



# Building alliances for better nutrition

The SAFO approach to fortifying edible oils  
with vitamin A in Bolivia, Indonesia and Tanzania

A publication in the German Health Practice Collection

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## Acronyms and abbreviations

ANF4W	Affordable Nutritious Foods 4 Women	HKI	Helen Keller International
BMZ	Federal Ministry for Economic Cooperation and Development, Germany	HPLC	High- Performance Liquid Chromatography
BPOM	Indonesian Food and Drug Board	IBNORCA	Bolivian Institute of Standardization and Quality Control
CSR	Corporate Social Responsibility	INLASA	National Institute of Health Laboratories, Bolivia
CT-CONAN	Technical Committee National Council of Food and Nutrition, Bolivia	KFI	Indonesian Nutrition Foundation for Food Fortification
DEG	Deutsche Investitions- und Entwicklungsgesellschaft	MI	Micronutrient Initiative
DFID	Department for International Development, UK	NFFA	National Food Fortification Alliance
ECSA	East, Central and Southern Africa Health Community	PMD-C	Multisectoral Zero Malnutrition Programme, Bolivia
FAO	Food and Agriculture Organisation of the United Nations	SAFO	Strategic Alliance for the Fortification of Oil and other Staple Foods
GAIN	Global Alliance for Improved Nutrition	SICAFF	Quality Control System, Bolivia
GDC	German Development Cooperation	SNI	Indonesian National Standard for fortification
GHPC	German Health Practice Collection	SUN	Scaling Up Nutrition movement
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH	TFDA	Tanzania Food and Drug Authority
		WHO	World Health Organization

# Building alliances for better nutrition

## The SAFO approach to fortifying edible oils with vitamin A in Bolivia, Indonesia and Tanzania

### Executive Summary

Roughly 2 billion people suffer from micronutrient deficiencies. Germany has played a significant role in the international response to malnutrition, including working through multi-stakeholder partnerships for supplementation, food fortification, or dietary diversification (the three basic strategies in the response). An example is the Strategic Alliance for the Fortification of Oil and Other Staple Foods (SAFO).

#### The SAFO approach

Initiated in 2008 under Germany's develoPPP.de programme, SAFO is an alliance between GIZ and the chemical company BASF which focuses on reducing vitamin A deficiency by adding vitamin A to staple foods, mainly edible oils. Scheduled for an initial three years, SAFO was extended until 2012, and worked concentrated on three countries: Bolivia, Indonesia and Tanzania.

Rather than finance or operate food fortification activities, SAFO works as a catalyst, providing targeted assistance to kick-start or reinforce existing programmes and to strengthen the 'business ecosystems' that produce and deliver food. The SAFO approach emphasises four components in national food fortification efforts:

- policy advice and advocacy
- economic and technical implementation
- testing arrangements, particularly for monitoring systems, and
- legally mandatory fortification.

#### SAFO in Bolivia

Much of SAFO's work in Bolivia has focused on building up monitoring systems for industry itself and public food inspectors. Key partners include National Council of Food and Nutrition, the Ministry of Health and Sports, and the edible oil industry. An agreement was reached with the Ministry's Nutrition Unit to bolster monitoring activities and reinforce the country's network of food testing laboratories. Inter-institutional cooperation agreements were signed with leading manufacturers of cooking oil, major municipal laboratories, universities, and the Bolivian Institute of Standardization and Quality.

Training workshops were held both 2009 and 2010, at which representatives of stakeholders outlined areas of cooperation and joint action, and received training in the use of the test kits supplied by BASF. In 2010, additional financial support became available from major donors to help the country's Zero Malnutrition Programme, which included food fortification. To support this, SAFO provided:

- additional training in the use of test kits for public entities, especially food inspectors, and local oil mills
  - test kits and instruction manuals
  - chemical reagents required by the qualitative test kits.
- A SAFO-consultant coordinated food fortification activities in the country and helped to improve working relationships between different levels of government.

At time of writing, there has been progress towards consistent monitoring and enforcement of standards across the country, including a common testing methodology and reporting procedure implemented in all nine Departments (provinces). There is now good cooperation among the various micronutrient laboratories across Bolivia.

## SAFO in Indonesia

While Indonesia has been successful in reducing rates of malnutrition among children under the age of five, vitamin A deficiency is estimated to affect approximately one in five Indonesian children of pre-school age. The country is one of the world's largest producers of edible oils, and unbranded palm oil is widely consumed in much of the country. In 2009, the Indonesian government announced a five-year strategy with the goal of reaching more than 200 million Indonesians with fortified cooking oil.

SAFO's main partner in Indonesia is the Indonesian Nutrition Foundation for Food Fortification (KFI), a non-profit foundation established in 2002. After SAFO activities began in the country in 2009, BASF concentrated on providing oil producers with technical knowledge, supporting business plan development, and helping to set up quality assurance regimes. Meanwhile GIZ proceeded along several paths, notably in boosting the technical capacity of KFI and supporting its work on an ambitious proposal to Global Alliance for Improved Nutrition for the funding of a country-wide edible oil fortification programme. This led to the Ministry of Health and GAIN's joint announcement in January 2011 of a \$US 6 million multi-sector partnership aiming to reach over 80 percent of Indonesians with vitamin A-fortified vegetable oil. GIZ also provided assistance to the Indonesian government in preparing a mandatory fortification standard and, working with the German firm BioAnalyt, entered into a formal partnership with the Indonesian authorities to help establish a functioning monitoring and evaluation system. By the end of the SAFO initiative, four major edible oil companies had begun to fortify their oil with vitamin A, and local government monitoring capacity has been reinforced through workshops in several provinces.

## SAFO in Tanzania

Although Tanzania has made progress in many health indicators over recent decades, malnutrition remains a serious problem. One third of women and under-five children are estimated to be deficient in vitamin A. The national government has developed a National Nutrition Strategy for 2009–2015 and a variety of international development partners have supported Tanzania's efforts. A National Food Fortification Alliance (NFFA) was established in 2003.

In 2008, SAFO conducted a fact-finding mission, identified potential stakeholders and highlighted a number of barriers to progress including: lack of a label to 'brand' eligible fortified products, insufficient political commitment, and stalled efforts to create monitoring system. In 2009, a series of workshops, meetings and forums began. While other stakeholders focused on building technical capacity within government units and helping to draft standards and monitoring regulations. SAFO concentrated on

- facilitating and financing the creation of a label;
- supporting the creation of a monitoring and evaluation system;
- providing technical assistance to the producers of edible oils.

In August 2011, the government issued regulations for mandatory fortification of edible oil. SAFO partners further completed guidelines and manuals for food producers and for the regulatory body, the Tanzania Food and Drug Authority (TFDA). SAFO partners also helped draft a National Action Plan for the Enrichment of Staple Food, making it possible for the country to utilise new donor funding, and ensure that progress continues to be made.

## Results

The evidence strongly suggests that in the absence of SAFO, national food fortification efforts would have had significantly less impact, would have been delayed, or implementation might not have been achieved at all. Achievements include:

**Increased availability of vitamin A-fortified foods to low-income populations.** An estimated 145 million-plus people have been reached by SAFO-related activities since 2008.

**Delivering affordable vitamin A-fortified foods to low-income populations.** The additional cost of producing fortified oil did not result in a significant price rise to consumers.

**Regulatory framework.** In both Indonesia and Tanzania, SAFO contributed to the creation or adoption of the standards and regulations.

**Production systems.** In all three countries, the producers accounting for the majority of edible oil are now fortifying some or all of their products with vitamin A.

**Enabling policy environment.** SAFO assisted in the creation of a nationwide logo (Tanzania) and social marketing tools (Indonesia), and reinforced the local alliance (Indonesia and Tanzania) or government unit (Bolivia) that has been vitamin A fortification in edible oil.

## Looking ahead

Partly based on the SAFO experience, the recently announced German Food Partnership (an international public-private initiative) has committed to nutrition-related activities in Indonesia and the Philippines, in coordination with GAIN. As well, GIZ has begun a new project called Affordable Nutritious Foods for Women (ANF4W) which is co-funded by the BMZ and the Bill & Melinda Gates Foundation, and includes BASF as one implementation partner.

### Box 1. Key Messages

**Situation.** Vitamin A deficiency is a common form of malnutrition in the global South. While fortification of foodstuffs with vitamin A is acknowledged as an effective strategy, progress in extending coverage has stalled in many countries.

**Approach.** Initiated in 2008 under the Germany's develoPPP.de programme, SAFO is an alliance between GIZ and chemical company BASF which focuses on adding vitamin A to edible oils. Rather than finance or operate food fortification, it works as a catalyst to reinforce government regulation and strengthen the business environment in which food is produced. This involves:

- policy advice and advocacy
- economic and technical implementation
- testing arrangements, particularly for monitoring systems
- legally mandatory fortification.

