



Nutritional aspects in the EDGET project: Addis Ababa, Ethiopia

Report of a mission

Marianne van Dorp



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A mission was implemented to advise SNV project management and project staff on how to integrate human nutritional considerations into the EDGET project that aims at increasing the production of milk and dairy products in selected areas in Ethiopia. The EDGET project already also identified the objective of contributing to improving the nutritional situation of 500.000 young children in the areas. The advisory services concentrated on technical aspects of nutrition, linking the EDGET project staff to nutrition related networks and expertise in Ethiopia and on the design of a nutrition related baseline.

Keywords: Dairy development, nutrition, Ethiopia



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1 Introduction

From January 20-25, 2014, a mission was implemented to advise the EDGET (Enhancing Dairy Sector Growth in Ethiopia) project team in Ethiopia on the human nutritional aspects of the programme.

The project defined two goals (impact level):

1. Increased dairy income of target farmer households.
2. Increased nutritional status of targeted farmer households and consumers in target areas (especially for children under 3 years of age).

And three objectives:

1. To enhance sustainable dairy production and productivity, input supply and related services.
2. To increase marketing of dairy products, particularly for children under-3.
3. To contribute to development of institutions and to sector-wide initiatives.

The questions for the nutrition mission were:

1. Which dairy products and product delivery systems are appropriate for (potentially) improving child nutritional status?
What are the necessary (project) conditions?
2. With which national/Ethiopian institutes, organisations, individuals working in the field of Human Nutrition the project could link up?
3. What should be the contours, set up, and indicators of a nutrition baseline in order to assess results of the project (midterm and end line)?

2 Dairy products and child nutritional status

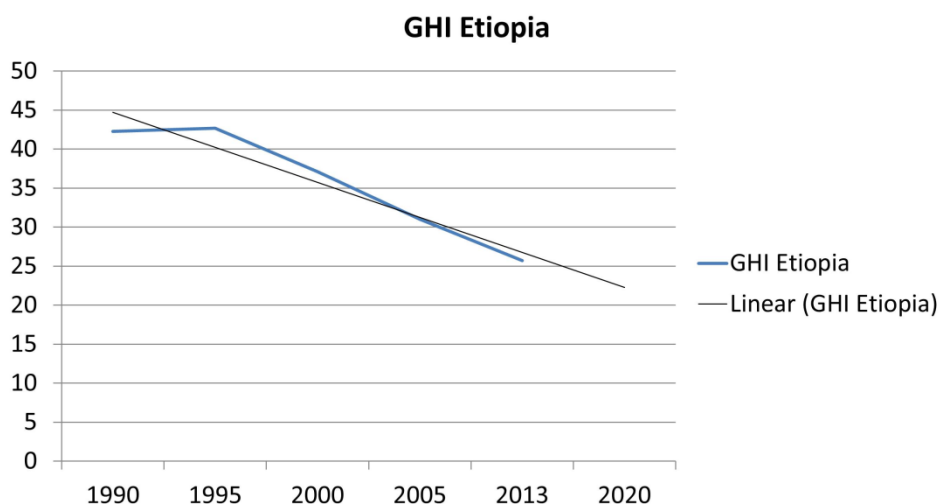
2.1 The nutritional status of young children in Ethiopia

Malnutrition¹ or undernutrition is a serious problem, affecting young children and doing most harm in children from conception to 23 months of age (first 1000 days of life). Undernutrition occurring during this period and not remedied is irreversible and leads to lifelong physical and mental effects negatively affecting labour productivity and quality of life.

The prevalence of undernutrition in Ethiopia is high. According to the Global Hunger Index (GHI)², a composite indicator of hunger and (child) undernutrition, Ethiopia is at position 71 of a total of 78 countries classified as having a GHIs >5. The GHI of Ethiopia is 25.7, while the GHI of the highest ranking country, Burundi, is 38.8. A GHI between 20.0 and 29.9 is classified as 'alarming'. Despite that, over the past two decades the hunger and undernutrition situation in Ethiopia has markedly improved. The trend line in Figure 1. shows that further improvement can reasonably be expected in the near future. However, reaching the 'acceptable' levels of GHI <5 is still far away in time, if no additional measures will be taken.

Figure 1

Trends in Global Hunger Index Ethiopia,
Global Hunger Index 2013



¹ Malnutrition is a term that is used for both undernutrition or overnutrition (obesity, overweight). In Ethiopia, undernutrition is still the most prevalent form of malnutrition. In the remainder of this document we will use the term 'undernutrition'. Undernutrition is used for sub-optimal intake in terms of quantity of food (kCalories, energy) and quality (micronutrients; vitamins and minerals).

² The Global Hunger Index (GHI) is a complex indicator composed of: 1) Proportion of undernourished 2) Prevalence of Underweight 3) Under 5 mortality rate in children. IFPRI, Welthungerhilfe, Concern worldwide.

Child undernutrition is expressed in anthropometric indicators (combinations of child's weight, height and age) and micronutrient status. Child undernutrition in a population is a proxy indicator of the nutritional situation of the population as a whole.

The prevalence of various forms of child undernutrition in young children in Ethiopia is still high, despite impressive improvements in this respects over the past two decades (Figure 2.; EDHS, 2000, 2005 and 2011; NNP, 2013). Chronic undernutrition or stunting (Height for Age) still affects almost 1 out of every 2 children in Ethiopia (44.4%).

Internationally, stunting currently is the most referred to indicator when discussing child undernutrition (e.g. Scaling Up Nutrition, Zero Hunger Challenge, Sustainable Development Goals). Stunting mostly occurs in the period between 6 and 23 months of age, as is shown in Figure 3. Most children in Ethiopia are breastfed, even up to ages of over 24 months. Exclusive breastfeeding suffices the nutritional needs of children up to 6 months of age. After 6 months, complementary foods should be added to the diet.

