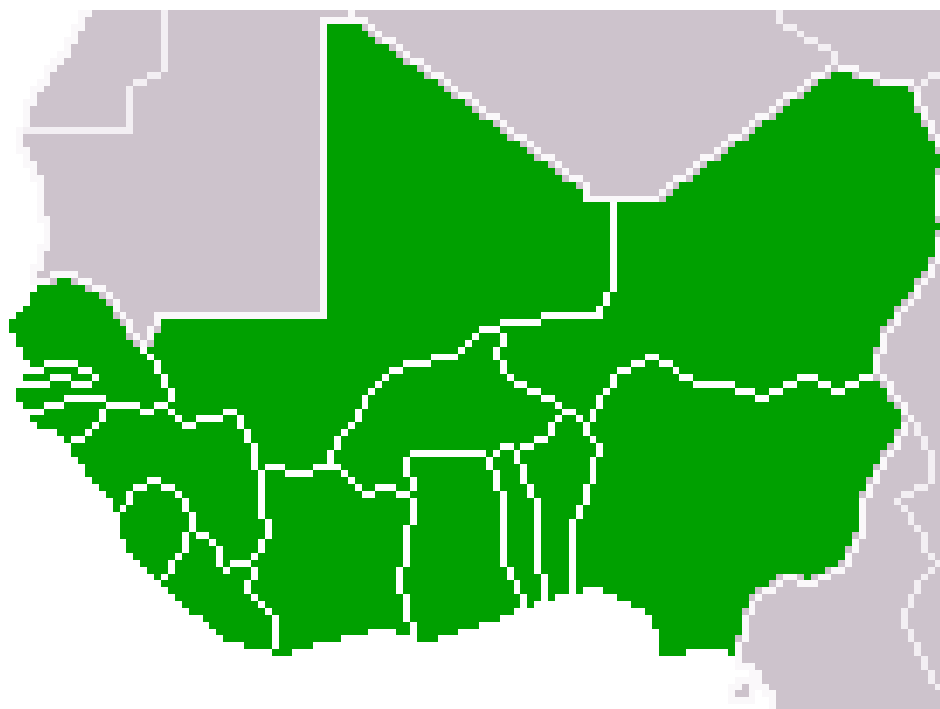


**REGIONAL HARMONIZATION FOR SUSTAINABLE FOOD
FORTIFICATION PROGRAM
(ECOWAS REGIONAL FEASIBILITY STUDY)**



**(Study for the West African Health Organization; Funded by:
African Development Bank-AfDB)**



**Human Development Department
Health Division**

December 2008

Consultant: Tidiane Traore

Reviewed by Shawn Baker & Mawuli Sablah of Helen Keller International; Ismael Thiam of the West Africa Health Organization and Maimouna Diop Ly of the African Development Bank

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS.....	4
EXECUTIVE SUMMARY	5
RECOMMENDATIONS	6
1.0 Introduction	10
2.0 The Scope of the Study	11
3.0 Methodology	12
4.0 Limitations and Risks	12
5.0 Literature review	13
5.1 General Principles guiding Food Fortification	13
5.2 Guiding Principles for Food Legislation.....	13
5.3 Quality assurance and control in food processing in general and food fortification in particular.....	14
5.4 Conclusions based on literature review	15
6.0 Justification for Regional Food Fortification.....	16
7.0 Regional Food Fortification harmonization efforts in West Africa.....	20
7.1 Choice of Food vehicles for fortification.....	20
7.2 UEMOA efforts towards Regional Fortification Harmonization	20
7.3 Total Regional Harmonization.....	22
7.4 Regional Initiatives	23
7.5 Regional Performance Assessment and Opportunities:.....	24
8.0 Results and Components of food fortification systems in some West African countries	25
9.0 Government Awareness	26
10.0 Laws and Regulations	26
11.0 INTERVENTIONS.....	27
11.1 Opportunity/Intervention 1	27
11.2 Intervention 2: Harmonization of Standards.....	27
11.3 Intervention 3: Testing Capacity	28
11.4 Intervention 4: Inspection System:.....	28
11.5 Intervention 5 – Donor Support	29
11.6 Intervention 6 – Training Support.....	29
11.7 Intervention 7 – National Stake Holder Capacity Strengthening.....	29
11.8 Intervention 8: Development Bank Foundation line of credit to the food industry.....	30
11.9 Intervention 9: – Regional Logo.....	31
11.10 Intervention 10: Project Management and Monitoring.....	31
11.11 Intervention 11: Social Marketing/ Public Outreach	32
12.0 Review of Country Specifics.....	33
13.0 Cost benefit of fortification	36

14.0	Regional and International Trade Issues:.....	39
15.0	Industry characteristics.....	40
16.0	Regional Best Practices	41
17.0	Current Status of Fortification Standard with Recommended Micronutrients.....	42
18.0	Food Fortification Status in West African Countries	44
18.1	Benin	44
18.2	Burkina Faso	44
11.3	Cote d'Ivoire	45
11.4	Guinea.....	45
11.5	Guinea Bissau	46
11.6	Mali	46
11.7	Niger	46
11.8	Senegal.....	46
11.9	Togo	47
11.10	Cape Verde, Gambia, Ghana, Liberia, Nigeria and Sierra Leone.....	48
19.0	Critical success factors for Regional Harmonization of food fortification.....	50
20.0	Roadmap:.....	51
	Harmonized Food Fortification in West Africa Study – What Next: Road Map	51
21.0	APPENDICES.....	55
21.1	Appendix 1	55
22.2	Appendix 2	56
21.3	Appendix 3	57
21.4	Appendix 4	60
21.5	Appendix 5	64
21.6	Appendix 6.....	65
21.7	Appendix 7	66
21.9	Appendix 9	68
21.13	Appendix 13.....	83
21.14	Appendix 14.....	83
21.15	Appendix 15-	86
21.16	Appendix 16.....	88
21.17	Appendix 17.....	91
21.18	Appendix 18.....	95
22.0	References	99

ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank
AIFO-UEMOA	Association Industriels de la Filiere Oleagineuse de l'UEMOA
BASF	Badische Anilin- und Soda-Fabrik (mulinational premix Comp.)
CET	Common External Tariffs
ECOWAS	Economic Community of West African States
EU	European Union
FAO	Food and Agricultural Organization
FDB	Food and Drugs Board
FFI	Flour Fortification Initiative
GAIN	Global Alliance for Improved Nutrition
GSB	Ghana Standards Board
HACCP	Hazard Analysis Critical Control Point
HKI	Helen Keller International
ISO	International Standards Organization
MI	Micronutrient Initiative
NEPAD	New Partnership for African Development
PSRSA	Program Special Regional pour la Securite Alimentaire
SPS	Sanitary and Phytosanitary Systems
SON	Standards Organization of Nigeria
TBT	Technical Barriers to Trade
UEMOA	Union Economique et Monetaire Ouest Africaine
UNICEF	United Nations Children Fund
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USI	Universal Salt Iodization
VA	VitaminA
VMD	Vitamin and Mineral Deficiency
WAHO	West African Health Organization
WFP	World Food Program
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

West African States are faced with serious micronutrient deficiencies coupled with lots of constraints and challenges but the capacities of member countries to meet these challenges are limited. It is believed that combining resources at the regional level will create a more cost effective pool that will have greater impact by leveraging countries with limited resources. Food fortification has been identified as one of the means of effectively combating the major micronutrient deficiencies. To make this more effective, there is a need to support a regional food fortification program to enhance the quality of life through the elimination of the micronutrient deficiencies in the region thus improving long term productivity. This will assist countries in the achievement of the Millennium Challenge Goals that will sustain economic growth, reduce poverty, and greatly improve the health status of the population.

A proposed intermediation will be to start a regional ECOWAS fortification program in earnest. This will involve the harmonization of the regulatory framework, so that compliance and procedures of the fortification programs become uniform. Regional harmonization of food fortification program calls for interventions at both the regional and country levels that will strengthen the institutional capacity of the public as well as the private sector to implement the fortification program in a sustained way. A harmonized food fortification will also impact intra regional trade by creating a level field thereby boosting demand creation.

In order to identify critical areas for intervention the African Development Bank and the West Africa Health Organization commissioned this feasibility study. The study was to extend the efforts undertaken at the Union Economique et Monetaire Ouest African (UEMOA) a sub-regional organization of seven francophone countries and one lusophone country, which share a common currency with a harmonized custom system and are committed to evolving towards a common market to the ECOWAS Region. UEMOA has achieved some landmarks in its food fortification program. A common regulatory framework has been drafted to serve as a template to member countries. This includes common standards on fortification of edible oil with vitamin A as well as standards for the fortification of wheat flour with iron and folic acid..

UEMOA's efforts has not taken into consideration other West African countries namely Nigeria, Ghana, Gambia, Sierra Leone, Liberia, and Cape Verde which form the larger population base of the ECOWAS region. Hence WAHO sees the need to include the remaining ECOWAS States in the fortification harmonization program in order to have a comprehensive harmonized food fortification regime.

The objective of this study is therefore to review the issues that affect full regional harmonization on food fortification and make recommendations as to critical areas of interventions that can make the food fortification program feasible and sustainable. Areas identified as a result of field interviews and focus group discussions are presented in the form of recommendations. A total budget of \$ 12,000,000 has been projected as the financial commitment needed to achieve the program.

RECOMMENDATIONS

Based on the various interviews, group discussions, and fora the following are recommended as areas of potential interventions:

- Support the development of regional legislation that addresses the regional food fortification needs and specifies standards for each food vehicle for fortification.
- Support the development of regional set of standards for flour and oil fortification based on FAO/WHO guidelines on nutrient addition to foods (CAC/GL 09 – 1987 amended 1989, 1991)
- Support the social marketing program of the regional food fortification program. This will help create unified and simple messages to build consumer awareness, not only about food fortification, but also about malnutrition prevention.
- Provide funding for creation of a common ECOWAS regional logo that will be the ECOWAS seal for quality to brand fortified foods. This will also create demand for the products that have the logo and leverage industries' competitiveness.
- Assist in the strengthening of the National Food Organizations in various countries as well as the regional food fortification networks. These Organizations are the driving force behind the food fortification program in the region.

Development banks and Donors to support Private Sector in partnership with the Global Alliance for Improved Nutrition (GAIN) by establishing an initial fund of \$5,000,000 to guaranty credit lines to finance acquisition of pre-mix (fortificants), on a revolving basis.

- Support the Project management, monitoring and evaluation Unit. Intervention will support the Regional Project Administration office (which will monitor activities in the participating countries, and each country project office (CPO) to implement investment plans.
- Enter into a strategic partnership with GAIN and Helen Keller International (HKI) which are the two organizations that have played major roles as implementing organizations of the food fortification in the ECOWAS. Field discussions with donors have revealed that finding capable implementing partners is key to success. GAIN and HKI have submitted concept notes on areas of support and collaboration. These are found in the Annexes.
- Support for specific interventions within individual countries is also recommended, because regional framework support is not in itself enough for the sustainability of the fortification program. Some of these interventions have been identified in the country specific performance section.

As to the accompanying measures the following recommendations are made to ECOWAS, Governments and partners ECOWAS

- Establishment of a common legal framework
- Adapt common Standard and policy on food fortification
- Create an environment that is favorable to private sector and that will enhance its competitiveness
- Strengthen and develop food fortification capacity in member states such as testing infrastructure, human capital.
- Speed the adoption of the legal framework and standards in the member states
- Speed the implementation of a regional free trade regime
- Ensure that control, inspection procedures and testing are harmonized in the region and are in accordance with international procedure of quality assessment.

Public Sector in member states

- Create an enabling environment for the industry to enhance implementation of food fortification by reducing administrative hurdles.
- Ensure that fortified food is available to the population through public policy.
- Support national quality infrastructure through appropriate financial commitment and budgetary allocation.
- Educate consumers on the benefits of fortification
- Ensure that taxes and duties on fortified products and equipment are at minimal level

Private Sector: The Private Sector fortifies and therefore should:

- Be committed to fortification
- Ensure quality and quantity of supply
- Comply with the standards set
- Integrate into multi lateral trading system and boost regional trade
- Invest in equipment and quality system.
- Should not only look at fortification in term of strictly profit but as a Corporate Social Responsibility that impact the health of their population with long term benefit to the Company
- Ensure proper packaging and labeling of fortified food products.
- Be mindful of environmental impact of production methods

The levels of addition of food micronutrient fortificants differ greatly from country to country and this drives home the need for regional harmonization of levels of addition for any given food product within given limits especially since the nutritional statistics is very similar across the sub-region. Each manufacturer will have to determine the choice of how much micronutrient fortificant to add within the given standard limits. They will also have to take into consideration, costs as well as any sensory changes that the addition of the micronutrient premix may impart.

B-Vitamins

The UEMOA standard for wheat flour for example does directly include fortification with the B vitamins which is done in countries such as Nigeria and Ghana. B-group vitamins are optional and are mostly added for restoration purposes to replace lost B-group vitamins present in wheat during milling/flour extraction.

Recommendation

For uniformity and harmonization, it is recommended that UEMOA countries take up the addition of the B-vitamins to flour. This will depend on the daily consumption of wheat flour products in the different countries.

Vitamin A

In terms of Vitamin A fortification, it is recommended that for uniformity all countries should use the same units preferably mg/kg, in the standards that are given to the manufacturers since the premix will be measured in those units. As part of the harmonization, it is also important when labeling fortified products, the same units (either mg or IU or RE) are used to indicate the levels of added nutrient that are available to the body. This will make comparison of nutrient levels in products from the different countries easier.

Even as a result of the harmonization, in setting standards for Vitamin A, the other sources of Vitamin A in the diet of particular country must be taken into consideration. This makes it imperative for the standard to have an upper and lower limit for the amount of Vitamin A that would be used. For example in parts of Ghana, consumption of palm oil and fruits such mangoes and papaya is high, such that the lower limit may be appropriate for Ghana.

Recommendation

Nigeria and Ghana could also increase the level of vitamin A in vegetable oil from current lower levels (20,000IU/Kg to 50,000IU/Kg) to fall in the range for the UEMOA Region, which is 30,000 - 60,000IU/Kg i.e.10mg/kg to 30mg/kg). By doing so it may be possible to stop the fortification of cereal flours with Vitamin A as cereal flours are not very good vehicles for vitamin A. Nigeria and Ghana could therefore agree on this (i.e. removal of Vitamin A from the premix) and if not, the harmonized standard could just specify the key mandatory micronutrients for flour fortification (iron, zinc and folic acid and B-group of vitamins) and make vitamin A optional for cereal flour fortification in the regional regulation for West Africa. Taking vitamin A out of premix will also reduce cost to industries and they will be happy with this move. The premix for flour will then have only iron, folic acid, zinc and B-group vitamin.

Folic acid

Folic acid is an important micronutrient and its use in appropriate food vehicles should also be part of the harmonization efforts. The study however shows that it is used in fortifying wheat flour in UEMOA countries and Ghana but not in Nigeria.

Recommendation

There will be a need to harmonize this and require folic acid fortification in wheat flour from UEMOA countries.

Vitamin D

It will not be necessary to recommend Vitamin D fortification because deficiency of Vitamin D in tropical countries is not common due to the abundant sunshine.

These areas have been identified as the most urgent for sustainable food fortification in the ECOWAS region. Other areas of intervention have been outlined in the study. However a donor's round table will be necessary to move the program forward.

1.0 Introduction

Most of the fifteen countries of the Economic Community of West Africa States (ECOWAS) have varying degrees of problems of malnutrition ranging from protein energy malnutrition to micronutrient deficiencies. Micronutrient deficiencies have been shown to contribute in no small way to the vicious cycle of poor health and depressed productivity with its attendant erosion of economic security for many families. This is because these deficiencies bring about changes in health especially of vulnerable groups such as pregnant and lactating women, and also increase the rates of morbidity and mortality for children aged less than five years.

World Health Organization has identified deficiencies in iron, iodine, and vitamin A as the most prevalent of the micronutrient deficiencies in many African countries including the ECOWAS countries. The levels of deficiency in micronutrients in the countries of the ECOWAS are much higher than the WHO acceptable limits. For example the prevalence of anemia among children due to iron deficiency varies between 65% to 82%, and 43% to 68 among women of child-bearing age. With regard to iodine deficiency this varies from 40% (Mali) to less than 5% (Benin) whilst vitamin A deficiency varies from 70% to 31%.

The United Nations has set a target of eliminating vitamin A deficiency and reducing by 30% the global prevalence of iron deficiency anemia by 30% by the year 2010. This calls for urgent action to consolidate efforts in this endeavor to attain the broader millennium development goals (MDGs). The recognition that deficiencies in essential vitamins and minerals are major causes of compromised immune system, impaired mental development, reduced school performance as well as work capacity, increased maternal/child morbidity and mortality and premature death throughout Africa. This has led the World Bank to reposition nutrition as central to sustained development in this region. Investment in proven technologies and interventions to tackle malnutrition has the potential to offer very high economic returns

One of the strategies in the fight against the deficiencies in micronutrients is the fortification of food that presents a good cost efficiency ratio. It is a strategy that requires a multisectorial approach involving governments, civil society, industries, researchers NGOs, as well as consumers. For food fortification to be a viable option for the food industry it would require the identification of an appropriate food as vehicle, and a good system for quality assurance.

Across the ECOWAS region, there has been some progress in the area of food fortification. Multisectorial alliances for the enrichment of food have been formed in some countries. Countries such as Nigeria, Cote d'Ivoire, Mali, Burkina Faso, Ghana, Guinea, and Senegal in the ECOWAS region are at different stages of implementing various food fortification intervention programs. Some of them have programs on mandatory fortification. Salt iodization for example is mandatory in some of the countries and availability of iodized salt at the household level is more than 50% in at least five countries of the ECOWAS Region.

The universal iodization of salt and its availability throughout the ECOWAS region, in spite of some constraints is possible taking into account that two countries (Ghana and Senegal) are the main salt producers of the region.

In West Africa, the Helen Keller International (HKI), Micro Nutrient Initiative (MI) West African Health Organization (WAHO) and Global Alliance for Improved Nutrition (GAIN) have agreed that food fortification is one of the most cost effective strategies to addressing micronutrient deficiencies and are spearheading efforts in this direction. Bearing in mind that any fortification program will have to be within a defined legal framework that makes room for regulation, food laws have to properly formulated taking into consideration levels of fortification within a safe and acceptable level hence standards have to be developed. Trade implications must also be considered in formulating the fortification regulations so that they do not become Technical Barrier to Trade (TBT).

To set up a regional project for the ECOWAS region there is a need to take stock of what already pertains in each country. This includes finding out the existing regulations, rules, and legislation, within individual countries, identification of the different food vehicles used, and how far advanced a country is in its food fortification effort. Above all the regional fortification program should be targeted at helping to meet some of the Millennium Development Goals (MDGs).

2.0 The Scope of the Study

The overall objective of the study is to determine a sound regional food fortification regulatory framework and strategy that will enable ECOWAS to identify the mechanisms and procedures of adoption of the norms or standards of control. Specifically, the study will:

- examine the legislation and the other legal instruments and regulations of countries of the ECOWAS zone, and replicate the initiative from Fortification of the UEMOA countries to the ECOWAS countries;
- identify possible mechanisms of harmonization of this regional strategy for harmonizing regulations and standards;
- map the cooking oil and flour industries in the non UEMOA countries of the ECOWAS region (in order to improve the existing map);
identify the mechanisms and procedures of adoption of the standards and regulations of the quality of fortified foods, and adoption of the logo branding fortified foods in the UEMOA countries by the ECOWAS countries;
- identify the financial institutions that could support the industries as well as the mechanisms of funding (lines of credit, tax exemptions for entrants for fortification, etc); as part of making food fortification sustainable in the region;
- identify the mechanisms concerning harmonization of application of the CET and the tax system for the products fortified both at the UEMOA and the ECOWAS levels; and
- identify the strategies of creation of an Association of the oil producing companies and affiliated millers in the ECOWAS region (along the lines of the association of the oil producing industries of UEMOA/AIFO-UEMOA.)

3.0 Methodology

The study methodology consisted of the review of all laws and regulations pertaining to food fortification in countries where they exist. This involved working with the standards organizations and the food regulatory agencies and the ministries of health in the target countries. A synthesis of the various regulations was made to identify the gaps between what exists and what ought to be done.

Countries visited were Ghana, Nigeria, Guinea, Senegal and Burkina Faso. Discussions were held with the private sector, the standards drafting institutions and regulatory bodies, on the UEMOA standards and their common logo. Country level discussions were held with focus groups made up of individuals from key government institutions and the private sector. The Consultant conducted interviews with relevant private, public institutions as well as development partners and NGOs.

Country information gathered from field research was supplemented by internet searches of relevant websites. These included the websites of WHO, WTO, Codex, World Bank, FAO, MI, GAIN, HKI, FFI. Various reports from HKI, WAHO, AIFO-UEMOA, ECOWAS, MI, GAIN, FFI were also reviewed.

4.0 Limitations and Risks

The limitations of the study were as follows:

- Time allocated to the study was limited;
- Scientific data available in some countries was limited
- Access to current legislations in the countries was difficult.
- Difference in vehicles for fortification between UEMOA and non UEMOA (i.e. oil versus flour). In the case of Nigeria there is a third vehicle, namely sugar.
- Identifying the requirements for a regulatory and policy framework for food fortification in non UEMOA countries
- Fortification framework limited to vegetable oil even though other vehicles may be identified
- Variation of reported deficiency may be due to data collection and availability
- Focus on regulatory options

5.0 Literature review

5.1 General Principles guiding Food Fortification

At the FAO technical consultative meeting in 1995 the following criteria were stated as general principles on food fortification: The chosen food vehicle must have the following characteristics:

- Be commonly consumed by the target population.
- Have constant consumption patterns with a low risk of excess consumption.
- Have good stability.
- Be relatively low in cost.
- Be centrally processed with minimal stratification of the fortificant.
- Have no interaction between the fortificant and the carrier food.
- Be contained in most meals, with the availability unrelated to socio-economic status
- Be linked to energy intake.

In addition to the above FAO criteria, the Codex Alimentarius in its General Principles for Addition of Essential Nutrients states that:

- The essential nutrient should not result in an adverse effect on the metabolism of any other nutrient.
- Addition of essential nutrients should not be used to mislead or deceive the consumer as to the nutritional benefit of the food.
- Methods of controlling, measuring and/enforcing the levels of added essential nutrients in foods should be available.
- Food standards, regulations or guidelines for fortification should identify the effectual nutrients which are to be required, and the levels at which they should be present in the food to achieve their intended purpose.

In the development of the West Africa regional fortification program and its standards the above guiding principles were taken into consideration. Recommended levels of fortification for a given micronutrient must be based on scientific data on deficiency levels within the target population.

5.2 Guiding Principles for Food Legislation

The primary purposes of food legislation are to:

- Protect the health of the consumer,
- Protect the consumer from fraud, and
- Ensure the essential quality and wholesomeness of foods.

Food laws must first provide the legal authority and an adequate legal framework for the food-control activities. Food law is managed most effectively in two parts: a basic food act and food regulations. The act itself sets out the broad principles, whilst the regulations contain the detailed provisions governing the different categories of products. Within the regulations governing food fortification there should be lists of approved fortificants as well as standards stating the allowed levels of each fortificants (nutrients) in the fortified foods.

This kind of organization is necessary because it gives some flexibility to food laws, as it is much more difficult to have laws amended than to revise regulations. For example, prompt revision of regulations may become necessary because of new scientific knowledge, availability of new processing technology, or emergencies requiring quick action to protect the public health. With respect to regulations dealing with fortified foods, changes might be prompted as a result of safety evaluations of nutrient compounds or new information regarding the roles and optimal levels of specific micronutrients in the maintenance of good health.. Changes in food-processing and packaging technologies could result in a significant reduction in processing and storage losses of micronutrients, thus requiring a revision in the allowed levels of added nutrients. In the face of demonstrated micronutrient deficiencies, regulations regarding standards for certain foods and levels of fortification may need to be revised and it is in the interest of the consumer if such changes are reflected in the regulations as soon as possible

In drafting legislation specifically for food fortification, the following principles should be considered:

- Fortification should always be in the best interests of the selected population;
- There should be input from interested parties in the development of the law and regulations;
- The provision of the law should allow flexibility;
- The law should state clearly what is required or prohibited;
- The law should create a device for enforcement;
- The law should provide for quality assurance.
- The law should provide the government with adequate inspection and sampling powers;
- The law should contain both incentives and penalties
- The law should treat everyone equally and fairly.