**Results.** SAFO has contributed to increasing the availability of vitamin A-fortified foods to an estimated 145 million-plus people. The additional cost of producing fortified oil has not resulted in a significant price rise to consumers. In the three focus countries, Bolivia, Indonesia and Tanzania, companies producing the majority of edible oil are now fortifying some or all of their products with vitamin A.

**Lessons learned.** SAFO's experience confirms that the business and regulatory environment for food fortification is an 'ecosystem'. Attention to all parts of the ecosystem, and timely intervention when one or another part of the system is blocked, is at the heart of SAFO's success.



# The drive to reduce micronutrient deficiency

‘The dual scourge of hunger and malnutrition will be truly vanquished not only when granaries are full, but also when people’s basic health needs are met.’

Gro Harlem Brundtland, 2002

Roughly 2 billion people suffer from micronutrient deficiencies, the most serious impacts of which largely affect populations in low and middle-income countries (FAO 2012). Micronutrient malnutrition is often called ‘hidden hunger’, since a person can have a full belly and not feel hungry but still lack one or more of the vitamins and minerals essential for growth, reproduction and good health. Traditionally, the causes are lack of access to vitamin- and mineral-rich foods such as vegetables, fruit, and animal products (as well as to fortified foods) whether due to local unavailability, cost, or even to cultural aversions. Specific deficiencies vary from place to place, and malnourished people are often deficient in more than one micronutrient, but the most common elements missing from diets include iodine, iron, zinc and vitamin A.

Since good health, cognitive development and economic productivity require good nutrition, the consequences of poor nutrition (or of malnutrition) can negatively affect the full range of human activities. In particular, expectant mothers with micronutrient deficiencies face greater risk of dying during childbirth, and of giving birth to a baby who is stunted, underweight or suffers from a variety of potential impairments. Later on, the micronutrient status of mothers may have an impact on breast-fed infants. As they grow up, malnourished children are at greater risk of reduced physical growth and impaired cognitive development, and higher vulnerability to infectious diseases due to weakened immune systems.

Micronutrient deficiencies can also trigger or increase the impact of non-communicable diseases such as diabetes. The incidence of these diseases is rising rapidly in developing countries, and they are now among the major causes of death. Developing countries also increasingly face high prevalence of simultaneous under- and over-nutrition even among poor population groups – the so-called ‘double burden of malnutrition’. For example, within a single household, a child may be stunted and her mother may be obese, with both also suffering from vitamin A or iron deficiency.

## Box 2. The importance of vitamin A

‘Vitamin A’ comprises a number of chemical compounds (retinol and its esters) with similar functions. It is present in certain pigmented fats and oils (e.g. red palm oil, animal fat, egg yolk, liver) as well as in a plant form (e.g. beta carotene) in pigmented plants, especially red, orange, and yellow fruits and vegetables.

Vitamin A deficiency is one of the most common forms of malnutrition in developing countries, affecting 250 million pre-school children. Vitamin A is crucial for the growth, function and structure of the skin, mucous membranes and blood cells, as well as for metabolism and eyesight. Vitamin A deficiency is a leading cause of child blindness globally (WHO 2009). Several international studies have shown vitamin A supplementation or fortification having a direct impact on child mortality and morbidity in children under five years of age (Hunt 2005).

The human body needs only very small quantities of vitamin A, but it cannot produce it, so it must be obtained from one’s diet. This is rarely problematic in the industrialised world; however, the situation in developing countries is very different. A balanced and more varied diet is the best way of preventing vitamin A deficiency among children, yet in many parts of the world, there is little prospect of this in the foreseeable future. In the medium term, therefore, food fortification is a viable approach.

## International initiatives

The right to adequate food, which includes the right to be free from hunger, was established in the Universal Declaration of Human Rights (1948), the International Covenant on Economic, Social and Cultural Rights (1966), and the Convention on the Rights of the Child (1989). States have an obligation to ensure, to the maximum of their available resources, that all right-holders have physical and economic access to sufficient, safe and nutritionally adequate food to meet their dietary needs, and to provide good nutrition for all. Adopted by the FAO Council in November 2004, the FAO Voluntary Guidelines to the Right to Food interpret this right and translate it into recommendations for States. Fortification to increase the nutritious value of food, if regulated by the State, is a measure suggested in the Guidelines.

States that adhere to the Guidelines can better achieve the Millennium Development Goals (MDGs). As well as contributing to MDG 1 (combating extreme poverty and hunger), better nutrition directly supports the health and survival of children and mothers, covered under MDGs 4 and 5, respectively.

Since the establishment of the MDGs, a number of international initiatives have emphasised the objective of reducing and eventually eliminating malnutrition, including through the provision of micronutrients. In recent years, two G8 initiatives – the 2009 L'Aquila Food Security Initiative and the 2012 New Alliance for Food Security and Nutrition – have expressed strong commitments to address food insecurity and malnutrition. In 2010, the Scaling Up Nutrition (SUN) movement was created to bring together over 100 international organisations, UN agencies, and governments of developing and industrialised countries in multi-sectoral partnerships (SUN Movement Secretariat 2012).

An initiative of particular relevance to this publication is the Geneva-based Global Alliance for Improved Nutrition (GAIN), which was launched at the 2002 Special Session of the UN General Assembly on Children. GAIN has an important focus on public-private partnerships, and has supported projects involving more than 600 companies and civil society organisations in more than 30 countries. In 2012, the Alliance estimated that it had provided nutritionally enhanced food products to 667 million people, about half of whom are women and children (GAIN 2012).

## Germany's contribution

As a major bilateral donor and prominent member of the UN General Assembly, European Union, G8 and the governing bodies of key multilateral organisations, Germany has played a significant role in the evolution of the international response to malnutrition. For example, in 2009, Germany committed US\$3 billion to L'Aquila Food Security Initiative over its first three years. Germany also was part of the informal exercise that led to official launch of SUN in September 2010, and has continued to be an active member of SUN.

Between 2013 and 2020, Germany will commit a total of € 200 million (\$260 million) additional funding for nutrition specific and nutrition-sensitive interventions. This financial commitment will be implemented in the context of

- a strong focus on women's empowerment,
- building new partnerships with business, science and foundations and
- a strong strategic framework for food and nutrition security that will be monitored transparently.



>> Food supplementation is a widely used strategy to combat micronutrient deficiency (photo courtesy of UNICEF)



One of Germany's main strategies is to engage with business in efforts to build multi-stakeholder partnerships at international, national and local levels for supplementation, fortification and dietary diversification. An example of that strategy in action, and the focus of this publication, is the Strategic Alliance for the Fortification of Oil and Other Staple Foods (SAFO), which concentrates on the reduction of vitamin A deficiency.

## Strategies for reducing micronutrient deficiency

Tackling vitamin and mineral deficiencies is one of the central means of reducing malnutrition around the globe, and is accepted as a key intervention in improving the health and well-being of populations in developing countries. The Copenhagen Consensus Centre periodically challenges leading economists to investigate cost-effective solutions to the world's most serious development challenges. Since 2008, the Copenhagen Consensus studies have consistently listed micronutrient-related interventions as being among the most cost-effective investments in poor populations (Copenhagen Consensus Centre 2012).

It is particularly important in the case of children. The first thousand days of life – from conception to a child's second birthday – is seen as the 'critical window of opportunity' for nutrition, as it is a unique time of rapid physical and cognitive development; after it is over, deficits are difficult to overcome. As the World Health Organization's Director General stated, 'Investing in good nutrition in the first thousand days of life pays handsome dividends that last a lifetime' (Chan 2011).

'Investing in good nutrition in the first thousand days of life pays handsome dividends that last a lifetime'

Margaret Chan, Director General, WHO

WHO advises countries to adopt comprehensive approaches to nutrition, to increase 'the supply, access, consumption and utilisation of an adequate quantity, quality and variety of foods' for all population groups. The ultimate aim is for individuals to obtain all the elements they need to enjoy a healthy and productive life from their normal diet (WHO/FAO 2006). To this end, a number of food-based strategies can be utilised. These include food supplementation, food fortification, nutrition education, public health and food safety measures, and dietary diversification. WHO notes that these various approaches 'should be regarded as complementary, with their relative importance depending on local conditions and the specific mix of local needs.'

Three of these approaches aim to increase the intake of micronutrients:

- **Provision of micronutrient supplements** is the fastest way to improve the micronutrient status of individuals or targeted groups. These can be distributed in a variety of forms, including tablets and capsules, and preparations for mixing with other foods.
- **Food fortification** involves adding selected micronutrients to a staple food that is consumed regularly by the target population. Fortification is an accepted intervention strategy to increase nutrient availability where deficiencies are endemic. A medium-term approach, it can potentially reach a significant percentage of poor and malnourished populations with small amounts of critical nutrients through commonly consumed foods. It is also a market-based approach that can be self-sustaining.
- **Increasing dietary diversity** to obtain a balanced diet of energy (carbohydrates, fats and oils), protein, vitamins and minerals from food sources is generally accepted to be the most desirable and sustainable option, but takes the longest to implement.

This publication focuses on the second of these approaches, food fortification.