A number of conditions have to be met for proper child feeding when complementary foods are introduced:

- Complementary foods have to be energy and nutrient dense; supplying enough calories and proteins to sustain child growth and sufficient micronutrients to support the utilization and the building up of body stores of micronutrients.
- Food safety standards should be met; complementary foods should not pose health risks, mainly gastro-intestinal difficulties, leading to diarrhoea and dehydration.
- Feeding practices should provide adequate frequency of child feeding; high feeding frequency per day is needed to match nutritional needs and small stomach sizes.

The Ethiopian Demographic and Health Survey (EDHS, 2011) shows that young child feeding habits in Ethiopia are compromised at all three above mentioned aspects (as is the case in many other countries in development); complementary foods (sometimes also foods that other family members are consuming) are often (too) bulky and variety of food items too small, thus not providing sufficient energy or nutrients per portion, complementary foods are prepared once a day and left at ambient temperature, leaving room for microbial proliferation; feeding frequency is often insufficient due to among others lack of awareness or time limitations. The EDHS shows that proper Infant and Young Child Feeding (IYCF) practices, defined as a combination of 1) breastfeeding or other milk products (including infant formula), 2) minimum meal frequency (differing per age group) and 3) sufficient variation in the meal composition are only received by 4% of the Ethiopian children, aged 6-23 months (EDHS, 2011).

Figure 2

Trends in the reduction of under 5 child malnutrition in Ethiopia (EDHS 2000, 2005 and 2011)

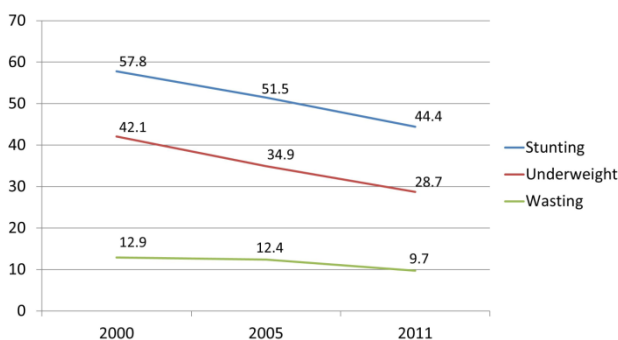
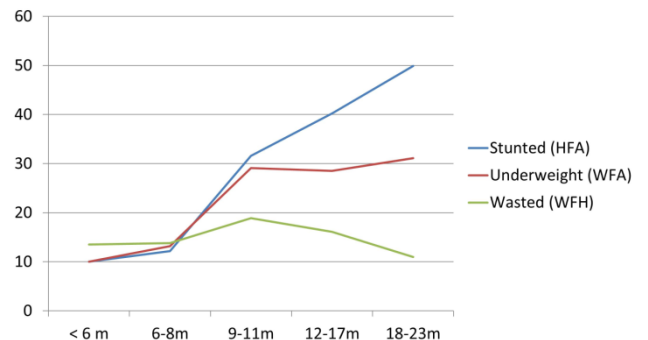


Figure 3

Malnutrition in Ethiopia for under 2 year olds, per age category (Ethiopia Demographic and Health Survey 2011)



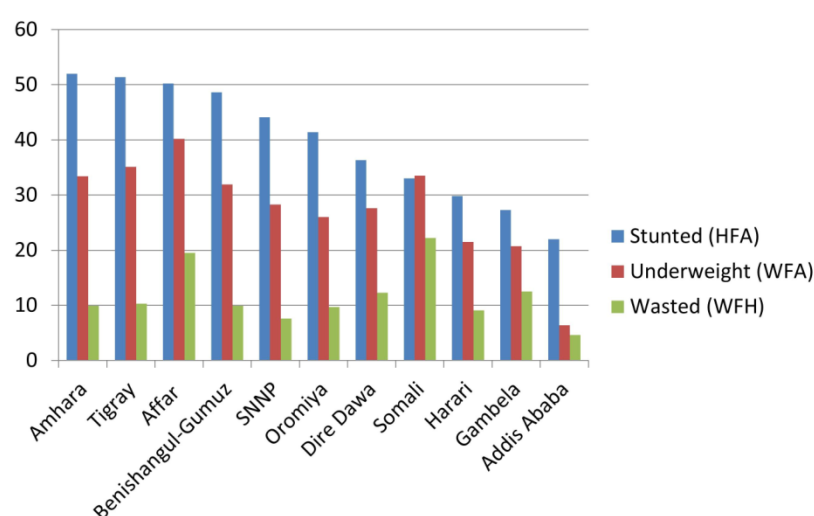
Child undernutrition rates, expressed as chronic undernutrition (stunting; Height for Age), acute undernutrition (wasting; Weight for Height) and underweight (combined chronic and acute undernutrition; Weight for Age) vary greatly per region in Ethiopia, as is shown in Figure 4. As for stunting, levels differ from a 'high' 52% of under 5 children in Amhara region to a 'low' 22% in Addis Ababa.

The three selected regions for the EDGET project all have high prevalences of stunting with resp 52% in Amhara, 44,1% in Oromiya, and 41,4% in SNNP. Unfortunately, no differentiated data per woreda or kebele are available.