5.3 Quality assurance and control in food processing in general and food fortification in particular

The survival of any food industry depends on the production of goods that consistently meets or exceeds the needs and expectations of the customer. Such products are said to be of good quality. The maintenance of a well-functioning quality assurance program is essential if a consistent product is to result that meets all required standards. Good manufacturing practices based on the Codex General Principles of Food Hygiene should be established as the basis of any food quality assurance and control program. In addition, a Hazard Analysis Critical Control Point (HACCP) system should be developed to ensure that potential hazards are identified and either prevented, eliminated, or reduced to acceptable levels.

The quality assurance program must consider all activities that have an impact on product safety and quality components of a quality-assurance system and should include:

- Raw material control: standard specifications must be adopted for all ingredients, which must then be inspected to ensure conformity with a first in – first out (FIFO) principle.
- Process control: all chemical, physical, and microbiological hazards as well as quality factors must be identified; critical control points must be established and monitored, and a record made of any action taken;
- Finished product control: this requires that the finished product be unadulterated and properly labeled, and that the integrity of the finished product be protected from the environment.

Importance of quality assurance in food fortification

The addition of nutrients to a food for the purpose of fortification increases the number of control points that must be considered which therefore calls for more vigilance in ensuring the quality of the fortified products. Poor manufacturing control leading to excessively high levels of nutrients in the finished product could have health implications for the consumer if intake of the nutrient reaches the toxic dose. Conversely, low levels of nutrients in the finished product could render it nutritionally ineffective. This could also have serious health implications if the target population in the fortification program is at high nutritional risk. Poor manufacturing control could also lead to other quality defects related to interactions of added nutrients with other components of the system.

5.4 Conclusions based on literature review

Food fortification is an important element in nutrition strategies to alleviate micronutrient deficiencies in selected populations. Food fortification must, however, be controlled through the development of appropriate regulations and legislation. Adherence to the legislation will ensure that the objectives of the food-fortification program are achieved and that the levels of micro-nutrients are controlled within safe and acceptable limits.

The standards, guidelines, and codes of practice adopted by the Codex Alimentarius Commission should be considered in the development of food legislation, including legislation drawn up purposefully for food fortification programs as these are now recognized under the WTO Agreements on Sanitary and Phytosanitary Measures and on Technical Barriers to Trade”¹

Within this context and since food fortification falls under the WTO SPS measures, the transparency clause of SPS should be taken into consideration when setting up a regional food fortification regulatory framework. Governments must make known the factors considered in their systematic risk assessments that led to the decisions relating to the level of deficiency figures determined for the target population. Their trading partners must be notified of any changes in requirements that affect trade, and/or provide information on new or existing measures. The transparency clause also requires that governments be open to scrutiny of their methodologies for the application of intervention measures. The systematic international exchange of information and experiences thus provides a better basis for drawing up national standards.

¹ Gregory D. Orris FAO “Food Fortification: Safety and Legislation

6.0 Justification for Regional Food Fortification

Four out of the eight (i.e. 50%) millennium development goals (MDGs) which are to be achieved by 2015 have a bearing on nutrition of the populations.

These are Eradicate extreme poverty and hunger, improve maternal health, reduce child mortality, combat HIV/AIDS, malaria and other diseases. They can be achieved through a concerted effort of using nutrition interventions. Using a food based approach to dealing with micronutrient deficiencies will go a long way in helping to achieve these MDGs

All West African States are faced with chronic deficiencies of various micronutrients. The most affected are infants and mothers and this is mainly due to nutritionally poor diets that are available to a vast majority of the population of these countries and the inability to afford diversified nutritionally balanced diets. The deficiencies in key micronutrients apart from affecting growth and well being are also largely responsible for the many diseases found in the region. For example even though the high prevalence of iron deficiency is the main reason for most cases of anemia, deficiencies in other micronutrients namely folic acid, vitamins B2, B6, B12, also play a major role. Fortification must therefore be tackled in a holistic manner.

This study indicates that the level of implementation of fortification program varies from country to country depending on the context of domestic policy and regulations, technical capacity, availability of finances, logistics and resources. There is however basic health and nutrition issues that all food fortification programs seek to address. Food fortification is done to prevent, counteract or mitigate the effects of deficiencies of micronutrients that have significant effect on the health and economic well being of the populations. The needs for specific interventions may vary from country to country depending on the level of deficiencies in specific micronutrients.

Table 1: Estimated Prevalence (%) of Iron Deficiency Anemia (IDA) and Vitamin A Deficiencies (VAD), iodine deficiency and folic acid deficiency in some West African Countries

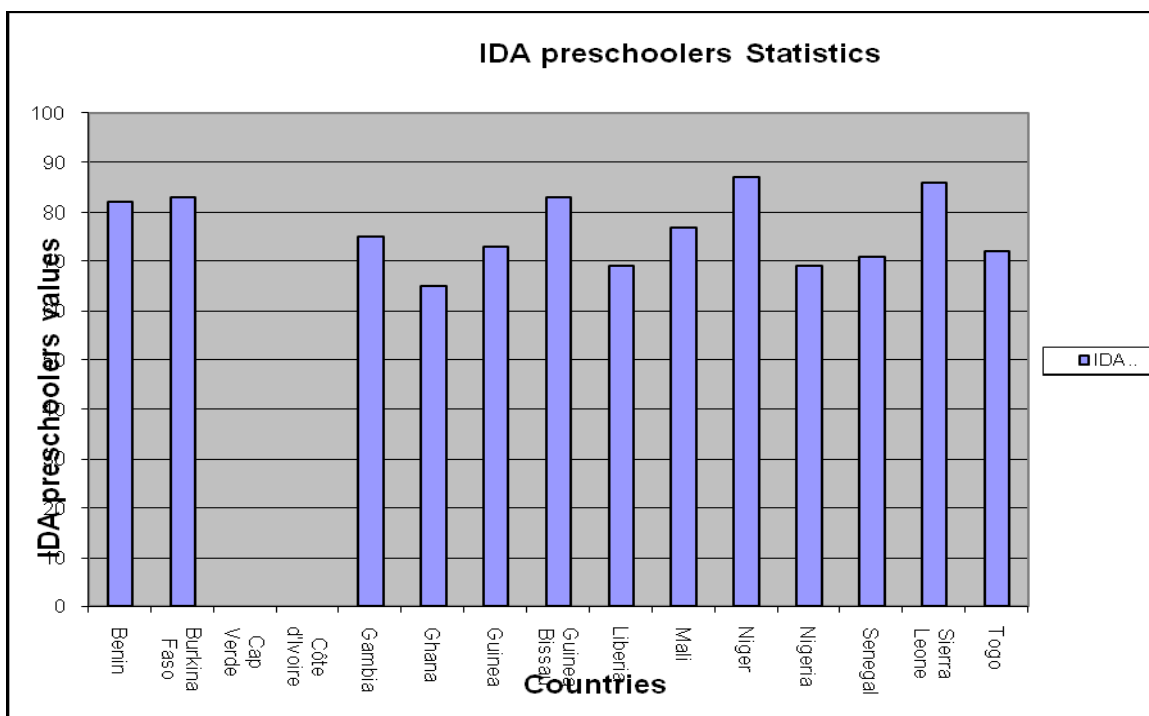
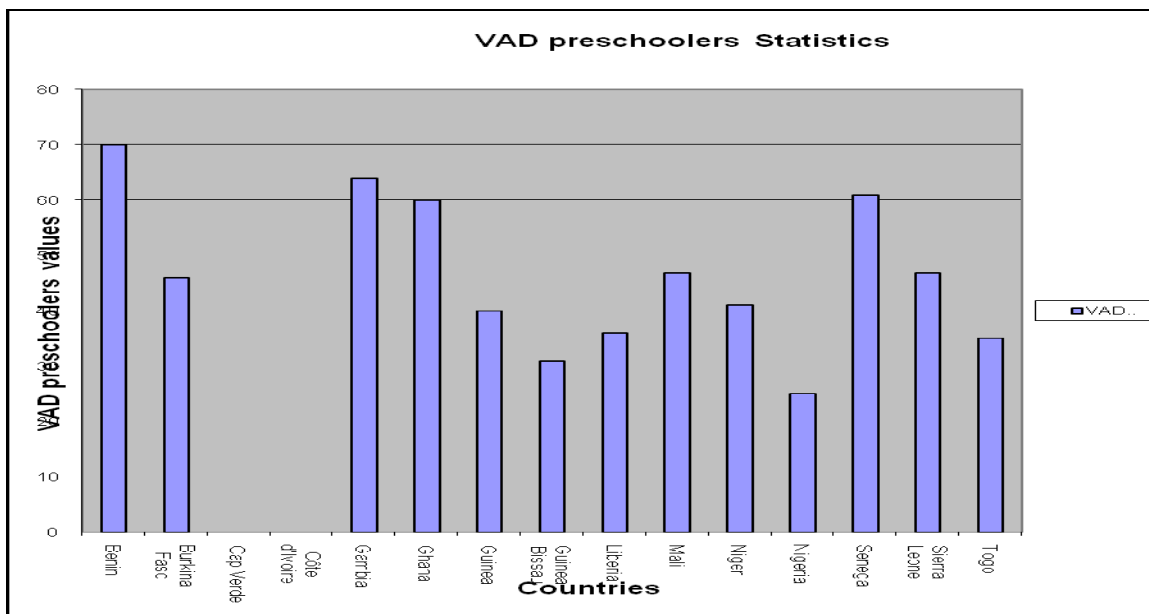
Country	IDA (women 15-49yrs)	IDA Pre- schoolers	VAD preschoolers	Iodine deficiency	Folic acid deficiency	Zinc Deficiency*
	% prevalence			Total Goitre rate (%)	Estimated annual # Neural tube birth defects	% population at risk
Benin	65	82	70	13	550	17
Burkina Faso	48	83	46	29	1230	13
Gambia	53	75	64	20	100	36
Ghana	40	65	60	18	1300	21
Guinea	43	73	40	23	700	34
Guinea-Bissau	43	83	31	17	150	29
Liberia	44	69	38	18	330	59
Niger	47	87	41	28	1300	9
Nigeria	47	69	25	8	9500	13
Senegal	43	71	61	23	750	25
Sierra Leone	68	86	47	16	500	57
Togo	45	72	35	14	350	23
Mali	47	77	47	42	1300	11

Source: Vitamin & Mineral Deficiency: A Global Damage Assessment Report. UNICEF & Micronutrient Initiative

*HarvestPlus Fact Sheet

Table 1 clearly shows the differences in the prevalence rate of micronutrient deficiencies in the different countries. In establishing micronutrient fortification of different food vehicles each country takes into consideration these rates, so that the needs of the most vulnerable in their societies will be met. The high prevalence of Iron deficiency anemia in the vulnerable groups as shown in the table lends support to the need for fortification of suitable food vehicles with iron.

Figures 1 & 2 – Bar Charts Showing Vitamin A Deficiency and Iron Deficiency Anemia in Preschool Children in Countries in West Africa:



Compliance with FAO/Codex and WHO general principles and guidelines and standards on food fortification is a basic requirement for countries seeking to mitigate deficiencies in micronutrients and address health issues of their population, as well as allow increased market access for their products in the regional trading system under similar conditions. Countries in West Africa currently lack efficient control systems required to optimize implementation of effective fortification program and this is a situation that needs to be addressed. Secondly, the low technical capacity, inadequate legal, policy and regulatory framework in ECOWAS countries opens the door to substandard quality food imports from the rest of the world that do not address the issues of the health of West African citizens. Consumers' associations now exist in most West African countries and are putting pressure on their governments to improve and control food quality – for both imported and locally-produced foodstuffs. Apart from dealing with the health issues of their populations, ECOWAS countries have little choice but to harmonize their fortification programs if the problems associated with interregional trade are to be effectively addressed along with enforcing the required standards.

Harmonization of fortification regulations in West Africa is therefore expected to:-

- a) Improve the overall health status of the target population
- b) Increase inter-regional trade and market access of agricultural products in the global multilateral trading system.
- c) Result in economies of scale with current limited resources, by pooling national resources under a regional authority.
- d) Facilitate intra-regional trade and lower costs for third countries that want to trade with several West African countries by adopting a common set of fortification standards.

Though harmonization is a vertical integration process between a member country and the FAO/WHO institutions, countries within regions and zones with common language, financial and trading systems may wish to horizontally integrate or harmonize their fortification systems in order to facilitate trade among themselves. One of the objectives of this study is to establish the feasibility of horizontal integration between countries of UEMOA and Non UEMOA countries of the ECOWAS Region. Under this framework, they may wish to develop equivalence agreements as a means of entering into bi-lateral or multi-lateral arrangements concerning food import and export inspection and certification systems. Such agreements may be binding instruments taking the form of “International Agreements” under the Vienna Convention on the Law of Treaties, or they may be other less formal arrangements such as Memoranda of Understanding. Such agreements may be limited to specific areas of trade or specific products and may include provision for certificates or other forms of certification of particular traded products or may provide for dispensing with certificates and other forms of certification.

The building blocks for establishment of fortification treaties include improving technical cooperation and information exchange, organizing discussion workshops, development of infrastructure and food control systems. These are necessary preludes to developing effective Fortification treaties as well as fortification options:

The ECOWAS countries had the choice between voluntary and mandatory fortification, but mandatory fortification was preferred in view of the prevailing malnutrition situation and weak systems existing in the region. Similar weak systems were found in most of the countries under consideration. These are:

- Weak and not well monitored food safety system.
- Poor infrastructure to support the food safety and quality standards
- Existence of a wide variation in the quality and robustness of regulatory infrastructure of the food safety systems
- No common inspection procedure for export goods, and weak inspection regime for imported food products
- Very low Level of awareness on food safety and quality matters within the target population as low level of nutritional knowledge and education
- Limited supply of fortified food for the population in the region.
- Distortion in the price structure between fortified and non fortified food and difficulties in addressing the price differentials and how to correct it.

In view of this existing weak system, it was evident for the West African Economic Commission, that a mandatory fortification was the most effective way to address the micronutrient deficiencies.

7.0 Regional Food Fortification harmonization efforts in West Africa

7.1 Choice of Food vehicles for fortification

In general, with the exception of salt iodization, the issue of which food vehicles should be fortified to address micronutrient deficiencies have been initiated at national level based on the data on assessment of the frequently consumed foods within the country. Fortification Rapid Assessment Tool (FRAT) has been developed to aid the determination of food consumption patterns of a given population, availability of foods at the household level and to identify which food may be appropriate for fortification. This tool has been used to help choice of food vehicles to fortify in some West African countries. For example, as at 2005, Helen Keller International and partners had already organized Fortification Rapid Assessment Tool (FRAT) surveys in Burkina Faso, Niger and Senegal to identify potential food vehicles for fortification prior to embarking on food fortification in these countries and the UEMOA Region. This allowed the identification of food items that had high household penetration (i.e consumed by over 80% of the population) and stable consumption patterns. The choices included vegetable oil, flour, sugar, and bouillon cubes. Of these choices vehicles such as vegetable oil and wheat flour are already being fortified in most West African countries.

At the regional level the ECOWAS Health Ministers meeting held in Abuja in July 2006 passed a resolution for mandatory fortification of vegetable oil and flour. In November 2007, the UEMOA Region adopted standards for fortifying vegetable oils with vitamin A in the region. Activities aimed at adopting norms for micronutrient fortification of cereal flours in the UEMOA region were initiated and there are plans to enlarge the scope of fortification work to cover all ECOWAS countries

7.2 UEMOA efforts towards Regional Fortification Harmonization

The *Union Economique et Monétaire Ouest Africaine* (UEMOA) is a regional organization of eight contiguous Francophone countries in West Africa that share a common currency (the CFA Franc) and are committed to evolving towards a common market. The 8 member countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo) have a total population of around 85

million, of whom 15.6 million are children under 5. These countries also have some of the highest under-five mortality rates in the world. Agriculture dominates the economies of its member states, therefore it aims to increase trade in agricultural commodities within its boundaries. However, the heterogeneity of the rules and regulations governing food, plants and animals in UEMOA's member states coupled with the inconsistency of their implementation constitutes a large non-tariff barrier to trade. The World Food Summit in Rome in October 1996 called for a major program of food security in developing countries. Thus the Heads of State of the member states of UEMOA were receptive to a proposal made in 1998 by the Director General of the Food and Agricultural Organization (FAO) that a Special Regional Program for Food Security (*Program Spécial Régional pour la Sécurité Alimentaire*, PSRSA) be set up under UEMOA's auspices. In August 1999, UEMOA produced a framework document, identifying a program with a budget of US\$84 million to undertake a wide range of food-security activities. Given UEMOA's orientation towards regional integration and its member states' dependence on agriculture, PSRSA adopted a trade-based food-security approach, encouraging the trade of food commodities between member states and to non-UEMOA countries.

In partnership with the professional association of cooking oil producers of the UEMOA zone (AIFO-UEMOA), WAHO and HKI launched a UEMOA-wide cooking oil fortification initiative in June 2007 known as *Faire Tache d'Huile en Afrique de l'Ouest*. In September 2007, they declared the *Fortify West Africa initiative* at the Clinton Global Initiative in New York, to include cereal flour fortification in the UEMOA region of West Africa,) with financial support from the United States Agency for International Development (USAID), the Michael & Susan Dell Foundation, the Global Alliance for Improved Nutrition (GAIN), the Government of Taiwan, the Micronutrient Initiative (MI) and, most importantly, the industries themselves. HKI signed a memorandum of understanding with the UEMOA Commission to ensure fortification of cooking oil in the 8 UEMOA countries in June 2007. The Vision of the *Fortify West Africa*, initiative is to reach at least 70% of the UEMOA population with fortified foods by the year 2010. Current amendment of the MOU between HKI and the UEMOA Commission includes fortification of multiple food vehicles in the UEMOA Region.

The process for preparing the legislative framework and associated treaties for the regional harmonization involved as series of steps as follows:

- a) a study in each UEMOA member-state of the current fortification program synthesis of the eight national studies into a regional report
- b) national discussion of the regional report
- c) regional discussion of the regional report
- d) amendment of the regional report
- e) development of UEMOA wide standards and regulations for edible oil and flour fortification
- f) adoption of the standards and regulations
- g) adoption by council of Ministers of Health of standards and regulation
- h) ratification of standards and regulations by heads of States
- i) countries adoption of standards and regulations
- j) designing the details of the training program for officials who will interpret and implement the treaties
- k) the reinforcement of quality-control laboratories under EU funded program with UNIDO as implementing agency.

Clearly UEMOA is the West African pioneer in promoting regional food fortification harmonization. However, its efforts have not taken into consideration non-UEMOA countries in West Africa of which Nigeria, Guinea and Ghana form a large share of the market and trade within ECOWAS.

7.3 Total Regional Harmonization

Countries in West Africa currently lack efficient control systems required to optimize their participation in the global market for food items as well as among themselves as a sub-region. Several exporters from West Africa cannot have access to markets due to non-compliance with importing country regulations. ECOWAS countries therefore have little choice but to harmonize their standards guided by general principles of FAO/WHO Codex and the WHO Guidelines. These standards will actually facilitate inter and intra regional trade and will not create technical barriers to trade in violation of WTO agreement of which of the members are party to with the exception of Liberia and Cape Verde. Compliance with regional food fortification standards and regulations are basic requirement for countries of the ECOWAS Region, seeking increased market access for their food products in the regional trading system

Secondly, the low technical capacity, inadequate legal, policy and regulatory framework in ECOWAS countries open the door to substandard quality food imports from the rest of the world that may not only endanger the health of West African citizens but compete unfairly with local regional food industries. Consumers' associations now exist in most West African countries and are putting pressure on their governments to improve and control food safety – for both imported and locally-produced foodstuffs.

Thirdly, most countries in West Africa lack product critical mass required to meet high and regular orders from the multilateral trading system. While a buyer in another part of the world could have sourced an agricultural commodity from two or more West African countries, this becomes difficult due to several quite different sets of quality standards, making purchases more expensive, and thus making West African countries less competitive.

Harmonization of food fortification regulations in West Africa is therefore expected to:-

- a) Promote and consolidate sustainable mandatory food fortification of selected food vehicles by food industries within the region
- b) Ensure that all the mandated food vehicles imported into the region are fortified in accordance with the specifications of the regional regulations.
- c) Create a model to be used within a regional fortification program as a guide in the development of national fortification regulatory frameworks.
- d) Address micronutrient deficiencies within a broader strategy using best practices.
- e) Lead to the implementation of a systematic fortification policy at regional level
- f) Increase market access of agricultural products in the regional trading system.
- g) Result in economies of scale with current limited resources, by pooling national resources under a regional authority.

Though harmonization is a vertical integration process between a member country and the FAO/WHO/CODEX, countries within regions and zones with common language, financial and trading systems may wish to horizontally integrate or harmonize their Fortification Program in order to

facilitate trade among themselves as has been done under UEMOA. Under these circumstances, they may wish to develop equivalent agreements as a means of entering into bi-lateral or multi-lateral arrangements concerning food import and export inspection and certification systems.

All West African States will have obligations under the harmonized program to implement the fortification program of one or more of the selected vehicles. However the program will vary from country to country depending on the context of industries, food vehicle, micronutrient deficiencies, government policies etc. Implementation of the fortification program will depend on domestic policy and regulations, technical capacity, availability of finances, logistics and resources.

In order to meet the regional harmonization of food fortification regulatory framework a provisional Regional Alliance for Food Fortification has been created with the following key highlights:

1). Vision

Regional Alliance for Food Fortification Vision: 2015

- Universal fortification of industrially processed cereal flours and cooking oil in West Africa (locally produced or imported) in accordance with ECOWAS specifications
- Universal salt iodization in accordance with existing ECOWAS directives
- Fortification of other food products with potential for high impact based on specific country opportunities (example bouillon cubes with over 80% house-hold penetration in West Africa)
- Engagement to leave no country behind

2). Objectives of the Regional Alliance for Food Fortification:

- Create ECOWAS-wide enabling environment (by end 2010)
 - Regulatory framework
 - Norms, standards and certification
 - Tariffs, taxes and related incentives
 - Consolidation of harmonization of UEMOA and ECOWAS
- Strengthen capacity of key stakeholders to implement food fortification
 - Private sector food industries
 - Regional public sector institutions
 - National institutions
 - Consumers associations
- Undertake advocacy to engage all key stake holders for adoption and effective implementation of food fortification
- Facilitate documentation and dissemination of food fortification information, lessons learned and best practices
- Facilitate resource mobilization for adoption and effective implementation of food fortification

7.4 Regional Initiatives

Regional meetings at which harmonization of food fortification efforts as well as regulations and standards were discussed include the following:

- a) ECOWAS resolution on salt iodization (1994)
- b) Public- Private- Sector Dialogue on Food Fortification held in Accra, Ghana October 15-17, 2002.
- c) Second Public-Private Sector Dialogue Planning Meeting, Bamako Mali November 11-16 2006
- d) Adoption of a Resolution on Food Fortification by the Assembly of Health Ministers of ECOWAS Abuja 2006
- e) HKI and partners launched the first regional initiative on Vitamin A fortification of cooking oil in the UEMOA countries (June 2007).
- f) Second private public sector dialogue on food fortification (June 2007)
- g) HKI and Partners declared “Fortify West Africa” initiative at Clinton Global Initiative (September 2007)
- h) Adoption of 10-regional standards on vitamin A fortification of vegetable oil in UEMOA in Dakar (November 2007)
- i) AHM recommended to ECOWAS Commission to accelerate mandatory fortification (2008)
- j) UEMOA plus Guinea Flour millers Workshop (September 2008) and creation of AIM-UEMOA; Professional Association of Milling Industries in UEMOA
- k) First Africa Regional Workshop on Cereal Flour Fortification in Arusha, Tanzania.
- l) UEMOA Regional meeting to adopt standards on micronutrient fortification of wheat flour (expected in February 2009)

7.5 Regional Performance Assessment and Opportunities:

A rapid assessment of the regional key performance was done. For this assessment UEMOA was taken as a unit and compared to performance of non-UEMOA countries in order to identify weaknesses and strengths of each grouping. Performance assessment documentation from the West African Health Organization and from NGOs and foundations such as HKI, GAIN and MI was carried out. A qualitative assessment was made using the methodological approach that is interviews of key stakeholders and the focus group discussions in selected countries. The group output of key issues affecting fortification in Africa from first African Flour fortification was also consulted. These allowed the consultant to arrive at a qualitative evaluation of each performance areas that are necessary for a national and regional food fortification program.

