli and other experts (2016) argued that complex interventions linking school demand for food and services to community-based stakeholders is the most effective strategy for reinforcing sustained commitment. The community plays a unique role as a nexus for the interventions and wider socio-economic behavior changes that address malnutrition and health issues (Nisbett et al, 2017). Furthermore, Hossain et al (2017) found that the most successful malnutrition interventions included a combination of strong national political commitment, multi-sectoral collaboration, community engagement, and a community based delivery platform.

A large-scale program requires local leadership but must be complemented by national ownership and involvement of all levels of government. Some strategies, such as the school health policy in Peru, used political incentives and central funding mechanisms to ensure local officials correctly implemented and monitored the central policy (Acosta and Fanzo, 2012). The innovative national policy in Kenya has two separate programs, led by the Ministry of Education and the Ministry of Agriculture respectfully, which allows the program to cross sectors and procure food locally at scale (Drake et al, 2016). Vertical coordination during implementation is particularly successful when local government officials belong to the same political party as the national government.

Framing nutrition as part of the national development agenda elevates the issue. Countries such as Brazil, Peru, and Ethiopia placed leadership for poverty reduction and undernutrition with the President, which subsequently led to a reduction in stunting levels (Acosta and Fanzo, 2012). Ghana used social accountability to improve community participation and demand-driven accountability to follow through on implementation of the national policy on the local community level (Drake et al, 2016). Further, civil society can be critical in influencing and shaping nutrition policies; the Children's Nutrition Initiative in Peru pressured the government to include nutrition goals in its overall poverty reduction strategy (Acosta and Fanzo, 2012). In Zambia, the National Food and Nutrition

Commission was instrumental in facilitating cooperation among local stakeholders and developing social accountability mechanisms to improve service delivery.

Specific School Health Nutrition Interventions

The most widely recognized SHN intervention is the provision of daily school meals; however, these programs are often complemented by other school-based activities such as the promotion of handwashing with soap, nutrition education, micronutrient supplementation, and construction of sanitation facilities. Sustainable school meals programs incentivize dietary diversification, as long as it is community-based, culturally acceptable, and economically feasible (Bhandari and Banjara, 2015). Multiple studies have found evidence the school meals programs increase school enrollment, attendance, attention and cognition, subsequently improving overall educational achievement and nutritional wellbeing of students (2012). School meals are often accompanied by take home rations (THR) to increase access, particularly of girls, to school which have been found to positively increase school attendance; however, studies have been unable to determine the direct impact of THR on nutritional status because the nutritional benefits are typically diluted within the girl's household (Nikiema, 2017). School meal menu composition is an important component of national strategies and must be tailored to address nutritional needs, which vary geographically (Aliyar et al, 2015). Home grown school feeding (HGSF) programs seek to improve the livelihoods of local farmers while addressing nutritional health of school children and increasing educational attainment (Rawson, 2013). Though cash transfers have proven to be highly effective in fighting malnutrition in many middle-income countries such as Mexico and Turkey, school health nutrition policies focus on school-based interventions where distributing cash to young children would be unlikely to result in reduced rates of malnutrition. Furthermore, as a low-income and least developed country, Nepal lacks the infrastructure and capacity to install a large-scale cash transfer program.

The level of school health awareness in Nepal varies significantly. Many schools combine health education with other subjects (Sohyun et al, 2015). The strongest programs include a nutrition curriculum with clear objectives from the government regarding how to teach children the advantages of nutrition (Bhandari and Banjara, 2015). These classes must be supplemented by nutrition education to women and heads of households in communities to reinforce the importance of health and nutrition at home and in school (Bhandari and Banjara, 2015). Some countries follow the Health Promoting Schools (HPS) model that emphasizes implementing health policies in schools and linking school services to the community (Sohyun et al, 2015). A study conducted in the Netherlands found positive effects in terms of improved behaviors and health outcomes when schools implement health promoting school interventions (Busch et al, 2015).

In addition to providing nutrition education, supplementary interventions, such as growth monitoring and screening to detect various forms of malnutrition, are critical for reducing undernutrition in school children. Providing these services in schools reduces historical gaps in access to preventative health services (WHO, 2017). Further, the WHO argues that a large-scale deworming program is critical to a national nutrition strategy (2017). Iron deficiency anemia (IDA) in school children is frequently associated with slower physical and mental development. School nutrition strategies typically fail to sufficiently address micronutrient deficiencies; despite the large impact they have on the health of vulnerable populations (Bhandari and Banjara, 2015). Several studies found that addressing IDA through iron supplementation and regular deworming reduces absenteeism, increases test scores, and improves overall school achievement (Bundy, 2001). Makamu et al (2017) found no evidence of an improvement in students test scores, however, their study found that deworming had positive impacts

on child education outcomes, demonstrating the cost effectiveness of the programs with regard to returns to education. Furthermore, Croke et al (2016) found that deworming is a cost-effective intervention to increases weight in school age children, illustrating how deworming is a low-cost intervention to improve health and nutritional status in school children.

Screenings and deworming, however, are only part of the solution; providing trainings to improve basic hygiene and sanitation are essential to shifting behavior and preventing future undernutrition (WHO, 2017). Dujister et al (2017) found that school based hygiene promotion and improved sanitation are effective in reducing student absenteeism by 21 percent to 58 percent and developing positive hygiene habits. These interventions should be integrated with programs that are designed to treat and prevent the direct causes of malnutrition, including health deficiencies, inadequate diets, poor knowledge of sanitation practices, and clean water (WFP, 2014). De Buck et al. (2017) argued that a comprehensive strategy should address sanitation and hygiene issues through active teaching methods and culturally-sensitive messaging. Promotional approaches aimed at sanitation behavior and handwashing, specifically using soap, were effective in creating behavioral change and improving health (De Buck et al, 2017). Hossain et al (2017) found that the most common interventions that lead to a reduction of child stunting were nutrition education and counselling, growth monitoring and promotion, WASH practices, and social safety net activities.

A Review of School Nutrition Policies

National governments have developed a broad range of policies and strategies to address undernutrition in school children. The Nutrition Friendly Schools Initiative is an integrated framework and set of criteria and standards for school accreditation in higher income countries that has the potential to expand to low and middle income countries (Hunter et al, 2017). However, many of these countries have already developed multi-sectoral national strategies to combat malnutrition in school children. Indonesia's action plan for school health provides guidance to stakeholders in strengthening implementation of the policy across all levels of government to increase commitment to the right to health for school-aged children (WHO, 2017). The *Ethiopian SHN Strategy* adopted the Focusing Resources on Effective School Health (FRESH) model as its guiding conceptual framework, aiming to facilitate effective coordination and organization of SHN responses across the country (2016). Brazil's school nutrition action plan prioritizes creating sustainable and resilient food systems, providing nutrition-related education, aligning health systems to nutritional needs, providing universal coverage of essential nutrition interventions, and promoting nutrition governance (WHO, 2017).

Despite the benefits of SHN interventions in fighting malnutrition and improving overall health and wellbeing of children, many experts are skeptical of their direct impact in effectively improving nutritional status as successful implementation varies widely depending on local ownership. Furthermore, many of these interventions are primarily implemented by NGO's and with no plan for sustainable handover to the government, the policies typically collapse when external organizations leave. This is often the case with interventions centered around the direct provision of commodities, which is why organizations such as WFP are beginning to prioritize capacity building activities and policies in order to improve the likelihood of sustainable government handover. Further research and evidence is needed to comprehensively evaluate the implementation of SHN strategies in a variety of contexts in order to justify the large investment of a national health and nutrition policy.

