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Salt iodization: a brighter future for Africa

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Foreword

Venkatesh Mannar, Michael Zimmermann Micronutrient Initiative; ICCIDD Iodine Network.



USI is critical for child growth and development

From the burial sites of Egyptian pharaohs to the camel caravans of the great Mali trading empire, salt has historically been a prized commodity across Africa. Adding to its value, iodized salt now is playing a central role in controlling iodine deficiency in Africa. Descriptions of endemic goiter caused by iodine deficiency in the 'IDD belt' along Eastern and Southern Africa date back to the early 1800s. Iodine deficiency impairs brain development and decreases IQ, and also impairs growth leading to stunting. These effects culminate in decreased education and reduced work capacity, slowing social and economic development of many African countries. But this ancient scourge is in retreat, as universal salt iodization (USI) programs spread across Africa.

Salt iodization in Africa has its roots in a seminal meeting hosted by WHO and ICCIDD in Yaoundé, Cameroun in 1987, with participation from 22 countries. The success of this initiative over the past 25 years has been dramatic: today, over 50 countries on the African continent have salt iodization programs, and 70% of all Africans have regular access to iodized salt.

This special issue of the IDD Newsletter takes a close look at salt iodization programs in Africa. Using national examples from across the continent, it focuses on the remaining challenges. African countries have a broad range of iodine programs at different stages of evolution and maturity. From these, there are many lessons to learn and successes to celebrate. Overall, we are optimistic that with commitment from national governments, supported by strong policies, programs and monitoring, sustainable elimination of IDD across all of Africa can be achieved by 2020.

Iodine nutrition in Africa: where are we in 2013?

Despite recent progress, 11 African countries remain iodine deficient in 2013. The largest burden of iodine deficiency is in Ethiopia, Algeria, Sudan, Morocco, Angola, Ghana and Mozambique.

Pieter Jooste, Maria Andersson and Vincent Assey ICCIDD Iodine Network, Cape Town, South Africa; Zurich, Switzerland; and Dar Es Salaam, Tanzania

The elimination of iodine deficiency is a health priority for many countries (1,2). Worldwide, salt iodization programs in nearly 150 countries have markedly improved iodine status over the past two decades (3). Against this background, what are the trends in Africa?

The 54 countries included in this review are all the countries of the WHO African Region, plus 8 countries of the WHO Eastern Mediterranean Region on the continent. Currently, the global dataset on iodine status in countries is managed and updated by the ICCIDD Iodine Network Secretariat in Zurich, Switzerland, and it was used for this review (4). The median UIC was used for the classification of iodine status of countries, as follows: moderate iodine deficiency (20–49 µg/L), mild iodine deficiency (50–99 µg/L), optimal iodine nutrition (100–299 µg/L), and risk of adverse health consequences (≥300 µg/L) (1,4). National data on household coverage of iodized salt was obtained from the UNICEF Global Database 2013.

Coverage of household salt

Household coverage of iodized salt by country varies widely in Africa (6) (Figure 1). Countries with successful iodized salt programmes achieving a household coverage of more than 90% are (data from 2007–2011): Burkina Faso, Burundi, Kenya, Malawi, Nigeria (see page 14), Rwanda, Uganda, and Zimbabwe. Countries with promising household coverage rates of between 70 and 90% are: Benin, Sao Tome & Principe, Lesotho, Comoros and Egypt. The challenge, of course, is for countries to sustain this excellent level of household coverage

Figure 1 Household consumption of adequately iodized salt in Africa (2007-2011)