Opportunities or intervention areas identified took into consideration what other donors, NGOs and private sector are doing presently, gaps are identified and areas where the Bank , other Donors and ECOWAS can intervene identified , it also takes into consideration areas of urgency that can be implemented within two years. The recommended interventions therefore focus on those priority areas.

8.0 Results and Components of food fortification systems in some West African countries

This section will highlight the findings from the survey of food fortification activities within different countries and some recommendations. Table 2 provides a summary of these findings.

Table 2. Summary of level of activity for various components of food fortification systems

Component	Activity Level
Government Awareness	In general government awareness of the importance of food fortification was limited to countries where fortification has already started and awareness campaigns were conducted. Ghana, Nigeria, Ivory Coast, Guinea Senegal, Burkina, Mali, and other UEMOA countries
Laws and Regulations	Activities have started in some countries with regards to regulatory framework, regulations have been developed for UEMOA countries and Cote d'Ivoire has mandatory legislation on vitamin A fortification of cooking oil and micronutrient fortification of wheat flour with Guinea having mandatory legislation on mandatory micronutrient fortification of wheat flour Nigeria has regulations for the administration of food fortification, and Ghana is advanced in the process of legislating food fortification..
Inspection System	Manuals, checklists and management systems have to be developed at regional level as well as country level following the same protocols for inspection.
Testing Capacity	A regional integrated strategy is currently in its implementation stage under the leadership of UNIDO and funded by the EU. Reference laboratories at regional level have been identified and are to be certified to address food safety issues. University of Ouagadougou chemical laboratory currently undertakes reference testing of fortified food samples for the UEMOA Region and the Institute of Food Technology in Senegal At industry level capacity is weak, needs to be strengthened
Certification and Standards	Standards have been developed for the UEMOA countries for oil and flour fortification, they are also in the process of adopting standards for wheat flour. Nigeria has adopted standards for oil and flour fortification, in Ghana standards have been developed but not mandatory yet as legislation is pending at Parliament. There should be harmonization of these standards at the Regional level. Identified reference laboratories need be ISO 17025 certified (Standard Organization of Nigeria, NAFDAC, Ghana Standards Board)

Education, Training, human Resources	Education, training, and institution capacity building is needed in many areas: product testing, facility certification, inspection procedures, conformity assessment, and quality system. Different institutions are involved in the process.
Information Technology	Regional website on food safety should be developed. Food fortification should be an integral part of the information system. Ghana has a good website on food safety, this can be replicated at regional level. Other links to be considered are FortAF and the ECOWAS Nutrition Forum Website.
Public Outreach	Public outreach has to be strengthened. All countries have serious funding problems in this area, and its importance has to be emphasized. Focus groups output consider public outreach as the second most urgent area of intervention.

9.0 Government Awareness

In general government awareness of the importance of food fortification was limited to countries where fortification has been implemented for selected vehicles. This includes Ghana, Nigeria, Ivory Coast, Senegal, Burkina Faso, Mali, and Guinea. The level of commitment in these countries also varies, and they need to be strengthened, where legislative drafts have been formulated they will have to be taken to the highest level for promulgation into laws.

10.0 Laws and Regulations

With the exception of Nigeria and Ghana, the legal framework of all other countries of ECOWAS needs additional support to update their laws using a single ECOWAS template in line with FAO/WHO Codex guidelines. Country specificity will be reflected in country legislation.

The UEMOA countries under their legal regimes are dominated by Ministerial Arretes (Ministerial Directives) it is important that the arêtes be at least at the level of Presidential or Ministerial Executive Order if not a national law, this is the only way to effectively reflect the political commitment and the importance of the fortification program.

11.0 INTERVENTIONS

11.1 Opportunity/Intervention 1

The African Development Bank has the opportunity to assist ECOWAS in the preparation of a template or draft legislation that addresses the issue of fortification and application of standards as well as the compliance and monitoring mechanism and subsequent penalties for non-compliance..

Nigerian laws and standards could be discussed along with the UEMOA regulations and standards. This calls for a technical committee composed of the legal officers of the various bureau of standards, the 'Food control' Departments, Attorney General Office, UEMOA and ECOWAS legal officers to be formed. The draft legislation must take into account issues of food safety and of WTO agreements on international trade. This document will then be used by each country to create national regulations. A consultant can be identified to facilitate the exercise. The consultant should be given clearly defined terms of reference for the assignment. It is recommended that the consultant be from WTO and be entirely bilingual.

Intervention 1.1 Development of terms of reference of the technical team/the consultant

Intervention 1.2 Organization of meetings

- Two meetings:
 - i. Preparatory meeting of 5 days to study the documents and
 - ii Meeting to come up with a single ECOWAS-wide template.
- Drafting of the legislation and circulation to Governments
- Validation meeting after the draft circulation of the Document.
- Timeline: three months January 2008- April 2008

11.2 Intervention 2: Harmonization of Standards

There is a need to agree on standards and test methods to be used within the region for micronutrients levels of key fortified food vehicles. These standards should be guided by the FAO/WHO guidelines and should specifically reflect the needs for local and regional trade. As in the case of the regulatory framework the same process should be applied: Consideration of the UEMOA standards, Ghana standards and Nigeria standards by a technical committee of specialists in standards and nutrition be formed to work in parallel to the committee working on the development of the regulations. FAO/WHO Codex could provide technical assistance to this process.

Procedure for action:

- Collecting the standards from UEMOA, Standards Organization of Nigeria, Ghana Standards Board and translating them into the second language
- Circulation of these standards to the technical committee members.
- Terms of reference and timelines should be defined. Timelines should be synchronized with those for the regulations drafting committee (January to April 2009)

Technical Committee membership:

- UEMOA already has a technical committee which can stand for UEMOA. The Non UEMOA countries could nominate the heads of the Standards or other regulatory bodies or any other competent staff within these organizations.

Meeting

- Ten (10) working days. WHO/FAO should give technical support in the definition of limits for each nutrient that is to be used as a fortificant based on their data in individual countries.

11.3 Intervention 3: Testing Capacity

A critical key area that can determine the level of compliance is the testing capacity of a country to ensure that products are fortified according to laid down specifications. The ability to test a food product is critical in establishing that the food is safe and nutritious.

Testing capacity level varies from one country to another and this needs to be addressed, a partnership between EU, UEMOA and ECOWAS plus a national contribution is supporting capacity building in laboratory infrastructure in eight ECOWAS countries. This is primarily to support food safety (SPS) programs within the countries. Improvement in the testing capacity will also be of benefit to the food fortification program. Apart from the food safety aspects, further support needed to build up the capacity for chemical analysis of food. There should be a training component for the use of equipment such as the atomic absorption spectrophotometer, (AAS), high performance liquid chromatography (HPLC) etc. and methods for determining the levels of micronutrients.

In support of the regional food safety program, regional laboratories have been identified to perform various tests. However this capacity is being built at control agency level but the private sector also needs to be empowered to meet the standards by also benefiting from the capacity building program.

Reference Laboratories identified under the EU/UNIDO quality project:

Physiochemical analysis: The physiochemical laboratory of the Standard Organization of Nigeria has been identified

Microbiological analysis: The microbiological laboratory of the Ghana Standards Board has been identified

Pesticide residues: The National Authority for food and Drug Administration and control of Nigeria has been identified.

At country levels 30 physiochemical laboratory and 40 laboratories for microbiologic analysis are identified as support laboratory where conformity assessment and procedures would be harmonized. This will constitute the laboratory network in West Africa from public as well as private sector.

11.4 Intervention 4: Inspection System:

Product inspection at factory level, from the market shelves and the borders needs to be strengthened in order to ensure safe and compliant food items. In order to ensure these policies, manuals on procedures, checklists and reference materials need to be developed so that inspections are carried out in the same and consistent manner.

An inspection kit should be developed with the help of NGO partners who have a competitive competency base in the field. This kit should consist of inspection manual, checklists, basic reference materials, and supporting tools to do the job. The same kit can also serve the industry so that they are aware of the procedure and can therefore comply with meeting the stated requirements.

Education Training and Capacity building (Human Resources):

There is no question about the existence of high caliber human resources; the existence of competencies, specialists and experts is in no doubt. What is lacking is how best the region can

leverage these talents and make them more productive. To achieve this platform for knowledge transfer and sharing needs to be created.

11.5 Intervention 5 – Donor Support

Donors, AfDB, ECOWAS should provide financial assistance through the various existing networks in the field of fortification in order to facilitate the provision of a platform for knowledge transfer and networking. This is a way of helping to ensure that knowledge sharing passing on information on lessons learnt in different countries takes place and to help disseminate best practices that can be replicated from country level to regional level. A regional knowledge transfer network in the area of fortification composed of professionals from universities, research institution, government institutions as well as the private sector and the consumer association can be created to serve a mechanism for information sharing. Now that the usage of the internet platform is getting cheaper this could be a good platform for information sharing.

A regional meeting on micronutrient fortification involving various partners and stakeholders can be organized to serve as a way of establishing and launching the regional fortification program action required Background work should have started before the meeting takes place. A website to facilitate information dissemination also should be ready for the meeting.

This technology based information sharing will be regional in nature thus lowering initial costs, software cost, maintenance cost, upgrade, and hardware because they will be only one system and not sixteen (16) systems in the region. This would lower barriers to sharing information by collecting and presenting information in the same manner. Initially the site can be developed in English and French and at a later stage in Portuguese.

11.6 Intervention 6 – Training Support

Within ECOWAS there will be the need to develop a set of training materials and training programs at the industry level.

Training needs included

- Analysis of micronutrient components in fortified food,
- Training in good manufacturing practices, and HACCP .

A strategic alliance can be created with EMORY University in the USA , FFI to participate in the program. Other partners such as BASF can contribute to this initiative if initiated by the AfDB

11.7 Intervention 7 – National Stake Holder Capacity Strengthening

The National Food Fortification Alliances is a key mechanism for information, knowledge transfer in the countries and is or should have been the driving force for an effective implementation. It is a public private sector partnership to mobilize and drive the fortification process. Its effectiveness varies from country to country; there is a need for it to be restructured and strengthened.

Currently the leadership of the alliances is with the Ministry of Health, Nutrition Departments in many countries. In Ghana it is under the Food and Drugs Board, and in Nigeria, the National Planning Commission is under the Office of the President. The process of fortification lies in the hand of industry since the government bodies only facilitate the creation of an enabling environment.

In order for the alliance to be more effective, it will have to be private sector driven instead of being based in a ministry or government agency, with a secretariat at an apex body. The chairman ship also should be the responsibility of the Ministry of Trade and Industry because the framework is within

industry and trade. A round table dialogue should be organized to address this issue. GAIN and HKI have played a critical role in the establishment of these alliances in West Africa, and lessons learned from these endeavors can be considered.

11.8 Intervention 8: Development Bank Foundation line of credit to the food industry

The Development Banks could be contacted for discussion on the establishment of a fund to support line of credit for the cereal flour milling and vegetable oil industries and other key players in the private sector. From discussions with GAIN and HKI, the two bodies would want the Bank to enter a partnership with them in order to establish such a funding mechanism to support the private sector in the fortification effort. The details have to be worked between the Bank, HKI and GAIN and there is urgency in the creation of such a Fund.

The Bank can start with the administration and the management of the Fund since it is ready to assist in the administration and management of the fund they can be a good partner. A matching fund between the two institutions could be worked out. The major concern of the private sector is inventory of micronutrients that ties their cash flow; this is where most assistance could support a working capital. Micronutrient premix is the largest recurrent input cost for large-scale mass food fortification programs. A number of barriers exist for countries in procuring premix: access to suppliers; inflated prices for premix; access to upfront capital for large purchases; governance challenges in the purchasing process; lack of quality assurance and monitoring of delivered products; and, often, the lack of funds to purchase premix.

GAIN has a strong comparative advantage in designing, managing and operating a Global Premix Procurement Facility (Appendix IX). It is currently establishing large new markets for the premix industry through its national fortification programs, and will continue to do so in the future with the addition of a new Infant and Young Child Nutrition Program and a Salt Iodization Program (USI GAIN-UNICEF partnership). This partnership supports the creation of a revolving credit facility that will provide help to local industries (millers and vegetable oil refineries) to access premix supply. The cost of micronutrients premix corresponds to US\$1.00 to US\$5.00 per ton of fortified food and generally represents between 0.5% and 2% of the cost of the final product. However, for companies fortifying large amounts of food, purchasing premix can generate significant cash flow issues. Large mills, for example, could easily procure up to US\$500,000.00 worth of premix at a time. A financial institution capable of providing a revolving facility is required to support this need; because of the size, distribution and social implications of this the AfDB Private Sector Division in conjunction with a Pan-African Commercial Bank, such as ECOBANK, could provide the solution that will assure availability throughout the continent.

In order to develop this facility, there is need to:

- identify milling and refinery production capacity and market size;
- Analyze the financial needs in terms of the cost of purchasing food fortificants relative to their individual levels of production;
- Analyze the capacity of GAIN suppliers to meet the demand for fortificants in each targeted country;.

- Review distribution channels and the capacity to receive fortificants on a regular basis to meet production levels.

AfDB will have to determine the level of intervention, the rate of turnover, actual yields and returns on facility. In general the millers and refiners should represent good financial risks due to the nature and size of their existing business and investment level. Nonetheless, a review of the financial condition of the refineries and milling facilities will have to be in place in order to determine that:

- there is management capacity to manage and assure proper use of the nutrients;
- international accounting standards are met and regularly implemented;
- management demonstrates good governance criteria and transparency.
- there is conformity with international sanitary and Phyto-sanitary regulations and reporting; and
- There is conformity with environmental and labor laws.

The GAIN concept paper which also serves as a request for an expression of interest is attached in appendix (IX).

11.9 Intervention 9: – Regional Logo

The Bank has the opportunity to assist in the creation of one West African logo that will send the message to build consumer awareness, about fortified foods and their benefit to health of children and mothers. Creating this logo and awareness will ensure demand and sustain the program. Once the logo is created it will require social marketing, and advertising campaigns, to strengthen the value of product that meets ECOWAS standards for quality and safety. The target group will be the population at large and mostly in the rural areas and among disadvantaged social groups.

Action to be taken should therefore involve the following:

- develop consensus for a single logo for branding fortified foods;
- Support the awareness campaign for the new logo in branding fortified foods

11.10 Intervention 10: Project Management and Monitoring

Well structuring the process of food fortification in West Africa will require coordination of various programs. A project approach will be sought for effective delivery of goals. It is therefore imperative that a West Africa Fortification program be centrally coordinated. This will make best use of resources and will ensure proper execution and monitoring of the program. The Secretariat of this body will be hosted at WAHO the health technical entity of ECOWAS. The supervising committee of the management and monitoring unit will be composed by representative of key players in fortification (UNICEF, WHO, WAHO, HKI, GAIN, FFI, MI, UEMOA, ECOWAS, Millers and Oil Refineries Representatives, Consumer Association Representative) . This Supervising body can meet quarterly and will form the Governing body for the project. Donors, ECOWAS, NGO's and other Partners have the opportunity therefore to support the creation and operation of the project.

11.11 Intervention 11: Social Marketing/ Public Outreach

In general within the countries as well as at regional level more public outreach on food fortification and its benefits should be devised and used. Budgetary constraints have been cited as the main reason for not embarking on massive social marketing. In Cote d'Ivoire, HKI has developed an elaborate social marketing program and in the UEMOA Region there is wide dissemination of activities related to food fortification. Social marketing from all evaluations has been considered as one of the most critical elements in ensuring the success of the food fortification program. It brings information to the population about the need for and benefits of fortification and by so doing they can buy into the program. When the population is well educated on the nutritional and health benefits of fortified food, fortification is well known, more confidence will be given to the industry so that there would be the needed demand for fortified food products to justify its investment. A sustainable national and regional food fortification cannot be created if there is no awareness of the value of the fortification. The awareness also creates the demand for the products that are fortified and have been labeled as such. The awareness creation goes hand in hand with the creation of a logo that will differentiate a fortified from non-fortified food product.

Assumptions and Risks:

Assumption

The underlying assumption for the regional fortification program to be successful and sustainable is that:

- Fortification will be mandatory in the region and that ECOWAS and UEMOA will ensure through an effective coordination that member states are implementing it through their national policies.
- That ECOWAS, UEMOA and National Governments are creating an enabling environment that will promote private sector involvement and commitment.
- That ECOWAS, UEMOA and National Governments are educating their population on the benefits of fortified food.

Risks associated with the success of the regional fortification program:

Political will at regional and national level

For the fortification program to succeed there must be a strong commitment at regional and national level by the leadership. This commitment has to be translated into concrete implementation with appropriate budgetary allocation.

Support of the private sector

The private sector in this case the industry fortifies. It is therefore imperative to have their full participation in design and implementation. This will ensure buy in and commitment.

Difference in infrastructure and technical capacity in member countries

In member states there is an important difference in the level of quality assurance infrastructures, countries such as Nigeria and Ghana have a very well developed infrastructures as compared to Guinea, Sierra Leone, Liberia and many others. This is a challenge in term of implementation of a regional harmonization program. Inadequate infrastructure and competencies will undermine the effectiveness of the harmonization program, products will not meet requirement.

Languages and cultural differences: There are three languages spoken in the region with cultural differences. Within the region 8 countries are French spoken, 5 are English and two are Portuguese, this poses problem at meetings and in documentation, specifically when it comes to legal documents. The francophone and Anglophone group must change mind set vis-a-vis of each others, Anglophones always accuse Francophone of receiving directives from France. This was evidenced at a focus group meeting in Ghana reference was made on the level of iodine in salt. The believe is that any decision to be taken by the francophone group will have to be subject to Consultation with France .Mind set change must precede implementation of the regional food fortification program.

Beneficiaries’ awareness of the benefits of fortification:

Lack of awareness at the level of the target population is a major challenge to the success of the food fortification program.

Financial resources: Government as well as the private sector must have the financial resources needed to implement their respective parts. Financial resources have been a major threat to implementation and success of programs.

12.0 Review of Country Specifics

Country assessment and review is based on work done by key players in different countries within the Region. Organizations that have conducted studies in different countries include HKI, GAIN, Micronutrient Initiatives (MI), Flour Fortification Initiatives, WHO, UNIDO and UNICEF. At the regional level WAHO, UEMOA, ECOWAS, USAID have also initiated support to some studies.

The review and assessment is mostly qualitative with minor semi-quantitative data because the time allocated for the study could not allow a detail quantitative assessment. However the review gives a good picture of the regional fortification capacity.

The HKI evaluation of the UEMOA framework and the USAID Non UEMOA regional Food Safety system evaluation, UNIDO quality control and testing capacity in the Region were the basis of the present conclusion. The performance evaluation system is based on a scoring system that allows for a comparison between countries with regards to key areas. The relative scale for the Non UEMOA countries is as noted below.

Poor	0.0 - 1.0
Fair	1.1 - 2.0
Good	2.1 - 3.0
Very Good	3.1- 4.0

Table 3: Performance of countries based on food fortification elements:

Food Fortification	Gambia	Ghana	Guinea	Liberia	Nigeria	Sierra Leone	Cape Verde
Legislation in place		3	2	N/A	4	N/A	1
Standards Developed		3	2		4		
Standard Operating procedures checklist and quality control		3	1		4		3
Laboratory infrastructure		3	2		4		2
Ability to inspect product		3	1		4		1
Human Resource		3	2		4		3
Political Will		3	2		4		3
Social marketing		3	3		4		3
Private Sector		2	2		3		3
Certification of food establishment		3	1		4		1
Total score		21	16		49		20

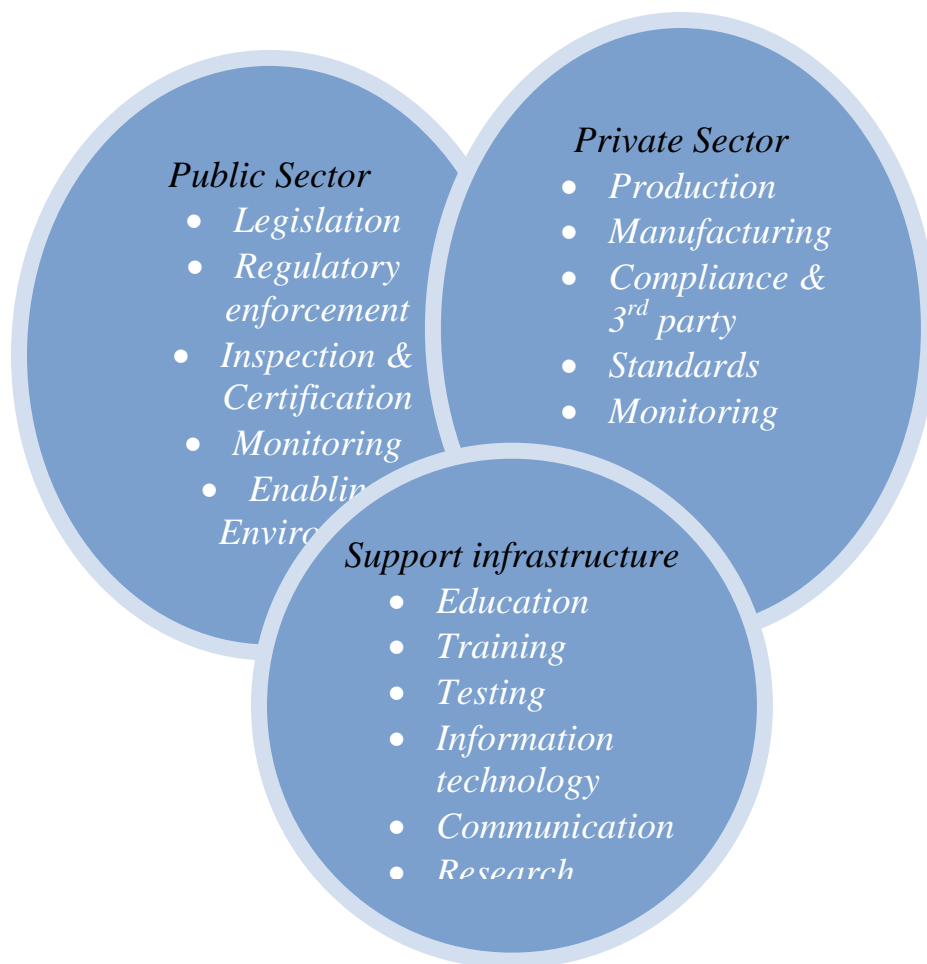


Figure 1: Interdependence and areas of responsibility of different sectors of a food program.

It is to be noted that the evaluation process is not limited only to government institutions since food safety is an integral part of the fortification program and is the responsibility of all players from different entities, and the various responsibilities need be identified.

Within this context the consultant has identified the following responsibilities:

The public sector is responsible for elements such as legislation, standards, and regulatory enforcement, and inspection and certification systems.

The private sector is responsible for supervising and managing production, compliance with regulations and client needs, specifications, and monitoring performance relative to these requirements, (e.g. WFP food requirement). The supporting infrastructure includes training and education, testing and diagnostics, information technology, and communications. It is the combination of these complementary areas and shared responsibilities that enables a country to meet regional and domestic food fortification, safety specifications or norms.

It is important to note that if any one of the participants—public, private, supporting infrastructure is unable to meet the requirements then the overall system cannot meet regional norms. If a company from Ghana did not meet these fortification norms for the Nigerian market, a prejudicial situation may be created that could affect import in Nigeria from Ghanaian companies. The supporting infrastructures

such as training, education, research, testing, and diagnostics services can and should be provided by a wide range of institutions such as universities, research institutions, private companies, and consumer groups. The role of these entities in general is not well defined and need to be elaborated as these institutions play key roles in the overall food fortification and food safety programs of a nation.