### ■ Food fortification: a market-based strategy

The strengths of food fortification are well documented (Hunt 2005). First, food fortification strategies have the potential to reach large numbers of poor and malnourished people under the right set of circumstances, and can do so cost-effectively. The World Bank (2006) has estimated that the per capita cost of vitamin A fortification can be about half the cost of supplementation. Unlike other nutrition interventions, food fortification does not require major behavioural changes. Food fortification also has the potential to be sustained by the private sector without ongoing public funding.

Food fortification's 'all-society' approach means that it can reach nutritionally vulnerable groups of children and women. For example, in societies where men or boys tend to receive a greater share of food, particularly meat and nutritious animal products, fortification of staple foods consumed by all household members can be a way of bolstering the nutrition of women and girls without being perceived as attacking traditional cultural values or 'invading' the private life of families.

### ■ Building National Food Fortification Alliances (NFFAs)

In many countries aiming to reduce micronutrient deficiency through food fortification, National Food Fortification Alliances (NFFAs) have been established. While their particular set-up and their respective names differs from country to country, they usually encompass representatives from

- government, e.g. Ministry of Health, Ministry of Agriculture or Industry, Food Safety Agency, etc.
- the private sector, e.g. food/condiment companies, miller's associations, millers, baker's associations, bakeries, etc.
- civil society, e.g. consumer groups, women's unions, NGOs
- international agencies, e.g. WHO, WFP, and development agencies, incl. bilateral donors
- academia

NFFAs serve as a forum for open discussion of strategies related to alleviating vitamin and mineral deficiencies in the country. Jointly, they work on developing regulation and standards, improving quality control of fortified foods, creating an enabling environment for industry, and ensuring sustainability. For international projects aiming to help partner countries overcome malnutrition, such as SAFO or GAIN (see below), working with NFFAs has proven to be an effective way to find sustainable market-based solutions to malnutrition that continue after project close out.

## The SAFO approach

Initiated in 2008 under the auspices of Germany's developPPP.de programme (see below), SAFO is an alliance between Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and chemical company BASF. At the beginning of the project, GIZ and BASF agreed on the overall goal to increase the availability of affordable, vitamin-A-fortified foods to low-income populations in selected developing and transitional countries. To achieve this SAFO would assist in establishing well-functioning, properly regulated markets for fortified food. This would include developing or strengthening regulatory frameworks, market incentives, and production systems.

As a major indicator of success, the alliance aimed to help provide at least 100 million people from low-income populations with access to commonly consumed staple foods fortified with vitamin A. In order not to overburden consumers with significant rises in the price of staple foods, it was agreed that vitamin A fortification equipment and supplies were to add no more than 0.2 percent to the costs of production, or that such increases be absorbed by subsidies or reduced tax rates.

SAFO has focused on reducing vitamin A deficiency by adding vitamin A to staple foods, mainly edible oils. Activities were scheduled for an initial three years, and received a two-year extension until 2012. The overall five-year budget of €2.8 million includes a contribution by BASF of €1.51 million (54 % of the total) for its own work, and 1.29 million (46 %) from Germany's Federal Ministry for Economic Cooperation and Development (BMZ) to be administered by GIZ.

In the initial phase from 2008 to 2010, SAFO carried out activities in a total of eight countries: Bangladesh, Bolivia, Brazil, Cambodia, Indonesia, Madagascar, Tanzania, and Uzbekistan. In the extension phase, work was concentrated on three countries – Bolivia, Indonesia and Tanzania – which are the focus of this publication, as well as a limited level of involvement in Bangladesh and Brazil. Although it officially ended in 2012, SAFO continues to carry out a limited number of follow-up activities in several countries. In addition, BASF has continued to work in most of the beneficiary countries in its capacity as a major supplier of vitamin A and as a source of technical advice to producers.

### A time-limited and catalytic development partnership

SAFO is limited in funding, scope and time. It is not intended to finance or operate food fortification activities for indefinite periods of time, but to help ensure that the necessary frameworks, networks and systems are in place by the time the SAFO involvement is over. The systems established by the end of SAFO involvement are then available to serve as platforms for further collaborations.

To achieve this SAFO works as a catalyst: it does not aim to carry out or finance food fortification itself but rather stimulate fortification efforts and leverage other contributions. SAFO works as a catalyst, providing specific and well-targeted assistance to reinforce existing national food fortification programs and to strengthen the 'business ecosystems' (Gradl 2012) that produce and deliver food as well as advising public sector partners. Based on a thorough assessment of needs and existing capacities, assistance may include technical support and training, providing testing kits, supporting organisational structures such as coordinating bodies, and hiring skilled personnel to facilitate or provide technical support for the preceding activities.

Most importantly, SAFO is built on development partnerships with the private sector, following an established methodology set up by BMZ's developPPP.de programme (see below). As food fortification is a market-driven approach using foods produced and distributed by private businesses, SAFO uses the respective advantages of public sector partners (GIZ, other international development institutions, national governments) and private sector partners (BASF, food producing companies in individual countries, technological entrepreneurs) in order to achieve agreed aims.

**Box 3. developPPP.de: A public-private ‘matchmaker’**

Launched in 1999, the developPPP.de programme is financed by BMZ and implemented by GIZ, the German development finance institution DEG (a subsidiary of KfW Development Bank), and the non-profit development organisation sequa GmbH. The programme promotes and supports public-private partnerships, so called PPPs, that are jointly planned, financed, and realised by companies and development aid organisations.

As a programme, developPPP.de recognises that the goals of private sector companies and public-sector development organisations frequently overlap, and that this common ground provides many opportunities to cooperate in joint projects in developing countries. The partners each contribute their own particular expertise, while sharing responsibilities and costs. The partnerships may take the form of projects with individual partner companies or more extensive strategic alliances. Supported activities range from energy projects, wastewater management, and vocational training through to product certification and supply chain management.

Strategic alliances such as SAFO involve a number of partners and countries and must meet a number of criteria. For example, they have to:

- have potential to make significant contributions to implementation of BMZ’ priority development policies;
- are transnational in scope, covering at least two countries and more than two regions within each country;
- involve important institutions and many stakeholders in each country;
- have potential to leave a sustainable legacy in each country (e.g., enabling legislation and administrative structures with capacity to carry on with the work);
- have potential to serve as ‘beacons’ – examples of good practice that can be replicated in other countries.

Strategic alliances are limited to a maximum of five years. A basic requirement is that the companies involved in such alliances be sufficiently committed to make significant contributions of their own resources. In no case is BMZ’s contribution counted as Official Development Aid since it is clear that the programme helps business enterprises make good use of opportunities to sell their products and services on the global market.

(For information see: [www.developppp.de/en](http://www.developppp.de/en))

## The four components of the SAFO approach

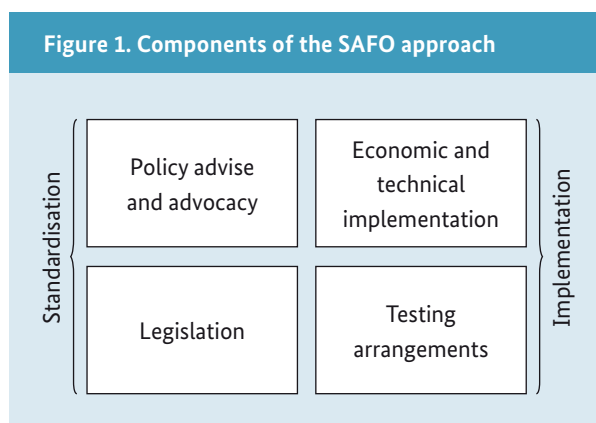


Figure 1. shows the four components of the SAFO approach in its support to partner countries:

The first comprises policy advice and advocacy. In this component, SAFO activities included hosting workshops and other information and training events, developing information, education and communications materials, and supporting studies to provide strategic information to decision makers. Financial and technical support would be provided to key stakeholders; in particular, it was intended that national food fortification alliances could either be supported or set up where they did not yet exist.

The second component is dedicated to economic and technical implementation, particularly to building the technical capacity of the private sector food companies to fortify their products. Activities included supporting business plan development, and advising on hardware equipment and analytics as well as sometimes assisting with campaigns to market

fortified foods. Considerable emphasis was placed on quality assurance and quality control.

The third component concentrates on testing arrangements: GIZ assisted national food and drug authorities and BASF assisted oil producers to build food fortification monitoring systems, by providing targeted advice to create effective monitoring systems, promoting portable testing devices and by offering training on meeting national fortification standards. In support of this activity, BASF not only participated in the trainings but also developed and supplied inexpensive, portable test kits that provide qualitative (yes/no) readings on vitamin A content in cooking oil. In 2011, the German firm BioAnalyt began to offer more sophisticated but fully portable quantitative test kits (see Box 4. and Table 1.).