Conclusion

Despite concerns regarding implementation, the literature suggests that a comprehensive SHN policy should increase access to and utilization of critical health services in schools while simultaneously addressing persistent societal inequities. Achieving sustained national nutrition security requires a wide range of efforts, including nutrition-specific and nutrition-sensitive interventions as well as strong political commitment to reducing child undernutrition nationally. Further, these strategies are most successful when they are complemented by interventions in health, education, agriculture, and WASH. The potential returns on investment for integrated school nutrition programs extend far beyond health and nutritional benefits, including increased access to education, social protection, and agricultural and economic development (Hunter et al, 2017).

Evaluative Criteria

The criteria with which each alternative will be evaluated include: cost, feasibility (political and administrative), sustainability, and effect on nutritional status. These criteria will consider the costs and benefits that may result from the various policy alternatives. Each policy will be evaluated in an outcomes matrix through either a qualitative assessment or a cost effectiveness analysis.

1. Cost
2. Feasibility
3. Sustainability
4. Effectiveness

Cost

This criterion estimates the financial cost of each alternative school health nutrition intervention, keeping in mind the limited resources of both the national and local governments. This consider costs imposed on various stakeholders (in the government, school and community) in order to estimate the implementation and administrative costs resulting from each alternative. This cost analysis follows the same cost analysis strategy of the World Food Programme for all internationally funded projects. Direct costs refer to all direct support costs required for the implementation of the project; all administrative and staff costs are factored into a 6.5 percent indirect support cost rate and there is no discounting for multi-year projects.

Feasibility

This criterion measures the likelihood of each alternative in gaining political support necessary to carry out the implementation functions of the policy. Political feasibility takes into account the various interests and positions of relevant stakeholders and the degree of ownership required by all levels of the government to successfully implement each alternative. This criterion also evaluates the degree to which each alternative will be implemented successfully by the World Food Programme and the Government of Nepal, given the required administrative functions and support. Given funding and resource constraints, administrative feasibility accounts for any increased burden the various alternatives may place on various stakeholders and the likelihood of success given that increased burden; for example, complexity of the various alternatives (such as the number of rules, additional burdensome tasks, reporting requirements). Furthermore, this considers the number of agencies and stakeholders involved and responsible for the program implementation and how long each alternative will take to implement. This specifically evaluates potential additional administrative duties placed on certain stakeholders (such as teachers) that might be challenging given the already overburdened nature of Nepali schools. Each alternative's administrative feasibility is evaluated as either low, medium, high, or uncertain. Both administrative and political feasibility will be determined through conversations with my client and interviews with government officials and school administrators in Nepal.

Sustainability

This criterion estimates the likelihood that the policy will continue once the World Food Programme withdraws from Nepal. Sustainability is the most important criterion for WFP as the ultimate goal of all projects by international organizations working to address malnutrition is for eventual government handover. Sustainable policy interventions will have the most impact on reducing malnutrition in the long run and while difficult to measure, this is a critical criterion to consider when evaluating the policy

options. This criterion is evaluated as either low, medium, high, or uncertain, based off conversations with my client, interviews with government officials and school administrators in Nepal, and anecdotal evidence.

Effectiveness

This criterion estimates the effect of each alternative intervention on the nutritional status of school-aged children by estimating how each intervention will perform in reducing undernutrition, micronutrient deficiencies, and stunting in school children. Estimating the direct effect on malnutrition and projecting the outcome of malnutrition rates of each alternative is too difficult given the lack of data available in the government of Nepal; therefore, this criterion will be evaluated using anecdotal evidence of the use of these polices in other countries, conversations with my client, and interviews with Nepali government officials, health officials, and school administrators. Given the varied nature of each of these policy alternatives, this analysis does not project outcomes but instead estimates the impact of the interventions on malnutrition based off of a combination of informational interviews and anecdotal evidence. Though the lack of data and inability to conduct an official statistical analysis is a caveat of this criterion, this report qualitatively estimated the impact on malnutrition of each alternative as either low, medium, high or uncertain.

Methodology

Quantitative

This report used quantitative data from the World Food Programme to estimate the cost of my policy alternatives. This data is from a variety of internal project proposals and budgets from previous projects in countries with similar low income levels, population size, and rates of malnutrition. There is extremely limited data on school health interventions in Nepal, therefore the majority of my analysis is restricted to using information obtained from the interviews conducted while in Nepal and conversations with colleagues at the World Food Programme.

Qualitative

This data was obtained through observation of Nepali schools and the implementation of services, interviews with stakeholders, and anecdotal evidence.

Informational Interviews

I conducted interviews with relevant SHN stakeholders in the various government Ministries in Nepal that play a role in the implementation of school heath nutrition services, including the Ministry of Federal Affairs and Local Development (MoFALD), the Ministry of Health and Population (MoHP), the Ministry of Education (MoE), the Ministry of Agricultural Development (MoAD), the Department of Water Supply and Sanitation (DWSS), and the District Education Office (DEO). I also conducted interviews with widely recognized school health and nutrition experts across Nepal, including Rachana Manandhar, Arun Khanal, Amrit Gurung, and Manoj Sah. Lastly, I interviewed school administrators, teachers, and principals. The purpose of these interviews was to examine the success of the SHN strategy, gain insight on how the programs work on the administrative and the implementation level, identify current issues in implementation, and determine how the services can be improved in order to better reduce malnutrition in Nepali school children.

School Observations

I conducted observations of the SHN services and interventions during site visits to schools in Sindhupalchowk in order to evaluate the implementation of the school health nutrition basic package at the school level. By comparing the delivery of services in these two schools, I gained a stronger understanding of the different implementation structures and insight into which interventions appear to have the greatest impact on school health nutrition.

Review of the Literature

This report conducted anecdotal research on school health and nutrition policies, in addition to reviewing the strategies of other similar income-level countries. Additionally, I conducted anecdotal research on impact evaluations and other studies conducted by experts in the school health nutrition field to determine which SHN services appear to have the greatest positive impact on nutritional status. Further, this research was used to the cost of implementing these services in the Nepali context. This anecdotal research informed the evaluation of this reports alternatives, specifically in contributing to my criterion of effectiveness as there have been several studies conducted in similar low-income countries that evaluate the impact of various school health and nutrition interventions in ultimately reducing malnutrition. This research provided me with a stronger understanding of the success rate of the proposed SHN policy interventions at improving the nutritional status of Nepali school children so that the Government of Nepal and WFP can invest in the most relevant, efficient, and effective SHN intervention.

Policy Alternatives

The policy alternatives are intended to improve health and nutritional outcomes of Nepali school children while facilitating wider social and behavior change to improve overall wellbeing. The following alternatives are proposed to be implemented in 100 primary schools in the Sindhupalchowk district in Nepal which was one of the hardest hit districts during the 2015 earthquake. The 100 selected primary schools will be based on a needs assessment to determine which schools are the most vulnerable but have enough capacity to follow through with the implementation of the policy interventions. This should first be implemented as a pilot project in one single district in order to ensure that the program is successful before expanding this three-year pilot project to other districts in Nepal. This section evaluates the policy alternatives with regards to the established criteria and will ultimately recommend the UN World Food Programme and the Government of Nepal invest in the policies which perform best to reduce malnutrition in Nepali school children in Sindhupolchowk.