13.0 Cost benefit of fortification

The scope of the study did not cover actual cost benefit analysis however a review of literature helped to outline the benefits of fortification vs. its cost. Information from the papers presented at the Copenhagen Consensus, 2008 and findings are summarized in the Table 4.

Table 4. Summary of cost benefit analysis of micronutrient fortification

Micronutrient Fortification	Cost/person/year		Benefit cost ratio	Comments
Salt iodization	\$ 0.05		30:1	Challenges papers
Iron	\$ 0.10-12		7.8:1	Horton & Ross 2003
Folic acid	\$ 0.01		12:1 to 39:1	Grosse <i>et al</i> 2005
Vitamin A	\$ 0.07			

When undertaking a cost benefit analysis of food fortification one should take into consideration the following:

- The costs/savings with regard to healthcare;
- Costs of monitoring of the effectiveness and safety;
- The costs to industry of implementing fortification
- Any possible knock on costs to the consumer

However a more non-monetary cost benefit is better suited for making decisions for intervention. For such an analysis, the issues to look are:

- Lower health because of the improvement of micro nutrients status.
- Reduced prenatal and maternal deaths with fortification with micronutrients such as iron and folic acid. The outcome for women is translated into fewer complications during childbirth.
- Improved productivity of women. An example of this is fortification with iron that makes adults less anaemic thereby more productive or less health care cost. The economic benefit is an increase of productivity that is translated into increase in income thus contributes to poverty reduction which is the goal no.1 of the millennium development challenge.

- Child care improvement will impact on long term market productivity of future generation. This impact is translated into improved cognitive skills, stronger and smarter future workforces that will impact industrial productivity thus assure future income.
- Improved child morbidity and mortality rate through food fortification with vitamin A by building an immune system against infections. This is a very cost effective intervention for the reduction of child mortality. Comparing the cost of child intake of vitamin (per year intake cost is estimated at \$0.40 /year/child) as compared to loss of life of a child..
- Anemia due to iron deficiency is associated with 17% lower productivity in heavy manual labor, 5% lower productivity in other manual labor, and an estimated 4% loss of earnings due to lower cognitive skills
- It is to be recognized that the cost of non fortification of food in countries such as found in West Africa where micronutrients deficiency is among the highest in the world is prohibitive. For these nations, it cannot be overlooked and interventions are needed. Key is that the decision should be based on the Cost Benefit of the Fortification Investment to the country

The following table gives a good summary of the benefits of food fortification.

Table 5: Valuation of economic benefits of fortification programs

Outcome	Benefits	Value
Reduced morbidity	Reduction in health care (depending on patterns of care)	Expenditure on health care, associated travel, and drugs
	Reduction in days of work lost by sufferer or career (depending on employment status)	Improved marginal productivity of labor
	Improvement in school attendance, concentration, and performance (depending on school enrolment)	Reduction in wasted education expenditure
	Production and consumption benefits	Discounted present value of per capita income over the years of life lost from premature death
Increased physical work capacity	Increased work output (depending on availability of work and complementary factors of production, job type, and skill and intelligence of worker)	Improved marginal productivity of labor
Improved cognitive effects	Greater efficiency of school system; increased future productivity	Reduction in education expenditure, not efficiently utilized Relationship with earnings and marginal productivity of labor

Source: Barry Potkin (University of North Carolina at Chapel Hill)

Economic loss due to Vitamin and Mineral deficiencies:

Countries	Estimated 2005 Population (1)	Population under 5 years (1)	GDP In Millions of Dollars	% Loss in GDP	Amount Loss in millions of Dollars
Benin	7,216,738	1,274,473	5,428	1.40	76
Burkina Faso	14,083,721	2,628,134	6,767	2.00	135
Cap Verde*	527,064	83,420	1,434		0
Côte d'Ivoire**	20,152,757	3,730,691			
Gambia	1,411,629	258,337	643	1.30	8
Ghana	23,118,804	4,002,466	15,246	1.10	168
Guinea	8,756,841	1,639,427	4,564	1.40	64
Guinea Bissau	1,320,095	236,253	357	1.50	5
Liberia	3,084,166	517,269	725	1.20	9
Mali	13,473,580	2,676,081	6,863	2.70	185
Niger	12,515,491	2,537,167	4,170	2.20	92
Nigeria	146,235,685	25,742,674	165,690	0.70	1,160
Senegal	11,042,372	1,924,721	11,151	1.30	145
Sierra Leone	6,102,215	1,113,619	1,672	1.40	23
Togo	5,834,130	1,076,292	2,493	1.00	25
TOTAL	274,875,286	49,441,024	227,203		2,096
* Figures for percentage loss figures not available					
** Figures for percentage loss and GDP not available					

Source of GDP: World Bank GDP 2007

Source: A Global Damage Assessment Report- "Vitamin and mineral Deficiency"- UNICEF-Micronutrient Initiatives

An analysis of the data above reveals a significant loss of GDP as a result of Vitamin and Mineral Deficiency. The impact of such a condition in countries in the West-African sub-region is as follows.

1. Food Fortification should be recognized as an essential element in the agenda of National, Economic and Development Policy in order to minimize the loss in terms of GDP due to micro-nutrient and vitamin deficiency. The estimated entire loss of GDP is about \$2 Billion annually.
2. The biggest losses are accounted for by countries that are situated in the Sahel regions. This reflects an indication of a special need to attend to the problems of food fortification programs and agriculture in such areas that share similar geo-climatic conditions.
3. Countries need to ensure that a significant level of GDP is not lost to VMD over long periods of time, as the consequences of such sustained losses would only translate into greater adverse marginal societal and economic difficulties. For instance, the multiplier effect in the losses of GDP due to losses in labor productivity in industry and agricultural production cannot be over emphasized.

4. National Budgets in the countries analyzed above are faced with severely competing budgetary allocations for social amenities and infrastructure. The composition of GDP in these countries is largely dominated by the contribution of the agricultural sector, which suffers directly from the problems of VMD since agricultural activities happen to be more labor intensive.

14.0 Regional and International Trade Issues:

In support of the harmonization program the Consultant had discussions with the Trade Department and the Director for regional customs and a list of equipment and pre-mix was submitted to the Director of Customs for consideration. During the discussion on common tariffs held in the week of November 16, 2008, it was identified that a harmonized custom tariff is necessary to support the harmonization of food fortification.

Regional food fortification will have to be mindful of trade issues at international level. Some of these issues are:

- It has to make sure that standards requirements for locally produced foods are the same for imported food with no discrimination. The standards should cover food vehicles, fortificants, and labeling requirements;
- When trade notification is conducted, trade partners must be informed of the new dispensation at the regional level, and transparency clause of WTO agreement must be respected. It is also to be noted that the new requirement should be backed by scientific and technical evidence. In this case two arguments can be presented :
 - protection of human health or safety and
 - prevention of deceptive practices through labeling requirement.

No international standards per se exist on food fortification apart from only guidelines, thus making it difficult in the context of international trade.

In the design of the harmonization program and specifically when one renders it mandatory, consideration should therefore be given to the WTO agreements GATT and TBT.

One has to consider that prescribing mandatory fortification requirements - may impose trade restrictions on imported products, either because they are unfortified or they have been fortified differently. These trade restrictions may cause difficulties for a country's trading partners. Nevertheless, it is clear from WTO jurisprudence that not only do countries have the right to determine the level of health protection they deem to be appropriate – providing such measures do not *unnecessarily* restrict trade (TBT)– but also the protection of human health is one of several legitimate objectives that countries can cite in justification of a trade restriction. Such considerations aside, different fortification requirements between nations may well create some practical difficulties for inter-country trade. ECOWAS countries with similar public health nutrition problems and food cultures may benefit from finding a common position on fortification policy and regulation that could be adopted across board through a harmonized regime. This would not only provide for intraregional trade and potential economies of scale, but also increase the leverage of the region, where necessary, to source an imported fortified product according to the region's particular specifications. Although,

mandatorily fortified food moving in international trade can be imported not only by countries with compatible mandatory fortification regulations but also by those countries whose voluntary fortification regulations accommodate the composition of the imported food, the product labeling may need to be modified so that it is nationally compliant. The need for labeling modification will depend on the flexibility of the labeling requirements of the importing country.

15.0 Industry characteristics

With the exception of Nigeria most millers and refineries are foreign owned entities and enjoy dominance in the market. Only a few millers and refineries exist in most West African countries and produce at 60 to 100% capacity. The industry is dominated by the large and medium size companies most of which are multinationals or foreign owned. They import their raw materials mostly, the only local agricultural produce that are processed are raw materials for oil production. Palm oil production along cotton seed and ground nuts are dominant. The existence of the two regional entities UEMOA and ECOWAS facilitates inter- regional trade, with common custom and free movement of goods across the region. The only country that makes an exception is Nigeria that has banned imports even from regional member countries. This issue has to be addressed by ECOWAS through a common customs and trade agreement. Policies have been developed to meet this endeavor. These trade agreements leverage the member states. However this has to be extended to other ECOWAS countries. Discussions are ongoing to meet the ECOWAS treaties on liberalization of trade. The creation of a free trade region will leverage the food industry and create demand for fortified food. A regional social marketing program will impact this demand creation at regional level and will expand market for the industry. However quality and compliance have to be observed by the industry.

Wheat is not produced in the countries under review; but is imported processed and fortified. However most of these countries produce corn and Nigeria is engaged in the fortification of corn flour and has already established standards for corn fortification as a mean to meet the need in micronutrient. Ghana could be one of the countries that can produce corn flour and fortify it, but to date there is no company involved in corn flour production on a large scale. The corn flour production is dominated by small companies and micro units of production.

Ghana and Senegal however produce adequate salt and can meet the regional demand. for fortified salt (iodized salt)

The West African region is a net importer of oil because of limited supply of raw material. Malaysia is the main supplier of oil of the region. Ivory Coast has a high potential to be a net exporter of oil in the region and has to pursue this opportunity. It has a large plantation scheme of palm production and a comparative advantage. Cotton seed dominates Burkina, Mali, and Benin while Senegal, the Gambia have a comparative advantage in ground nuts production but still import their oil.

In terms of performance, Nigeria and Ivory Coast are out-performing the other countries. This is explained by the characteristics of the two markets, such as appropriate supply chain, compliance, testing capability, competency availability, and scale of production. These give them a competitive average cost of production and market.

In terms of mineral and vitamin pre- mix production, Nigeria is the only country that produces pre-mix. The companies are engaged in aggressive marketing to satisfy the regional market. However quality is still a challenge to them, thereby technical assistance should be made available to them.

In the UEMOA region HKI has assisted in the advocacy and strengthening of industry networks. Two networks now exist, one oil network of 17 members and one of millers of 13 members. The list of members is attached in Annex IX. The challenge is to bring the industry of non-UEMOA countries into this network.

A challenge that faces the industry is addition of right levels of micronutrients in the finished/final product as consumed (not simply added to food at source). It is assumed that a precise level of micronutrients could be achieved in the final food product by adding micronutrients to food. The technical aspects of this would need to be considered, including:

- Feasibility of addition of iron and folic acid to flour, and vitamin A to oil.
- Capability of manufacturers for addition of micronutrients to food at a given target level. (not the minimum level)
- Losses in processing/cooking, and storage, and their variability, and the additional amount needed to be added to food.

Establishing a list of oil producers and flour millers will assist in the mapping of the industry and the creation of a regional network where they can share information, knowledge and technology, lessons learned can be of value to the industry and can reinforce the fortification program and industry commitment. In Nigeria three associations exist presently namely the Association of vegetable oil producer, the Association of seed oil producers and the Association of millers. List is in Appendix XIII.

Establishing a list of oil producers and flour millers will assist in the mapping of the industry and the creation of a regional network where they can share information, knowledge and technology, lessons learnt can be of value to the industry and can reinforce the fortification program and industry commitment.

Training is needed in the industry on the benefits of fortification to create a corporate culture that will inspire employees in the social marketing and outreach activities to improve nutrition in their communities.

The industry through its participation in the food fortification can address health goals of the population and this can be an important achievement in meeting their Corporate Social Responsibility (CSR).

16.0 Regional Best Practices

Nigeria should serve as the example of best practices in the Region. Within the context of fortification Nigeria is presently ahead of other West African countries and among the leaders in Africa Sub-Sahara and their experience can highlight lessons to be learnt. Nigeria has in place good food laws, three food vehicles which are most likely to have a high impact in terms of population covered have been identified and are being fortified. Nigeria has achieved over 90% salt iodization and had made

mandatory fortification of wheat and wheat flour, sugar and oil are fortified with vitamin A. In addition Nigeria has good quality and testing infrastructure and compliance is being monitored.

What needs to be improved using the Nigeria model for the Region are the levels of micronutrients in identified vehicles, lower and upper limits need to be set in each fortification vehicle to address safety as well as nutritional concerns. Countries can then set their fortification levels for each micronutrient within the upper and lower limits based on their specific needs.

17.0 Current Status of Fortification Standard with Recommended Micronutrients

Table 6: Summary of Current Status of standard limits for micronutrient fortification of selected foods

Country	Mandatory Voluntary Standards	Product Fortified	Micronutrient							
			Vit A (IU/kg)	Vit D (IU)/kg	Thiami ne (mg/kg)	Ribofla vin (mg/kg)	Niacin (mg/kg)	Folic acid (mg/kg)	Iron (mg/kg)	Others Levels/kg
UEMOA Standards	Voluntary Standard Draft Regulations formulated	Wheat Flour	N/A	N/A	N/A	N/A	N/A	1.1mg/k g	≥45mg./ kg	
	Voluntary Standard. Draft regulation formulated	Vegetable and seed oil	11-24 mg/kg							
Ghana New Food Law in Parliament	Standard FDGS 811 Tolerance +/- 10%	Strong wheat flour	2.0 mg/kg		8.4mg/ kg	4.5 mg/kg	59.0	2.08	58.5	B12: 0.01 Zinc: 28.3
Ghana	Standard: FDGS 810:2006 Draft Legislation	Vegetable oil	10mg/k g (Retino l Palmita te)							
Nigeria	Standard NIS:121:20 00	Wheat/cor n Flour	30,000 iu/kg (palmit		6.2mg/ kg	3.7mg/ kg	49.5mg/ kg		40.7mg/ kg	

			ate) 10mg/kg							
Nigeria	NIS 475:2004	Vegetable oil	20,000i u/kg ≈ 7mg/kg							
Guinea	Ministerial Directives	Wheat Flour				4.05mg /kg	1.8 mg/kg	1.35mg/ kg	54mg/k g	

The summary status of current practices shows that most of the countries do not have mandatory standards for fortification. The levels of addition of micronutrients differ greatly from country to country and this drives home even more the need for regional harmonization of levels of addition for any given food products within given limits especially since the nutritional statistics is very similar across the sub region.

Recommendation

The choice of exactly how much micronutrient to add within the given standard limits each manufacturer. In addition, other issues will also have to take into consideration, such as costs as well as any sensory changes that the addition of the premix may impart.

B-Vitamins

The UEMOA standard for wheat flour for example does not include fortification with the B vitamins which is done in countries such as Nigeria and Ghana. In the UEMOA region, iron and folic acid are mandatory whilst the other nutrients such as B-group vitamins and zinc are optional for flour fortification.

Recommendation

UEMOA countries can keep B-group vitamins as optional in nutrients but recommend addition to their flour as suggested in their guidelines.

Vitamin A

In terms of Vitamin A fortification, it is recommended that for uniformity all countries should use the same units preferably mg/kg, in the standards that are given to the manufacturers since the premix will be measured in those units. As part of the harmonization, it is also important when labeling fortified products, the same units (either mg or IU or RE) are used to indicate the levels of added nutrient that are available to the body. This will make comparison of nutrient levels in products from the different countries easier.

Even as a result of the harmonization, in setting standards for Vitamin A, the other sources of Vitamin A in the diet of particular country must be taken into consideration. This makes it imperative for the standard to have an upper and lower limit for the amount of Vitamin A that would be used. For example in parts of Ghana, consumption of palm oil and fruits such as mangoes and papaya is high, such that the lower limit may be appropriate for Ghana. In the UEMOA region, the level of vitamin A in fortified oil is estimated to meet 30% of recommended daily allowance of an individual.

Recommendation

Nigeria and Ghana could also increase the level of vitamin A in vegetable oil from current lower levels (20,000IU/Kg to 50,000IU/Kg) to fall in the range for the UEMOA Region, which is 30,000 - 60,000IU/Kg i.e.10mg/kg to 30mg/kg). By doing so it may be possible to stop the fortification of cereal flours with Vitamin A as cereal flours are not very good vehicles for vitamin A. Nigeria and Ghana could therefore agree on this (i.e. removal of Vitamin A from the premix) and if not, the harmonized standard could just specify the key mandatory micronutrients for flour fortification (iron, zinc and folic acid) and make vitamin A and B-group vitamins optional for cereal flour fortification in the regional regulation for West Africa. Taking vitamin A out of premix will also reduce cost to industries and they will be happy with this move. The premix for flour fortification will thus have only iron, folic acid, with zinc and B-group vitamins.

Folic acid

Folic acid is an important micronutrient for appropriate food fortification and should also be part of the harmonization efforts. The summary however shows that it is used in fortifying wheat flour in UEMOA countries and Ghana but not in Nigeria.

Recommendation

There will be a need to harmonize this and require folic acid fortification in wheat flour for the entire ECOWAS and UEMOA region.

Vitamin D

It will not be necessary to recommend Vitamin D fortification because deficiency of Vitamin D in tropical countries is not common due to the abundant sunshine.

18.0 Food Fortification Status in West African Countries

18.1 Benin

Equipment needs assessment has been completed for three industries: Industrie Béninoise des Corps Gras (IBCG), Fludor Benin S.A and Société des Huileries du Benin (SHB). Fludor Benin S.A is already fortifying vegetable oil with vitamin A and equipment installation completed for IBCG and SHB with equipment upgrade completed for Fludor Benin. Benin is host to the 15-member professional association of vegetable oil producers in Francophone West Africa (AIFO-UEMOA); committed to the regional initiative for vitamin A fortification of vegetable oil “Faire Tache d’Huile en Afrique de l’Ouest”. The Grand Moulin du Benin will be fortifying wheat flour by first quarter of 2008. The first batch of vitamin A premix has been procured for Benin oil industries by HKI.

18.2 Burkina Faso

Burkina Faso started fortification of vegetable oil in November 2007 in the largest vegetable oil industry SN-Citec. The second vegetable oil industry Jossira already has equipment installed for fortification. The executive secretariat of the professional association of milling industries in the

UEMOA Region is hosted by the Grand Moulin du Faso, Burkina Faso. The National Alliance for Food Fortification (NAFF) for Burkina Faso is highly motivated meets regularly and on 29th May 2008, Burkina Faso launched vitamin A fortified oil with global press coverage. Second batch of fortification premix for vitamin A fortification of cooking oil has been procured for industries in Burkina Faso.

11.3 Cote d'Ivoire

Three thousand eight hundred and sixty (3,860) kilogram of vitamin A and 16,400kg of micronutrient premix of mainly iron and folic acid had initially been provided to industries in Cote d'Ivoire for vegetable oil and cereal flour fortification respectively and in 2007 126,767tons of fortified vegetable oil was produced in the country; 50% of target production of 250,000tons per year. Cote d'Ivoire has regulations in place for mandatory fortification of industrially manufactured vegetable oils and cereal flour with a national logo for branding fortified foods. The country also has effective social marketing strategy coupled with monitoring and evaluation mechanisms. Fortified foods from Cote d'Ivoire currently have spill over to neighboring countries. Launching of fortified foods under GAIN funded program took place on the 27th of February 2008. Cote d'Ivoire also hosted the first workshop on micronutrient fortification of cereal flours in Francophone West Africa in September 2008. Industries are still being supported with additional micronutrient supply under GAIN funded project to continue fortification.

11.4 Guinea

Guinea was the first Francophone country in West Africa to fortify all cereal wheat flour with iron, folic acid and B-group vitamins. A nationwide sensitization program was carried out recently to ensure conformance to established mandatory national regulations on wheat flour fortification. The biggest wheat flour industry (Le Grand Moulin du Guinea) and two of the biggest wheat flour importers have their fortified wheat flour conforming to the national regulation. The country has a national logo for branding fortified wheat flour and a strong national alliance for food fortification. Guinea also has a vibrant social marketing program with television and radio sensitization on the consumption of fortified foods during festive occasions.

There is a consideration for oil fortification. BASF and HKI have initiated contact with major oil importers for them to buy into the fortification program. Les Huileries de Guinea is the major oil importer. The company imports oil in bulk and repackages it for distribution. The results of the preliminary contacts with them suggest that they are willing to fortify oil. What is needed is a support in equipment and technical assistance in the formulation.

The testing capacity of the country is highly limited thus making compliance difficult. Beside the laboratory at the University of Conakry the country does not have a competent authority. UNIDO program includes Guinea in its support to food quality program in term of equipment and training. As a counterpart of the framework the Guinean Government is supposed to provide the building to host the laboratory, and this is still forth coming. The cost of renovating an existing building for \$ 300,000 is still problematic. Pressure has to be applied for the government to meet its commitment or funding secured from other sources to meet this requirement.

Salt iodization still poses challenges to the government and a critical problem is packaging and labeling. The country also faces the problem of small producers that are putting on the market non iodized salt, similarly import from neighboring country Senegal does not carry out the iodization of salt. A bilateral discussion needs to take place between the two countries, Senegal been the main supplier of Guinea in salt.

11.5 Guinea Bissau

There are no industries fortifying food products in Guinea Bissau. As a member of the UEMOA group of West African countries, Guinea Bissau will be covered by directives mandating fortification of specific food vehicles in the UEMOA zone of West Africa. Guinea Bissau actively participates in all food fortification activities and regulatory frame work meetings in the UEMOA Region.

11.6 Mali

Mali was the first Francophone West African country to launch vitamin A fortified vegetable oil in November 2006. There is an active National Alliance for Food Fortification. Mali hosted the regional planning meeting for the second public-private sector dialogue on food fortification in November 2006, and also hosted the actual dialogue in June 2007. Mali under GAIN funded extension of "Doumani Nafama" program is currently expanding vitamin A fortification of vegetable oil in 4 additional vegetable oil industries in addition to the biggest industry HUICOMA. The country has successfully negotiated a grant agreement with USAID for micronutrient fortification of wheat flour.

11.7 Niger

In September 2007, HKI facilitated the acceptance into membership of AIFO-UEMOA professional association, the only vegetable oil industry in Niger. Equipment assessment needs for fortification has been completed for this industry with the identification of the site for fortification within this industry. Equipment installation has already been completed for the oil industry. Activities are underway to undertake micronutrient point of use as well as wheat flour fortification in Niger; HKI, CDC, UNICEF; MSDf etc (Please re-phrase this sentence). There is the need to re-activate the National Alliance for Food Fortification in Niger.

11.8 Senegal

There is a strong National Alliance for Food Fortification (COSFAM) in place with commitment to undertake vitamin A fortification of vegetable oil and micronutrient fortification of wheat flour. Equipment needs assessment has been completed for all major industries with free-will supply of vitamin A premix from BASF. Equipment installation has been completed in the biggest industry SUNEOR and premix procured to begin fortification in Senegal. The Ministry of Health will undertake base-line studies on micronutrient deficiencies to validate adopted regional norms and accelerate wheat flour fortification in the country. Additional funding is required for driving the processes.

Regulations have been formulated but there is a need for strong advocacy at government level to decree the regulations. The private sector is ready to push the fortification program but needs the regulatory

framework that will create a fair competitive environment for them. The launching of the private sector fortification is therefore pending waiting for the government action.

Social market program need to be supported. Cultural barriers exist in Senegal that need to be addressed through an effective social marketing program. An estimate budget of \$ 200,000 is needed. The private sector capacity in analysis using HPLC is limited and training program for them is a must a budget for training has been estimated at CFA 5,000,000 and a trainer has been identified.