Figure 4

Prevalence of undernutrition per region in Ethiopia, organised for stunting levels

Ethiopia Demographic and Health Survey 2011



Conclusion

The child nutritional situation in Ethiopia justifies interventions in the field of increasing food intake as well as in the field of enhancing the quality of the food consumed in terms of nutrient composition. Especially the period of 'weaning', when children are gradually introduced to other foods than breastfeeding, is a crucial one. This is the period when chronic undernutrition sets on. It is exactly in this period that prevailing child nutritional habits show room for improvement (EDHS, 2011)

The EDGET selected regions are among the ones with the highest prevalence of child undernutrition in the country.

2.2 Dairy and dairy products as complementary foods for young children

Animal source food products including milk and dairy products can make an important contribution in meeting the nutrient requirements of pregnant and lactating women and young children. Animal source food products are usually more energy dense than plant source food products, and thus less bulky and more easily palatable and ingestible for children with small stomach sizes. Animal source food products have higher levels of certain micronutrients, e.g. riboflavin, Vitamin B12, Calcium, phosphorus, and for others, the bioavailability is higher (e.g. iron, zinc, vitamin A/carotenoids). Studies implemented in the 1980s (Nutrition CRSP studies in Egypt, Kenya and Mexico) have shown that adding only small amounts of animal source food products to plant-based diets can yield significant improvements in maternal health and child development.

In many developing countries with a developing dairy sector, most milk is traded through informal channels. Ethiopia is no exception. Raw milk, the absence of cold chains and the absence of a regulatory framework to control for health hazards potentially presents a problem in compromising human health and inducing food-borne illnesses. Because of the relatively high content of nutrients and micronutrients, milk and dairy products are not only potentially good for (human) nutrition, but they also provide an excellent source for bacterial proliferation, potentially affecting the quality of the products. Especially vulnerable groups, such as infants and young children, pregnant women, immune-compromised individuals and the elderly should be protected from these risks.

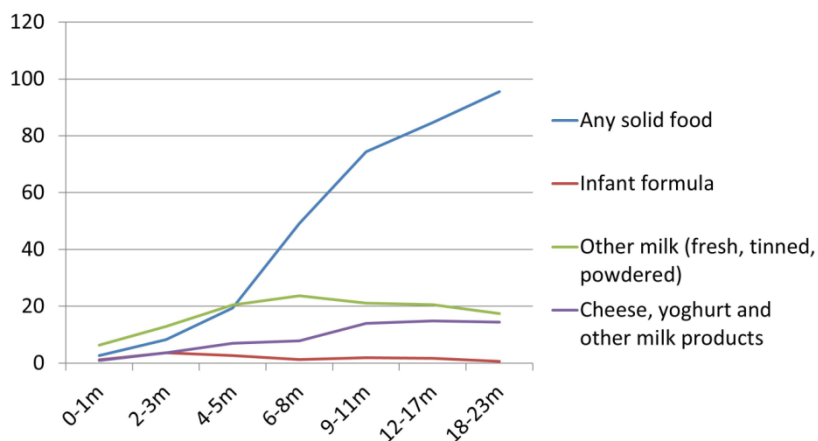
In Ethiopia, milk and dairy products are used as complementary foods for children 6-23 months. Figure 5 shows that fresh, tinned or powdered milk is used for 17% of the children; cheese, yoghurt or other milk products for 14% of the children. It is not known whether mothers feeding one type of dairy product also feed the other type to the same child.

The reasons for the relatively low provision of milk and dairy products to young children are not fully known (to the consultant), and can differ for various regions in Ethiopia:

- Data used (EDHS, 2011) are for Ethiopia on average and not everywhere milk and dairy are (abundantly) available.
- Milk and dairy products are relatively expensive and might be used to generate an income rather than for household consumption.
- Access to milk and dairy for non-producing households can be limited (price is high).
- There is a (cultural) preference for providing milk and dairy products to males in the households (despite the Orthodox Fasting habits preventing adults from consuming animal-based food products for up to 200 days per year).
- Differences in food habits and food taboos between the many different ethnic-cultural groups in Ethiopia.
- Lack of awareness on the side of mothers/caregivers on the beneficial effects of milk and dairy products for child growth and development.
- Etc.

Figure 5

The role of milk and dairy products as complementary foods for children 0-23m (for breastfed children)
Ethiopia Demographic and Health Survey 2011



Conclusion

Milk and dairy products can potentially play an important role in improving the nutritional intake of young children because of the nutrient density of the food products. However, food safety issues have to be taken into consideration, especially because of the vulnerability of infants and young children for gastro-intestinal infections and the consequent risk of dehydration. The traditionally available dairy products could potentially be used as a basis for child feeding.

2.3 Dairy development contributing to household food and nutrition security, including child nutrition

Milk and dairy products potentially affect the nutritional situation of household members, including young children, through various pathways:

- **Direct:** the increased availability of milk and dairy products leads to increased consumption and milk and dairy products being energy- and nutrient-dense food products.
- **Indirect:** through the sale of milk and dairy products the income of the household increases, POTENTIALLY leading to increased quantity or quality of food intake by the members of the household PROVIDED caretakers are aware of the importance of good nutritional habits.

The examples of impressive dairy sector development in India and Kenya show that increases in milk production thus milk availability do not necessarily and automatically lead to improved child feeding habits and child nutritional situation.

Concerted efforts to develop the dairy sector in India led to a fourfold increase in dairy production between 1963 and 2003. However, this increased availability has not translated into increased consumption for all strata of the population. Although a direct link with nutrition improvement is difficult to show, dairy consumption levels show that higher socio-economic groups consume more dairy than lower socio-economic groups, and girls consume notably less dairy than boys. Stunting levels remain invariably high in India at 38% at the national level (FAO, 2013).