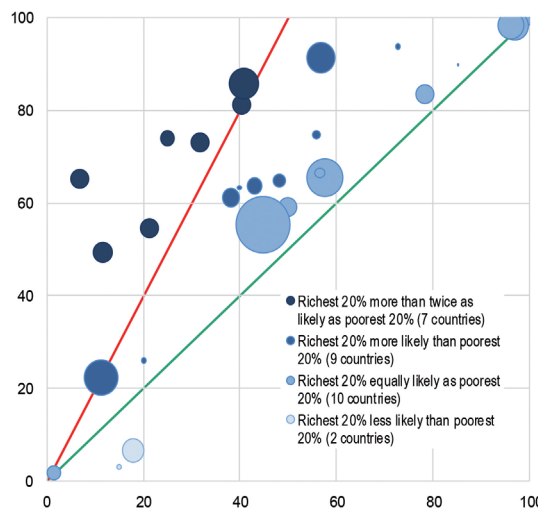
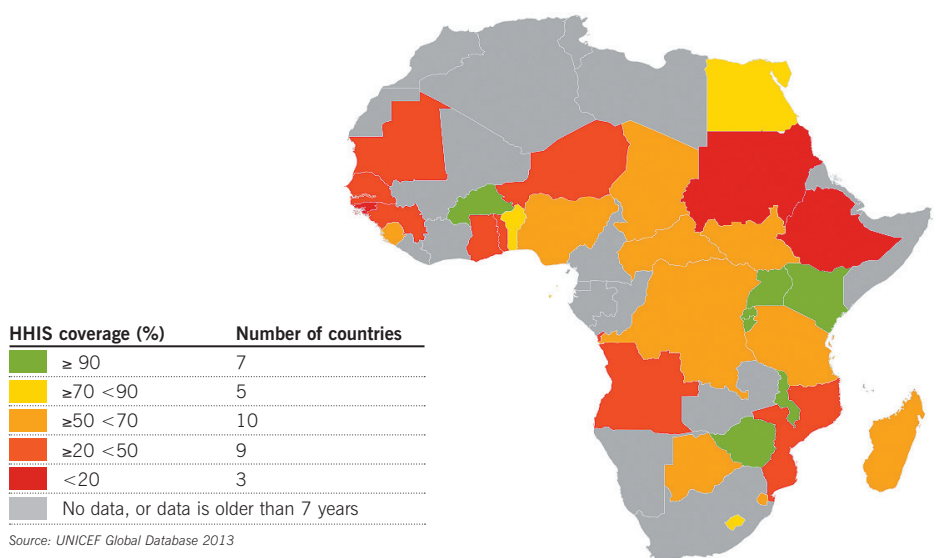
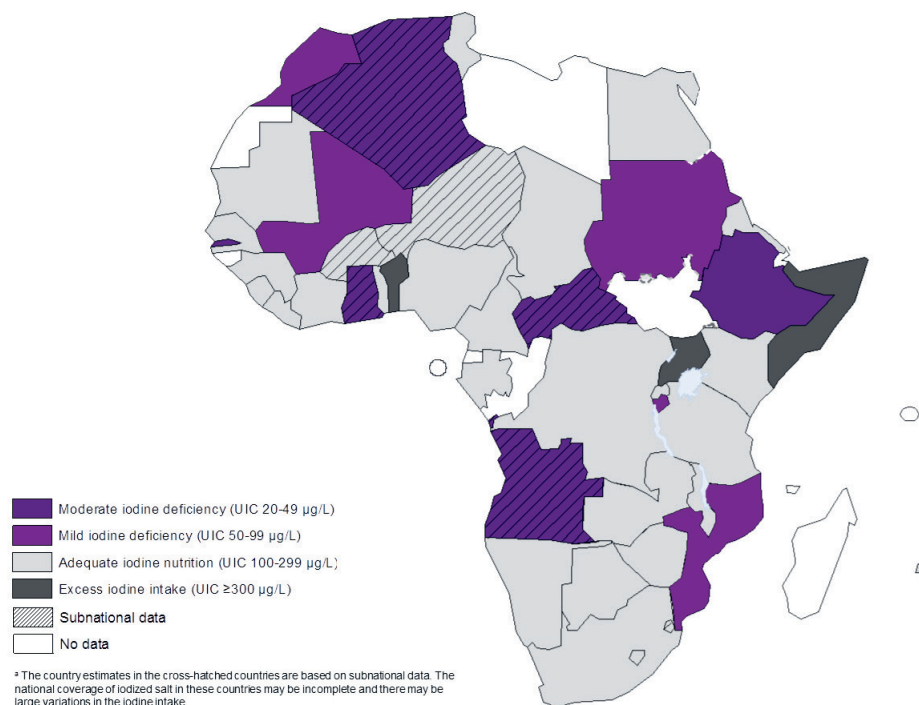


Figure 2 Disparity in access to iodized salt

Each circle represents data from one country. The size of a circle is proportional to the size of the country's population. The horizontal axis represents the percentage of the poorest 20 per cent of households consuming adequately iodized salt, while the vertical axis represents the percentage of the richest 20 per cent of households. Circles along the green line represent countries in which the likelihood of consuming adequately iodized salt is similar among the richest and the poorest households. Circles above or below the green line suggest disparity. The closeness of circles to the upper-left corner indicates greater advantage for the richest households in that country (greater disadvantage for the poorest households). Source: UNICEF Global Database, 2012.