11.9 Togo

Assessment for equipment need for vitamin A fortification of vegetable oil and identification of the site for fortification has been completed for the only vegetable oil industry in Togo Nioto. The only flour fortification industry, "*le Grand Moulin du Togo*" is willing to undertake fortification of wheat flour under the regional program for cereal flour fortification of HKI. Togo is also formulating a policy to establish a National Alliance for Food Fortification.

11.10 Cape Verde, Gambia, Ghana, Liberia, Nigeria and Sierra Leone

These countries mainly Anglophones with the exception of Cape Verde, are at different developmental stages in implementing food fortification programs. Cape Verde has implemented wheat flour fortification with micronutrients. Nigeria has regulations for mandatory fortification of vegetable oil and cereal flours whilst Ghana has voluntary fortification programs with GAIN funded projects. Sierra Leone has cereal milling industries that could also embark on fortification. All countries in West Africa have mandatory regulations for salt iodization.

Ghana: Ghana kick started the fortification program in West Africa in 2002 with the first Regional Food Fortification dialogue. With the funding and technical assistance from GAIN Ghana established one of the most successful public private partnership as a champion to drive food fortification. Standards have been developed for flour fortification as well as vegetable oil by the Ghana Standards Board which is responsible for setting all standards in Ghana. The food laws of Ghana now incorporate fortification and a draft law is presently pending at the Parliament after approval at Cabinet level. Even though food fortification has not yet been made mandatory, a voluntary food fortification has been adapted by the industry and a Memorandum of Understanding has been entered into between industry and regulatory bodies that industry will fortify all vehicles identified for fortification. On the import side major importers are part of the National Food Fortification Alliance and are now importing fortified food, mainly the vegetable oil imports since all flours are produced by the local industry. With the increase in commodity and food price at import the local food industry is faced with a non competitive business environment and now requires intervention in two key areas:

- Procurement of pre-mix
- Social market to create demand.

Until a culture of consumption of fortified food is developed in the country or food fortification is made mandatory there will be a need for continuous support to the National Food Fortification Alliance after GAIN support ends in 2009, it is estimated that an average annual budget for operational support is around \$ 500,000 a year up to 2012.

In the assessment of the country testing capacity Ghana Standards Board has been selected under the EU- UNIDO program as a reference laboratory for microbiological analysis in the Region. The Board also has a good capacity for chemical analysis with a good testing capacity and trained personnel. Other laboratories to support the industry also exist with high testing capacity and trained personnel such as the CSIR-Food Research Institute.

Nigeria: Nigeria has set standards for all oil and flour fortification and there also exists standards for pre mix and fortificants. In the region the case of Nigeria has been recommended as best practice in food fortification. The food fortification program strength lies in three key underlining components:

- Food fortification is mandatory and this is backed by the food laws;
- A competent authority as a regulatory body enforces compliance;
- Testing capacity exist at the Standards of Nigeria (SON). SON has also been selected as one of the reference laboratory under the EU-UNIDO quality program for the Region. NAFDAC the competent authority is also one of the selected laboratories under the same program and both laboratories are well equipped and have the competence for all required analyses.

As in the case of Ghana, Nigeria was assisted in its food fortification program in term of funding and technical assistance by GAIN, which establish the National Food Fortification Alliance a Public Private Partnership. The assessment revealed that some challenges still exist in Nigeria that need to be addressed. These are:

- With the population and the broad geographic distribution of industry, the National Food Fortification Alliance faces the challenge of organization of meetings which becomes very costly and support is needed in terms of travel cost of members and the organization for regular meetings. An estimated cost per meeting is about \$ 40,000 and with four quarterly meeting a budget of \$ 160,000 is needed.
- A new support has been requested for operation and administration of the Alliance
- At private sector level there is a need to develop testing capacity through the establishment of a private sector lead testing laboratory in food analysis for micronutrients. The private sector request a support in equipment mainly HPLC and spectrophotometer. This goes with developing the needed competence in the use of the equipment. An estimated cost of setting up an effective laboratory is estimated at \$ 120,000.
- Pre-mix quality has been a challenge for the industry to meet. A procurement support with technical assistance in quality testing and sourcing is required. GAIN proposed procurement funding system can leverage the industry. Few pre-mix producers already exist in Nigeria but need technical assistance in meeting quality requirements as well as demand. A revolving credit line for Nigeria alone is estimated at \$ 5,000,000.

Nigeria has been successful in its food fortification program because of the underlining facts cited above; however Nigeria has to have genuine discussions with other members of the community as to the level of micronutrient fortificants and also revisit flour fortification without vitamin A. An area of concern deals with the ban on import of vehicles to be fortified or fortified. This has to be examined since Nigeria has been part of the WTO agreement and TBT issues alongside with regional trade with the other members.

Sierra Leone, Liberia and Gambia: Not much information is available from these three countries in term of food fortification. One thing is to be noted is that all the three countries were represented at the ECOWAS Ministers of Health meeting in Abuja that passed resolution for mandatory food fortification in the region.

SeaBoard operates a flour mill in Sierra Leone and from their representative at the First African Flour fortification in Arusha Tanzania Sierra Leone mills forties Wheat flour as part of the company policy. The levels of fortification and the micronutrients are not known. This needs further investigation.

The former governor of the Central Bank of Liberia has established a flour mill in Liberia (Premier Flour Mill Inc and is still not known whether fortification takes place. However it is understood that the mill has been supported by USAID and WFP and as such we assume that fortification must be required. This also needs further investigation.

The Gambia does not have a mill and thus imports its flour, and information as to whether imported flour is fortified is lacking.

These three countries have not established as yet a National Food Fortification Alliance and there is a need therefore to support the creation of these Alliances to drive food fortification in the image of the other countries.

Regional fortification agenda is expanding and the resolution passed by the Assembly of Health Ministers in 2006 indicated a mandatory fortification of vegetable oil and cereal flours. This was also reiterated for accelerated implementation at the 2008 General Assembly of Health Ministers meeting in Cotonou within the ECOWAS region. The first Africa regional flour fortification meeting hosted by the Flour Fortification Initiative in November 2008 in Arusha called for individual as well as institutional commitment of participating institutions to food fortification which is one of the fundamental recommendations of the Comprehensive Africa Agricultural Development Program (CAADP).

19.0 Critical success factors for Regional Harmonization of food fortification.

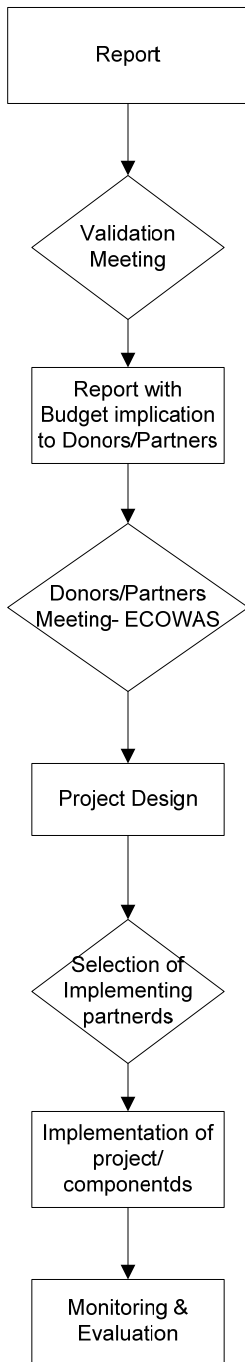
It is imperative that critical success factors be addressed for the sustainability of the food fortification program in the ECOWAS Region. Identified critical success factors are the following:

- A legislative framework to regulate fortification that makes fortification mandatory
- A strong political will and leadership
- The development of a common base for standards to create a level playing field
- The existence of quality control and testing infrastructure.
- An existence of common tariff and taxation system that is non discriminatory.
- Availability of large companies interested in and willing to invest in fortification of their products.
- Experience with fortifying other products – e.g. vegetable oil.
- Existence of a regional program for the fortification of flour (e.g. the West Africa program)
- Existence of regional norms and standards on fortification of flour with iron, zinc and folic acid, e.g. UEMOA
- Keeping partners on board by incorporating concerns and different perspectives: Firm leadership and give-and-take needed.
 - e.g. finding local solutions to cost issues i.e equipment and premix
 - Listening to different views, e.g. on standards, and moving toward finalization – scientific input and regional consensus documents are helpful.
- Ensure that there is capacity to resolve practical issues on factory floor or in testing labs - ‘just in time’ technical support
- Maintain advocacy, communication, mobilization throughout each phase of the process. i.e from launch through to the initial implementation phases
- Support from development partners
- Financial resource investment and establishing revolving funds for micronutrient premix
- Leadership at all level s to drive the program.

20.0 Roadmap:

Harmonized Food Fortification in West Africa Study – What Next: Road Map

<p>01 Activity: Design of a Road Map for the harmonization of food fortification legislations and standards in West Africa. What next after the study.</p>	<p>02 Result/s targeted: Commitment of fund to the program at the donors meeting for an effective execution</p>
<p>03 Activities:</p> <ol style="list-style-type: none"> 1. Finalize the report after consultation and feed back from partners. 2. Translation of report for circulation 3. Translation of standards and regulation (UEMOA texts, Ghana standards, Nigeria standards on flour and edible oil fortification). 4. Organize a validation workshop. 5. Circulate the validated document as final document to potential Donors and Partners 6. Organize a Donors/Partners meeting 7. Elaborate a project Document. 8. Select implementing partners 9. Implement project 10. Monitor and Evaluate project performance 	
<p>04 Objective: Share the study with all partners to the West African Food Fortification Program with the aim of securing their commitment to the program in term of resources, technical, physical and financial as a result of which a project will be formulated and implemented.</p> <p>Timeline: 6 months</p>	



Commodity Price Increase

In the mist of the increase in essential food commodities such as wheat and financial crises there is a strong just justification for food fortification to be mandatory. The increase in commodities prices are generally passed on to the consumers by the industry. What this translates in to is the decrease in the composition of the household food basket. Items of high value will be decrease in their basket thus decreasing their intakes in more expensive proteins and foods such as

vegetables and fruits. The selection of fortification food vehicle already takes into account what is staple food, thereby eliminating high costing food. It is therefore more of a reason to fortify these basic food in order to make up for loss in high value food to make up for this loss by filling the gap in micronutrient needs. This was also voiced by Cargill global Chair of the Flour Fortification Initiative Executive “The need for flour fortification is all the more acute in today’s environment of escalating food prices, where an increasing number of impoverished families are unable to meet their basic nutrition needs”.

It is therefore important for food fortification program policies to ensure supply to target groups required micronutrients such as iron, vitamin A, folic acid, and zinc to prevent deficiencies in these micronutrients by the target population.

Some data have been given by FFI on the cost of wheat on the global market as well as the production and the fortification cost. This analysis based on mid September 2008 prices is as follows:

Cost to buy a metric ton of wheat:	\$ 312
Cost to produce a metric ton of wheat:	\$ 268
Cost to fortify a metric ton of wheat:	\$1.50 to \$ 3.00

When fortification is not mandatory and the prices of staple food for political reasons are more or less fixed and controlled, the industry tends to revert to non fortified food given the increase in price as a justification because of the margin perceived after the increase in price even though the fortification cost are marginal. It is therefore imperative that for West Africa fortification be mandatory, but this will have to be supported by the initiative of the industry in term of cash flow. The Gain project is one of such initiative by making available to qualified millers a 6 months revolving credit facility for them to meet their premix needs. GAIN Executive Director stated it clearly “While we advocate mandatory fortification, we should also advocate for increase from public and private sources, as well as international aid, to remove this financial obstacle to implementation”. GAIN has set the tone; it is for other donors to participate in the initiative. Private sector initiatives have already started with Cargill a major US Agribusiness industry is participating in this program with GAIN by leveraging its food supply chain expertise and global infrastructure to promote fortification. This also includes FFI and Micronutrient Initiative. An on going discussion for partnership with local bank, Ecobank is underway, to leverage the industry in West Africa.

However the industry will also have to look at fortification as a Corporate Social Responsibility as stated by the Chair of the Flour Fortification Initiative Executive, “As a company devoted to nourishing people, we recognize the very tangible health and economic benefits that fortification brings and encourage our partners in the food industry to support efforts to make global implementation of flour fortification a reality”

Donors’ Interventions:

Despite the fact that food fortification has been recognized by 50 top world economists at the Copenhagen Consensus that it is the key to the world nutrition problem we still have only few players in support to its implementation. The field is dominated mainly by organizations such as GAIN, HKI, MI, FFI and Harvest Plus, these organizations are the few that have taken up the issue and it is also true that only few outside the specialist circles that are aware of the severity of the problem. It can result in a serious state of impairment of poor population in the West African region.

In West Africa Donors’ programs on food fortification is limited to these organizations.

Support of major donors have rather been scanty and have been done through these actors. Regional programs are trying to get involved as a solution to risks faced by their population in term of micronutrients deficiencies. Initiatives such as the West African Health organization on food fortification in the region, the NEPAD- African Vitamin and Micronutrient Deficiency Program are only at a start and need to sensitize many donors for their involvement.

It is to be noted that the World Bank recognizes fortification as a result of the Copenhagen Consensus as and area where intervention should be directed to solve the micronutrient deficiency in the region. This recognition has been voiced by the bank in a vivid term “The control of vitamin and mineral deficiencies is one of the most extraordinary development-related scientific advances of recent years. Probably no other technology available today offers as large an opportunity to improve lives and accelerate development at such low cost and in such a short time”. However the Bank involvement in the region is yet to come. USAID has supported some programs through organizations such as HKI and MI. A major player in the field of fortification in the region has been UNICEF which is involved in implementing food fortification in the region and has made substantial impact in salt with iodine and in the distribution of vitamin A supplement to children of the region.

Contact during the field work of the consultant did not identify any direct involvement from the Word Bank, or the EU. However they are present in indirect programs that support the fortification program in the region. These programs are in the area of food safety and quality program where each is present in the region. As to the establishment of the quality program EU is supporting the quality infrastructure development with UNIDO as implementing agency. This will leverage the testing capacity of the quality infrastructure and capacity of the region to be able to adequately support the food fortification program.

Regional organization such as UEMOA and ECOWAS are actively involved, this has been voiced at the Ministers Meeting in Abuja in term of political will by a resolution to make fortification mandatory in the region.

21.0 APPENDICES

21.1 Appendix 1

Health effects being addressed through micronutrient fortification

Iodine deficiency will result in the following:

- Cretinism
- Goiter
- Low birth weights
- Vulnerability to disease
- Decreased brain development in children

Vitamin A deficiency will lead to:

- Night blindness
- Dry eyes
- Blindness
- Compromised immune defense system

Folic acid deficiency will lead to:

- Birth defects of the spine and/or brain
- At risk for strokes as adults

Iron deficiency results in:

- Increase risk of dying while giving birth for pregnant women
- Severe deficiency, brain damage
- Anemia

Zinc deficiency leads to:

- Pregnancy-induced hypertension, pre-eclampsia and placental abruption, pre-term delivery and hemorrhaging
- Hair loss, growth retardation, inflammation of eyelids, and recurring infections among school age children
- Delayed sexual development, decreased sperm count and lower levels of testosterone, as well as skeletal abnormalities, short stature and anemia, among male adolescents
Chronic non-healing leg ulcers and recurring infections among the elderly

22.2 Appendix 2

Importance of Micronutrients

Micronutrients are essential vitamins and minerals needed in small quantities for our bodies to function in a healthy and efficient manner. On its own, the body does not produce these nutrients in adequate quantities and so they must be regularly provided through the foods we eat.

Micronutrients contribute to the following bodily functions:

- Helping our organs (heart, lungs, skin, muscles, nervous and immune system, etc) to function properly.
- Making the blood healthy and boosting the immune system.
- Reducing the risk of disease, infections and illnesses (e.g. arthritis, cancer, cardiovascular disease, diabetes, etc.).
- Keeping eyes healthy.
- Helping to build a strong skeletal structure (bones and teeth).
- Helping brain development and cognitive function.
- Keeping the muscles healthy and contracting properly.
- Minimizing the effects of aging and air pollution.
- Ensuring the body grows to its proper height and weight.

21.3 Appendix 3

Food legislation: the role of legislation

The primary purposes of food legislation are to protect the health of the consumer, to protect the consumer from fraud, and to ensure the essential quality and wholesomeness of foods. Food law must first provide the legal authority and an adequate legal framework for the food-control activities. It has been found that food law is managed most effectively in two parts: a basic food act and food regulations. The act itself should set out broad principles, whereas the regulations should contain the detailed provisions governing the different categories of products. Within the regulations should be found lists of approved fortificant compounds and food standards stating the allowed levels of nutrients in the fortified foods. This organization gives some flexibility to food laws, as it is much more difficult to have laws amended than to revise regulations. Prompt revision of regulations may become necessary because of new scientific knowledge, changes in new processing technology, or emergencies requiring quick action to protect the public health.

With respect to regulations dealing with fortified foods, changes might be prompted as a result of safety evaluations of nutrient compounds or new information regarding the roles and optimal levels of specific micronutrients in the maintenance of good health. Changes in food-processing and packaging technologies could be shown to result in a significant reduction in processing and storage losses of micronutrients, thus requiring a revision in the allowed levels of added nutrients. In the face of demonstrated micro-nutrient deficiencies, regulations regarding standards for certain foods and levels of fortification may need to be revised.

Principles regarding food-fortification legislation

“The following principles should be considered in the development of food-fortification legislation:

- » Fortification should always be in the best interests of the selected population;
- » There should be input from interested parties in the development of the law and regulations;
- » The provision of the law should allow flexibility;
- » The law should state clearly what is required or prohibited;
- » The law should create a device for enforcement;
- » The law should provide for quality assurance;
- » The law should provide the government with adequate inspection and sampling powers;
- » The law should contain both incentives and penalties;
- » The law should treat everyone equally and fairly.

Quality assurance and control

The maintenance of a well-functioning quality assurance program is essential if a consistent product is to result that meets all required standards. Good manufacturing practices based on the Codex General Principles of Food Hygiene should be established as the basis of any food quality assurance and control program. In addition, an HACCP system should be developed to ensure that potential hazards are identified and either prevented, eliminated, or reduced to acceptable levels.

A quality assurance program must consider all activities that have an impact on product safety and quality, from raw materials and ingredients used to product handling, through distribution channels, all the way to the final consumer. Components of a quality-assurance system include:

- » Raw material control: standard specifications must be adopted for all ingredients, which must then be inspected to ensure conformity;
- » Process control: all chemical, physical, and microbiological hazards as well as quality factors must be identified; critical control points must be established and monitored, and a record made of any action taken;
- » Finished product control: this requires that the finished product be unadulterated and properly labelled, and that the integrity of the finished product be protected from the environment.

Quality assurance in food fortification

All food-production activities must be monitored and controlled within the framework of an effective quality assurance program. The addition of nutrients to a food for the purpose of fortification increases the number of control points that must be considered. Poor manufacturing control leading to excessively high levels of nutrients in the finished product could have important health implications for the consumer if intake of the nutrient reaches the toxic dose. Conversely, low levels of nutrients in the finished product could render it nutritionally ineffective. This could also have serious health implications if the target population in the fortification program is at high nutritional risk. Poor manufacturing control could also lead to other quality defects related to interactions of added nutrients with other components of the system.

Conclusions

Food fortification is an important element in nutrition strategies to alleviate micronutrient deficiencies in selected populations. Food fortification must, however, must be controlled through the development of appropriate legislation. Adherence to the legislation will ensure that the objectives of the food-fortification program are achieved and that the levels of micro-nutrients are controlled within safe and acceptable limits.

The standards, guidelines, and codes of practice adopted by the Codex Alimentarius Commission should be considered in the development of food legislation, including those related to food fortification as they are now recognized under the WTO Agreements on Sanitary and Phytosanitary Measures and on Technical Barriers to Trade”²

Within this context and since food fortification falls under the WTO SPS measure, in setting a regional food fortification regulatory framework should take into consideration the transparency clause of SPS. Government must make known the factors considered in their systematic risk assessments to arrive at their measures in this case the level of deficiency at target population. They must notify trading partners of any changes requirements that affect trade, provide information on new or existing measures. It also requires that governments be opened to scrutiny of their methodologies for the

² Gregory D. Orris FAO “Food Fortification: Safety and Legislation

application of measures. The systematic international exchange of information and experiences provides a better basis for national standards.

21.4 Appendix 4

INTERVENTIONS/OPPORTUNITIES IN WEST AFRIAC FOOD FORTIFICATION PROGRAM (Please use same Font and size for all captions of Appendices)

Intervention/opportunity	Estimated Time	Estimated Budget	Priority level	Observations
<p>Intervention -1 There is opportunity to support the development of a template or a draft legislation that meets the regional food fortification that meets the standards for each vehicle of fortification that will be the basis for each national regulations</p>	<p>10 days Team LOE (team of 20 legal experts)</p>	<p>75K (What is 75K? Is it dollars or what? Please change all the Ks in this appendix to reflect the real amount)</p>	<p>High</p>	<p>Draft legislation has been developed for UEMO, Nigeria and Ghana have developed good legislations, these should be basis for developing Regional Draft legislation. It will</p>
<p>Intervention- 2 Awareness creation/Social marketing promoting public awareness and acceptance of micronutrient–enriched oil and flour, . The Intervention will support information, education and communication campaigns through different levels of media, and social mobilization and marketing by National food fortification Alliance (PPP). .</p>	<p>Development of the program and then marketing in each country</p>	<p>200K/country 500K/Nigeria</p>	<p>High</p>	<p>This will help create unified and simple messages to build consumer awareness, not only about food fortification, but also about illness prevention, a common logo that will be the ECOWAS seal for quality. This will also create demand for the products that have the logo and leverage industry. Implementing partners: Zone UEMOA + Guinea: HKI-FFI-MI Nigeria, Ghana: GAIN- FFI- MI</p>

<p>Opportunity- 3 Harmonized Standards: There is opportunity to support the development of a set of standards for flour, oil fortification based on FAO/WHO guidelines- This will take into account country specific needs and will set maximum and minimum level.</p>	<p>10 days Team LOE(team of 20 experts)</p>	<p>75K</p>	<p>High</p>	<p>Much of this work has been done with UEMOA, Nigeria and Ghana- Guidelines by FAO/WHO/CODEX exist. One needs to apply best practices, within local conditions and need. Implementing partners: FFI-CODEX/FAO/WHO</p>
<p>Intervention -4 Support to the Private Sector: Funding institutions , Donors and ecowas have the opportunity to support the financing of inventory (pre-mix), quality control of pre-mix and fortificants, and establishment of quality system at the level of the private companies involved in fortification.</p>	<p>2 years program</p>	<p>Nigeria: 75 UEMOA: 28 Guinea :1+1p Liberia: 1 Sierra Leone: 1 Total numbers of millers/refineries = 106 Need 300K/mill/year Estimated needs: 5000K/year</p>	<p>High</p>	<p>A fund to support line of credit. A partnership with GAIN to support the private sector could be put in place. Mechanism and administration can be developed jointly ; Baking network such as EcoBank can be local partner in each country. Implementing partners: Local Bank-GAIN</p>
<p>Intervention- 5 Strengthening the National Food Fortification Alliances: The re is opportunity to assist in the strengthening the National Food Alliances in various countries as well as the regional food fortification networks: The organizations are the driven forces behind the food fortification. This will drive the social and awareness initiatives,</p>	<p>Two years</p>		<p>High</p>	<p>The National Food Fortification Alliances is a key mechanism for information, knowledge transfer in the countries and the driven force for an effective implementation. It is a Public Private Sector Partnership to mobile and to drive the fortification process. Country project for</p>

<p>and assist in industry mapping. They need to be supported in term of organization, logistic and information sharing.</p>				<p>food fortification should manage the day to day activities of the Alliance. Same as the Project management and monitory country office</p>
<p>Intervention 6 Development of testing and inspection manuals and training: Donors, ECOWAS, AfDB can assist in the development of inspection, procedures manuals at public as well as private sector level. This is to be done with collaborating partners (HKI, FFI, GAIN,BASF). Private Sector should be supported in developing capacity for testing through training on analysis to determine micronutrient levels.</p>	<p>2 months Oil –Vitamin A (10 days team) Flour- Iron Folic Acid Vitamin B (10 days team) (10 days manual development) Team of (10 same members) Vitamin A- Nigeria* (Nigeria should considered not fortifying Flour with VA)</p>	<p>30K 30K 30K Total 90K UEMOA Sec.(1) ECOWAS (2) Technical Committee UEMOA (1) NAFDAC(1) SON(1) GSB(1) GFDB(1) Guinea(1) Facilitator External(1)</p>	<p>Medium</p>	<p>Reference materials should be secure/developed, inspection manuals with checklist developed in collaboration with the partners as TA. HKI, FFI, BASF, WHO- have competencies in these areas. Nigeria has developed a code of good practices concerning these Micro- nutrients these can be reviewed and a regional code arrived at.</p>
<p>Intervention:9 Project management, monitoring and evaluation. Intervention will support the Regional Project Administration office, which will inspect activities in the participating</p>	<p>Two years</p>	<p>Country support: All countries</p>	<p>High</p>	<p>Fortification project office to be established in consultation with all partners, with well terms of reference</p>

<p>countries, and each country project office (CPO) to implement investment plans. The intervention will also support technical and supervisory workshops at 6-month intervals, including the midterm review workshop, and annual auditing. The intervention emphasizes rigorous evaluation through sentinel studies on the impact of fortified food, economic and financial analysis of food fortification, and other interventions for reducing VMD</p>		<p>Regional Coordination Support</p>		<p>and a project manager hired with supporting staff. At country level the Ministry of Trade and industry be representing the country project office, with a dedicated project officer.</p>
---	--	---	--	---

21.5 Appendix 5

Budget Recapitulation (Same font and size?)