As a fourth component, SAFO supports partner countries to introduce legally mandatory fortification as the basis for nationwide compliance. As the context at large for food fortification is different in each country, so is the legal setting. No country can simply copy other countries' legal framework for fortification, yet countries can learn about different options by looking at how others have introduced food fortification. To support this mutual learning, SAFO produced a detailed account of legislation relating to micronutrient food fortification in 64 countries and international organisations. This documentation has been very popular with SAFO partner countries, as well as with a number of other countries. Decision makers have used it to analyse their own legal and regulatory framework. GIZ provided targeted expert inputs and consultancies in broader partner networks for advice on questions of mandatory fortification in Bolivia, Indonesia, and Tanzania. There is no set schedule or ranking of the four components of the SAFO approach: when and how they are carried out depends on the unique conditions in any given country.



>> SAFO has supplied its implementing partners with an inexpensive mobile kit for testing the presence of vitamin A in edible oils.

#### Box 4. Monitoring food fortification

One of SAFO's most important contributions to food fortification efforts is to strengthen countries' ability to monitor the presence or absence of vitamin A in fortified foods. SAFO follows relevant international guidelines, including those issued by the WHO-FAO Codex Alimentarius Commission, regional and national legal frameworks, and the WHO-FAO Guidelines on Food Fortification with Micronutrients. Collecting data for industry standardisation is especially important in order to set appropriate minimum and maximum levels for a given micronutrient in the staple food selected. Only this ensures that food fortification is clearly focused on delivering a public health impact.

Food fortification monitoring depends on knowing a staple food's initial nutrient content, and comparing it with the fortified product to confirm that the set levels of micronutrient content are met. Currently, there are three tools available to determine vitamin A content in fortified staple foods:

- Qualitative mobile test kits for screening purposes: These test kits are based on photometric (i.e. light-based) analysis, and allow a first screening of micronutrient contents resulting in a 'yes/no' answer.
- Quantitative mobile test kits: these too are based on photometric analysis, and determine micronutrient contents within numeric ranges.
- High Performance Liquid Chromatography (HPLC): this laboratory-based technology allows for precise determinations of micronutrient contents.

The different tools for testing micronutrient levels are compared in Table 1. Rather than being seen as 'stand-alone' instruments, they are ideally combined in three steps as follows. The first step is **screening**: for a large number of samples, the qualitative test allows for an initial, inexpensive screening of micronutrient contents in staple foods sold in places where target populations do their normal purchases (markets, local shops, etc.). The second step, **micronutrient content measurement** uses the quantitative mobile kit to test a representative number of samples, measuring actual levels of micronutrient content in a given food product. It also allows for double-checking samples identified in the screening as not containing micronutrients. Finally, **high-precision content measurement** is carried out on a smaller number of samples using HPLC in laboratories.

Table 1. Measurement tools for food fortification monitoring

	High Performance Liquid Chromatography	Quantitative mobile test kits	Qualitative mobile test kits
Results	Precise measurement	Precise measurement (if validated)/ Approximate measurement	'Yes/no' answer
Complexity	Laboratory test for specially trained staff	Mobile test kit explicable to laypersons	Mobile test kit explicable to laypersons
Equipment costs	Around 90,000 US\$	Around 7,000 US\$	None to project participants
Costs per test	US\$ 50–100	US\$ 8–10	US\$ 0.02–0.05
Time	24 hours minimum	15 minutes	15 minutes
Available for ...	Vitamin A determination in foods	Vitamin A determination in foods and blood	Vitamin A determination in edible oils

Source: BASF



## Getting the best from partners' comparative advantages

The SAFO approach relies on the comparative advantages that its various partners bring to the alliance. On the public sector side, GIZ offers credibility as a trusted development partner, broad technical expertise, and a highly useful network of contacts in government and non-governmental circles, including international organisations. For example, in the early stages of the work within countries, GIZ drew on its research and policy-related strengths to support research studies aimed at gathering malnutrition data; these enabled governments to translate these data into policies and regulations in accordance with international standards, and thus to 'mainstream' food fortification as a development activity. Another of GIZ's advantages is the presence of development experts and offices in many parts of the world, permitting it to provide the close supervision and support required to see development projects through to their successful conclusion. Finally, GIZ has long understood the importance of catalytic interventions, identifying and then providing the 'missing ingredients' (often relatively small ones) that are necessary for otherwise well-conceived projects to succeed.

BASF, the major private sector partner, is a leading international chemical company and a major manufacturer of vitamin A. BASF not only sells vitamins and other micronutrients to food producers in many countries but also advises them on the production processes that use its ingredients. As part of its corporate social responsibility (CSR) efforts, BASF has been involved in vitamin A fortification projects globally since 2002, and thus entered the SAFO project with a food fortification unit already in place. It has often worked with German Development Cooperation in other business areas and is a corporate member of GAIN. Importantly, BASF routinely utilises a business-to-business model, providing capacity development to local food processing companies for business plan development, hardware equipment, and analytics. This allows SAFO to directly contribute to the development goal of supporting small-and-medium enterprise, as well as improving nutrition and health.

In addition, SAFO activities supported the work of a number of international organisations committed to improving nutrition. These include GAIN, Helen Keller International (HKI) and the Micronutrient Initiative (MI), all of which are major partners in food fortification efforts, with significant experience in addressing micronutrient deficiencies in the

developing world. Support could take a variety of forms. In Indonesia, for example, SAFO financed research that underpinned a local partner's bid for funding from GAIN; the data collected allowed GAIN to make an informed decision, and ultimately to agree to the proposal. In Tanzania, SAFO acted as a convenor, providing the funding and administrative support for meetings that allowed the various partners to discuss and coordinate activities. The following chapters will take a closer look at the way in which SAFO, together with different partners, supported Bolivia's, Tanzania's and Indonesia's pathway towards food fortification.

## SAFO in Bolivia

The SAFO partnership in Bolivia must be understood in its wider context, as part of a multi-faceted effort by the country to improve the health of its citizens through improved nutrition. Since 2006, Bolivia has been engaged in a far-reaching initiative called the Multisectoral Zero Malnutrition Programme (generally referred to as the Zero Malnutrition Programme, or by its Spanish acronym PMD-C). The programme is chaired by the country's President, with representatives from civil society and seven key Ministries. This effort is operated by the National Council of Food and Nutrition (CONAN), under the direction of CONAN's Technical Committee (CT-CONAN) and the Ministry of Health and Sports.

The Bolivian President issued a decree in 2005 rendering mandatory the technical standard that regulates the fortification of edible oil with vitamin A. In that same year, the company Industrias Oleaginosas voluntarily became the first Bolivian edible oil miller to comply with the decree under a pilot project carried out with assistance from the World Food Programme. Four other major oil producers soon came into compliance, fortifying their products with vitamin A.

In 2006 and 2007, a baseline national nutrition survey was carried out, paying particular attention to mothers and children aged six months to two years. Based on the survey findings of malnutrition among certain populations, including vitamin A deficiency among 11% of children, the PMD-C stakeholders developed a five-year strategic plan (2007–2011), and received support from GAIN, MI and the UN system. In early 2010, financial agreements were finalised adequately to initiate the Zero Malnutrition Programme. This permitted a variety of activities such as an incentive programme for Municipalities to establish their own Nutrition Units, efforts to encourage small farmers to produce nutritious food, and a number of targeted micronutrient supplementation activities (CT-CONAN et al. 2012).

In 2011, a mid-term evaluation of the Zero Malnutrition Programme reported that progress towards a number of goals had been made in its first two years. At the time of writing, the three donors (Canada, France and Belgium) on an Inter-agency Basket Fund Committee created in 2009 were in the process of agreeing on financing for continuation of the Programme up to 2015.

### The SAFO-Bolivia partnership

In 2008, after preliminary discussions, SAFO determined that Bolivia was a good candidate for its support. Although mandatory food fortification standards had been introduced by the early 2000s for edible oil with vitamin A, enforcement was still poor. Some of the organisational elements of a quality control system (Sistema Informático de Control de Calidad de los Alimentos Fortificados, or SICCAF) were in place thanks to the Zero Malnutrition Programme. A network had been established of national, departmental and municipal health authorities, laboratories, food inspectors and lab technicians willing to start collecting, measuring and monitoring the vitamin A content of edible oil from producer to market to consumer. Generally, motivation was high but as the food inspection powers lay with the local authorities, resources were scarce. The main challenge was a lack of accessible tools to conduct monitoring activities. Consequently, enforcement was virtually non-existent.

This being the case, much of SAFO's efforts focused on compliance and building up sound monitoring systems for industry itself and public food inspectors. The SAFO team identified the CONAN Technical Committee and the Ministry of Health and Sports as key public partners. Key private partners were the oil industry and its industrial committee. An agreement was reached with the Ministry's Nutrition Unit to bolster food fortification monitoring activities and reinforce the network of food testing laboratories in Bolivia. These were followed by inter-institutional cooperation agreements with leading manufacturers of cooking oil and other key stakeholders, such as the Departmental Health Services, municipal laboratories in the cities of La Paz and Santa Cruz, public universities in the departments of Cochabamba, Chuquisaca, La Paz, Tarija, and Santa Cruz, and the Bolivian Institute of Standardization and Quality (IBNORCA).