1. Establish Midday Meal Menu Program and Awareness Campaign
2. Establish the Fit for Schools Program
3. Establish School Gardens
4. Establish Take Home Rations Program

OPTION ONE: Distribution of Midday Meal Menus and Awareness Campaign

Description

This policy alternative will distribute five midday meal menus to children to bring home to their parents while simultaneously conducting an awareness campaign on the importance of school health and nutrition for physical and cognitive development. These menus will be created with locally available food in the district in order to encourage parents to send their children to school with a lunch or snack. The costs of food will be included in the menus as they are created with foods that are intended to be low-cost and high in nutrients. The menus will be distributed to children to bring home at the beginning of each month. Schools will also be provided with resources and posters to elevate the issue of school health nutrition, prioritizing specific school-based health and wellness initiatives. This campaign would strengthen efforts to integrate health promotion and wellness into the national education curriculum when possible. Communication for behavior and social change is critical for promoting behavior change in communities, raising awareness of nutrition and health services and stimulating shifts in social norms to improve the enabling environment for good nutrition and health in vulnerable communities. WFP will ensure the delivery of trainings four times per year in order to effect behavior change, including the distribution of advocacy posters and flyers to the schools, during trainings, and in the communities surrounding schools.

Cost

After conducting a thorough cost analysis, the total cost for the World Food Programme of establishing midday meal menus in 100 schools in Sindupalchowk for a three-year project is $8,910.00. These costs are detailed in the cost analysis table included in the annex and are based off estimations from previous WFP menu distribution programs in similar low income countries in South Asia.

Effectiveness

This alternative rates "uncertain" for effectiveness in reducing malnutrition in Nepali school children. Without conducting an impact evaluation, it is difficult to determine direct effects of menu distribution and nutrition promotion on child malnutrition. However, behavior change to increase the likelihood that parents will send their children to school with food in the long run will be much more effective than providing rations for school meals for a three-year project and then stopping the rations at the end of the project, because nutrition sensitive interventions that focus on behavior change are more likely to be sustainable (Hossain, 2017).

Feasibility

This policy alternative rates "high" in administrative and political feasibility as it will be relatively simple to implement and will not require a significant amount of time or resources from WFP or government staff. While WFP will be funding and developing the menus and distributing posters to schools, they will not be required to provide trainings or other technical support to schools. The government is supportive of this program as it does not require government commitment or resources.

Sustainability

This alternative rates "medium" for sustainability as it does not require the provision of in-kind commodities by WFP for school meals but is difficult to determine whether families will continue with the meals after the project ends. It is anticipated that providing families with menus for the week each month for three years will reinforce the importance of midday school meals and facilitate positive behavior change to increase the nutritional status of children. Furthermore, this policy alternative promotes changing behaviors and attitudes, rather than providing specific in-kind support to address malnutrition, which in the long run will be the most sustainable method of changing communities' and children's' attitudes towards nutrition and fostering positive school nutrition outcomes.

OPTION TWO: Establish the Fit for School Program

Description

This policy alternative will establish the Fit for Schools program that promotes hand washing, tooth brushing, sanitary practices, and distribution of soap in the 100 selected schools in Sindhupolchowk. WFP will train an SHN focal teacher in each school who is responsible for conducting the daily group activities on water, hygiene, sanitation, and nutrition, in addition to promoting good hygiene practices throughout the school year and spearheading SHN week activities. WFP will provide four trainings a year in Chautara, the capital of Sindhupolchowk, on handwashing practices, tooth brushing, and the importance of school health and nutrition. Signs, posters, and materials (including soap) will be distributed at these trainings.

The program provides a clear model and guidelines for implementation of the core preventative services: group activity of daily hand-washing with soap and group activity of daily tooth brushing with fluoride toothpaste. The SHN focal teachers will be responsible for promoting these practices throughout their schools, especially in training fellow teachers on the importance of incorporating health and nutrition practices into the daily curriculum of activities. Trained teachers will then strengthen the existing Child WASH Clubs, which are comprised of students and teachers who work to address hygiene needs within the school, so that students can learn about proper hygiene behaviors as well as practice them during school hours. These clubs are already established using the WHO Wash In Schools guidelines to improve the effectiveness of hygiene behavior change activities. This approach ensures that healthy habits are taught, practiced, and integrated into daily school routines and helps schools meet the essential criteria for a healthy and protective learning environment for children as part of the broader child-friendly school's initiative.


Photo: Althea Pickering

A number of countries have implemented this program with the goal to improve water supply, sanitation, and hygiene in schools while meeting SDG goals two and six of providing quality education and clean water and sanitation. Malnutrition is frequently a combination of inadequate food in addition to poor sanitation and hygiene because unhealthy children are often unable to absorb and retain nutrients, specifically certain carbohydrates, proteins, and vitamins (WFP USA, 2014). There is significant evidence demonstrating that the FIT interventions, include handwashing with soap, tooth brushing with fluoride toothpaste, biannual deworming, and improved WASH infrastructure

Photo: Althea Pickering

have been effective at improving children's health in school settings (Duijster et al, 2017). Furthermore, improving health outcomes is a key component of reducing malnutrition in Nepali school children because the benefits of school-based handwashing with soap are now well established. This intervention alone has been shown to prevent around one-third of diarrhea in children (Dujister et al, 2017). Improving WASH practices in schools is a key intervention to improve children's health and nutrition in addition to fostering a healthy learning environment.

Cost

The cost to the World Food Programme of establishing the Fit for School Program in 100 schools in Sindupalchowk for a three-year project is $11,385.00. These costs are detailed in the cost analysis table included in the annex and are based off estimations from previous WFP and UNICEF WASH programs and FIT for school programs in similar low income countries in South Asia.

Effectiveness

This alterative rates "medium" for effectiveness because while handwashing practices with soap and the promotion of good WASH behaviors have been proven to improve nutritional status of school children in other countries, the success of the policy requires teachers to follow through with the trainings and implement the practices in schools, therefore it is difficult to determine how effective the policy will be. Duijster et al (2017) found that even the most effective and simplest of health interventions, such as tooth brushing with fluoride toothpaste and handwashing with soap depend on implementation quality to reach their full beneficial potential. Though the FIT program was successful in improving hygiene and health practices at target schools in the Philippines, Cambodia, and Laos, it is difficult to make generalizations to Nepal as the success of an alternative focused on behavior change has significantly more variables regarding implementation (Siegmund, n.d.). Furthermore, the success of this policy requires constant access to clean water in schools, which is not always present in Nepal, even though it is one of the priority goals for the new government beginning in 2018.

Feasibility

This alternative rates "high" for feasibility, as it requires technical support from WFP to provide trainings biannually to all the schools in Nepal, however, it does not require provision of hardware or handwashing stations and the materials to be distributed are relatively cost-effective. The national government, especially the Department of Water Supply and Sanitation is supportive of establishing this behavior change program.