Intervention	Amount(000 USD)	Other contribution	GAP	Comments
Development of regulations	75		75	
Social Marketing	3,300	152	3148	In UEMOA countries plus Guinea 152 K partner with HKI that has secured
Development of Standards	75	0	75	Other Donors UNIDO-EU program
Development of manuals testing and inspection, Training materials	90	0	90	Other Donors and Foundations UNIDO, GAIN, FFI,
Procurement Support to Private Sector	5,000	2,000	2,000	Fund to support revolving line of credit is estimated at \$ 5000,000/yr
Strengthen National Food Fortification Alliances	3,000	1,000	2,000	Other Donors be contacted
Project Management and Monitoring	1,000	0	1,000	Other Donors be contacted plus regional organizations (ECOWAS, NEPAD, UEMOA)
Total	11,540	3,152	8,392	
Contingency (10% of total)	1,154	0		
GRAND TOTAL	12,694	3,152	9,542	Partners meeting at a round table.

21.6 Appendix 6

State of Oil Fortification Implementation in Francophone West Africa (Same font size)

Action	Benin	Burkina Faso	Cote d'Ivoire	Guinea Bissau	Mali	Niger	Senegal	Togo
Nutrition policy on food fortification	✓	✓	✓	✓	✓	✓	✓	✓
Nutrition status assessment		✓	✓		✓	✓	✓	
Food vehicle identified	✓	✓	✓			✓	✓	✓
National alliance established		✓	✓		✓	✓	✓	
Identification of site within industries	✓	✓	✓		✓	✓	✓	✓
Identification of equipment needs	✓	✓	✓		✓	✓	✓	✓
Establish standards	✓	✓	✓		✓	✓	✓	✓
Launch fortified foods		✓	✓		✓			
Logo for branding fortified foods		✓	✓					
Social marketing /logo for branding			✓		✓			
Monitoring and evaluation								
Impact evaluation								

21.7 Appendix 7

State of Flour Fortification Implementation in West Africa-Non UEMOA

Action	Ghana	Guinea	Nigeria	*Gambia	*Liberia	*Sierra Leone	*Cape Verde
Nutrition policy on food fortification	✓	✓	✓				✓
Nutrition status assessment	✓	✓	✓				✓
Food vehicle identified	✓	✓	✓				
National alliance established	✓		✓				
Identification of site within industries	✓	✓	✓				
Identification of equipment needs	✓	✓	✓				
Establish standards	✓	✓	✓				
Launch fortified foods	✓	✓	✓				
Logo for branding fortified foods	✓		✓				
Social marketing /logo for branding	✓	✓	✓				

21.8 Appendix 8

State of Oil Fortification Implementation in West Africa-Non UEMOA

Action	Ghana	Guinea	Nigeria	*Gambia	*Liberia	*Sierra Leone	*Cap Verde
Nutrition policy on food fortification	✓		✓				✓
Nutrition status assessment	✓		✓				✓
Food vehicle identified	✓		✓				
National alliance established	✓		✓				
Identification of site within industries	✓		✓				
Identification of equipment needs	✓		✓				
Establish standards	✓		✓				
Launch fortified foods	✓		✓				
Logo for branding fortified foods	✓		✓				
Social marketing /logo for branding	✓		✓				

21.9 Appendix 9

GLOBAL PREMIX PROCUREMENT FACILITY

Background

The Global Alliance for Improved Nutrition (GAIN) was launched in 2002 at a United Nations Special Session on Children. GAIN was established to build partnerships between the public and the private sector with the objective to eradicate malnutrition. GAIN's main strategy is to bring together key stakeholders to increase efforts and investments in the reduction of malnutrition, an issue which had received limited international attention for the previous twenty years. The first program launched by GAIN in 2003 focused on food fortification in developing countries, accelerating the reduction of vitamin and mineral deficiencies through large-scale mass fortification. Currently GAIN is supporting 18 large scale fortification projects in 17 countries and has plans to initiate another 23 projects in the coming years.

Ensuring the quality of premix used in mass fortification is difficult for industry and government partners in the developing world. With global concerns over the effect and quality of food additives, fortification programs have been under growing pressure to ensure that vitamin and mineral fortificants are of the highest quality standards. While WHO and FAO have published quality guidelines, many fortification programs and food producers in the developing world are not readily able to verify the quality of the premix they procure globally. They are unable to travel long distances to directly inspect the manufacturing facilities of premix manufacturers and they often do not have adequate testing facilities for the full range of vitamins and minerals. A globally recognized quality certification process for premix is therefore needed.

At the same time, micronutrient premix is the largest recurrent input cost for large-scale mass food fortification programs. A number of barriers exist for countries in procuring premix: access to suppliers; inflated prices for premix; access to upfront capital for large purchases; governance challenges in the purchasing process; lack of quality assurance and monitoring of delivered products; and, often, the lack of funds to purchase premix.

To address these barriers, GAIN is proposing to establish a new mechanism, ***a Global Premix Procurement Facility***, to specifically help partners in the developing world manage premix procurement. GAIN has a strong comparative advantage in designing, managing and operating a Global Premix Procurement Facility. It is currently establishing large new markets for the premix industry through its national fortification programs, and will continue to do so in the future with the addition of a new Infant and Young Child Nutrition Program and a Salt Iodization Program (USI GAIN-UNICEF partnership). GAIN's programs have a unique and strong relationship with food producers who will continue to need guidance and support in sustaining the benefits achieved under the projects. GAIN can leverage its technical knowledge of and operational experience with fortification programs to support the Global Premix Procurement Facility and its recipients, thereby reducing administrative and operational inefficiencies. In addition, GAIN's regional Business Alliances provide a strategic partnership network to enable constructive dialogue with the premix industry on issues such as pricing, standards and quality.

Proposed mechanism

To successfully implement large-scale mass food fortification programs, government and industry partners face many challenges in the premix procurement process, such as premix costs and quality assurance. To address these barriers, a more efficient system is needed to procure premix at the best price, through transparent and efficient processes. At the same time, a globally recognized quality certification and monitoring process for premix is needed to ensure that premix supplies are of the highest quality and will yield the intended health benefits. Moreover, it is necessary to establish a mechanism to provide support to countries or specific target groups where no resources are available to cover the cost of premix.

Therefore, GAIN proposes to develop and implement a Global Premix Procurement Facility (hereafter referred to as GPPF) that will entail four distinct functions:

- A *Certification Process* which establishes industry-wide standards and guidelines for premix.
- A *Procurement Facility* that makes premix more easily accessible to countries and the private industry engaged in fortification.
- A *Revolving Fund Mechanism* that will help projects finance their premix purchases.
- A premix *Grant Mechanism* that provides premix for fortification of food products used to reach vulnerable groups, including public sector programs and emergencies.

The Global Premix Procurement Facility will focus on vitamins and minerals used to fortify the following foods and condiments:

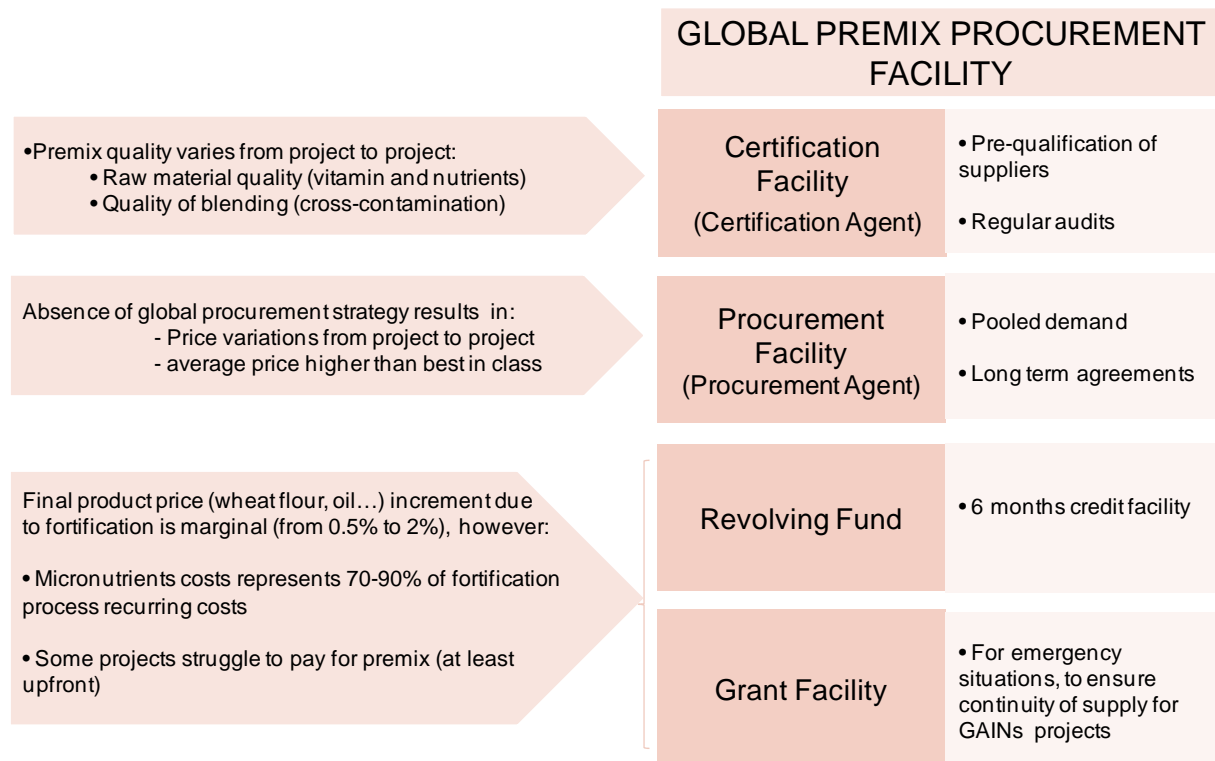
- Salt and similar products: with iodine (potassium iodate)
- Flour (wheat, maize, rice): with multi-micronutrient fortificants including iron, zinc, folic acid, other B vitamins and vitamin A
- Edible oils: particularly with vitamin A
- Other food vehicles such as fortified complementary foods, complementary food supplements, and condiments

In a second phase, the GPPF will also look at opportunities for procuring products for GAIN's infant and child nutrition programs (IYCN).

GAIN aims to offer a global purchasing platform for premix. This purchasing platform serves a dual purpose:

- Lowering cost of premix by facilitating multi-program bidding
- Ensuring high quality standards

Additionally, GAIN will set up a Revolving Fund and Grant Facility to help staple food manufacturers face the initial costs of food fortification.



It is estimated that approximately US\$10 million will be purchased via the GPPF in the first year. This volume will rapidly increase to over US\$30 million as new GAIN projects scale-up their production.

Proposed mechanism for the Revolving Fund

The GPPF Revolving Fund is de facto a credit facility to help local industries (millers and refineries) to access premix supply.

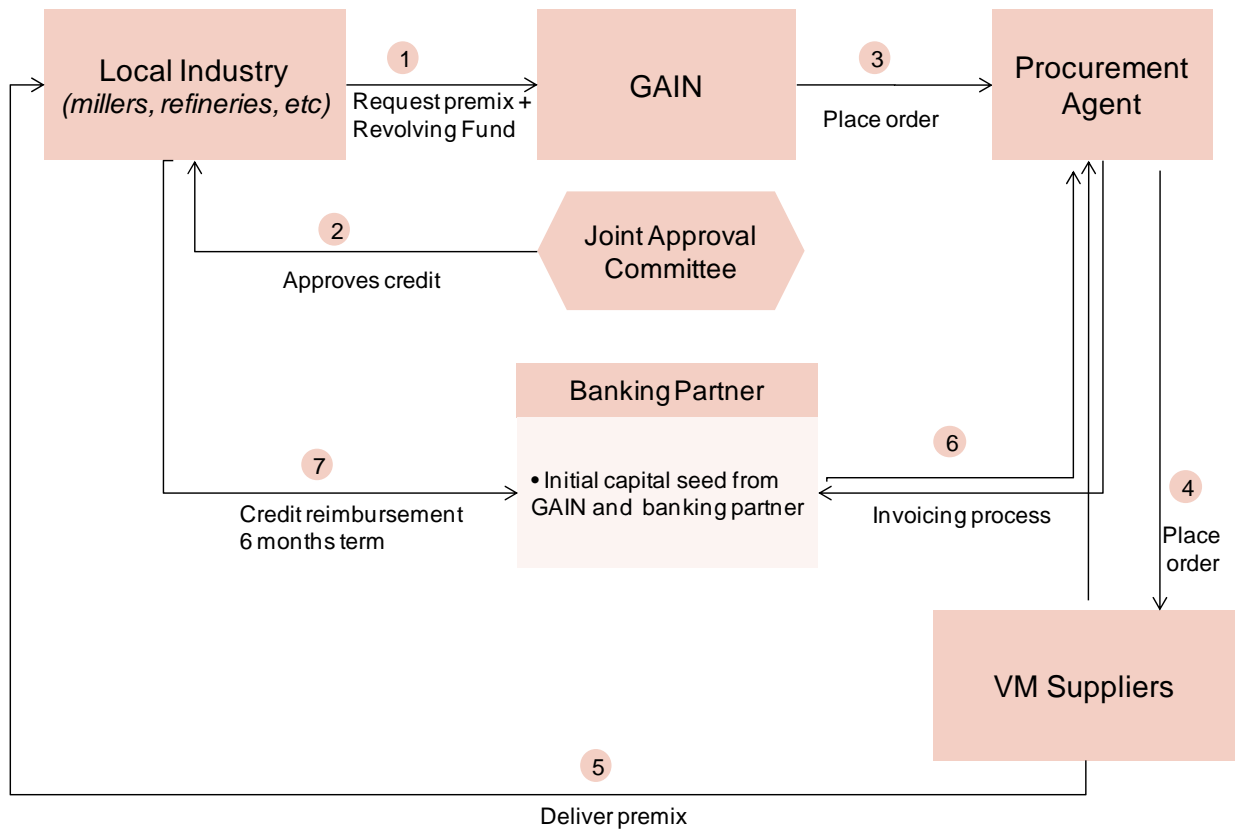
The cost of micronutrients premix corresponds to US\$1.00 to US\$5.00 per ton of fortified food and generally represents between 0.5 and 2% of the cost of the final product. However, for companies fortifying large amounts of food, purchasing premix can generate significant cash flow issues. Large mills, for example, could easily procure up to US\$500'000 worth of premix at a time. To facilitate the access to premix, GAIN is looking for a banking partner able to provide 6 months loans to industries in need.

GAIN envisages the following process:

The miller or refinery makes a request to GAIN for micronutrients premix and support from the Revolving Fund ¹. GAIN approves the premix request and evaluates, together with its banking partner, the loan request ². Once the credit has been approved, the banking partner enters into contractual agreement with the local industry, and GAIN places the premix order with the procurement agent ³. The procurement agent relays the order with the suppliers ⁴.

The suppliers deliver the premix to the miller or refinery and invoice the procurement agent ⁵. The procurement agent settles the invoice with the banking partner once the project has acknowledged the goods receipt and GAIN has approved the invoice ⁶. Finally, the local industry reimburses banking partner at 180 days, including a percentage fee (to be defined with banking partner). ⁷

The following figure illustrates the proposed mechanism:



In the long term, the Revolving Fund managed by GAIN and its banking partner could be further capitalized by investments made on the basis of a fixed return rate. GAIN estimates that at full scale, this fund would require a capitalization of US\$50-60 million.

Countries in which GAIN operates (or will in the future)

Actual Countries	Future Countries	Salt Iodization
		Russia
		Ukraine
	Kenya	
		Senegal
	Tanzania	
	Mozambique	
		Niger
Ghana		Ghana
	Nigeria	
Côte d'Ivoire		
South Africa		
	Ethiopia	Ethiopia
	Madagascar	
Zambia		
Uganda		
Egypt		
Morocco	Morocco	
Mali		
UEMOA (Benin, Burkina-Faso, Côte d'Ivoire, Guinée-Bissau, Mali, Niger, Senegal, Togo)	Francophone West Africa (Burkina-Faso, Côte d'Ivoire, Mali, Senegal, Cameroon)	
	Philippines	Philippines
	Bangladesh	
India	India	India
Kazakhstan		
Georgia		
Pakistan	Pakistan	Pakistan
		Indonesia
	Cambodia	
China	China	China
Vietnam	Vietnam	
Uzbekistan	Uzbekistan	
	Bangladesh	Bangladesh
Dominican Republic		
Bolivia		
	Guatemala	
	Mexico	

21.10 Appendix 10

Concretizing Social Responsibility through Partnership for Food Fortification to Address Micronutrient Deficiencies in West Africa

*Concept Paper- submitted to the African Development Bank by Helen Keller International
(November 2008)*

1.0 Effects of Micronutrient Deficiencies in UEMOA and ECOWAS Region

In 2006, the World Bank published a seminal report on repositioning Nutrition as central to development with a strong case that investment in proven technologies and intervention to tackle malnutrition offer potentially very high economic returns. The World Health Organization identified iodine, iron, vitamin A and zinc deficiencies among the world's most serious health risk factors with micronutrient deficiencies contributing to a vicious cycle of poor health and depressed productivity, trapping families in poverty and eroding economic security. The Economic Community of West African States (ECOWAS) covers 15-countries; 8-Francophone including 7-countries in the Economic and Monetary Union of West Africa (UEMOA) using the CFA Franc, 5-Anglophone and 2-Portuguese speaking countries. With a population of 260.5million over a total land space of 5079.4 square kilometers, the region has some of the worst health statistics in the world with life expectancy at birth averaging 51.1 years. Countries in the region rank between second and 31st highest in the world in terms of under-five mortality (U5MR). The under-five mortality rate varies from 73 to 316 deaths per 1,000 live births with an average of around 175. In West Africa, the infant mortality rate (IMR) varies from 54 to 182 per 1000 live births. Out of the 10 countries in the world with the highest under-five mortality four are in the region. In most of the countries from where data are available 4% to 21% of infants are born with low birth weight. Of children under five, 14 to 50% suffer from moderate or severe malnutrition. With the call by the United Nations to eliminate vitamin A deficiency and reduce by 30% the global prevalence of iron deficiency anemia by 2010, there is an urgent need to concretize efforts in this endeavor for the attainment of the broader millennium development goals. Maternal mortality is very high in the region with ratios ranging from 55 to 1100 deaths per 100 000 live births. One-third of Africans do not have access to adequate levels of vitamins and minerals and the situation has worsened with current global food crises, which has reduced further the purchasing power of several families to afford nutritious diversified foods. Deficiencies in essential vitamins and minerals are major causes of compromised immune system, impaired mental development, reduced school performance as well as work capacity, increased maternal/child morbidity and mortality and premature death throughout Africa.

2.0 Role of Large-Scale Food Fortification in Combating Vitamin and Mineral Deficiencies

In May 2008, the Copenhagen Consensus put micronutrient fortification as the third most critical solution to economic development in the world after micronutrient supplementation and the Doha development agenda, putting micronutrient intervention at the top of the list of global strategies for sustainable economic development. Drawing from a research by the World Bank, UNICEF, WHO, GAIN, the Micronutrient Initiative, the World Economic Forum etc, the WB seminal report of the leadership dialogue held on June 22nd 2006 had four clear messages:

- Tackling malnutrition should be a much higher priority for leaders everywhere
- Proven solutions already exist and need to be replicated and scaled (e.g. fortification)

- The private sector can be a valuable partner
- Institutional innovations and partnerships are crucial

One of the most cost-effective strategies to sustainable control of vitamin and mineral deficiencies is to engage private sector food companies to add vitamins and minerals to commonly consumed staples and condiments – a process called food fortification. Food fortification is a common practice in North America and Europe, and Helen Keller International has been at the forefront of engaging private and public sectors to bring this technology to sub-Saharan Africa. It is estimated that controlling vitamin A deficiency with fortification as one of the key strategies will avert the death of over 105,000 child deaths per year in the UEMOA Region alone, which has 48% of young children estimated to be at risk of this micronutrient deficiency. Addressing deficiencies in vitamin A, iron, folic acid and zinc through fortification will go a long way to compliment the gains of salt iodization in Africa and HKI is exploiting the opportunity for fortifying other food condiments such as bouillon cubes with multiple micronutrients to promote the availability of multiple fortified foods and condiments for the nutritional well being of the population of Africa.

3.0 Regional commitments to Food Fortification (UEMOA, ECOWAS, African Union/NEPAD CAADP)

Helen Keller International in collaboration with several partners including the West African Health Organization (WAHO), the UEMOA Commission, USAID, Michael and Suzan Dell Foundation, Micronutrient Initiative (MI), Global Alliance for Improved Nutrition (GAIN), Food Industry Associations and private Companies in West Africa have been advancing food fortification throughout West Africa and other parts of Africa including recent efforts in Cameroon. In 2002 the focus of the first regional private-public sector dialogue held in Accra on food fortification focused on developing food fortification processes in each country in the sub-region, however the second regional dialogue held in Bamako focused on creating a favorable regional environment for mandatory regional vegetable oil and cereal flour fortification, building on the 2006 resolution of the ECOWAS Assembly of Health Ministers for mandatory fortification of cereal flours and vegetable oils in the region. Several industries in different countries in the sub-region have already embarked on food fortification with several others poised to begin implementing the technology. Industries now have very high interest in food fortification. HKI and partners launched the first regional initiative on vitamin A fortification of cooking oil “*Faire Tache d’Huile en Afrique de l’Ouest*” in June 2007 and in September of the same year declared the “*Fortify West Africa*” program at the Clinton Global Initiative in New York to include micronutrient fortification of cereal flours in the UEMOA Region. Significant strides have been achieved in the implementation of both initiatives. In November 2008, the first Africa Regional Workshop on Cereal Flour Fortification was hosted by the Flour Fortification Initiative in Arusha, Tanzania and emphasis was laid on the statement by the participants of this workshop on the Comprehensive Africa Agricultural Development Program’s mandate for fortification of cooking oil and cereal flours as fast track programs for combating vitamin and mineral deficiencies in the Africa Region.