Also in Kenya, dairy production levels have increased fourfold since the 1970's. However, consumption is and remains skewed, with highest levels among higher socio-economic classes and milk producing households (45 Kg/capita/year), less with rural households having to purchase milk (19 kg/capita/year). Urban households (e.g. Nairobi and Mombasa) consume notably more than rural (125 kg/capita/year on average compared to 19 kg/capita/year for rural households on average). Also in Kenya, the linkages between increased milk production and availability and child nutritional status have been difficult to show (FAO, 2013).

Several programmes on milk and dairy promotion, that explicitly included milk fortification, have been implemented in Latin America, and have shown positive results on child nutritional status. The programmes in Latin America have often been targeted to poor and vulnerable population groups and the fortification efforts of (whole) milk have been tested out through well-designed Randomized Control Trials (RCTs). The RCTs have indeed showed an impact on child nutritional status (improved micronutrient status, reduced associated morbidities). Milk fortification has mainly concentrated on iron and zinc as the major micronutrient deficiencies. Vitamin C was added in several cases to enhance the absorption of iron. Milk by nature is a rich source of calcium, phosphorus, and Vit A and D (FAO, 2013).

Next to potential positive effects of dairy development on nutrition, also potential negative effects on child nutrition should be considered:

1. Increased labour demand of mothers/women (caring for dairy cattle) can be detrimental for health of young children because time for child care/child feeding is compromised.
2. Food safety aspects of milk and dairy products should well be considered not to compromise the health situation of the infant/young child and thus affect the nutritional situation.

The review of agricultural development programmes with a (stronger or lesser) objective to improve child nutrition (World Bank, 2007, Massett et al, 2011) show what the conditions are for agricultural programmes to indeed have a (potential) impact on child nutritional status:

Programme design:

1. Deliberate objective to improve nutrition with clear intervention pathways on how to achieve this.
2. Flexible programming.

3. Proper and well-designed M&E system with regular assessment of progress and possibilities for reflection and adaptation of intervention strategies.

Programme content design:

1. Empowerment of women, enhanced decision making power to mothers/caretakers on spending household income (on food and food products).
2. Nutrition awareness creation, especially oriented to nutritional needs of vulnerable groups.

FAO clearly points at the 'do no harm' principle for agricultural programmes, including dairy development programmes, to explicitly prevent potential negative impacts on child nutritional situation (FAO, 2013).

Conclusion

For agricultural development programmes to have an impact on child nutritional situation, a number of conditions are crucial:

1. Enhanced availability and accessibility of nutritious food products for vulnerable groups.
2. Ensured food safety of the nutritious food products.
3. Women empowerment; involvement of women in productive activities and improved decision making power of women on spending of the household budget.
4. Nutrition awareness creation on good nutrition habits, especially oriented to vulnerable groups.
5. Respect the 'do no harm' principle.

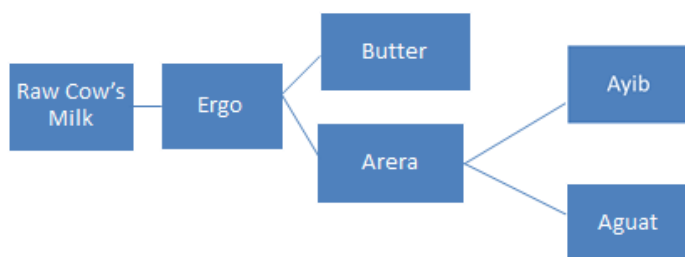
2.4 Options for milk and dairy products in Ethiopia to improve child nutrition.

EDGET has identified a high level of undernutrition among young children as a major issue in the country. The undernourished children partly live with dairy producing households. In addition, milk and dairy produced can potentially improve the dietary intake of infants and young children and thus improve the nutritional status. The intervention strategy of the project is 1) to increase dairy availability in the country through increasing milk production and milk quality through making available cross bred cows and improved livestock management practices (for 65.000 dairy farming households in 51 woredas), 2) improve the income of the dairy producing households through improved market linkages for dairy producing households, and 3) improve the nutritional status of young children, living within and around the dairy producing households that benefit from the project's interventions (500.000 children living with dairy farming households and around).

Figure 6. provides a simplified milk processing chain for Ethiopia and pictures traditional dairy products that are potentially available to Ethiopian households. It is not known (to the consultant) exactly WHAT kind of milk and dairy products mothers/caregivers provide to infants and young children (skimmed milk, skimmed sour milk, cottage cheese,...), if there are regional differences and if yes, what they are. The National Food Consumption Study (EHNRI, implemented 2012-2013) of which reports are expected in 2014, might provide more information on this.

Figure 6

Simplified milk processing in Ethiopia Yima Zelalem et al, 2011



Box 1. Milk and dairy processing and consumption in Ethiopia

- Not many people in Ethiopia consume whole milk as such, except in tea or coffee, or providing it to infants, the elderly or the infirm
- Most milk is processed into butter, *ayib* and *ergo*.
- *Ergo* is naturally fermented whole milk
- *Arera* is skimmed/defatted sour milk
- *Ayib* is Ethiopian cottage cheese made by further fermenting *arera*, and then boiling for the milk proteins to coagulate
- *Aguat* is the remaining whey, often fed to the animals

Yilma Zelalem et al, 2011

Possible dairy products to be used in child feeding:

1. Full cream cow's milk.
2. Ergo; naturally fermented cow's milk.
3. Arera; skimmed milk.
4. Ayib; Ethiopian cottage cheese.
5. Composite products; e.g. a yoghurt drink (EmBwa).

1. Full cream cow's milk

As stated, the consumption of only relatively small amounts of full cream milk (e.g. half a cup) already makes a significant difference in child nutritional status because the relative energy density of the food product, the high quality of the protein, and last but not least the relative good amount and bioavailability of micronutrients, including the fat-soluble. However, as affordability is an issue for most consumers, farmers prefer to sell the butter that has good market value.