Preliminary training workshops were held in both 2009 and 2010, at which representatives of all stakeholders discussed the existing situation and SAFO objectives, and outlined areas of cooperation and joint action. They also received training in the use of the test kits supplied by BASF, using a 'training by doing' methodology. (Further trainings were held following the extension of the SAFO agreement for the period 2010–2012.)

## A coordinated effort

All nine Departmental Health Services were strongly committed to playing their roles in the strategic plan, which included working with Municipalities to ensure that any edible oils sold in shops and markets were fortified with vitamin A. However, of Bolivia's 337 Municipalities only three – La Paz, Santa Cruz, and Villazón – had laboratories with fully qualified technicians. Fortunately, portable testing kits made it feasible for the collection and analysis of edible oil samples to be done without labs and by staff who are not fully qualified technicians.

With the extension of the SAFO project till 2012, SAFO hired a consultant in 2010 to coordinate activities in the country (GIZ does not have an office in Bolivia; in other countries, this coordinating function was assumed by resident GIZ staff). In the same year, additional financial support became available from major donors (notably from GAIN). This permitted the Zero Malnutrition Programme to begin scaling up all of the interventions called for in its strategic plan, including food fortification. Accordingly, the SAFO partners and Bolivian stakeholders adopted a division of tasks described as follows:

- SAFO would provide:
  - additional training in the use of test kits (qualitative and quantitative methods) for public entities, especially food inspectors, and local oil mills;
  - test kits (qualitative and quantitative) and instruction manuals;
- chemical reagents required by the qualitative test kits until the nine Departmental Health Services had procurement systems in place.
- The Departmental Health Services would:
  - appoint qualified personnel to undertake training in use of the kits and to transfer their training to others;
  - collect edible oil samples, measure their vitamin A content and report the results to the designated national entities in the SICAFF network according to the Bolivian regulations;
  - develop chemical reagent procurement systems by:
    - immediately procuring dichloromethane (one of the three reagents) as it is difficult to import;
    - making provision in their annual budgets for the procurement of all three chemical reagents.
- All national, departmental, municipal and university laboratories in the SICAFF network would support training, procurement of reagents, collection and testing of edible oil samples and reporting of results.
- INLASA, the national lab, would oversee and support the activities of the other labs.
- IBNORCA would oversee application of the regulations regarding vitamin A fortification.
- IBNORCA's Technical Committee on Standards for Edible Oils and Fats would continue to serve as a mechanism for liaising with the edible oil producers.

### Box 5. Strong cooperation among stakeholders



>> Coordinator Anahí Rojas de Meyer conducts a training workshop.

As SAFO consulting coordinator since early 2010, Anahí Rojas de Meyer is in a strong position to comment on progress achieved by the initiative in the country.

'All of the Departmental Health Services in the country,' she emphasises, 'are involved now. They are all monitoring the fortification of vitamin A in edible oils using the test kits provided by SAFO-Bolivia, and doing so according to the plan devised by the Nutrition Unit of the Ministry. Reporting from all nine Departments has been underway since September 2010. And that is one of the real achievements of the initiative – not only to have provided a tool and trained the personnel, but to have strengthened cooperation between all of these different entities.'

It was further agreed that the Ministry of Health and Sports' Nutrition Unit would have primary responsibility for monitoring and supporting all of the above. GIZ would therefore provide a part-time consultant to support the Nutrition Unit and the work of SAFO partners. This work involved a variety of activities, starting with the organisation of trainings in the use of the test kits, which were carried out with stakeholders in various parts of the country. It also included creating and supporting working relationships between different levels of government, arranging meetings and travel for stakeholders.

In early 2010, CT-CONAN and the Ministry of Planning and Development's unit for analysis of social and economic policies requested that GIZ support the mid-term evaluation called for in the Zero Malnutrition Programme's strategic plan by helping to design and execute a survey to determine vitamin A, iron and other micronutrient deficiencies in Bolivian children. While the Inter-American Development Bank and the World Bank financed the collection of samples in urban and rural areas, GIZ arranged for their analysis in Germany through the University of Gießen. At the same time, and as Bolivian labs would theoretically be well-equipped for conducting these analyses themselves, GIZ also requested Gießen to provide technical trainings and transfer know-how, so that Bolivian labs might in the future be in a position so as to carry out the analysis themselves. Such a survey would provide baseline data against which to measure future progress. The Gießen team led a workshop to design the survey and to assign responsibilities for specific tasks to relevant stakeholders including INLASA and a selection of other laboratories. This was followed by a training workshop for laboratory technicians and others and included discussion to identify needs for equipment and supplies. At time of writing, the blood samples are being analysed in Germany.

#### ■ Day-to-day challenges of monitoring edible oil

A morning spent with staff from the Municipal Laboratory in the Unit for Control of Sanitation and Communicable Disease in La Paz, provides an opportunity to see the day-to-day challenges of monitoring food fortification at Municipal level. First, the lab's technicians (acting as inspectors) go to a popular food market with streets of small shops, stalls, and food sellers sitting on blankets with stacks of fruits and vegetables spread around them. Many of the small shops and some of the stalls sell a range of edible oils at a range of prices.

The more expensive oils are in sealed bottles with labels indicating the brands and bearing the official logo indicating the contents are fortified. The less expensive oils are sold 'a granel' (in bulk), scooped out of barrels and into plastic bags or other containers in whatever quantity a customer may request; the poorest customers tend to buy the smallest quantities. Each company has its own distinctive type and colour of barrel, with labels indicating that the oil within was produced on certain dates and was fortified with the required amount of vitamin A. However, the laboratory staff members say that companies recycle these barrels and it is easy for anyone to intercept the recycling process and fill these barrels with contraband oil. The least expensive oil is often sold out of buckets. This is used oil collected from bakers, other food manufacturers and restaurants. It may have been filtered and otherwise processed to make it more attractive. If it had ever had vitamin A content, the content has largely been lost by the time it is resold.

It is unknown how much contraband oil from Argentina, Brazil and other countries slips across borders into Bolivia but it is believed to account for a significant share of the bulk oil sold out of barrels in the markets where most low-income people shop. SICAFF, which includes customs authorities and the laboratories they use, aims to stop the importation of any edible oil into Bolivia that does not comply with Bolivian legislation and regulations requiring vitamin A fortification.



>> L. to r.: A wide variety of indigenous and imported edible oils are available in the Bolivian market.

>> Many Bolivians with low income buy their cooking oil straight out of barrels.



>> L. to r.: Food inspectors collect samples of oils offered in shops and markets, from expensive branded products to those sold in jars or plastic bags.

>> The certification programme puts vitamin A fortification details on barrels distributed by Bolivian producers.



>> L. to r.: Preparing to test oils in the La Paz municipal lab using BASF's qualitative test kit.

>> The portable kit contains all a local laboratory needs to test for the presence of vitamin A in certain edible oils.

At a modern supermarket, there is a whole row with shelves of oils of various types (pure soy, pure sunflower or mixed) and various brands and at various prices. Most of the bottles are clear plastic, so customers could see the oil, exposing the bottles at the front of the shelves to direct sunlight. Depending on the date of manufacture and how long they have been exposed to light, the vitamin A content of oil in these bottles may have decreased substantially. Testing can show whether or not they still have the minimum required amount of vitamin A.

In May 2012, the La Paz laboratory announced that while some bottled oils met the formal standards, 90 percent of the oil sold from bulk in two large districts of the city contained less than the mandatory level of vitamin A – and in many cases had none at all (Diario Nacional 2012).





## Challenges

The SAFO-Bolivia initiative faced a number of challenges in the course of its implementation. One problem was frequent changes in personnel at national level, which caused delays as new officials were ‘brought up to speed’ on the programme. Another was procurement of necessary supplies, with representatives of some oil producing companies reporting difficulties in importing vitamin A.

Although the qualitative test kits were widely used and greatly appreciated by the participating laboratories, a weakness was identified that undermined its overall effectiveness in the Bolivian context. In Bolivia, about 30 percent of all oil produced is sunflower oil, while a greater proportion – approximately 70 percent – of all oil produced is soy oil. Moreover, much of the edible oil sold in the country is a mixture of both soy and sunflower oil. In early 2010, the Gießen team had done an assessment of the test kit on behalf of GIZ, and found it to be effective for the analysis of edible oils if the instructions were carefully followed and periodic confirmatory checks were done using HPLC equipment, which Bolivia had in some laboratories. The edible oils tested were walnut, olive and sunflower oil. It emerged to scientific surprise that photometric test kits cannot be directly used for testing soy oil. SAFO is addressing this challenge in two ways. First, BASF is making efforts to modify its test kit to work for all edible oils including soy and mixtures that contain soy. Second, BioAnalyt is currently adapting its quantitative test kit so that it, too, works for soy oil and mixtures that contain soy.