Figure 3 Iodine deficiency at the national level based on the median urinary iodine concentration in school-age children, 2013.



and not to allow their programmes to weaken over time. At the other end of the scale, 20 of 54 countries (40%) had household coverage rates of less than 50%. These 20 countries represent 325.6 million people, or 31.9% of the population on the African continent.

Another challenge is the disparities among different population groups accessing iodized salt (Figure 2). Analysis by UNICEF indicates that richer households are more likely to access adequately iodized salt as compared to poor households. Even in some mature programs with high coverage, disparities may be hidden within national survey results. Thus, for example in Egypt, where national household coverage with iodized salt is 79%, households in the richest wealth quintile are 1.6 times more likely to access iodized salt as compared to households in the poorest wealth quintile. In countries like Ghana and Mozambique, the richest households are more than twice as likely to access iodised salt than the poorest households.

Iodine status based on urinary iodine concentrations

Iodine status in 2013

In 2013, iodine survey data was available for 44 out of the 54 African countries (Figure 3), covering 95.6% of the African population, compared to 75% in 2007 and to 81% in 2013. Recent surveys, carried out from 2003 to 2013, are available in 27 countries, and 25 of them were national surveys. Data is entirely lacking for ten countries, although the majority of them are small (<1 million inhabitants). Madagascar and Libya are two

large countries without UIC data, but national UIC surveys are planned. New national surveys are underway in Tunisia and Djibouti as well as data from a recently conducted national survey in Ghana.

Notable shifts occurred in the iodine status of many countries on the African continent over the past 5 years. Table 1 shows that the number iodine deficient countries decreased from 15 in 2007 to 11 in 2013. The number of countries with iodine sufficiency on the national level increased from 22 to 30 since 2007 (Table 1).

Despite the improvements in iodine status between 2007 and 2013, a significant burden of iodine deficiency still remains in Africa. It should be noted that 11 countries are still iodine deficient in 2013: 6 countries are moderately iodine deficient and 5 countries have mild iodine deficiency. The largest burden of iodine deficiency in 2013, because of large populations, remains in Ethiopia, Algeria, Sudan, Morocco, Angola, Ghana and Mozambique.

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Table 1 Iodine status of African countries in 2007 and 2013.

Iodine status	Median urinary iodine concentration (µg/L)	Countries, n (%) ¹	
		2007	2013
Moderate deficiency	20-49	4 (10%)	6 (14%)
Mild deficiency	50-99	11 (28%)	5 (11%)
Adequate iodine nutrition	100-299	22 (55%)	30 (68%)
Excessive iodine intake	>300	3 (8%)	3 (7%)
Countries with current data		40	44
No data		13	10
Countries in region		53	54 ²

¹ Percentages (%) refers to number of countries in each category out of the total number of countries with data. ² Sudan was divided into North and South Sudan in 2007.

Positioning salt iodization within SUN (Scaling Up Nutrition) programs in Africa

Greg Garrett Global Alliance for Improved Nutrition (GAIN), Geneva, Switzerland



Rising SUN programs in Africa should integrate USI

The Scaling Up Nutrition Movement, or SUN, is an initiative founded on the principle that all people have a basic right to good nutrition. It brings together key representatives from governments, civil society, the United Nations, donors, businesses and researchers in a collective effort to improve nutrition. Forty-three countries have now committed to the SUN movement.

Within SUN, national leaders are prioritizing efforts to address malnutrition including USI. Participating countries are ensuring that effective policies are in place, collaborating with partners to implement USI programs with shared goals, and mobilizing resources to effectively scale up salt iodization. For example, in Zambia, the National Food and Nutrition Commission, has developed a national SUN work plan that maps and costs all nutrition-sensitive interventions under implementation or being planned in the country.