Food safety might be an issue when milk is given to infants and young children and the milk is not properly cooked prior to consumption, or left standing at ambient temperature for a full day after cooking and used for child feeding during that day.

2. Ergo or naturally fermented milk

The natural fermentation process might remove or overgrow pathogenic microbes. The naturally fermented milk still contains the full fat content and is thus acceptable for child nutrition.

3. Arera or skimmed milk

Skimmed milk as such is not suitable for child feeding because of the low fat and energy content and because the removal of fat also removes (most of the) fat-soluble vitamins and/or strongly reduces their bioavailability. Skimmed milk can be used as a component of other foods in order to upgrade protein and (water-soluble) micronutrient content. Usually, skimmed milk is added to products in the form of skimmed milk powder (added to Corn Soy Blend (CSB+) or PlumpyNut (a UNICEF-developed Ready to Use Therapeutic Food on the basis of groundnut paste, enriched with skimmed milk powder and micronutrients).

4. Ayib or Ethiopian cottage cheese Ayib is Ethiopian cottage cheese; a regular part of the diet on non-fasting days.

The product is a concentrate of proteins (coagulated milk proteins), so a potentially rich food product. However, ayib is made from defatted milk. Ayib has a very bland taste and in that respect potentially lends itself for child nutrition. It is not known whether there is a cultural habit/tradition to feed children with ayib. Being a processed product, ayib is also relatively expensive and households might prefer to sell the cheese.

5. **EmBwa, a fortified yoghurt for child feeding made from skimmed milk**

The project proposes to embark on home or cottage industry based processing of a yoghurt, based on skimmed milk (arera), in which a number of criteria should be met in order to make the product suitable as a child complementary food:

- Increase the energy content through adding fat (palm oil).
- Utilize the yoghurt as a carrier for micronutrients (fortification).
- Product quality improvement: ensure proper emulsion of the enriched yoghurt and ensure food safety & shelf life (adding emulsifiers and bactericides).
- Ensure acceptability and 'aspiration' for the product by adding a flavour.
- Ensure the economic viability of the product; develop the 'business case' at the cottage industry level.

There are a number of questions that should be answered before deciding that developing EmBwa is a proper complementary food for children. These questions partly concern the potential nutritional impacts for the children and partly concern the production and the business case:

1. What are the perceived advantages of EmBwa for child nutrition, and do they outweigh potential risks of the processing when this takes place at the household or cottage industry level? Can the perceived advantages be made more factual and quantified?
2. What are the potential (health) risks for the vulnerable group of young children of 6-23 months that the product will be targeted to?
 - Food safety? Accuracy of adding the right amounts of fortification mix, bactericides, emulsifier?
 - Is the bactericide added potentially affecting intestinal flora of the children?
3. Palm oil is a cheap vegetable oil widely consumed and available in Ethiopia. Yet, it is not known as the most healthy vegetable oil. Palm oil is relatively rich in saturated fats, which makes it increase risks for cardiovascular diseases. Risks should deliberately be recognized.
4. Is developing EmBwa the most efficient and effective way to improve the nutritional situation of the children? In what other (simpler) ways could the intake of (available) dairy products by children be enhanced, e.g. adding Micronutrient Powders (MNPs) or Lipid Based Nutrient supplements (LNSs) to prevailing complementary foods to increase micronutrient and/or energy?
5. What is the prevailing regulatory framework for fortified food products in Ethiopia (FMHACA)? Is it allowed to bring fortified foods on the market, also if it is local markets? Which fortified foods are currently produced in Ethiopia and are they publicly sold, or is sale restricted to use as emergency foods?
What are prevailing regulations for other additions to the food product? Bactericides? Flavours?
FMHACA is the relevant authority that should provide insight into the do's and don't's.
6. The product should be developed under laboratory conditions and checked for quality (food safety) and for accurate levels of micronutrients and other additives to fine-tune the product design and check for potential chemical reactions within the final product.
7. The product should be pre-tested for taste and acceptability by both mothers and children.
8. It is recommended a market study is conducted to check what mothers are able and willing to pay for the product, even if selling occurs door to door and at village level? Do they see the added benefit of the product for their children?
9. It is recommended a feasibility study is performed at the household/community level: is the 'business model' viable? Are villagers willing to invest (their time) in the production of EmBwa? Do they foresee a potential market? Do they regard it as a good livelihood opportunity? How does the development of EmBwa relate to other dairy products and their market value and how to dairy farmers/processors value the various products (for economic return)?

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10. The project should be aware of risks of potentially substituting breastfeeding when orienting a dairy product to such young children. The Government of Ethiopia has signed the International Code of Conduct for Breastfeeding Substitutes.

Conclusion

Traditional milk processing in Ethiopia shows that a number of potentially nutritious dairy products are available and culturally accepted, although it is not known if these products are also used to feed (young) children. Soured or fermented milk products and yoghurt are highly nutritious, have enhanced shelf life and are a little less likely than fresh milk to harbour pathogenic organisms. These potentially nutritious and potentially relatively safe dairy products can be encouraged, also for consumption by young children. For the proposed development of a relatively complex product as complementary food for children, a number of questions remain open, such as 1) what are the business opportunities for producers and 2) what is the foreseen nutritional benefit young children can get out of the product EmBwa and 3) what are the potential health risks involved when developing EmBwa at the household or village level.

3 Ethiopian nutrition related policies, institutes and networks

The EDGET project at this moment lacks specific expertise in (human) nutrition in the Ethiopian team. In order to be connected to sources of knowledge, it is advised that the project actively links up with the networks and expertise that exists in this field in Ethiopia. These networks and contacts can also be used to further advocate the approach the EDGET project is taking in 'utilizing' the dairy development approach of increasing milk production to improve child nutritional status.