## The future

Although the SAFO project officially ended in December 2012, the German SAFO partners are determined to fulfil remaining commitments. These include providing a more effective kit for measuring the vitamin A content of soy oil and mixed oil containing soy, and to report on the results of the recent micronutrients deficiency survey carried out by the Gießen team. In the meantime, the project appears to have made substantial progress in achieving its objectives in Bolivia.

In particular, the consistent monitoring and enforcement of standards across the country is now within reach. Departmental Health Services are now using a common testing methodology in all of the country’s nine Departments, and are reporting on the fortification of edible oils within their territories. Moreover, as a result of SAFO-Bolivia’s efforts to engage a variety of stakeholders, there is now good cooperation among the network of micronutrient laboratories of the Departmental Health Services, the Municipalities, INLASA, and state universities. INLASA provides overall supervision and coordination for the network, as well as training in testing, and is in constant communication with its members.



## SAFO in Indonesia

Indonesia has been successful in reducing rates of malnutrition among children under the age of five. However, the absolute number of malnourished children may have remained stable or even increased due to the proportion of young children in the growing population. The government estimated in 2010 that 18 percent of under-fives were under-weight, and that wasting and stunting – symptoms of malnourishment – were of major concern in some parts of the country (IRIN 2012). One estimate suggests that vitamin A deficiency affects approximately one in five Indonesian children of pre-school age (GAIN 2011).

For many years, the country has had a programme of providing under-five children with vitamin A supplementation in the form of a high-dose capsule twice a year. While effective in reducing the most severe manifestations of vitamin A deficiency, the problem remains a public health concern despite the fact that four-fifths of rural and poor urban children receive the supplement. Moreover, levels of night blindness (another symptom of vitamin A deficiency) among women in different parts of the country is high enough to qualify as a public health problem,

and efforts to provide vitamin A supplements to post-partum women are extremely limited (Rice et al. 2004, Sari et al. 2004). Food fortification has been proposed for many years as a cost-effective alternative that could reach a wider population and also could run in parallel with the supplementation programme. For all of these reasons, there has been growing interest in complementary strategies to reduce vitamin A deficiency in Indonesia (Soekirman et al. 2012).

### Box 6. A food fortification pioneer



>> *Professor Soekirman explains the vitamin A fortification programme on World Nutrition Day, 2013.*

Since its creation in 2002, KFI has been headed by Professor Soekirman (known by the single name only). He is one of the leading experts in this field, educated in the US at Cornell University and a member of numerous international and Pan-Asian nutrition networks. Soekirman began his career promoting nutrition in a remote community at the north end of Sumatra in 1961. He went on to work at Indonesia's National Development Planning Agency and in 1988 became Indonesia's Deputy Minister of Health responsible for nutrition. Soekirman has taught at a number of universities, and is now Professor Emeritus of Nutrition at Bogor Agricultural University:

'Vitamin A fortification calls for no action by mothers other than continuing to cook with the oil they have always used,' notes Professor Soekirman. '[It] adds only 0.5 percent to the cost of oil, so it has almost no implications for the price paid by consumers.'

Soekirman is enthusiastic about fortifying cooking oil as an appropriate strategy for Indonesia. However, he added that it is imperative to keep the needs of the country's poorest people firmly in mind. While he lauded the fact that among others the country's two largest companies are now voluntarily fortifying their oil, these companies account for 60 percent of the palm oil produced in Indonesia yet are major exporters so it is not known how much of their fortified oil reaches Indonesian consumers. Soekirman believes that most of the poorest households are continuing to consume unfortified oil from small producers, much of it scooped out of barrels into small containers at local markets. He advocates for mandatory fortification with rigorous monitoring to rectify this situation.

## Indonesia's progress towards vitamin A fortification

Indonesia is one of the world's largest producers of edible oils, and unbranded palm oil is widely consumed in much of the country by both high- and low-income groups. Over the years, it has instituted mandatory fortification of salt with iodine, and of flour with iron and B vitamins. Voluntary fortification of subsidised rice is underway. It therefore has both experience and the raw material to institute fortification of edible oils with vitamin A.

SAFO's main partner in Indonesia is the Indonesian Nutrition Foundation for Food Fortification (KFI), a non-profit foundation established in 2002 by Professor Soekirman (see below). Among other activities, KFI has been highly involved in research to establish the necessity and feasibility of fortifying edible oils. In 2007, KFI conducted a feasibility study with financing from the Japan Fund for Poverty Reduction and the Asian Development Bank. The study indicated that the fortification of unbranded oil in the country was technically feasible, acceptable and beneficial.

In 2009, the Indonesian National Planning Board set up a steering committee and an implementation committee for fortification of cooking oil with vitamin A. Committee membership included representatives from various government units that worked with KFI. In the same year, a five-year strategy was announced, with the goal of reaching more than 200 million Indonesians with fortified cooking oil. Ultimately, it is intended that vitamin A fortification will be mandatory, based on a national standard issued by the National Standardization Agency and monitored by the Indonesian Food and Drug Board (BPOM).



>> Recipient of Indonesia's 2010 'Superbrand' award: cooking oil fortified with vitamin A.

## SAFO support to Indonesian partners

Formal SAFO involvement began in 2009. Despite the strides made in gaining official government acceptance of the need for vitamin A fortification, KFI and SAFO agreed that greater efforts were needed to reach decision makers in key government ministries (e.g. Health, Industry) and regional authorities, as well as in universities, NGOs, and mass media. Increased support is also needed from both the public and private sectors in favour of developing and implementing a national standard.

It was also decided that efforts to extend fortification of edible oil would benefit from a nutrition campaign to inform the public of the modification to their commonly consumed staple food. At that time, the Musim Mas Group, a major producer of cooking oil, agreed to become a 'champion of food fortification' in order to provide other companies with a positive example. The impact of this decision was all the greater when the company's fortified SunCo VA Oil received the national 'Superbrand' award in 2010 in recognition of its acceptance by Indonesian consumers.

During this period, a public controversy arose over whether fortifying cooking oil was necessary in Indonesia: it was argued that the widely-available raw red palm oil naturally contains beta-carotene, a pigment which the body converts into vitamin A. In response, GIZ funded a study by University of Gießen to investigate the properties of this oil. The study showed that it would not be possible to achieve an impact for large population groups with raw palm oil, due to its colour, its bitter taste and the small amount of useable vitamin A that results from its consumption. This confirmed the appropriateness of a major oil fortification programme for Indonesia (Krawinkel 2011).



>> SAFO-supported training workshop at a major oil mill in 2011

### ■ Activities

In the first phase of the project from 2008 to 2010, BASF concentrated on providing assistance to large and small oil mills by supporting business plan development (including corporate social responsibility models), and technical know-how. Considerable attention was paid to assisting companies to set up quality assurance regimes, in order to ensure consistency and maintain high standards in the fortification process. These activities continued in the second phase of the project from 2010 to 2012.

For its part, GIZ proceeded along several paths. A significant focus was on helping to boost the technical capacity of KFI. In particular, funding was provided for hiring of scientific and communications experts to work with the foundation, to support its activities, and to support KFI's organisational development. Beginning in 2009, GIZ supported KFI's work on an ambitious proposal to GAIN for the funding of a country-wide edible oil fortification programme. Despite some delays along the way, the proposal was ultimately successful: on National Nutrition Day, in January 2011, the Indonesian Ministry of Health and GAIN jointly announced a \$US 6 million, multi-sector partnership aiming to reach over 80 percent of the population with vitamin A-fortified vegetable oil. The National Development Planning Agency was a key partner in this initiative.

GIZ also provided funding and personnel to create a social marketing team within KFI. The team developed a wide variety of information and education materials including a newsletter in the national language, created material for the KFI website, and promoted food fortification through mass media such as television and radio talk shows. Following an impact study carried out by the Indonesian Ministry of Health, GAIN, KFI and several Indonesian research institutions, GIZ co-funded some accompanying studies to support strengthening of the evidence base for food fortification in Indonesia.

Working on a different track, GIZ provide expert assistance to the Indonesian government in preparing a mandatory fortification standard. The draft standard was completed ahead of schedule in 2011. It is expected that in 2013, the process

of moving the standard through the final steps of adoption by the National Standardization Agency will be complete. This will be followed by an additional one-year 'grace period' during which producers who have not voluntarily begun to fortify their oil will have time to adjust their production processes to meet with the new standard. The grace period will ensure the fortification of bulk oil, consumed mainly by poor, malnourished population groups.

Finally, working with the German firm BioAnalyt, GIZ entered into a formal partnership with BPOM to support the establishment of a functioning monitoring and evaluation system.

### The future

In a country as large and administratively complex as Indonesia, progress towards universal, mandatory fortification of edible oil has inevitably run into obstacles. It has been a constant challenge to maintain food fortification as a government priority, and progress has been both slower than expected and inconsistent across the country. Nonetheless, a number of positive developments have been achieved through SAFO's work in Indonesia between 2009 and 2012, which bode well for the future.