Sustainability

This alternative rates "medium" for sustainability as it will be difficult to measure the long-term impacts of this program, however, the components related to behavior change and raising awareness increase the likelihood that WASH and health practices will become institutionalized in the schools over the period of the project. Furthermore, several studies have found that the FIT program has been effective in improving children's health in school setting by leading to positive behavior change (Duijster et al, 2017).

OPTION THREE: Establish School Gardens and Promote Nutrition-Sensitive Literacy

Description

This policy alternative will establish school gardens in the 100 selected primary schools. These gardens produce vegetables while simultaneously improving the nutritional intake of children, providing nutrition education, and improving children's' development of livelihood skills. WFP will select vulnerable schools that have sufficient water, access to land and buy-in from the school and community to establish the gardens. Trainings will take place four times a year during the first year of the garden. WFP will support these school gardens initially by providing tools, seeds, soil, fertilizer, and helping the schools build the facilities for the school gardens. In addition, WFP will develop guidance and materials to distribute throughout the schools that details care for the gardens. WFP will mobilize the community to participate in developing school gardens through contributions of seeds, fertilizer, and labor. Students will be taught how to care for the gardens as part of their education in nutrition and agriculture.

Photo: Althea Pickering

The school gardens will serve as learning laboratories for the children to experiment with different vegetable and cultivation systems and as a pedagogic tool to support nutrition learning. Equipped with knowledge and skills, students, teachers, and parents will be encouraged to transfer their learning to gardening and agricultural activities at home and in their communities. Gardens will be managed by teachers and parents of the targeted schools. Fresh produce may be added to the school feeding food basket when available. WFP will provide an efficient logistics network to provide commodities, knowledge, and materials to schools.

Implementation of school gardens will take into consideration access to land and water, tools, availability of adult labor, technical expertise, and most importantly, the institutionalization of school gardens and participation of all stakeholders. School garden activities will draw insight from lessons learned in the establishment of school gardens under the ongoing Nutrition Sensitive Literacy (NSL) pilot. The NSL project focuses on the development of a nutrition literacy package to foster the literacy skills of children and provide a platform to increase critical knowledge of nutrition and health. This package includes a teacher's guide, student workbooks, and other materials for class room activities to help students gain critical knowledge about food, nutrition,

Photo: Althea Pickering

health. and hygiene while also practicing their basic literacy skills. This project is important because it helps teachers develop strategies and techniques to promote healthy eating habits and personal hygiene to school children. Both of these lessons serve as a source of innovation that students can take home to their families and apply in their own household gardens and farms.

School gardens aim to increase diet diversity, providing vegetables for school meals, while dually presenting an opportunity for students to participate in nutrition learning. Mid-day school meals in Nepal are critical in reducing short term hunger among school children, and school gardens will assist in addressing micronutrient deficiencies by diversifying the food basket with fresh and locally produced foods. This will dually increase the overall sustainability of the SHN program as it will build local capacity and establish connections to the local community while also improving nutritional status of children. Ideally, the establishment of school gardens will enhance community engagement by linking the SHN program to local agriculture, providing multiplier benefits for the local community.

Cost

The cost to the World Food Programme of establishing school gardens in 100 schools in Sindupalchowk for a three-year project is $11,550.00. These costs are detailed in the cost analysis table included in the annex and are based off estimations from previous WFP school garden programs, which have been implemented in a number of similar low income countries in South Asia and West Africa.

Effectiveness

This alternative rates "medium" regarding effectiveness, given the ample evidence on the benefits of school gardens in contributing to a better understanding of farming and nutrition principles, in addition to gaining development life skills (Robinson-Obrien et al, 2009). FAO has found evidence that growing and preparing garden food at school increases children's preferences for healthy fruits and vegetables and when combined with nutrition education, results in voluntary changes in diets, improving children's understanding of and attitudes to the natural environment through hands-on learning (FAO, year). Furthermore, school gardens diversify the school meal food basket contributing to more balanced diets which are essential for improved nutrition, health, and well-being.

Feasibility

This alternative rates "medium" for feasibility as it will require significant administrative and resource costs for the initial establishment of the gardens; but after the first year, the costs will decrease significantly as will the administrative functions of WFP. This alternative was viewed favorably by the government and the MoAD expressed interest in supporting school gardens following the end of this proposed project. Further, this alternative is feasible within WFP because the organization has implemented a number of school garden projects in a variety of countries in South Asia and West Africa, and has expressed interest in working with the Government of Nepal to initiate a policy in the country.

Sustainability

This alternative rates "high" for sustainability as school gardens increase engagement with the local agricultural community and provide life skills that emphasize the importance of regular consumption of fresh fruits and vegetables. School gardens will increase the overall sustainability of the SHN program as it will build local capacity through enhanced community engagement and establish connections to the local agricultural community, increasing the likelihood of a successful shift to a

home-grown school meals program and providing multiplier benefits for the local economy. The school administrators and students will take care of the school gardens. Food shipped from the US does not include fruits or vegetables, therefore transitioning to locally procured food will allow students to eat more fruits and vegetables, diversifying their diets and improving their nutritional status. This alternative is important because it will contribute to increased sustainability of the provision of school meals in Nepali schools.

OPTION FOUR: Establish a Take Home Rations Program for Girls in selected schools.

Description

This alternative will provide Take Home Rations (THR) to 2,500 girls in selected schools, based on a needs assessment. Selected girls will be eligible to receive 50kg THR of lentils per quarter (three times per calendar year) on the basis of their attendance rate (at least 80% of school days per month). Focusing on girls is key to addressing malnutrition in a country as girls are often the most vulnerable in a population. In many low-income countries, girls are frequently held back from school in order to work or care for their families, sometimes even forced to marry young to reduce their households' financial burdens (WFP USA, 2014). THRs incentivizes parents to send their girls to school increasing enrollment. Therefore, in addition to enhancing nutritional intake among children and families at home and increasing school attendance, THRs offer a financial incentive to decrease the gender disparity in Nepal, especially in frequently marginalized ethnic groups, such as Dalits. THRs will be distributed by the head teacher under the supervision of the Parent Teacher Association (PTA). Monthly monitoring of attendance particularly during distribution will be conducted by WFP monitors in cooperation with head teachers, who will maintain girl's daily attendance records to establish eligibility. The lentils will be purchased by WFP from local farmers. The diet of the average Nepali household is particularly low in proteins and micronutrients; therefore, the provision of lentils is intended to provide additional protein to meet the daily nutrient requirements. THRs provide a value transfer freeing up household income that would otherwise be used for food consumption, which can be used to invest in savings or other productive assets (UNAIDS, 2010). Food, cash, or voucher transfers lessen the financial pressure on the household helping parents keep their children in school, increasing attendance and preventing them from dropping out and seeking employment to support the family (Grede, 2014). THRs also provide an economic incentive to attend and remain enrolled in school through a value transfer, especially for girls, who are traditionally held back from attending school (Grede, 2014).

Cost

The cost of establishing a take home rations program in 100 schools in Sindupalchowk for a three-year project is $54,945.00. These costs are detailed in the cost analysis table included in the annex and are based off estimations from previous WFP take home rations programs, which have been implemented in a number of similar low income countries in South Asia and West Africa with success. Further, the cost of lentil procurement and transportation are based off estimates from the governments national school meals program in Nepal.