Another boost for USI through the SUN Movement is occurring through the SUN Business Network (SBN), that was launched in December 2012. SBN enables

businesses to align with the priorities of national governments as they increase their investments in nutrition.

The SUN Business Network works in a number of African countries to:

- map entry points for business in national SUN plans
- convene meetings with business leaders (local and global) in-country with SUN country multi-stakeholder platforms
- stimulate partnerships with agreed areas of common interest.

In Kenya in January 2013, the first convening of the business community was attended by 50 of the key business leaders, from a wide cross section of the private sector including the salt industry. The industry leaders present at the event focused on the need to work within an existing industry lead group to create a groundswell, and nominated the Kenya National Food Fortification Alliance to become the focal group for this. Over the coming year, the Food Fortification Alliance will aim to ensure active participation of the food processing industry, including salt businesses, in ensuring better nutrition in Kenya.

In Nigeria in late 2012, the first convening of SBN in Nigeria was held under the title “Seeking the Commitment of the Private Sector in Scaling Up Nutrition (SUN) in Nigeria”. Professor Ngozi Nnam, President of the Nutrition Society of Nigeria shared an assessment of the impact of iodine deficiency in Nigeria estimated at \$1.12 billion losses annually. The dialogue ended with business participants making a number of commitments to supporting nutrition in Nigeria.

Through the SUN Movement including the SBN, salt iodization to correct IDD is being placed clearly on the national agenda of governments with constructive dialogue occurring between civil society, donors, businesses and researchers.

A strong enabling environment for salt iodization

Experience gained from over twenty years of salt iodization programming shows that an enabling environment consisting of political commitment, a well functioning regulatory mechanism and a strong partnership of key stakeholders, in particular, the salt industry, predict success. The different stakeholders – government, salt traders and producers, public health authorities, with support of agencies and donors – need to work together with clearly defined roles and responsibilities. This partnership is the foundation of national coordination of salt iodization programs.

Harmonization of salt iodization within nutrition programs in Africa

Roland Kupka and **Banda Ndiaye** UNICEF Regional Office for West and Central Africa, Dakar, Senegal; ICCIDD Iodine Network; Micronutrient Initiative, Dakar, Senegal

With their focus on a single nutrient and vehicle, as well as their specific monitoring needs, salt iodization programs have been successfully scaled up as vertical programs.

But as salt iodization programs mature, they are likely to benefit from greater integration in nutrition strategies at national, regional, and global levels. In fact, this improved harmonization at different levels is already occurring in Africa.

Regional harmonization efforts in Africa

The Micronutrient Initiative, the Global Alliance for Improved Nutrition, UNICEF and Helen Keller International have engaged in a strategic partnership with the West Africa Economic and Monetary Union (WAEMU) to develop regional solutions to salt iodization and food fortification programs in general. This five-year project, started in 2012, supports industries and national governments to increase the consumption of fortified flour, cooking oil, and salt in an effort to reduce micronutrient deficiencies among vulnerable groups. Led by the WAEMU Commission, the partners were able to develop harmonized regional standards for iodized salt (1).

In East Africa, the East, Central, and Southern African Health Community (ECSA-HC) has passed a resolution to strengthen food fortification initiatives in the region in 2002. The aim of this initiative is to fast track the implementation of food fortification in the ECSA countries. ECSA-HC developed harmonized standards for vitamin A fortified oil and sugar, iron fortified wheat and maize flours, and salt iodization. In addition, guidelines and tools for internal and external QC/

QA, technical auditing and commercial inspection were also developed and disseminated in the region.

National examples

The ultimate purpose of global and regional programs is to support program implementation through national programs. Over the two decades, the progress achieved with salt iodization in Africa has been remarkable.

The increased attention to nutrition as a key determinant for human capital and national development is likely to bring further opportunities for salt iodization and iodine control programs. Integrating IDD control programs into national action plans, while maintaining close monitoring of their performance, will render them more effective and sustainable.