The following initiatives and/or institutes are worth noting:

1. National Nutrition Programme, June 2013-June 2015, spearheaded by MoH, signed by 9 State Ministers, is a policy framework for addressing undernutrition in the country.
Dr Ferew Lemma, Ministry of Health, is the key person who facilitated the putting together of this policy document.
2. Ethiopia is one of the 46 countries that have committed themselves to improving the nutrition situation in their countries. These countries are gathered under the Scaling Up Nutrition (SUN) movement (<http://scalingupnutrition.org/>). Dr Ferew Lemma is chair of the National Coordinating Body.
3. The Ethiopian National Nutrition Working Group, consisting of MoH/Nutrition (Dr Ferew Lemma, chair), UN organisations, USAID and other donors (Irish Aid, JICA, EKN,).
4. UN organisations active in nutrition, e.g. UNICEF, FAO, WFP, gathered under REACH (Renewed Efforts to End Child Hunger and Undernutrition).
5. GAIN Ethiopia, Mr Alem Abay.
6. Ethiopian Public Health Institute (EPHI, formerly EHNRI), responsible for nutrition related research in the country including national level food consumption surveys. EPHI collaborates in the 5 yearly data collection and analysis for the Demographic and Health Surveys (DHS).
7. University of Hawassa, School of Nutrition and Food Sciences (Nutrition capacity development in the country); human nutrition, food processing, food sciences.
8. Food quality control laboratories: Hilina Food Quality Laboratory, EPHI Food Quality Laboratories for checking microbial content of the products but also nutrient content (either with or without fortification).
9. FMHACA, the Ethiopian Food and Drug Administration.

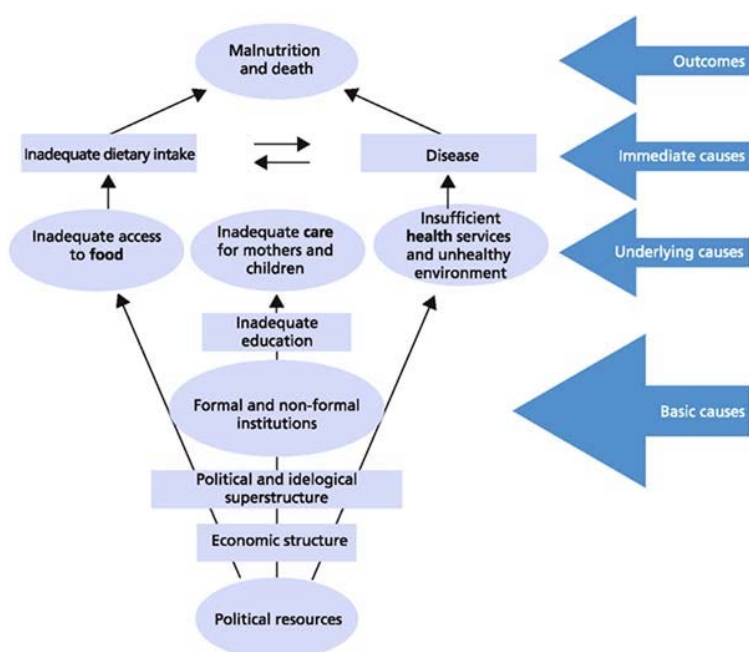
4 First ideas on set up and indicators for a nutrition baseline in order to assess results of the project (midterm and end line)

In order to set up a baseline, there are a number of considerations and questions:

1. Up to now, internationally it has been difficult to show results from agriculture-based interventions on the nutritional situation of children (Masset et al, 2011, 2012). There have been shown impacts on increased food intake of children or increased diversification of the food intake of children, but very limited on child nutritional status in terms of anthropometric indicators. There have been examples of improved micronutrient situation of children (in case of (bio)fortification; e.g. reduced anaemia, improved Vitamin A status).
2. Child nutritional status results from the interaction between food intake and health situation (Figure 7. UNICEF Framework for Nutrition). The EDGET project does intervene in the field of enhancing food availability and accessibility. The project does not explicitly intervene in the field of (creating awareness on) child feeding habits/care taking practices and will most certainly not intervene in the field of securing the health situation of the children. The project should thus be careful in identifying what is the maximum level of result (impact) that can be achieved, and most probably that will be at the level of increasing the consumption of dairy products by young children, ASSUMING a positive contribution to child nutritional situation.

Figure 7

Framework for nutrition



Regarding this 'theoretical logic' of arriving at improved nutritional situations, before deciding on indicators (and designing a baseline) the following questions are relevant:

- How does the EDGET project currently defines 'improved nutrition'? Possibilities include increased milk consumption; increased dairy products consumption; improved child nutrition situation as defined through anthropometry; improved child nutrition situation as