Effectiveness

This alternative rates "high" for effectiveness in reducing malnutrition and stunting in Nepali school children because it involves the direct provision of food rations to girls in exchange for attending school, directly affecting nutritional intake. Take home rations have been implemented in a number of countries and have been shown to increase nutritional intake and improve school attendance.

Feasibility

This alternative rates "low" for feasibility because of the high administrative and operating costs required. Though the government would be supportive of this program as it will stimulate economic development because rations will be bought on the open market from community farmers, this alternative is less politically and administratively feasible as it requires significant funding and resources from WFP. Furthermore, the provision of in-kind rations is unsustainable and WFP is unlikely to support a policy that requires significant long term support from an external organization. This policy alternative requires high administrative costs and burdens on the WFP staff in sub-offices to purchase, transfer, and distribute the rations to schools and children, ensure girls remain eligible to receive the rations, and monitor the effectiveness of the rations in reducing malnutrition and increasing school attendance.

Sustainability

This policy alternative rates "low" for sustainability because commodity-based rations are not sustainable long-term and when WFP stops purchasing local food from stallholder farmers to send home with girls from school, parents may be inclined to stop sending their girls to school and keep them at home to work and support the family. The GoN has already determined it is unable to continue this project without direct financial and technical support from WFP therefore it is long a long-term policy alternative for effectively reducing malnutrition in Nepali school girls.

Outcomes Matrix

Table 1.1 Evaluating the Policy Alternatives for Addressing Child Malnutrition in Nepali School Children

Criteria	Impact Category	Policy Alternatives			
		Menu Distribution and Awareness Campaign	Fit for Schools	School Gardens	Take Home Rations
Cost		$8,910.00	$11,385.00	$11,550.00	$54,945.00
Feasibility	Administrative	High	Medium	Medium	Medium
	Political	High	Medium	Medium	High
Effectiveness	Direct effect on nutritional status; reduction in stunting; improved health outcomes	Uncertain	Medium	Medium	High
Sustainability	Likelihood that the intervention will continue to improve nutritional health after WFP program ends	Medium	Medium	High	Low

POLICY RECOMMENDATION: Establish School Gardens

This report recommends that the World Food Programme establish school gardens as the most cost-effective, feasible, and sustainable policy to address malnutrition in school-age children Nepal. School gardens benefit the wider community by contributing to an understanding of farming and nutrition principles among students, encouraging the development of home gardens, and developing life skills. School gardens have been found to increase children's awareness about fruit and vegetables, their knowledge about sustainable agriculture, nutrition, and health, and their preferences for eating healthy fruit and vegetables (Schreinemachers et al, 2018). Furthermore, school gardens provide both a nutrition-sensitive and a nutrition-specific intervention because they allow for nutrition education to facilitate behavior change but also provide direct nutrients that can be used in school meals. Though the gardens will only provide fruits and vegetables during the growing season, approximately March to July and August to January, the broader impacts of school gardens linked to promotional activities about gardening and broader nutritional awareness will occur year long. Policy interventions that address malnutrition must include implementation approaches that enable short-term behavior change combined with longer-term structural changes to ensure sustainability.

I am recommending an initial three-year pilot project with clear potential for scalability after the initial hurdles have been resolved in order to ensure the intervention is worth the investment before expanding the program across the country. The World Food Programme would introduce this policy of establishing school gardens in all schools in Nepal in cooperation with the Government of Nepal so that the program can be handed over to the government after three years. The section below outlines the implementation strategy for establishing these school gardens, including short and long-term considerations and a potential media strategy to introduce during the implementation process.

Implementation Strategy

WFP will work in collaboration with the Ministry of Basic Education (MoE), Ministry of Agriculture, FAO, Ministry of Health and other partners to support the establishment of school gardens in primary schools. Though the MoE is the lead agency regarding school health and nutrition interventions, WFP would specifically spearhead the school garden implementation with the MoAD in addition to the Ministry of Federal Affairs and Local Development and the MoE's decentralized organizational units including the District Education Office and the local municipalities. Tackling malnutrition requires a multi-sector effort to address the underlying determinants of malnutrition and school gardens through combined involvement of the MoE and the MoAD. The agriculture and health ministries in particular can address the underlying determinants of malnutrition in Nepal through the promotion of school gardens while the education department can support the incorporation of fruits and vegetables into the daily school meals program (Harris and Drimie, 2012).

Nationwide interventions are most successful through the combination of a top-down approach that leverages funding mechanisms through national ministries in Nepal and bottom-up local ownership of the school gardens where students, teachers, and community members directly support the gardens. In each target school, focal teachers will be trained in school garden management by WFP and FAO. WFP will ensure the delivery of trainings two times per year and will include the distribution of advocacy posters and flyers to the schools. WFP will link the schools and communities to smallholder farmers and cooperatives, specifically prioritizing women's participation.

Given that this policy will begin as a pilot project, I am recommending that the World Food Programme establish these gardens in 100 primary schools in Sindupalchowk, one of the districts most

affected by the earthquake that suffers from particularly high rates of child stunting. WFP will select 100 schools with sufficient water, access to land, and buy-in from the school and community to establish these gardens. The establishment of school gardens will depend on a needs assessment, including the size of the school, sufficient availability of water, willingness and capacity of school to maintain the garden. Implementation will also take into consideration availability of adult labor, technical expertise, and most importantly, the institutionalization of school gardens and participation of all stakeholders. WFP will support these school gardens initially by providing materials, seeds and facilitating the construction of the sites. Gardens will be managed by teachers and parents of the targeted school children and will be used as a platform for nutrition education. Fresh produce will be added to the school midday meal menu when available and during season. WFP will provide an efficient logistics network to provide commodities, knowledge, and materials to schools. In addition to the materials and resources necessary to establish the gardens, WFP will also provide schools with trainings and materials for nutrition education, including developing a nutrition guide for teachers and school administrators in cooperation with the MoE and MoHP and organizing awareness campaigns on good nutrition practices.

WFP will mobilize the community to contribute to developing and maintaining school gardens through material and labor contributions. Community based service delivery platforms are the most successful implementation strategy for reducing malnutrition and schools are respected and permanent community institutions. WFP should link the establishment of school gardens with other preventive malnutrition platforms, such as the *Suaahara* program, in order to strengthen local ownership of the policy. Successful implementation of this school garden policy requires a combination of national commitment, collaboration across government sectors, community engagement, and local ownership in Nepal (Hossain, 2017).

This policy requires monitoring and evaluation in order to ensure that the intervention effectively addresses malnutrition through both direct nutrients and nutrition education. Prior to the beginning of the pilot program, WFP will collect a baseline survey in order to measure the impact of the gardens following the conclusion of the three-year pilot. While schools will be required to report on the nutrition activities occurring in their school each month, WFP will also conduct a midterm evaluation on the short-term successes of the school gardens in addressing both direct nutritional deficiencies but also facilitating behavior change through nutrition education. The midterm evaluation will allow the program to be adjusted if necessary. In addition to regular monitoring and reporting, at the conclusion of the three-year project, WFP, through an external third party evaluator, will conduct a final evaluation on the success of school gardens in achieving their goals of reducing child malnutrition (both directly and indirectly), in order to determine whether the pilot project is a worthy long term investment for the government to scale up across the country.