By the end of the SAFO initiative, four major edible oil companies had begun to fortify their oil with vitamin A, ensuring that a significant (although as yet unquantified) percentage of consumers are now using fortified oil in their daily diets. Moreover, in its work with KFI, SAFO has helped to address misconceptions about vitamin A fortified oils through a concerted information, education and communications effort. This has assisted in maintaining food fortification as a priority at different levels of government, and in the public eye. The expected adoption of a mandatory fortification standard by the National Standardization Agency will reinforce such progress, as will government's expanded capacity to monitor and enforce the standard when it is fully implemented.

**Box 7. The partnership at work**

As the SAFO involvement drew to a close, the alliance supported several of Indonesia's efforts to roll out vitamin A fortification in edible oils. One of these was to build monitoring capacity in more provinces, which is the responsibility of the BPOM. For example, in June 2012, 35 BPOM staff and personnel from other relevant ministries in North Sumatra Province participated in a training workshop entitled Monitoring Palm Cooking Oil. Workshop presenters included Professor Soekirman, two other KFI experts, three senior BPOM officials, a GIZ-SAFO consultant, and a representative of BioAnalyt. In addition to reviewing the goals and rationale of vitamin A fortification, the workshop included in-depth discussion of the progress towards the national standard, and of the procedures that will be necessary when mandatory fortification is finally in place and operational. Participants also received training in the use of the quantitative testing kit and were impressed by the equipment's accuracy and ease of use.



>> Participants in the North Sumatra workshop receive training in a quantitative mobile testing device.

## SAFO in Tanzania

Although Tanzania has made progress in health indicators such as child mortality over recent decades, malnutrition remains a serious problem. One-third of under-five children and 37% of women aged 15–49 are estimated to be deficient in vitamin A, although prevalence varies greatly from region to region (NBS 2011).

Micronutrient deficiencies in Tanzania are partly explained by the fact that local diets tend to be undiversified and heavily reliant on staple foods that are low in micronutrients; cooking methods also contribute to reducing micronutrient content in food. The country's 2005 Demographic and Health Survey found that only 51% of rural children and 62% of urban children had eaten vitamin A-rich fruits and vegetables during the previous day. Since the late 1980s, a programme providing twice-yearly vitamin A supplements claims to have achieved nearly universal coverage of children up till the age of six. However, deficiency persists and this approach does not change the underlying problem of inadequate diets.

The national government has developed a National Nutrition Strategy for 2009–2015 and its implementation is supervised by a high-level multisectoral committee. The Ministry of Health and Social Welfare has been working to increase its nutrition capacity both at central and district level. Moreover, a variety of bilateral and non-governmental development partners have supported Tanzania's efforts.

Support for food fortification has been well established in the country for several years. A National Food Fortification Alliance emerged in 2003. Key participating stakeholders include various government ministries and agencies, edible oil producers, international donors, academia, and international and Tanzanian civil society organisations. The NFFA works with other countries through the East, Central and Southern Africa Health Community (ECSA), and among other activities has drafted national standards for flour fortification.

### SAFO support to Tanzanian partners

SAFO first contacted the NFFA in 2008. A fact-finding mission was conducted by BASF and GIZ to identify potential stakeholders, and to suggest ways of moving ahead. One of the activities that began almost immediately through SAFO was a study of vitamin A deficiency in the country, conducted by the University of Gießen. The study determined that while coverage of vitamin A supplementation for under-fives in Tanzania has been high since the early 2001, there were significant geographic gaps in 'reaching all children and women in need, especially in remote areas' (Krawinkel 2009). The study made a number of recommendations, including fortification of vitamin A in vegetable oil.

In 2009, engagement with Tanzanian stakeholders began in earnest through workshops, meetings and forums which eventually produced a strategy and permitted the drafting of a National Action Plan for the Enrichment of Staple Food. In February, a workshop was jointly organised with NFFA in Dar es Salaam, with the objective of re-energising the drive in favour of food fortification in Tanzania and to identify ways in which SAFO could assist most effectively. Intensive information-gathering and preparation in advance of the workshop ensured both good attendance as well as time to hear and acknowledge the concerns held by certain participants. A number of gaps and barriers to progress were identified. These included: lack of progress towards creating a label to 'brand' eligible fortified products; lack of high-level political commitment; and the still unfinished business of putting a monitoring process in place.

Other stakeholders undertook the building of technical capacity within relevant government units and the drafting of standards and monitoring regulations. SAFO concentrated on the following:

- Facilitate and finance the creation of a label
- Support the creation and implementation of a monitoring and evaluation system
- Provide technical assistance to the producers of edible oils.

GIZ took responsibility for developing the label, creating a taskforce from among NFFA stakeholders and working with designers. After an extensive consultation period, the label was finalised and presented at an NFFA meeting in November 2010.

BASF concentrated on raising awareness and providing technical support for fortification among edible oil producers. The Tanzanian market for edible oil was dominated by two major companies, Murzah Oil Mills Ltd and East Coast Oils and Fats Ltd. In October 2010, BASF hosted a workshop with East Coast Oils and Fats Ltd and the World Bank on food fortification. Topics included fortification processes, business plans, monitoring and evaluation. Participants also received training in the use of the qualitative test kit. Companies became convinced that there was a strong business case for fortification, particularly because the additional cost of fortification was negligible. Moreover, some producers judged that the raised profile of labelled oil might increase sales in neighbouring countries where fortified oil is not yet distributed. Together with GAIN, GIZ held a meeting on advocacy during an all-African conference on development partnerships with the private sector.

In December 2010, with considerable technical support from the World Bank, standards for oil, flour, and maize meal fortification were finalised and disseminated. In August 2011, the government issued regulations for mandatory fortification of edible oil.

DFID, GAIN and the World Bank implemented activities through HKI to support the establishment of a monitoring system and coordinate with the private sector (DFID 2011). Through SAFO, GIZ provided for an extensive public sector assessment. SAFO partners further completed guidelines and manuals for food producers and for the regulatory body, the Tanzania Food and Drug Authority (TFDA). The TFDA plans to roll out monitoring and evaluation procedures to its food inspectors in all of the country's 127 districts in accordance with the Tanzanian Bureau of Standards and the Tanzanian Food and Nutrition Centre.

## The future

Given their good working relationship with the NFFA, SAFO partners had a strong impact on realizing the National Action Plan for the Enrichment of Staple Food. This has made it possible for the country to utilise international funding that has recently become available (notably from Great Britain), and ensure that progress continues to be made. Representatives of the edible oil industry are confident that oil fortification will continue to be rolled out in the next years. When fully implemented, it is expected that as many as 30 million Tanzanians (around 62 % of the population) will be reached by vitamin A-fortified oil.

### Box 8. Praise for SAFO-Tanzania

In January 2012, the Corporate Social Responsibility Initiative at Harvard's Kennedy School published a case study about SAFO-Tanzania's activities since 2009 (Gradl 2012). This case study, part of research on 'inclusive business ecosystems,' focused on understanding which type of networks make development partnerships work for companies. It concluded:

'SAFO itself combined various structures. As a project-based alliance, it built on and strengthened existing national platforms through targeted interventions. It worked closely with local companies to develop a CSR business case in order to motivate the private initiative of these players.'



>> Fortified oil label, developed with the assistance of SAFO-Tanzania.



## Results

The formal objective of the SAFO project was to increase the availability of affordable, vitamin A-fortified foods to low-income populations in developing countries. Achieving this objective required the formation of effective alliances with public and private sector partners, including a broad range of technical experts, private companies, academic institutions, government departments, national and international NGOs, and donors.

In any discussion of whether the objective was achieved, SAFO must be thought of as a contributing partner rather than the sole or lead driver. Quantifying or even attributing specific impacts to a given partner is difficult, and this is especially so in the case of a partner with a deliberately catalytic role. However, the evidence collected for this publication strongly suggests that in the absence of SAFO, national food fortification efforts would have had significantly less impact, the processes would have been delayed, or implementation might not have been achieved at all.

### Availability and affordability

Set against formal criteria established at the beginning of the project, SAFO can be seen to have contributed strongly to the achievement of its two major goals:

Increased availability of vitamin A-fortified foods to low-income populations. It is estimated that over 145 million people have been reached by the food fortification activities that SAFO has contributed to since 2008, more than double the original goal of 100 million people (Tilden 2013). This includes not only the three countries looked at in detail by this publication, but also Bangladesh and Brazil, which received most of their SAFO assistance during the first phase of the project. Of the total, it is estimated that more than 85 million were people living on less than US\$ 1.25/ day. It is also estimated that the fortified oil reached over 100,000 children under the age of five who were suffering from vitamin A deficiency.<sup>1</sup>

Delivering affordable vitamin A-fortified foods to low-income populations: In all of the countries for which data is available, the additional cost of producing fortified oil did not result in a significant price rise to consumers. This was achieved by ensuring that, as had been originally planned, the addition of vitamin A fortification equipment and the procurement of related supplies added no more than 0.2 percent to the costs of production.