For instance, in Kenya, salt iodization is part of the National Nutrition Action Plan. The roll out of this Action Plan is one of the key priorities for the national SUN initiative.

In Senegal, the government Cellule de Lutte Contre la Malnutrition (CLM) leads the implementation of the National USI Program. In this role, the CLM coordinates the inputs of development partners and ensures integration of IDD-related activities into the national nutrition program, thus enabling the IDD program to obtain regular program data.

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Salt iodization is a critical component of maternal and child health programs © UNICEF/NYHQ2011

Ethiopia: breaking through with a new iodized salt law

Abdulaziz Adish; Tesfaye Chuko; Alem Abay; Vincent Assey; Teshome Desta Micronutrient Initiative; UNICEF Ethiopia; Global Alliance for Improved Nutrition (GAIN); ICCIDD Iodine Network; Federal Ministry of Health, Ethiopia

Background

As far back as 1988, Ethiopia was one of the first countries in Sub-Saharan Africa that was close to achieving USI, having achieved almost 80% iodized salt coverage, when most iodized salt came from Eritrea. The 1998–2000 war between Ethiopia and Eritrean interrupted Ethiopia's iodized salt supply. As a result, Ethiopia started importing salt from neighboring countries, particularly Djibouti.



These evaporation ponds are on the southern shore of Lake Afrera, a hypersaline lake in northern Ethiopia. Cinder cones and the Hayli Gubbi volcano are in the background. ©Stromboli



Salt production at Lake Afrera. ©Stromboli

As a result of the interruption of the supply of iodized from Eritria, there was a rapid deterioration in the iodine status of the population. For example, the National Micronutrient Survey conducted in 2005 showed alarmingly high total goiter rates of 40% and 35.8% among school-age child-

ren and their mothers, respectively. The median urinary iodine concentration (UIC) was only 24.5 µg/l among school-age children indicating moderate to severe iodine deficiency. In 2011, it was estimated that some 66 million persons in Ethiopia were “unprotected from iodine deficiency” as only 15 % of households had access to adequately iodized salt. Ethiopia had the lowest coverage of adequately iodized salt amongst countries in Sub-Saharan Africa during this period.

Progress was very slow due to factors including: lack of commitment by salt producers to iodize, the harsh weather in Afdera, low productivity of the iodization machines, lack of infrastructure (water, electricity), lack of skilled human resources and lack of a clear strategy to enforce the salt legislation. But the Council of Ministers passed new salt legislation in February 2011. In January 2012, the government started enforcing the legislation and the rate of salt iodization progressively increased, from a low of 10% to over 90%, but the quality of salt iodization still remained a challenge.

Rapid recent progress

Over the past 3 years, the Government of Ethiopia, with support from partners including UNICEF, ICCIDD, GAIN and MI has made remarkable strides in ensuring that

the majority of salt produced in the country for edible consumption from Afar (Afdera and Dobi) and Somali (GodUsbo) is iodized. This progress was made possible because of the leadership of the Federal Ministry of Health.



IQ and growth of Ethiopian children will benefit from the new iodized salt law, spurring greater economic development in the years to come. ©ademmm

1. *Governance and National Coordination*

– The government, as part of its strong commitment, established a National Coordinating Committee (NCC) for USI including all relevant ministries. The USI NCC organized a USI Technical Steering Committee (TSC). The TSC was instrumental in pushing key initiatives including drafting of a joint USI national plan, drafting of the salt legislation, resource mobilization (salt iodization machines, vehicles, KIO₃ supply and communication/advocacy). The TSC was also instrumental in setting up a KIO₃ cost recovery scheme.

2. *Sustainable supply of KIO₃* – UNICEF, GAIN and MI supported the procurement of 28 MT of KIO₃ as seed stock for one year. This created an opportunity to put in place a cost-recovery mechanism for sustainable supply of KIO₃. This scheme is currently working well, and the FMOH has currently submitted an order for the procurement of 14 MT of new KIO₃, using money collected from salt producers.

3. *Communications and Advocacy* – UNICEF conducted a KAP (knowledge, attitudes and practices) study in August 2012 to inform behaviour change and communication strategies. TSC partners are also supporting celebration of National IDD Prevention day every October/ November.