Media Strategy

Creating and promoting a national awareness campaign to accompany the establishment of school gardens would serve to elevate the issue of school health nutrition across Nepal, prioritizing specific school-based health and wellness initiatives. This activity would include funding and supporting local radio broadcasts and TV commercials sensitizing parents on the importance of health and nutrition for school-age children. Previous WFP programs have found that TV and radio are effective platforms for promoting nutritional awareness. Broader community awareness of the importance of nutrition is critical to addressing the social and environmental factors that influence the adoption and maintenance of positive behavior change. This partnership with local radio stations will help broadcast key positive

behavior change messages targeting parents and key opinion leaders with information on basic good hygiene and health practices for parents and children. WFP will also distribute branded banners, stickers and signs to schools and communities to promote visibility of school health nutrition. Given the high presence of mobile smart phones in Nepali communities, WFP will also use its social media presence to raise awareness of SHN messaging and promote SHN services and behavior change through Twitter, Facebook, and blogs. Communication for social and behavior change is critical for the incorporation of these changes into daily life and transforming social norms to improve the enabling environment for good nutrition and health in vulnerable communities (UNICEF, 2013).

Limitations

Though establishing school gardens is the most promising policy alternative, on its own it will not solve the problem of malnutrition in Nepal. According to stakeholders in Nepal (2018), the main in country constraints that would likely hinder the ability of school gardens to address the identified needs are governance, financing, service delivery, and human resources. The main barriers to implementation of school gardens identified in Nepal are resource constraints and coordination issues across the various government sectors and between the different levels of government.


Photo: Althea Pickering

Furthermore, health and nutrition interventions are only successful in the schools and classrooms in which they are served, therefore local ownership at the school level and commitment by primary school teachers is essential. Limited financing and human resources always remain a challenge in low income countries and weak governance may become a barrier to sustainable government handover of this policy in Nepal. As Nepal continues to develop and reduce its reliance on external organizations for support, WFP and the government will need to further develop appropriate policy frameworks, institutional capacity of government and community institutions, and sustained financial commitment from the government to the implementation of this school garden policy.

Moving Forward

Schools gardens can act as an access point for engaging parents and community members in preventing future malnutrition. According to Ugyen Wangdi, a school principal in Bhutan, "the School Agriculture Program is important, not only because it provides our canteen with fresh vegetables, but also because the children learn about modern ways of farming; they learn to appreciate the value of producing nutritious food and they take this knowledge home to their parents" (Mendoza, 2013). School gardens serve to nurture the community as the benefits of the program extend beyond nutritious school meals and improving nutrition education of school children; these gardens also stimulate the local agricultural market by linking school gardens to small holder farmers in order to

reduce dependence on food imports from other countries in the long term. WFP's ultimate goal is full hand over of control of all school health and nutrition programs to the Government of Nepal once the funding, framework, and capacity are in place, which is why investing in a sustainable alternative that simultaneously builds local capacity and addresses micronutrient deficiencies is the recommended policy solution. Gardens are a small investment with potential for big impact and schools are not only a respectable and permanent community institution but also present a unique opportunity to engage with the community. Addressing malnutrition at the right time helps change children's lives while simultaneously breaking the cycle of poverty. In addition to the negative impacts of stunting and micronutrient deficiencies on individual children, in the long-term malnutrition holds back communities and countries, undermining economies and development. Given the complex and unprecedented challenges of today's society, it is critical to develop policies such as school gardens to address food and nutrition insecurity that build the capacity of countries to find long-term, sustainable solutions to alleviate hunger and malnutrition A national policy that establishes school gardens works to both prevent and reduce malnutrition in order to create sustainable positive change and support efforts to eradicate hunger and all forms of malnutrition in Nepal.

Photo: Althea Pickering

Annex

Cost Analysis

Table 1.2: Cost Analysis Evaluating the Four Policy Options

Cost Analysis for Policy Alternatives

Establish School Gardens	**Year 1**	**Year 2**	**Year 3**	
Trainings to SHN teacher	1,000.00	1,000.00	1,000.00	
Distribution of garden tools/inputs	1,200.00	800.00	500.00	
Promotion of nutrition-sensitive literacy materials	500.00	500.00	500.00	
Total Direct Costs	2,700.00	2,300.00	2,000.00	
Indirect Support Cost (ISC)	1,755.00	1,495.00	1,300.00	**Total Cost**
Grant Total Activity Costs	**4,455.00**	**3,795.00**	**3,300.00**	**11,550.00**

Fit for Schools Program	**Year 1**	**Year 2**	**Year 3**	
Trainings to SHN teachers	1,000.00	1,000.00	1,000.00	
Distribution of materials	800.00	800.00	800.00	
Promotion of WASH and WINs	500.00	500.00	500.00	
Total Direct Costs	2,300.00	2,300.00	2,300.00	
Indirect Support Cost (ISC)	1,495.00	1,495.00	1,495.00	**Total Cost**
Grant Total Activity Costs	**3,795.00**	**3,795.00**	**3,795.00**	**11,385.00**

Midday Meal Menus	**Year 1**	**Year 2**	**Year 3**	
Menu Development	500.00	500.00	500.00	
Distribution of menus and materials to schools	800.00	800.00	800.00	
Campaign promoting the importance of school nutrition	500.00	500.00	500.00	
Total Direct Costs	1,800.00	1,800.00	1,800.00	
Indirect Support Cost (ISC)	1,170.00	1,170.00	1,170.00	**Total Cost**
Grant Total Activity Costs	**2,970.00**	**2,970.00**	**2,970.00**	**8,910.00**

Take Home Rations	**Year 1**	**Year 2**	**Year 3**	
Procurement of food from local farmers	10,000.00	10,000.00	10,000.00	
Distribution of food to schools	1,000.00	1,000.00	1,000.00	
Selection of eligible girls	100.00	100.00	100.00	
Total Direct Costs	11,100.00	11,100.00	11,100.00	
Indirect Support Cost (ISC)	7,215.00	7,215.00	7,215.00	**Total Cost**
Grant Total Activity Costs	**18,315.00**	**18,315.00**	**18,315.00**	**54,945.00**

General Assumptions of Costs

1. Distribution of food to schools includes costs for transporting the food to schools across Nepal
2. All direct support costs refer to materials required for the direct implementation of the project
3. All staff costs are factored into the 6.5% indirect support cost; WFP does not break this down into hours and wages per hour therefore this analysis followed their model.
4. WFP does not use a discount rate for multi-year projects therefore this analysis follows the WFP model and does not discount.