-
- defined through Hb levels; improved child nutrition situation as defined through other (micronutrient) indicators; etc.?
- Why did the EDGET project select children up to the age of 3 years, where the international community either identifies children up to 5 years (60 months) of age, or children during the first 1000 days 9up to 23 months of age?
 - Is it actually realistic (regarding the UNICEF framework) to expect reduced stunting levels in children through the intervention logic as it is currently designed?
 - Is it actually realistic to expect reduced anaemia (or other micronutrient deficiency) levels through the intervention logic as it is currently designed?
 - If both are not realistic, what additional steps are needed in the intervention to enhance the chances to indeed achieve such results?
 - If both are not realistic, what is the 'maximum level outcome' that can be expected, and what is the appropriate indicator?
3. (Related to the points mentioned under 2)
- What actually is the intervention logic/Theory of Change of EDGET project in order to contribute to the desired nutrition impact? How can the project team, on the basis of the intervention logic, structure an impact pathway and identify relevant indicators along the route?
- Having relevant indicators along the 'route of change' enables the project team to monitor up to where 'things go right' and where we achieve less results than expected. This will yield guidance on how and where to adapt the intervention logic in order to achieve the best possible impact by the end of the project.
4. Is iron deficiency anaemia (IDA) the most prevalent micronutrient deficiency in children in Ethiopia? What about zinc? Little data are available as yet. Yet, it seems that zinc intake of Ethiopian children is more at risk than iron. Teff is relatively rich in iron and the fermentation process to produce enjera enhances the bioavailability of this iron; those families that can't afford teff are not likely to be using dairy products either. How are poverty, food habits, nutrition deficiencies and potential solutions using dairy products linked together?
5. Cheap, portable and even non-invasive assessment measurement methods are available for assessing Hb levels. Cost estimates per test vary from US\$ 0.04 (non-invasive) -US\$ 0.90 per test (HemoCue). Validity of the testing methods varies.
- For potentially using Hb as an indicator for the baseline, more detailed checking of the variability of the assessment methods and the respective costs involved should be checked. In addition, the decision on which indicators to select (including Hb) needs to depend on the assumed/assessed nutritional situation of the children and the assumed contribution of the project to the nutritional situation of the children ('route of change').
6. It might be good for the project to select (nutrition) indicators that are more or less in line with what is internationally accepted/what the international community is slowly building coherence on. Nutrition improvement is getting higher on the agenda and agenda setting bodies such as Scaling Up Nutrition, High Level Panel of Experts, High Level Panel of Eminent Persons (HLPE), Sustainable Development Goals, Zero Hunger Challenge, etc. all agree on proposing reduced levels of child stunting as one of their major/key indicators. Major donors do the same (DFID, USAID Feed the Future, Ministry of Foreign Affairs, The Netherlands). The EDGET project is financed through the Netherlands government, that adopts the indicators of Zero Hunger Challenge (including prevalence of stunting) as its indicators for food security.

Some donors (USAID Feed the Future) select anaemia in children and/or women in reproductive age as an additional indicator to levels of stunting in children and BMI in women, but NOT as a stand-alone indicator/proxy for nutritional status.

Conclusion

In order to design a nutrition baseline, it is advised to have a workshop/meeting with the project team to discuss the proposed Theory of Change and assumed pathways of change and (together) identify

relevant indicators along that road. This automatically delinks the nutrition baseline from other baseline collection.

In addition, and partly parallel, other necessary preparations such as the identification of partner(s) for collaboration for the nutrition baseline, sampling methods, relevant methods for data collection, etc. should be made.

5 Conclusions and recommendations

Conclusions

- Milk and dairy products do have the potential to contribute to necessary diversification and increase of (nutritional) quality of food intake by young children in Ethiopia.
- Milk and dairy products are vulnerable to deterioration and the lack of hygiene potentially pose a health risk to consumers, which is mainly important to consider for vulnerable groups such as young children.
- Many questions still remain on what would be the best possible dairy product to contribute to child food intake and child nutrition. Regarding the foreseen product EmBwa, the question remains whether more simple and already available dairy products would not be (at least) as good (effective, efficient), potentially complemented with micronutrient supplements such as Micronutrient Powders (MNPs) or Lipid Based Micronutrient Supplements (LNSs), and potentially entailing less risks from a food safety point of view.
- It remains unclear if the project team has a well thought through, understood and shared among all project members, intervention logic on how the project aims to contribute to improving the nutrition situation of 500.000 children and how well this is connected with prevailing insights of nutritionists.
- The lack of a clear intervention logic for improving child nutrition makes it difficult to design a proper nutrition baseline, which should allow mid-term and end-line assessments of results but also enable the project to adapt intervention strategies if results achieved turn out to be too limited/too slow. Appropriate indicators along the (nutrition) intervention logic will allow the project team to decide where and how to adapt the intervention strategy. As baseline data collection for nutrition can only be carried out once the intended impact pathway/result chain is more developed, the nutrition baseline automatically is delinked from the main baseline data collection.
- The project team, currently lacking specific nutrition expertise, might benefit from closer linkages with the existing and active nutrition network in Ethiopia (organisations, persons, networks and platforms).

Recommendations

- Background research is recommended into the feasibility of EmBwa as a preferred product for improving child food intake and child nutritional situation, from a food processing and food safety point of view, but also from a point of view of (child) nutrition, business case development, EmBwa vis-a-vis other dairy products, etc.
- It is recommended to actively link up (at least) one staff member of the EDGET project to existing nutrition networks in Ethiopia.
- A workshop with project staff (including the 3 regional managers) is advised to thoroughly discuss the nutrition component of the project, in order to enhance the understanding of the nutrition component, realize what is needed in order to arrive at improvements in child nutritional status (which is more than making milk or dairy products available), think through the intervention logic, design interventions and collaboration/coordination with other sectors, and put down the groundwork for the nutrition baseline.