4.0 Status of Vitamin A/Micronutrient Fortification of Cooking Oil/Cereal Flours in West Africa

Three countries are now fortifying vegetable oils in the UEMOA Region; Mali, Cote d'Ivoire and Burkina Faso with two to join by the end of this year - Benin and Senegal. Vitamin A premix has

already been procured for industries in Benin and Senegal which completed equipment installation for vitamin A fortification of cooking oil this year. Equipment installation for the only vegetable oil industry in Niger is almost completed to embark on vitamin A fortification of cooking oil. The regulatory frame-work is being created with the adoption of 10-regional standards for fortifying vegetable oil in the UEMOA Region and the adoption of a regional logo for branding fortified foods within the region. Fifteen vegetable oil industries have adopted vitamin A fortification of cooking oil under their professional association in the UEMOA Region and 13-cereal flour milling industries recently catalyzed the creation of a professional association of milling industries in the UEMOA Region with commitment to embark on micronutrient fortification of cereal flours in the region. HKI has already completed industrial assessment for all vegetable oil and cereal flour milling industries in the Francophone Region with Guinea and Cote d'Ivoire already fortifying all centrally produced cereal flours in the Region. In September 2008, HKI trained all flour milling industries in the UEMOA Region in a workshop in Abidjan on micronutrient fortification of cereal flours. In the non-UEMOA countries Ghana and Nigeria are producing vitamin A fortified cooking oil for their populations with mandatory regulations in place in Nigeria. Ghana, Nigeria and Cape Verde are also advanced with micronutrient fortification of cereal flours. HKI also facilitated the active participation of public and private sector institutions from West Africa in the first Africa Cereal Flour Fortification Workshop in Arusha, Tanzania, to strengthen the institutional capacities of partners in the implementation of cereal flour fortification in the Africa Region. With support of the West Africa Health Organization, HKI is also strongly collaborating with the consultant of the African Development Bank on the regional harmonization framework on food fortification for the ECOWAS Region.

5.0 Existing Program and Policy Gaps

There is the need to reinforce inspection and regulatory bodies in the sub-region, procure initial micronutrient premix for industries, and establish harmonized standards and regulations with legal decrees on mandatory fortification of cooking oil and cereal flours to concretize the resolution of the Ministers of Health and the achievements and commitment of local industries and regional partners to fortification. A more rigorous monitoring and evaluation system is required to enforce established regulations and standards with external monitoring of quality of imported food products and locally produced fortified food on the regional market. Boarder control will play a key role in the success of this endeavor with training of industries and upgrading support for quality control systems including modern food safety systems such as hazard analysis critical control points (HACCP) system development. Standards and regulations are critical in ensuring that factories sustain food fortification in the region with fairness and control of the levels of micronutrients added to foods. In partnership with the West African Health Organization (WAHO), the Economic and Monetary Union of West Africa, the 15-member professional association of vegetable oil producing factories of the UEMOA Region (AIFO-UEMOA), and the newly created professional milling industries association HKI and the Africa Development Bank will facilitate vitamin A fortification of cooking oil in addition to micronutrient fortification of cereal flour in the entire ECOWAS Region. There is an urgent need to ensure the development and effective implementation of harmonized regional standards and regulations on food fortification particularly given the increased regional integration and harmonization of sanitary and phyto-sanitary (SPS) standards in the ECOWAS region and the readiness of the private sector to engage in food fortification. This will entail: development of technical standards, legal frameworks and procedures

for adopting and ratifying these standards; technical capacity building on implementing the standards; food safety and quality control management systems; and the promotion of effective, external quality monitoring systems. The result of the work of the African Development Bank feasibility analysis will provide the platform to build on this work.

6.0 Goals and Objectives of Concept

Support from the African Development Bank will ensure the sustainability of the current regional food fortification initiatives by mandating that all factories conform to harmonized regional standards and regulations to leading to a positive impact on the public health and economic growth of the region to maintain the momentum and enforce mandatory legislation for food fortification. Partners must accelerate establishment of ECOWAS regulatory frameworks and undertake effective social marketing on fortified foods with a regional logo adopted for branding fortified foods for the ECOWAS Region based on the experience of the UEMOA Region (flour and oil). HKI and the African Development Bank will:

- Support the UEMOA and ECOWAS Commissions to:
 - Develop harmonized regional standards
 - Organize national and regional level technical review of standards
 - Adopt and publish standards on food fortification
 - Develop the legal and regulatory framework for implementing harmonized standards within the region on food fortification
 - Establish and adopt the regional logo for branding fortified foods
- Expand vitamin A fortification of cooking oil and micronutrient fortification of wheat flour to cover the entire ECOWAS Region
- Undertake social marketing of fortified foods
- Build capacity of regional control laboratories and food inspection institutions to support effective implementation of standards and regulations
- Organize workshops on standards for food fortification for regulatory institutions
- Establish monitoring systems for imported fortified food vehicles
- Reinforce internal quality monitoring systems of food factories to meet the requirements of established standards and regulations.

7.0 Estimate of Financial Gaps and Budget

The total budget required to advance and sustain food fortification in the ECOWAS Region is estimated at \$13,303,962 over a three year period. A total of \$3,429,840 approximately 26% has been secured and currently being managed by HKI for implementation to cover the period. A significant amount of the balance will go into procuring micronutrient premix for industries to sustain fortification and the African Development Bank could provide the amount directly to each industry in the sub-region with special conditions over the period to purchase their requirement for micronutrient premix (approximately \$ 5,000,000). The African Development Bank could provide funding to HKI, the West African Health Organization, the UEMOA Commission to manage the regulatory, monitoring/evaluation, quality control and social marketing component of the regional fortification program. Helen Keller International will provide technical support to both public and private sector institutions to sustain food fortification throughout the region and the African

Development Bank could establish a premix revolving fund to support private sector to continue food fortification for the nutritional well being of the population of West Africa.

Budget

Item	2009			2010			2011		
	Total Needs	Secured	Gap	Total Needs	Secured	Gap	Total Needs	Secured	Gap
Personnel	300,000	300,000	0	750,000	350,000	400,000	800,000	350,000	450,000
Specialized consultants	136,000	92,000	44,000	100,000	70,000	30,000	105,000	75,000	30,000
Meetings, conferences, travel	320,000	165,000	155,000	245,000	90,000	155,000	290,000	90,000	200,000
Training	155,000	120,000	35,000	140,000	45,000	95,000	155,000	0	155,000
Fortification and other equipment	650,000	300,000	350,000	617,000	267,000	350,000	0	0	0
Fortification pre-mix	1,407,000	0	1,407,000	1,500,000	0	1,500,000	2,100,000	0	2,100,000
Social marketing/demand generation	348,435	297,000	51,435	200,000	100,000	100,000	151,000	0	151,000
Monitoring	102,200	47,200	55,000	105,000	50,000	55,000	105,000	50,000	55,000
Impact evaluation	0	0	0	0	0	0	150,000	0	150,000
Operations research on new vehicles and new nutrients	155,000	0	155,000	0	0	0	0	0	0
Total	3,573,635	1,321,200	2,252,435	3,657,000	972,000	2,685,000	3,856,000	565,000	3,291,000
Indirect cost 20% of total cost	714,727	264,240	450,487	731,400	194,400	537,000	771,200	113,000	658,200
Grand total	4,288,362	1,585,440	2,702,922	4,388,400	1,166,400	3,222,000	4,627,200	678,000	3,949,200

21.11 Appendix 11

GENERAL DISCUSSIONS (This should take care of most of the Comments)

One of the main challenges in the West African context is the complexity of the etiology of micronutrient malnutrition. Overall protein-energy malnutrition is complicated in many cases by specific micronutrient deficiencies, HIV/AIDS, malaria and widespread infectious disease. Consequently, programs are addressing this through an Integrated Management of Childhood Illness (IMCI) approach, increasingly in both the community and in health centers, within a life-cycle framework. This addresses antenatal care to promote increased birth weights, and includes other vulnerable stages of life such as adolescence and the school years.

A related problem is the need for more prevalence data, including the more effective consolidation (and hence access to), what data are already around but not necessarily readily available. A further difficulty is measuring the extent of the problem in the field (although the Hemocue™ photometer has been used extensively to assess anemia). Misclassification of micronutrient status can occur because of the confounding effects of concurrent infections in countries where infections are prevalent, such as in much of Africa. Cities in West Africa offer a wide range of street foods that are accessible to all. The consumption of these foods contributes to decreasing the risks of micronutrient deficiencies because of the diversity they bring into the diet of urban dwellers, many such dwellers whom live in underprivileged urban environments. The requirements of consumers as to the hygienic quality of street foods are, however, weak, and the ensuing health problems are often mentioned. The organization of this sector and the improvement of the hygienic quality of foods sold in public places remain a major challenge.

Particularly in West Africa, a further problem that applies not just only to micronutrient malnutrition, consists of institutional challenges whereby administrative/government systems in charge of nutrition policies, programs and priorities are under-financed, under-staffed and the potential impact of nutrition programs to development and national progress under-valued. Other challenges are related less directly to nutrition but include continuing internal wars, refugees, epidemics and increasing urbanization, along with increasing environmental pressures.

However, the situation is by no means all-negative. Some of the most innovative operational research is currently taking place in Africa and should lead to new solutions to micronutrient malnutrition. There is continuing refinement of the actual extent of the problem and determination of who is most at-risk. The astonishing success of adding vitamin A to the polio national immunization days presents the challenge of how this high level of coverage will be maintained as many countries are discontinuing the National Polio Immunization Days. There is considerable progress and experience with new distribution systems of vitamin A with national micronutrient days, and other innovations for micronutrient delivery. Fortification will play an ever-greater role in micronutrient deficiency prevention and control besides iodine. The major initiatives currently addressing malaria, tuberculosis, HIV/AIDS and infectious diseases in general will all contribute.

CONCLUSION

Experience has shown that any one approach will not be enough to sustain a significant improvement in the micronutrient status of populations. The key is to use a combination of approaches, delivered in an

integrated and participatory manner. In the end, it is this complementarity that will contribute to reaching the revised micronutrient goals set at the UN's Special Session on Children.

21.12 Appendix 12:

**FLOUR MILLS INVOLVED IN THE MANDATORY FORTIFICATION
OF WHEAT FLOUR IN NIGERIA**

s/n	ORGANISATION	LOCATION /ADDRESS	PROD CAPACITY		
			MILLING CAPACITY MT/DAY	OUTPUT T 2005 MT/YR	OUTPUT 2006 MT/YR
1	Adoka Mills Nig. Ltd	Jos	80	N/A	N/A
2	Bendel Feeds and Flour Mills Nig. Ltd	Benin-Auchi Road, PMB 1. Ewu, Edo State	160	11,000	11,000
3	BUA flour Mills Nig. Ltd.	2 nd Gate Bye-pass, Tin Can Island Port, PMB 1105, Apapa Lagos	500	36,000	36,000
4	Crown Flour Mills	2 nd Gate Bye-pass, Tin Can Island Port, PMB 1105, Apapa Lagos Tel: 01-545394, 5876405, 5873814, 5873721	1000	100,000	80,000
5	Dangote Flour Mills Ltd	Calabar Port	360	N/A	N/A
6	Dangate Flour Mills Ltd	Apapa Port, 20 Berth Road Lagos Tel: 01-2695108 – 10 Fax: 01-2695009, 2695316 E-mail: dangote@dangote-group.com	1000	270,000	270,000
7	Dagnote Flour Mills Ltd.	Sharada Phase III, Kano	400	N/A	N/A
8	Dagnote Flour Mills Ltd.	Asa Dam road, Ilorin	120	N/A	N/A
9	Dyechem Nig. Ltd.	Industrial Estate, Ota	N/A	N/A	N/A
10	Flour Mills of Nigeria Plc	2, Old Dockyard road, P. O. Box 341, Apapa Tel: 01-28230, 28374 Fax: 01-5870395, 5871602	5,000	900,000	810,000
11	Honeywell Flour Mills Nig. Ltd	2 nd Gate Bye-pass, Tin Can Island Port, PMB 1105, Apapa Lagos Tel: 01-5453679 – 83 Fax: 01-5878308, 2616498 E-mail: hfml@honeywellflour.com	1500	195,000	XX
12	Ideal Flour Mills Nig. Ltd	Kudendan Industrial Layout, Kaduna Bye-pass, P.O Box 5335, Kaduna Tel/Fax: c/o NAFDAC Zonal office (062-312140)	420	15,500	14,425

13	Interstate Flour Mills Nig. Ltd	2 nd Gate Bye-pass, Tin Can Island Port, PMB 1105, Apapa Lagos	600	20,000	8,000
14	Life Flour Mills Nig. Ltd	Ogorode Industrial Layout, P.O Box 547, Sapele	800	79,165 MT	XX
15	Lister Flour Mills Nig. Ltd	Old Lagos Road, Podo Village, P. O. Box 1940, Ibadan Tel: 02-2311337, 2312242, 2316112/3 Fax: 02-2318708	500	50,000 MT	N/A
16	Maiduguri Flour Mills	2, Busari Road, PMB 117, Maiduguri Tel: 076-803370 – 9 Fax: 076-870395, 681799	125	N/A	N/A
17	Mix & Bake Flour Mills Nig. Ltd	Warri Port, Warri Tel: 053-253306, 256907	500	40,000	35,000
18	Nazifi Halidu & Bros. Nig. Ltd	Jos	N/A	N/A	N/A
19	Niger Mills Company Plc	Km 18, Enugu-Onitsha Expree Way (Umunya), Onitsha	150		XX
20	Niger Mills Company Plc	P. O. Box 339, Calabar	125	40,258	44,801
21	Nigerian Eagle Flour	Eagle Flour Road, Toll Gate/Point, Ibadan-Lagos Express way, P.O. Box 4868, Ibadan	125	64,000	59,830
22	Northern Flour Mills Pls	13, Mai Malari Road, Bompai, P. O. Box 6007, Kano Tel: 064-634735, 634850, 647166, 647165 Fax: 064-639758	600	100,000	95,000
23	Omega Flour Mills Nig. Ltd	Km 11, Kakara Village, Hadeija Road, Kano	N/A	5,375	6,000
24	Port Harcourt Flour Mills Nig. Ltd	Industry/Alfred Diete Spiff Road, Port Harcourt	200	135,500	140,500
25	Ranks West Africa Ltd	Ejibo, Lagos	N/A		
26	Standard Flour Mills	15, Creek Road, P. O. Box 172, Apapa Tel: 01-5870519, 7900603, GSM: 08055501738, Fax: 01-5877487	N/A		23,760
27	Sunrise Flour Mills Nig. Ltd	Emene Industrial Layout, P.O. Box 2575, Enugu	N/A		23,000
28	U-best Flour Mills Nig. Ltd	Mushin Lagos	N/A		

21.13 Appendix 13

LIST OF MAIZE FLOUR MILLERS IN NIGERIA

S/NO	NAME OF ORGANIZATION	ADDRESS OF ORGANIZATION	CAPACITY		
			INSTALLED MT/DAY	OUTPUT 2005 MT/YR	OUTPUT 2006 MT/YR
1	Albokyl Flour Mills Nig. Ltd	Kano	N/A	N/A	N/A
2	Grand Cereals and Oil Mills Nig. Ltd	Km 17, Zawan Roundabout, Jos	200	11,030	8,180
3	Northern Nigerian Flour Mills Plc	13, Mai Malari Road, Bompai, P. O. Box 6007, Kano Tel: 064-634735, 634850, 647166, 647165 Fax: 064-639758	200	NO PRODUCTION	N/A
4	Pioneer Milling Company	Jos	200	15,000	10,800

21.14 Appendix 14

LIST OF VEGETABLE OILS MANUFACTURERS

	COMPANIES	INSTALLED CAPACITY (TONS/DAY)	2006 OUTPUT CAPACITY (TONS/ANNUM)	FORTIFICATION Compliance (%)
1	A.B.J. Oil Mills Ltd, Katsina	80	25,600	20
2	A.B.J. Oil Mills Ltd, Katsina	80	25,600	20
3	A.M.Z Oil & Bros Ltd, Kano	70	22,400	0
4	A.M.Z Oil & Bros Ltd, Kano	70	22,400	0
5	Afgrow, Kano	40	12,800	0
6	Afgrow, Kano	40	12,800	0
7	Amyaco Oil Mills, Kano	40	12,800	60
8	Best Oils, Ibada	100	32,000	60
9	Consolidated Oils	60	19,600	0

10	Envoy Oil, Aba	80	25,600	100
11	Funtua Oil Mills Katsina	160	51,200	0
12	General Agro Oils, Port Harcourt	120	38,400	80
13	Gerawa Oil Mills Kano	100	32,000	0
14	Grand Cereals	60	19,600	100
15	IFMP Limited, Ikeja, Lagos	100	32,000	100
16	Ila Ventures Oil Mills, Kano	60	19,600	50
17	Jof Ideal Oil Mills, Ikeja, Lagos	80	25,600	80
18	Karami Oil Mills (Fortune), Kano	80	25,600	100
19	Katsina Oil Mills Ltd, Katsina	100	32,000	0
20	Lina Oils, Ibadan	70	22,400	60

21	Maikpobi Oils, Benin	40	12,800	20
22	Nalmaco Oil Mills, Kano	120	38,400	40
23	Nifex Oils, Aba	70	22,400	20
24	Nigeria Oil Mills Kano	120	38,400	0
25	Nouri Oil Mills, Kano	80	25,600	20
26	Nouri Oil Mills Kano	80	25,600	20
27	Pioneer Oil Mills, Lagos	80	25,600	0
28	Planet Oils, Aba	100	32,000	40
29	Presco Oils, Benin	100	32,000	20
30	PS Mandrides, Kano	120	38,400	60
31	PS Mandrides Kano	120	38,400	60
32	Real Oil Mills, Ojota, Lagos	100	32,000	50
33	Rimco Oil Mills, Nnewi	100	32,000	100

34	Rivoc Oils, Port Harcourt	100	32,000	100
35	Salma Oil Mills Ltd, Kano	200	64,000	100
36	Sarauni Oil Mills, Kano	60	19,200	40
37	Sarauni Oil Mills, Kano	60	19,200	40
38	Shamad Concept, Kano	80	25,600	0
39	Sharada Oil Mills, Kano	80	25,600	60
40	Solive Oils, Aba	80	25,600	100
41	Sudit Oils, Ibadan	80	25,600	60
42	Tahir Oil Mills, Kano	100	32,000	100

43	Talamiz Oil Mills, Kano	160	51,200	100
44	Yakassai Oil Mills, Kano	100	32,000	100
45	Yakassai Oil Mills, Kano	100	32,000	100
	TOTAL	3,970	826,400	37

21.15 Appendix 15-

GHANA MILLS

Ghana Flour Mills: Wheat					
Companies	Address	Contact Person	Telephone	Association	Type
Golden spoon	Coplan Hse, Kojo Thompson Rd. Box AN16861. Irani Brothers & Others Ltd (Head Office) Behind Trust Hospital Osu. Box 672. Tel:		021-228701 021-776673 021-773509 021-777124	Association of Ghana Industries Ministry of Food and Agriculture	Wheat
S.C.S. International Ltd	#29/22 Odon St. Box GP 2736		021-226835		
Takoradi Flour Mills	56 3 rd Rangoon Close, Cantonments. Box 1812		021-774226 021-774227		
Ghana Agro Food Company	Ghana Agro- Food Company Limited (GAFCO) P. O. Box 11345 Tema - Ghana		022- 2041214		
Ghana Flour Mills: Cassava					
Women in Agriculture Development (WIAD)	ICT Unit Ministry of Food and Agriculture Head Office P. O. Box M37 Accra Ghana.		021-670574 021-671534		
Ghana Flour Mills: Maize					

Women in Agriculture Development (WIAD)	ICT Unit Ministry of Food and Agriculture Head Office P. O. Box M37 Accra Ghana.		021-670574 021-671534		
Ghana Oil					
Unilever Ghana Ltd	Swamill Hse. Box 1648 Accra		021-664985 021-664986		
Tragrimacs Sunflower Ghana Limited.		ISSAH SULEMANA (CEO)	022 -251129 022-251130 0208135861		
Olga Oil Refinery					
Ghana Agro Food company	Ghana Agro-Food Company Limited (GAFCO) P. O. Box 11345 Tema - Ghana		022-2041214		
Benso Oil Palm Planation	Adum Banso Estate, P. O. Box 740 Takoradi		031-24219		
Oils & Fats Ltd					
TOM OIL & FAT PROCESSING LIMITED					
Tinto Oil Palm Plantation Ltd					
Ghana Oil Palm Development Ltd	P.M.B. Kwae, Kwaebibirem District Kwae (Near Kade) Ghana		027- 519881		

Liberia
Premier Flour mills
P.O.Box 1253
Monrovia
General Post Office
Capacity : 100 tonnes/day
790,00 bags a year of 45 kg

Somalia Drive

21.16 Appendix 16

Vegetable Oil Industries that are members of AIFO UEMOA and Embarking on Vitamin A Fortification of Cooking:

Benin:

1. Industry Beninoise des Corps Gras 06 BP 2548 Cotonou Tel. +229-21-330701 Fax. +229-21-330460
2. Societe des Huileries du Benin, BP 08 Bohicon Benin Tel. +229-22510363 Fax. +229-22511583
3. Fludor Benin BP 195 Bohicon Benin Tel. +229-22511950 Fax. +229-22511988

Burkina Faso:

1. Jossira Industries S.A 01 BP 2083 Bobo Dioulasso 01 Burkina Faso Tel. +226-20977325 Fax. +226-20977324
2. Societe Nouvelle Huilerie et Savonnerie Citec BP 1300 Bobo Dioulasso Tel. +226-20972703 Fax. +226-20972701

Cote d'Ivoire :

1. Cosmivoire 01 BP 3576 Abidjan 01 Cote d'Ivoire Tel. +22521757757 Fax. +225-21272813
2. UNILEVER Cote d'Ivoire 01 BP 1751 Abidjan 01 Cote d'Ivoire Tel. +225-21754400 Fax. +225-21356050
3. Trituraf Cote d'Ivoire BP 1485, Bouake, 01, Cote d'Ivoire Tel. 225 31 63 26 42, Fax. 225 31 63 17 91 f

Guinea Bissau – No cooking oil industry in Bissau-vegetable oils largely imported

Mali:

1. HUICOMA BP 2474 Bamako Mali Cell +223-6756265 Fax. +223-2262904

Niger :

1. Groumpe Oumarou Laouali Gago (OLGA OIL) BP, 483 Maradi Tel. +227-20740249 Fax. +227-20411437

Senegal :

1. SUNEOR BP 639 Dakar Senegal Tel. +221- 338 491708 Fax. +221-338 236737

Togo:

1. NIOTO – l’huile du Togo BP 3086 Zone Industrielle du Port Lome, Togo. Tel. +228-227-2379 Fax. +228-227-6833.

Cereal Flour Milling Industries in Francophone West Africa Embarking on Micronutrient Fortification of Cereal Flours (UEMOA)

Benin :

1. Grand Moulins du Benin 01 BP 949 Recette Principale Cotonou, Rep. du Benin Tel. +229-21-331723 Cell. +229-95967743 Fax. +229-21-330149

Burkina Faso

1. Grand Moulin du Faso 01 B.P 683 Ouagadougou, 01 Burkina Faso Tel. +226-50355593 +226-78831212, Fax. +226-50358564
2. Societe Nouvelle Des Grand Moulins du Burkina BP 207 Banfora Burkina Faso Tel. +226 70527967 +226-20911601 Fax. +226-2091160
3. Les Grand Moulins des champs Zone Industriel de Kossodo 01 BP 612 Ouagadougou 01, Burkina Faso Tel. +226-50358688, +226-70243569, Fax. +226-50358689

Cote d’Ivoire :

1. Les Moulins de Cote d’Ivoire 04 BP 1664 Abidjan 04 Cote d’Ivoire Tel. +225-07076613 +225-23530053 Fax. +225-23466387
2. Grand Moulins d’Abidjan 01 BP 1743 Abidjan 01 Cote d’Ivoire Tel. +225-21217400, Fax. +225-21240942

Guinea Bissau : No centralized flour milling industry – imported industrial processed cereal flours

Mali:

1. Grand Moulin du Mali Directeur Administratif Financier BP 324 Zone Industrielle Bamako Mali Tel. +223-2213664/2215768 +223-6402023 Fax. +223-2215874
2. Moulins Moderne du Mali Directeur General Tel +223-6508468, +223-6508440

Niger :

1. Les Moulins du Sahel, Niger Zone Industrielle BP 12170 Niamey Tel. +227-20742807 Cell. +227-96961176 Fax. +227-20742901

Senegal :

1. Les Grands Moulins de Dakar BP 2068 Dakar, Senegal Tel. +221-338399793 Fax. +221-338328947
2. Nouvelle Minoterie Africaine Km 11 Route de Rufisque – BP 5722 Dakar Fann Tel. +221-338790000 Cell. +221-776396844 Fax. +221-338542993