Analysis of the 2006 Nepal School Health Nutrition Strategy

Implementation Challenges

The main challenges identified in this review were coordination, resources, ownership, accountability, governance, and awareness. Lack of coordination between the lead ministries, MoE and MoHP led to a fragmented approach to service provision. Competition among government sectors may have contributed to this coordination challenge. Further, this lack of coordination was apparent across the national level and between the national and local levels of government. Given the multi-sectoral nature of SHN, the government needs to consider increasing involvement from other ministries in order to share the burden of services and improve overall service delivery. This will continue to remain a concern as the government transitions to a decentralized structure, as coordination will be critical for ensuring the consistent provision of effective and efficient SHN services across the country. As a least-developed country, resources will continues to remain a challenge for Nepal. Lack of human, financial, and material resources hindered the provision of these services at all levels. Weak infrastructure, lack of manpower at the local level, and not enough trainings to develop local capacity to own and carry out these programs contributed to the challenge of ownership. Limited commitment and responsibility at the school level compounded by the political dynamics of teachers and lack of motivation further hindered the implementation of SHN services. Lack of commitment and weak governance appeared to hinder service provision, however, corruption at the school level needs to be further explored. The combination of lack of accountability, no proper monitoring or reporting system, and contradicting interests of stakeholders create inherent conflicts of interest in multi-sectoral policies. Some teachers and health workers are motivated and promote SHN but there needs to be increased monitoring because of the politicization of teachers in Nepal. There also appears to be a lack of community awareness of the importance of SHN services. Manandhar found that the lack of a local level policy decreased accountability and oversight because there were fewer incentives for the local level to follow through with implementation of the services.

Coordination and Organization: Several government stakeholders emphasized challenges in coordination among the various ministries. Though CHD tried to establish strong coordination among different

levels of government and between the levels of government, there is minimal coordination among the sectors, the SHN committees are not very active, and only approximately 70% of the Food Management Committees (FMCs) are functional.

Resources: Funding at the school level inhibits the successful implementation of school health nutrition interventions. School Improvement Plans (SIPs) provide funding for basic school resources but are barely sufficient as is, and many schools in remote and poor regions are already under-resourced or supported by an outside organization. Remote schools frequently lack sufficient infrastructural facilities. Furthermore, funding for Nepali schools is based on the number of students, instead of other factors that may affect the school's environment. The majority of government resources go towards teacher salaries and school building; there is not enough emphasis on soft skills such as knowledge based health practices and nutrition learning.

Local Ownership: Implementation at the local level is insufficient, likely due to lack of capacity to manage and implement the programs. The education and health system lacks incentives to encourage and promote the implementation of school health nutrition activities. There is no clear delineation of roles in the community and local government for the planning and implementation process of the SHN interventions. In addition to local ownership at the school level, a sustainable SHN program requires community mobilization because once parents and communities begin demanding these services for their children, schools and the government will be help more accountable.

Teacher Motivation: Nepali teachers are irregular, unprofessional, and heavily protected by political patronization. Already overburdened and overloaded with administrative duties and trainings, teachers and school administrators are often more concerned with their potential for promotions than they are with promoting school health and nutrition. The lack of intrinsic motivation undermines the provision of services. Teachers typically fail to reach their full credit hours and are not incentivized to report, therefore there is no mechanism in place to hold teachers accountable for SHN implementation.

Accountability and Monitoring: Despite emphasis on enhancing accountability and transparency, institutional mechanisms to monitor and evaluate programs remain weak and legislative oversight is highly limited. Lack of supervision undermines the provision of SHN as there are no incentives for local ownership or capacity building. The SSRP Evaluation (2015) found that fragmented accountability between the central government and local governments hindered the implementation of school health interventions. This gap is exacerbated by a lack of understanding of individual responsibilities and perceptions of the strategy.

The Decentralized Structure

The introduction of the federal system under the Constitution of Nepal (2015) completely changes the institutional arrangement of the state. Given that new arrangements have yet to be established, there is increased risk of interruption of service delivery of the School Health and Nutrition interventions. The education sector has given the local municipality level government complete autonomy over the provision of services, while the federal level of the health sector has retained some control related to health policies, standards, and services. There is significant uncertainty within the government ministries as to what will happen under the new decentralized structure and how the SHN programs will be implemented. The general consensus is that the individual municipalities will have much more autonomy to decide which services to implement, and in which schools, but that varies by government sector. Given this uncertainty and the potential for increased inconsistency in program

delivery across municipalities, it will be important to find ways to standardize school health nutrition and enhance accountability.

The central government will now only play a supporting role, especially in providing technical support to municipalities. The goal of the MoE is to create a guiding policy to circulate; however, there is no official metric for accountability and the municipalities decide whether to follow the guidelines. Under the MoE, the municipality will have one section led by education that will be in charge of health, education, women etc., which will make it easier for partners to coordinate and eliminate duplication of services. The MoE is trying to coordinate the implementation of the SMP within the MSNP but this will be increasingly important under the new structure to enhance consistency and increase coverage. Development partners need to work with municipalities so that the programs are channeled through the local government. The MoHP is unsure what the implementation structure will look like in the federal context; they are currently conducting an organizational structure analysis and will hopefully know in the next six months. However, the district WASH committee will continue to lead school WASH activities and determine which services to implement.

Within the MoFALD, local municipalities will plan and decide what parts of the MSNP they want to prioritize and implement, including services for schools, the community, or both. The budget as a whole will remain the same but the municipalities will have much more autonomy and can even modify different MSNP components based on local priorities or needs. Given the coordination issues across government sectors at the national level, many stakeholders expressed hope that this will be resolved under the new structure because coordination is easier at the local level. Further, in cases where programs may contradict each other, local municipalities can make adjustments as needed in order to improve the implementation of SHN. While giving the local level much more independence to decide which services to prioritize will hopefully increase the efficiency and relevancy of SHN services, some municipalities may lack the capacity or institutional knowledge to effective maintain SHN programs. Increased independence is a good start for improving SHN implementation but there needs to be a metric for accountability.

Recommendations to Improve the Implementation of the Policy

In order to address some of the challenges and concerns with SHN implementation identified in this review, I developed a set of preliminary recommendations to improve school health nutrition in Nepal. Given the limits of my analysis, these recommendations are preliminary suggestions that are meant to spark dialogue and initiate a conversation within the government on how to better improve health and nutrition in Nepali School children.

A National Awareness Campaign

Creating and promoting a national awareness campaign would serve to elevate the issue of school health nutrition across Nepal, prioritizing specific school-based health and wellness initiatives. This campaign would strengthen efforts to integrate health promotion and wellness into the national education curriculum when possible. Ratings and visualizations of best performing schools and teachers can be helpful to generate awareness about the importance of health, wellness, and nutrition. A star approach that classifies schools according to the SHN strategy with one, two or three stars depending on the quality of the SHN services provided would incentivize schools to improve their star level through an award and recognition scheme run by the MoE, with all three star schools

nationally profiled. The national awareness campaign should be spearheaded by the National SHN Committee but the committees at all levels should be involved in resource mobilization and promotion of the campaign. WHO emphasized the importance of informational campaigns in creating demand for services and mobilizing the community to hold key institutions accountable for school health nutrition (2017). It is important to highlight the importance of nutrition services to communities at the local level to enhance community support for these programs on a larger scale. The government should develop SHN documents to disseminate on the local and community levels to raise awareness of the importance of SHN. This also serves to link SHN activities to the community which reinforces the importance of SHN to children. Explaining the importance of nutrition services to communities is a critical component of SHN and MSNP implementation because linking these activities to the community reinforces nutrition education for children at home and at school.