### Improved processes and infrastructure

In pursuit of its overall objectives, SAFO worked towards various process-related targets that were essential to its success. In each of the three countries detailed in this paper, SAFO aimed to ensure that three key components of the food fortification system were in place by the end of the project:

- a regulatory framework,
- market incentives, and
- production systems for vitamin A-fortified oil.

**Regulatory framework.** In both Indonesia and Tanzania, SAFO contributed to the creation or adoption of the standards and regulations. SAFO has contributed directly and decisively to the effectiveness of government monitoring efforts in Bolivia, Indonesia, and Tanzania through the provision of test kits and training in their use.

**Market incentives.** While a number of oil producers in Bolivia and Indonesia were already willing to fortify their products, in Tanzania SAFO successfully stimulated cooperation from a previously uninterested private sector.

**Production systems.** In all three countries, the major producers accounting for the majority of edible oil are now fortifying some or all of their products with vitamin A. In Indonesia and Tanzania, BASF helped to motivate edible oil companies to participate in food fortification (in particular by helping to promote the business case for it), and provided technical assistance for them to do so. In Bolivia, a significant proportion of oil was already being fortified when the project started and the greater need was support for regulation.

An additional component that emerged during the course of the project was the creation or strengthening of an enabling policy environment. SAFO worked towards this by supporting nutrition advocacy, including e.g. the creation of a nationwide logo (Tanzania), social marketing tools (Indonesia), and policy advice for industry standardisation. Policy advice included evidence creation for lower and upper limits of fortification, and the provision and training in the use of tools for monitoring vitamin A oil fortification at food inspection and factory levels. In all countries, SAFO reinforced the capacity of the local alliance (Indonesia and Tanzania) or government unit (Bolivia) that has been spearheading the implementation of vitamin A fortification in edible oil.

<sup>1</sup> The estimates are based on a number of factors including national population figures, socio-economic and demographic data, WHO estimates of child malnourishment, and proprietary data from BASF.

## Lessons learned

The following lessons are suggested by the SAFO experience since 2008:

The private sector can put new issues on the development agenda. The SAFO initiative to join public and private forces in promoting food fortification in countries where vitamin A deficiency prevails was initially put forward by BASF. At the time, micronutrient deficiencies were not on the agenda for German Development Cooperation and it took some time until the idea caught on. In the meantime, GIZ and BMZ have both recognised the potential of this Development Partnership and they consider it a great success.

Pre-implementation assessments are essential. Political barriers to food fortification programmes should be carefully assessed prior to their implementation in order to prepare necessary country-specific activities for lobbying and marketing. In all three country cases described in detail, initial fact-finding missions to the countries proved invaluable in establishing whether not only the technical but the political conditions existed for SAFO activities.

Local lead partners help channel external support. A local organisation should be chosen as lead partner, and provided with technical support (and sometimes financial support) in order to spearhead national efforts and provide a single contact point for external partners. This also provides an institutional 'home' for consultants hired on a temporary basis to assist in activities. In Bolivia, for example, the Nutrition Unit of the Ministry of Health and Sport and CT-CONAN assumed primary responsibility for monitoring and supporting all SAFO-Bolivia activities. In Indonesia, the main partner was a local non-profit foundation specializing in food fortification issues, while in Tanzania it was an existing alliance of stakeholders working in this area.

Capacity development ensures programmes' sustainability. The provision of technical training for local staff, especially in the areas of monitoring, social marketing, and project management, helps to enhance the sustainability of a food fortification programme. In Bolivia and Indonesia, SAFO leaves a legacy of municipal and laboratory staff with a greater understanding of how to monitor food fortification programmes and enforce agreed standards.

Food fortification must be looked at through an ecosystem lens. The experience confirms and extends the characterisation of the business and regulatory environment for food fortification as an 'ecosystem' (Gradl 2012). The inter-dependence of the various activities supported by SAFO has been demonstrated by experience (von Roenne 2012):

- Food fortification relies on national standards.
- National standards rely on industry compliance.
- There can be no standard setting nor implementation without research.
- The state and industry both need the research and therefore have an incentive to cooperate closely with it.

Attention to all parts of the ecosystem, and timely intervention when one or another part of the system is blocked, is at the heart of SAFO's success.

## Looking ahead

One of the benefits of SAFO has been its ability to support future action. Partly based on the SAFO experience, the recently announced German Food Partnership (a public-private initiative for German, European, and associated international agribusiness and food industries) has committed to designing and implementing nutrition-related activities in Indonesia and the Philippines, in coordination with GAIN.

In a related development, GIZ has initiated a new project called Affordable Nutritious Foods for Women (ANF4W), which is designed within the develoPPP.de framework. ANF4W aims to work on both the demand and supply sides to provide reproductive-age women with access to an improved diet at reasonable prices. The project is co-funded by the BMZ and the Bill & Melinda Gates Foundation. As with the SAFO project, BASF has committed to being one of ANF4W's implementation partners.

## Peer Review

The German Health Practice Collection has established criteria that programmes and projects must meet to qualify for publication as part of this series. The two expert reviewers of this report provided positive but often nuanced judgments regarding seven of eight criteria (effectiveness, transferability, participatory and empowering approach, gender sensitivity, quality of monitoring and evaluation, innovation, and sustainability). Neither felt able, on the basis of available information, to comment on comparative cost-effectiveness.

Both noted that it is not possible to accurately assess effectiveness in terms of overall impact on the health of specific populations, partly because the project did not begin with a set of detailed impact indicators and partly because the implementation of vitamin A fortification is at different stages in different countries. In terms of impact on public health systems and institutions, however, the impact of SAFO was clearer. One reviewer noted that, ‘Certainly from the point of view of achieving progress in engaging with the private sector to move toward fortifying at least some portion of the oil in each of the three countries as well as achieving legislative changes, etc. to institutionalise vitamin A fortification for the future, the approach was effective.’

Both reviewers found that the catalytic approach of SAFO was transferable, though one remarked much would depend on the technical capacity of government institutions tasked with monitoring its implementation. Both agreed that modifications and adaptation would be required according to the conditions reigning in different countries. On participation and empowerment, both commented positively on SAFO’s efforts to involve, as one reviewer put it, ‘multiple actors including both public and private sector actors, individuals at the household level (in their role as consumers of processed foods), academics, and NGOs, etc. in research and advocacy.’ The other reviewer highlighted the pivotal role of a national NGO (Indonesia’s KFI) as an example of empowerment. Both agreed that, although not gender-specific, the SAFO approach works in favour of gender objectives as it improves the micro-nutrient intake of all members of a society.

As regards monitoring and evaluation, both reviewers regretted the lack of detailed pre-set indicators for the initiative as a whole. However, one commented that ‘the SAFO approach documented in the three countries also appears to have established strong M&E systems to continue to monitor and evaluate the effectiveness of the approach in the specific country settings.’ Both noted that food fortification in itself is not a new

intervention, but agreed that SAFO’s catalytic approach and ability to work across a range of strategic components (i.e. filling in those that are missing) was innovative. Finally, the two reviewers each found that SAFO had helped create the conditions necessary for the future sustainability of vitamin A fortification, with one reviewer introducing the important caveat that governments must be committed to providing adequate funding for enforcement of national standards. More optimistically, the other reviewer suggested that chances of sustainability might be enhanced by greater involvement of national civil society such as consumers’ groups.

### Box 9. Selection and review process

Each year, experts working in GDC-supported initiatives propose projects that they regard as good or promising practice to the Managing Editor at [ghpc@giz.de](mailto:ghpc@giz.de). Proposals are posted on the Collection website and several specialist fora to allow GDC experts and the interested public to compare and rate them. Informed by this initial assessment, an editorial board of GDC experts and BMZ officers select those most worthy of publication. Reports are written by professional writers following on-site visits, working with the local partners and GDC personnel who jointly implement the projects. Draft reports are peer reviewed by independent scholars and practitioners, emphasizing eight criteria:

- Effectiveness
- Transferability
- Participatory and empowering approach
- Gender awareness
- Quality of monitoring and evaluation
- Innovation
- Comparative cost-effectiveness
- Sustainability.

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Programme to Foster Innovation, Learning and Evidence  
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Friedrich-Ebert-Allee 40

53113 Bonn, Germany

Tel. +49 228 44 60 - 0

Fax +49 228 44 60 - 17 66

Dag-Hammarskjöld-Weg 1-5

65726 Eschborn, Germany

Tel. +49 6196 79 - 0

Fax +49 6196 79 - 1115

ghpc@giz.de

[www.health.bmz.de/good-practices](http://www.health.bmz.de/good-practices)

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Health; population policy

Addresses of the BMZ offices

BMZ Bonn

Dahlmannstraße 4

53113 Bonn, Germany

Tel. +49 228 99 535 - 0

Fax +49 228 99 535 - 3500

BMZ Berlin

Stresemannstraße 94

10963 Berlin, Germany

Tel. +49 30 18 535 - 0

Fax +49 30 18 535 - 2501

[poststelle@bmz.bund.de](mailto:poststelle@bmz.bund.de)

[www.bmz.de](http://www.bmz.de)