4. *Evidence based planning* – UNICEF, GAIN and MI have provided financial and technical support to EHNRI for a National Micronutrient Survey to monitor progress in iodization. Partners have also supported a data capture scheme at site of production to monitor progress.

PERSONAL STORIES:

Monitoring salt iodine in Addis Ababa

We met Hiwot Kidane and Abrehet GSelase in the Kirkos sub-city of Addis Ababa conducting their daily community visits. Hiwot and Abrehet are two of over 2,500 urban and 35,000 rural Health Extension Workers (HEWs) recruited to serve their communities. HEWs provide 16 packages of health and nutrition services to their communities. Mehret explains: “As a result of the public awareness on Iodine Deficiency Diseases, demand for iodized salt has increased”. Abrehet added that, having grown up and still living in the same community, she is close to and accepted by the local community, allowing her to reach each family at least once in a month to give her services including monitoring salt.

We followed Hiwot and Abrehet in their daily tour of their community and had the opportunity to see them testing salt from small shops and homes. With every test that turned positive their excitement increased and they were satisfied only when all the salt they tested turned positive for iodine.



Hiwot Kidane and Abrehet Selase, Health Extension Workers in Addis Ababa, testing retail salt for iodine

Challenges

While there has been good progress, to assure sustainable USI in Ethiopia it is important to further strengthen the national program by addressing challenges, including:

- It is crucial that salt producers accept ownership of iodization program.
- The harsh climate calls for a resilient machines, strong support structure and availability of electricity and water to iodize salt effectively.
- Strong enforcement of legislation and monitoring and evaluation at all levels are needed to ensure sustainable program success.
- Simply iodizing raw salt as is done now will not meet the minimum quality requirement of the Ethiopian iodized salt standard.



A modern government and privately owned salt iodization factory and bagging plant in Afdera with capacity of producing 60,000 MT tons/year.

The way forward

- In the interim it is important to encourage the maintenance and use of existing machines that have been abandoned in favor of knapsack sprays. It is also important to utilize the idle capacity of the Afar salt factory.
- In the long run the government understands that a Central Iodization Facility (CIF) is a more reliable approach to overcome the current challenges with salt iodization and improving quality and packaging of iodized salt.

Tanzania: marching toward sustainable IDD elimination

Vincent Assey, Richard Mwanditani and Sabas Kimbioka ICCIDD Iodine Network; UNICEF Tanzania; Tanzania Food and Nutrition Center, Dar es Salaam, Tanzania



Photo 1: President Jakaya Mrisho Kikwete getting a brief on IDD status in Tanzania and exchanging words with Deputy Minister for Health and Social Welfare Dr. Seif Suleiman Rashid (with white cap) before launching SUN in Tanzania on 16th May 2013.

Salt iodization

Legislation on salt iodization for mainland Tanzania was effected in January 1995 and revised in 2010 (2,3). Based on this legislation, all salt for human and animal consumption must be fortified with iodine. Currently the major limitation is enforcement, as non-iodized salt is still being traded for human consumption. UNICEF is supporting national efforts to achieve USI by training of salt producers in quality assurance, and promoting demand creation through the Tanzania Food and Nutrition Centre, to ensure that households demand iodized salt. To create community awareness on iodized salt, a salt iodization logo was

developed in 1992 to distinguish iodized from non-iodized salt (Figure 1). Recently, iodized salt has been included in the national Monitoring and Evaluation Framework for fortified products.

Introduction

The United Republic of Tanzania has a current estimated population of 45 million. In 1980s it was estimated that 41% of the population was at risk of iodine deficiency disorders (IDD)(1). Salt iodization was adopted with a very high political commitment in early 1990s, and the program was inaugurated in April 1994 (2).

The government's commitment to USI continues, and Tanzania was among the first countries to join the Scaling Up of Nutrition (SUN) movement in June 2011. As an 'early riser' of SUN, Tanzania launched a call for nutrition actions in May 2013 and inaugurated the national fortification program of the most commonly consumed foods, such as wheat/maize flour and edible oil. This was done by President Kikwete (Photo 1).