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Appendix 1 - Time schedule

| Date | Time | Activity |
|----------------------------|-------------------|--|
| Monday January 20, 2014 | 7.30 hours | Arrival Churchill Hotel, Addis Ababa |
| Monday January 20, 2014 | 10.00-14.00 hours | Meeting with Mr. Roland Hodson and Mr. Jan Vloet |
| Tuesday January 21, 2014 | 10.00-11.30 hours | Meeting with Mr. Alem Abay, GAIN Ethiopia |
| | 15.00-17.00 | Meeting with Mr. Gerrit Noordam, Embassy of the Kingdom of the Netherlands |
| Wednesday January 22, 2014 | 9.00-13.00 | Working at SNV office |
| | 14.00-16.00 | Meeting with EHNRI, various staff members, Contact person Mrs. Aragash Samuel |
| | 17.00-18.00 | Debriefing Mr. Jan van der Lee |
| Thursday January 23, 2014 | 6.30-16.30 hours | Field visit to milk collection centres, smallholder dairy farmers and small-scale milk processing centres in Chancho, Selale area |
| Friday January 24, 2014 | 10.00-13.00 | Meeting with Dr Eleni Asmare (FAO Ethiopia Human Nutrition) Meeting with Dr Oumer Diall, FAO Regional Office, Livestock officer |
| | 14.00-15.00 | Debriefing SNV office |
| Saturday January 25, 2014 | 9.00 hours | Departure to airport |

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Appendix 3 - Terms of reference

Enhancing Dairy Sector Growth in Ethiopia [EDGET]

PLANNING CHILD NUTRITION INTERVENTIONS

Terms of Reference for Wageningen UR Centre for Development Innovation

No : IV.1
Version : 1
Date : January 15, 2014
Developed by : JL

N.B. This is a growing document that may be adjusted over the course of the year.

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EDGET fact sheet

| | |
|--|--|
| Project title: | Enhancing Dairy Sector Growth in Ethiopia (EDGET) |
| Duration: | December 2012 to December 2017 (5 years) |
| Goal: | To improve household income and nutritional status of children through increased dairy production and enhanced dairy processing & marketing. |
| Expected project impact on: | <ul style="list-style-type: none"> Increased dairy income of target farmer households Improved nutritional status of children |
| Key targets: | <ul style="list-style-type: none"> 65,000 farm households double income from dairy Increased nutritional status of 500,00 children |
| Project financing: | Total budget from Embassy Kingdom of the Netherlands (EKN) in Ethiopia € 10,000,000 |
| Lead organisation and subcontractor | <ul style="list-style-type: none"> SNV Netherlands Development Organization Ethiopia Sub-contractor: Wageningen University & Research centre (Wageningen UR) |
| Main government counterpart agencies: | <ul style="list-style-type: none"> Ministry of Agriculture in Ethiopia – concerned Directorates Regional Bureaus of Finance and Economic Development Regional Livestock Development and Marketing Agencies Private sector (input supply, service provision, production, processing, and marketing) |

1. Background

In December, 2012 the Embassy of the Kingdom of the Netherlands (EKN) signed a funding agreement with the Government of Ethiopia and SNV-Ethiopia for a dairy development project in Ethiopia. The EDGET Project is building on the experience of the SNV Dairy Value Chain project (BOAM 2005-2011 and WUR/SNV MIDD Project (2011-12).

The main goals of EDGET are 1. Increased Dairy Income and 2. Improved Nutritional status of children. EDGET's objectives are defined as:

1. To enhance sustainable dairy production and productivity, input supply and related services
2. To increase marketing of dairy products, particularly for children under-3
3. To contribute to development of institutions and to sector-wide initiatives

2. Objectives and scope

This consultancy is designed to contribute to achieving the above objectives in general, and in particular "to increase the quality and diversity of processed dairy products increased, in response to nutritional needs" (result area 2).

Its objective is to assist project management in identifying a feasible approach and activities for its nutrition component.

The scope of the consultancy is exploratory; additional involvement will be decided upon after identification of approach and activities.

3. Tasks, requirements and main deliverables

The tasks of WUR consultant are:

| No. | Tasks | Methodology |
|-----|--|---|
| 1 | Assess existing ideas of project team in terms of effectiveness and feasibility | Discussions with team |
| 2 | Advise on approach and set of start up activities | Discussions with team followed by written advise to project manager |
| 3 | Advise on desired partnerships of project with third parties in and out of country | Discussions with potential partner organizations |
| 4 | Write advisory report | |

The main deliverables of WUR are:

- An advisory report detailing the choices that have to be made by EDGET management, and suggestions for approach, activities, needs for partnership, and potential partners.

4. Time table

Trip Marianne van Dorp January 2014

Draft advisory report submitted to project leader by February 15

5. Resources

Consultancy fee at WUR senior level for

- 7 days trip, including ticket, hotel and DSA
- 4 days to draft 8-page advisory report – scope of additional engagement and planning beyond advisory report to be agreed later.

6. Rules of the game

- EDGET and WUR will keep open communication lines in order to come to a good and quality baseline
- When one of the parties is not satisfied with the results, direct consultation should be sought for
- Each party tries to react as soon as possible to proposals, feedback and results.

To explore
the potential
of nature to
improve the
quality of life



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CDI Report CDI-14-003

The Centre for Development Innovation works on processes of innovation and change in the areas of food and nutrition security, adaptive agriculture, sustainable markets, ecosystem governance, and conflict, disaster and reconstruction. It is an interdisciplinary and internationally focused unit of Wageningen UR within the Social Sciences Group. Our work fosters collaboration between citizens, governments, businesses, NGOs, and the scientific community. Our worldwide network of partners and clients links with us to help facilitate innovation, create capacities for change and broker knowledge.

The mission of Wageningen UR (University & Research centre) is 'To explore the potential of nature to improve the quality of life'. Within Wageningen UR, nine specialised research institutes of the DLO Foundation have joined forces with Wageningen University to help answer the most important questions in the domain of healthy food and living environment. With approximately 30 locations, 6,000 members of staff and 9,000 students, Wageningen UR is one of the leading organisations in its domain worldwide. The integral approach to problems and the cooperation between the various disciplines are at the heart of the unique Wageningen Approach.