Foster Local Ownership through Capacity Building at Nepali Schools

Though schools are very much community owned and SMCs are entrusted with management, the SHN program lacks ownership. When considering the new decentralized structure, the government must look for ways to include the local government officials and community members in owning the program. Municipalities will need to develop human resources, with support from the central government, to carry out technical functions required for implementing SHN activities. Linking the SIP to SHN initiatives combined with technical trainings on SHN will serve to foster local ownership and build capacity at the school level. WFP and other partners should help provide more skills-related and knowledge-based activities and trainings to increase support municipalities. Further, government officials need more training and technical support from external agencies so that key personnel can build capacity and share knowledge (Sir Interview). This will hopefully lead to increased ownership and leadership at the school level as SHN is ultimately the responsibility of the local government. The creation of a professional development program that can deploy to schools would provide trainings to staff members on the need for school health nutrition, provide guidance on how to teach SHN, and provide increased technical assistance for implementation of the SHN program at the school level to build local ownership. A program like this would likely need to include some sort of extrinsic motivation, such as financial incentives, for Nepalese teachers who are already overworked. This professional development would improve quality of SHN interventions and increase the likelihood that students would receive a quality education on the importance of SHN. Creating a student peer educator program would also allow students to share lessons across various grades within the same schools and serve to improve student behaviors and attitudes about school health and nutrition. The peer educator program could be organized through the child clubs. This also serves to link SHN activities to the community which reinforces the importance of SHN to children.

Strengthen Community Partnerships and Ownership

Directly linking the school health strategy to local partners would facilitate community buy-in (both labor and material) and improve the sustainability of the strategy. Ademokun et al (2014) found that strengthening of long-lasting and sustainable community partnerships through inclusions of community role models in the implementation of school programs and committees help communities embrace school health and its policies more. Further, working with community structures (PTAs, LGUs, SMCs) would help link school meals with local farmers and connect school health services with local providers. This should also include trainings to village health committees, parents, teachers (especially head teaches) on the importance of health education and specific behavior changes in order to foster educational institutional memory. Strengthening these community partnerships can increase local power in decision making and hopefully improve ownership and sustainability of the program.

The involvement of the broader community and effective community partnerships (i.e. the private sector, community organizations and women's groups) can enhance and reinforce SHN promotion and resources. These partnerships, which should work together to make schools more child-friendly, can jointly identify health issues that need to be addressed through the school and help design and manage activities to address them (Ethiopia Strategy).

Develop a National School Health Accreditation Program

This national school health accreditation program would be modeled off of others in higher income countries, for example the Nutrition Friendly Schools Initiative, in order to reward schools that invest heavily in School Health Nutrition activities. The SSRP Evaluation found that extrinsic incentives produce results in Nepal, therefore a rating system to recognize schools that excel in school health and nutrition would create competition and likely improve overall levels of school health. One study found that in order for increased accountability in the education systems of developing countries, reforms should focus on incentives, especially for teachers (Mbiti, 2016). The current strategy lacks sufficient rewards for successful implementation and further lacks motivation and public support for school nutrition health. The accreditation program would acknowledge schools that are successfully implementing the activities from the SHN strategy in addition to rewarding top districts and schools based on a combination of ratings. Further, distinguished schools that demonstrate a desire to invest in capacity building to improve school health would receive financial grants to incentivize and reinforce institutional capacity for school health and nutrition. The national media would be used to promote and recognize schools that excel in SHN, creating visibility for best performing schools. The GoN could also consider presenting worst performing schools as a disciplinary measure.

Create an Institutionalized Performance Monitoring System

The creation and implementation of an institutionalized monitoring system to track and measure schools' implementation of SHN activities would improve service provision and enhance the sustainability of the program. Similar to the current issue of lack of teacher motivation and public support, there is no effective performance management tool to ensure Nepali schools are implementing SHN activities and creating a health-enabling environment. The GoN could create a robust information system to track SHN activities linked to the current educational management information system (EMIS). This information management system would provide reliable and open data and allow schools and the government to access information on the progress of the SHN objectives. This system could also include the development of an equity index to track and provide additional information on disparities across various districts in Nepal to allow the GoN to provide additional support to schools in rural districts that may be lagging behind because of insufficient funds and lack of infrastructure. This information system would simplify and harmonize the process for reporting of SHN activities, increasing financial accountability and transparency. The GoN must ensure that this monitoring system is efficient and easy to use – increased reporting but not for the sake of reporting. In the new federal context, municipalities will have much more control over which programs to prioritize and implement so a standard monitoring system will be important for tracking the provision of services and ensuring needs are met across districts. Capacity constraints at the provincial and local levels demonstrate a need for institutional capacity building at all levels. When creating this reporting system, the government must consider which SHN services need to be standardized across all municipalities (if any), and how to develop incentive mechanisms to ensure that schools accurately report on SHN.

Develop a National School Health Curriculum

The GoN could develop a national school health curriculum that includes information on knowledge, values, attitudes and life skills necessary to ensure the school health and nutrition of school children. This curriculum would provide basic information on key health and nutrition issues and messages, allowing students to practice skills-based learning to facilitate attitude and behavioral change, fostering desirable health and nutrition habits and discouraging unhealthy practices. This curriculum could consider including a health specific class to distribute key health messages in order to create greater cohesion of SHN practices. However, integrating health and nutrition topics into traditional education classes can reinforce the importance of SHN and help students transform their attitudes and behaviors to improve overall wellbeing. By continuing to incorporate school health education into regular class materials and textbooks, the national government can continue to set the nutrition agenda while allowing the local municipalities decide which SHN services to implement. The elementary curriculum would prioritize basic WASH and nutrition behaviors to reinforce these behaviors early on whereas the secondary school curriculum would include a specific component for girls on sexual education and menstruation practices. These new education materials on key messages and skills should be included in both current school textbooks and supplementary readings. This should also include the expansion of the Nutrition Sensitive Literacy project to other districts in order to continue promoting nutrition education and healthy eating habits in primary schools. Manandhar found that NSL had a positive impact on behavior practices, such as handwashing with soap and positive impact on nutrition knowledge (Interview). This must coincide with increased dissemination of SHN information to explain the importance of SHN to communities.

Increase Government Coordination

There is a need to increase coordination among government officials and other relevant stakeholders. Given the large budget and commitment from the government for MSNP II, it will be important to coordinate across sectors in the design and implementation of SHN services to ensure that programs are not contradictory or duplicative. By increasing coordination and incorporating more government sectors, for example MoAD, and MoWSS, into the core SHN implementation strategy, the government can share the burden and allow various institutions to hold each other accountable, enhancing the overall provision of SHN services. MoAD should play a greater role in spearheading the nutrition component of SHN. Increasing involvement and ownership of MoAD will link the SHN strategy to local agriculture. Though national level agriculture stakeholders participate in conversations, involvement is not trickling down to the community level. Linkages to local agriculture at all levels of the government, including the community level, are critical for increasing the sustainability of the SMP. Furthermore, including the provision of school gardens as a core component of the strategy will support increased nutrition education in addition to providing nutritional benefits. WSS can play a greater role in promoting school sanitation and ensuring that hardware is not only present in all schools but that it is operational. MoFALD recognized the importance of having good coordination between government and development organizations so that services are spread out among beneficiaries and not duplicated. Several stakeholders recommended combining the SHN and SMP Committees to avoid duplication and increase consistency because there are more resources and political support for the SMP. There is a need for active SHN committees at all levels of government (school, municipality, provisional, national) that includes all relevant sectors and actors.

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