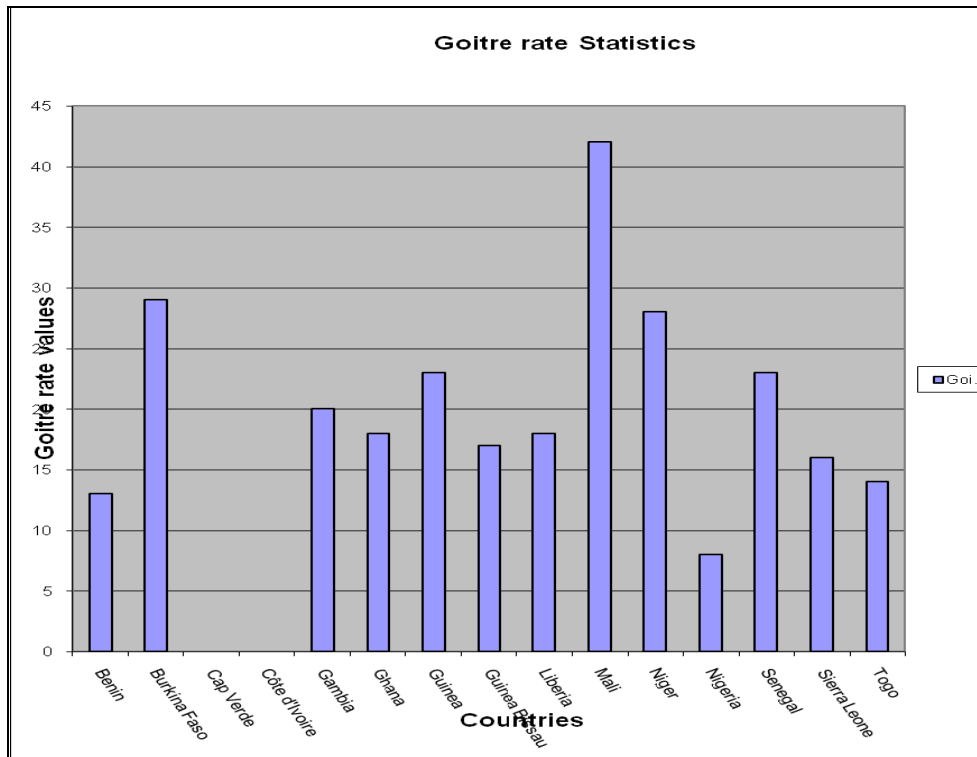
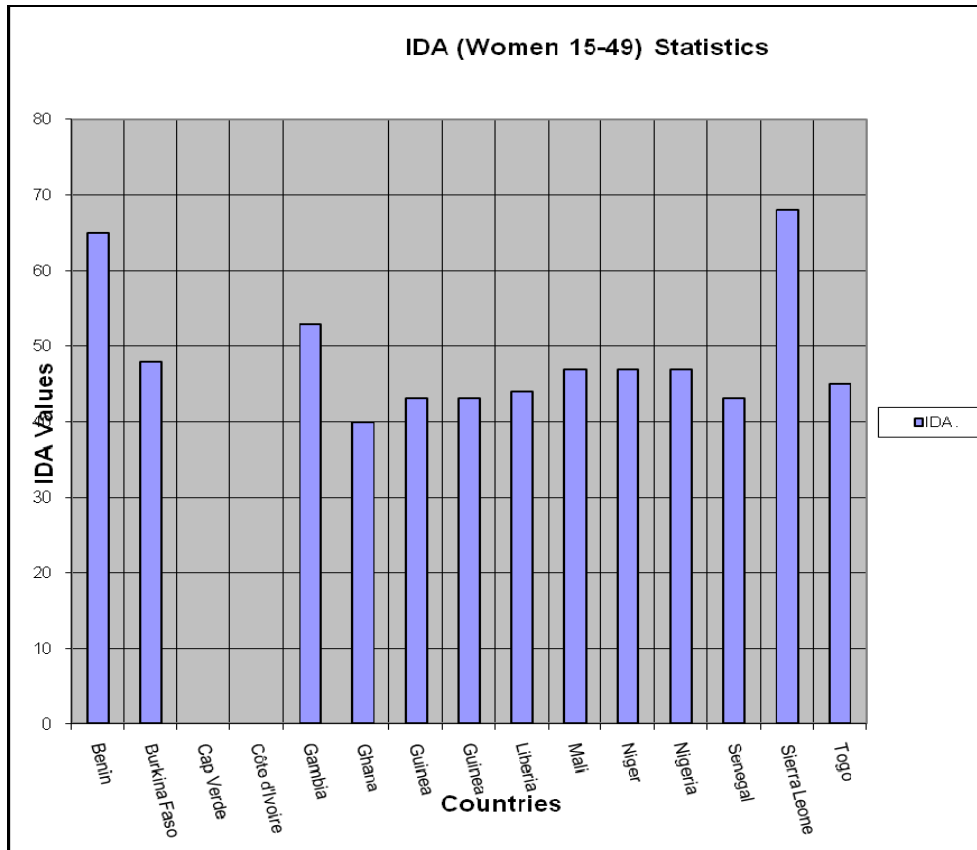
3. Les Moulins Sentenac Km. 3,5 Bd du Centenaire de la Commune Dakar BP 451 –
Dakar Tel. +221-8399000 Fax. +221-8323670

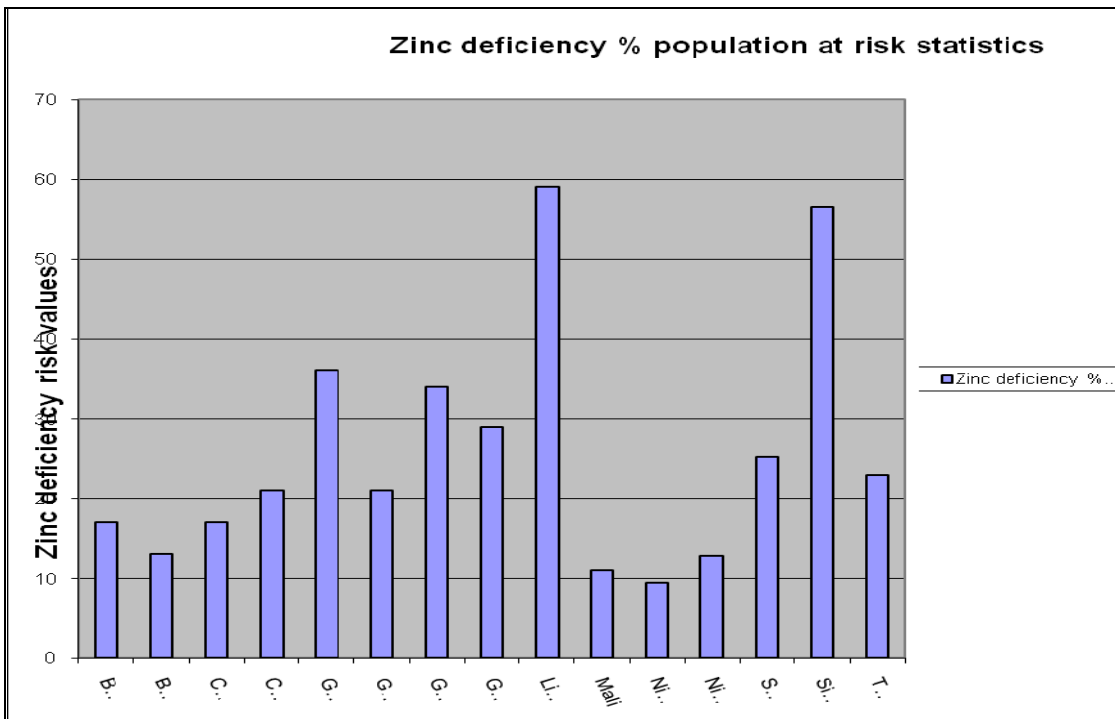
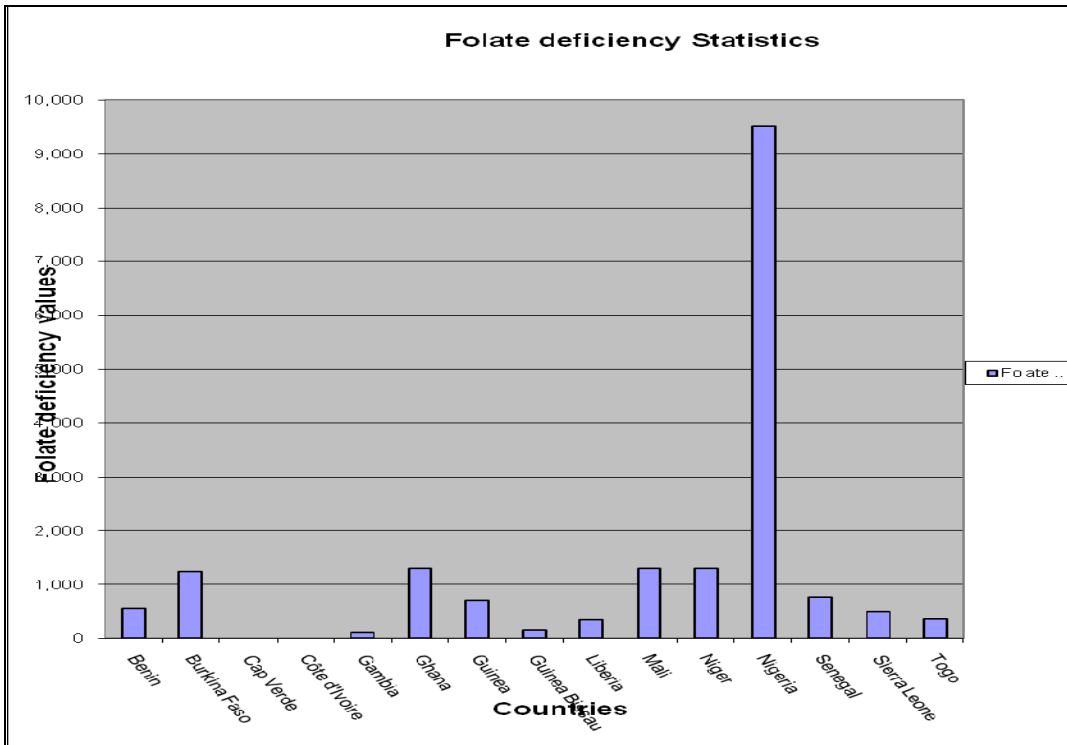
Togo :

1. Societe General des Moulins du Togo BP 9098 Lome Togo Tel. +228-
2277346/2274377 +228-9050736/9327705

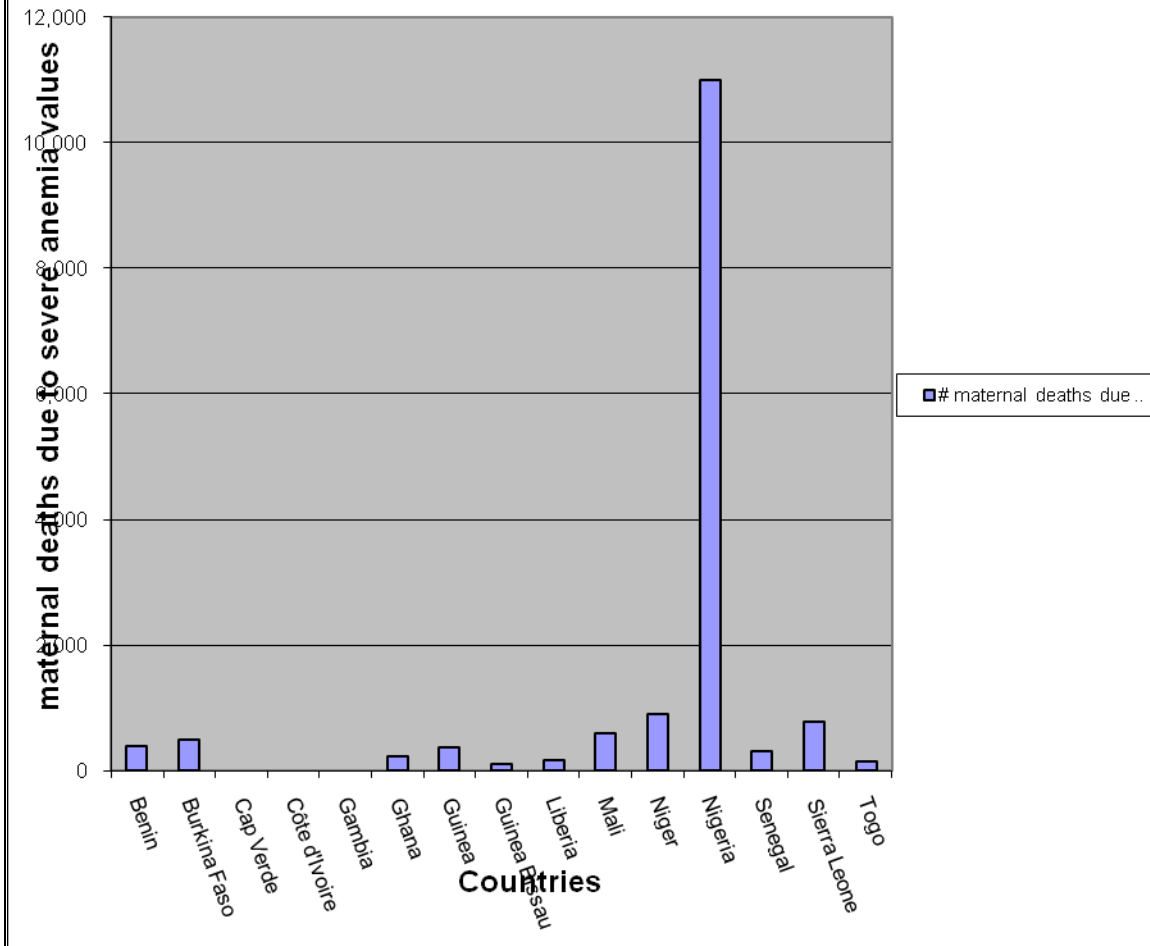
21.17 Appendix 17

Graphs on Nutritional Status in West Africa





maternal deaths due to severe anemia (4)



21.18 Appendix 18

LUTTE CONTRE LES CARENCES EN MICRONUTRIMENTS. ETUDE SUR LA FAISABILITE DE LA FORTIFICATION DES ALIMENTS DANS LA ZONE DE LA CEDEAO.

TERMES DE REFERENCE POUR UNE CONSULTANCE SOUS REGIONALE

1. CONTEXTE

La plupart des quinze pays de la Communauté Economique des Etats de l'Afrique de l'Ouest (CEDEAO) ont d'importants problèmes de malnutrition parmi lesquels, les carences en micronutriments, notamment les carences en iode, Fer et vitamine A qui sont les plus fréquentes. Ces carences entraînent des altérations de la santé particulièrement des groupes vulnérables et peuvent entraîner une augmentation des taux de morbidité et de mortalité surtout chez les enfants âgés de moins de cinq ans.

Les niveaux de carence en micronutriments dans les pays de la CEDEAO sont largement supérieurs aux seuils acceptables par l'OMS. Ainsi la prévalence de l'anémie chez les enfants varie de 82% à 65%, et de 68 à 43% chez les femmes en âge de procréer. En ce qui concerne la carence en iode, elle varie de 40% (Mali) à moins de 5% (Bénin). Pour la vitamine A, les taux (signes infra cliniques) varie de 70% à 31%.

L'une des stratégies de lutte contre les carences en micronutriments est la fortification des aliments qui présente un bon ratio coût efficacité. C'est une stratégie qui nécessite une approche multisectorielle impliquant les gouvernements, la société civile, les industries, les consommateurs, les ONGs, les chercheurs, etc. Par ailleurs, une planification et un suivi rigoureux sont nécessaires. Ceci nécessitant au préalable l'identification d'un bon aliment véhicule et un bon système d'assurance qualité. Dans le cadre de la fortification des aliments, des progrès sont notés au niveau de la région avec la mise en place d'alliances multisectorielles pour l'enrichissement des aliments et huit pays de la CEDEAO sont dans le processus de mise en œuvre d'intervention de fortification (Nigéria, Côte d'Ivoire, Mali, Burkina FASO, Ghana, Guinée, Sénégal). Certains de ces pays ont des programmes de fortifications obligatoires. En ce qui concernent la carence en iode, les progrès sont réels eu égard à la disponibilité de sel iodé au niveau des ménages qui est de 50% au moins dans cinq pays de la CEDEAO. L'iodation universelle malgré quelques contraintes est parfaitement possible compte tenu que deux pays (Ghana et Sénégal) sont les principaux producteurs de la région.

Cependant, le passage à l'échelle et la mise en place d'un projet régional à l'échelle de la CEDEAO va nécessiter de faire le point sur la mise en œuvre (régulations, règles, législation, identification des différents aliments véhicules, état d'avancement en fonction des pays, etc).

2. OBJECTIFS

Objectif général

Etudier la faisabilité de la mise en œuvre d'un programme régional de fortification dans la zone de la CEDEAO ;

Objectifs spécifiques

- Examiner la législation et les autres instruments légaux et réglementaires des pays de la zone CEDEAO pour étendre l'initiative de Fortification des pays UEMOA aux pays CEDEAO
- Identifier les mécanismes possibles d'harmonisation de cette stratégie sous régionale ;
- Faire Une cartographie des Industries des huiles et des Farines dans les pays non UEMOA de la CEDEAO (afin d'améliorer la cartographie existante)
- Identifier les stratégies de création d'une Association des huiliers et meuniers affilié à la CEDEAO (à l'image de l'Association des Industriels de la filière oléagineuse de l'UEMOA/AIFO-UEMOA)
- Identifier les mécanismes et procédures d'adaptation des normes, de control ;e de la qualité et du logo pour les aliments fortifiés des pays UEMOA aux pays CEDEAO
- Identifier les Institution financières qui pourraient appuyer les industries ainsi que les mécanismes de financement (lignes de crédit, franchises, etc); a travers un projet sous régional de fortification.
- Visiter la Commission de l'UEMOA et de la CEDEAO pour identifier les mécanismes en matière d'harmonisation, d'application du TEC et de la fiscalité pour les produits fortifiés

3. RESULTATS ATTENDUS

- Le point sur les instruments légaux et la législation pour la fortification des huiles et des farines est fait et les stratégies d'extension des pays UEMOA aux pays CEDEAO fait.
- Des propositions concrètes sont faites concernant les étapes progressives de la mise en œuvre du sous régional projet à court, moyen et long terme (pays concernés, les vecteurs a fortifier, etc) ;
- Le mécanisme d'appui à un soutien technique a l'Alliance Régionale pour la fortification en Afrique de l'Ouest (voir le rapport de Bamako) en collaboration avec OOAS et HKI au niveau de la Commission de la CEDEAO est défini en vue de :
 - Définir les procédures d'application de la Résolution sur la Fortification des huiles et farines adoptes par l'Assemblée des Ministres de la Santé de l'OOAS en 2006 a Abuja
 - Des stratégies pour harmoniser les normes, le contrôle de la qualité règlements et législation dans les pays CEDEAO identifiées
 - Les possibilités de déclasser les produits fortifiés (application du TEC, législation fiscale) identifiés

4. METHODOLOGIE ET MANDAT DU CONSULTANT

4.1a revue documentaire

La revue documentaire de toutes les expériences menées dans les différents pays de la CEFDEAO, de la législation et des lois relatives à la fortification sera faite. Cette revue documentaire sera faite avec l'appui de l'OOAS et des différents partenaires (UNICEF, OMS,

GAIN, IMI, HKI, BM). Le consultant se rendra au siège de l'OOAS, à la Commission de l'UEMOA et de la CEDEAO

4.2 Visites de terrain

Des visites de terrain seront faites au niveau de quelques pays de la CEDEAO sur la base de critères bien définis en fonction de leurs expériences dans la mise en place de programmes de fortification. Ces visites seront aussi l'occasion de rencontrer les différents partenaires impliqués. Les réseaux de nutrition et du partenariat secteur public-secteur privé seront utilisés pour avoir des informations pertinentes. Lors de ces visites des entretiens seront menés. Au niveau des pays certaines industries seront visitées ainsi que certaines banques d'investissement appuyant le secteur privé.

4.3 Collecte des données et analyse

Le consultant à l'issue de sa revue documentaire et de ses visites de terrain collectera et analysera les données disponibles.

L'analyse mettra en exergue :

Le cadre légal de mise en œuvre de la fortification dans la région ;

Les mécanismes d'harmonisation possibles ;

L'identification des contraintes et les solutions préconisées (actes légaux, conventions commerciales, etc);

La cartographie des interventions et des propositions concernant les pays qui devront faire l'objet du programme régional à court terme ;

Les mécanismes de financement notamment du secteur privé.

Elaboration du rapport

Le rapport va résumer les principaux résultats issues de l'analyse faite au point 4.3. Des recommandations seront faites concernant la faisabilité de l'étude.

Le rapport sera présenté par le consultant à la rencontre.

5. ZONES D'ETUDES

Burkina Faso, Cote d'Ivoire, , Ghana Guinea Conakry, Mali, Nigeria et Senegal Commission CEDEAO et de l'UEMOA

Personnes ressources: - Aifo UEMOA

-

6. PROFIL DU CONSULTANT

Etre titulaire d'un diplôme universitaire supérieur en droit, économie, sciences sociales ou équivalent

- Avoir une expérience d'au moins 10 ans dans les politiques et la réglementation dans le cadre de la fortification des aliments ; dans la réglementation des aliments, l'analyse des législations,.
- Avoir une bonne connaissance du partenariat secteur privé-secteur public et des mécanismes de financement du secteur privé

7. DUREE ET PERIODE

PLAN D'EXECUTION

Activités	Lieu	Période					
		Jun sem 1	2008 Sem 2	sem 3	sem 4	Juillet sem 5	2008 sem 6
Revue documentaire							
Discussion avec quelques responsables de la CEDEAO et de l'OOAS	Burkina Faso/Nigéria						
Visite de quelques pays/partenaires							
Rédaction du rapport	Tunis						
rapport final	Tunis						

22.0 References

Asian Development Bank “ Sustainable Food Fortification” Between ADB and Kazakh Academy of Nutrition

Asian Development Bank: “Workshop on Quality Assurance, Surveillance, and Trade for Food Fortification” 22-25 April 2002 Bangkok

Codex Alimentarius, “ General Principles for Addition of Essential Nutrients to Foods” CAC/GL 09- 1991

[Http://www.codexalimentarius.net/download/standards/299/CXG_009e.pdf](http://www.codexalimentarius.net/download/standards/299/CXG_009e.pdf)

David Clarke, Amelia Carter and Brigid Borlase- Policy and Regulatory Specialists Limited “ A Study on Regulatory Requirements For Food Fortification in the Pacifics

First Annual Forum of the Business Alliance for Food Fortification “ the devastating effects of vitamin and ineral deficiencies and improve the the health of the world’s poorest peoples, China 22-23 October 2005

Flour Fortification Initiatives Leadership Forum Westminster London June 17, 2004- A PublicPrivate- Civi Investment in Each Nation

Emory University “Forging Effective Strategy to Combat iron deficiency” School of Public Heath –May 7-9, 2001- J. Nutr 132- n871S-874S -2002

Gegory D. Orris “ Food Fortification: Safety and Legislation – FAO

Dietary Reference intake: “Guiding Principle for Nutrition labeling and fortification” – 2003 www.nap.edu/catalog/10872.html

Flour Fortification with iron, folic acid and vitamin B12= Otober 9-10, 2003 Chile-Pan American Health Organization, Regional Meeting

Malnutrition and Hunger – Copenhagen Consensus 2008- Perspective Paper Results = Coprenhagen Consensus- 2008

Weinstein Herbert “ Learning From Regional Approach- Regional Quality Assurance” April 2002- Asian Development Bank

WHO “Global Database on Vitamin and mineral Deficiency, 2006

West Africa initiates Regional Food Fortification program- NutriView 2003/1

World Bank: Health Enhancing Foods “ Opportunity for Strenthening the Sector in Developing Countries – Discussion paper