Figure 1 Logo for iodized salt

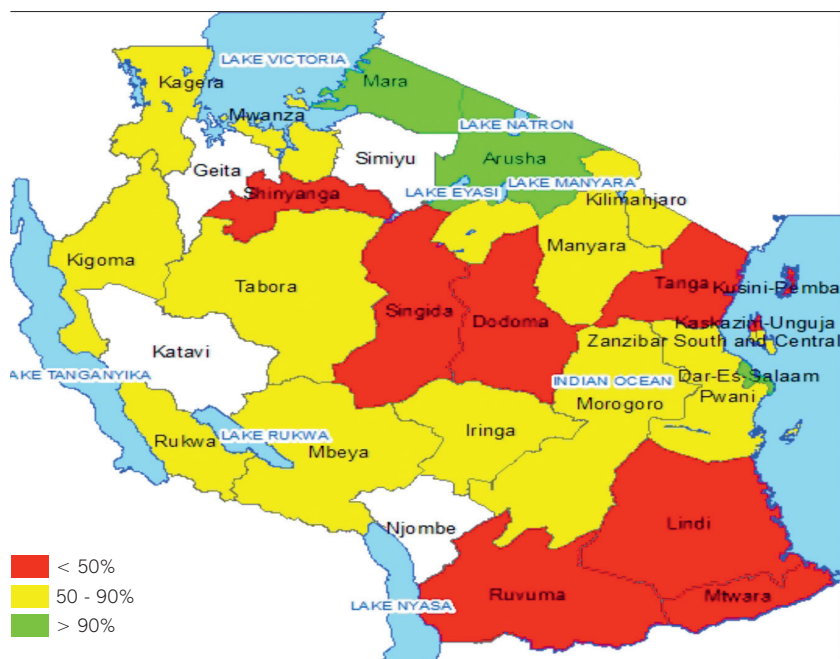
For procurement of potassium iodate (KIO₃), the Tanzania Salt Producers Association initiated a revolving fund in 1999 with support from the Government and UNICEF. In 2010, the global price of KIO₃ sky-rocketed after the tsunami disaster in Japan, and this caused this fund to be eroded, together with the inability of some small salt producers to pay back in. In response, in 2012 the government donated 8000 kgs of potassium iodate to keep the revolving fund operational.

Because medium and small-scale producers were producing a significant amount of salt, the program was expanded to support them. To ensure that salt iodization was carried out by small producers at affordable cost (salt iodization machinery entailed running costs that were too high for them), salt producers were trained on the use of hand held knapsack spray pumps. This technology enabled the salt producers, irrespective of their production capacity, to iodize their salt.

Rapid test kits for iodized salt are available in every district and have been used at the community level by trained health officers. The WYD iodine checker method has been installed in salt producing factories under UNICEF support. Also, 12 satellite laboratories have been established in remote peripheral areas by the government. These ensure that salt reaching into these areas is adequately iodized and, if not, legal action is taken. However, not all these facilities have been utilized fully and this has led to disparities in iodized salt coverage by region.

Tanzania has maintained household coverage with iodized salt at over 80% for the past 10 years. However, iodine content in salt is uneven and access to adequately iodized salt is low in eight regions where small-scale salt production is practiced, such as in Lindi (5% coverage) and Mtwara (23.4%). These regions will continue to receive attention to ensure that there is equitable access to iodated salt in Tanzania.

Availability of adequately iodized salt at household level



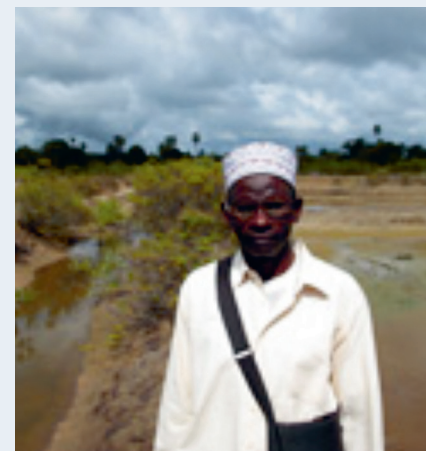
PERSONAL STORIES:

Iodizing Salt in Zanzibar

Mbarouk Hamad Yussaf, a salt farmer in Pemba island, Zanzibar, sighs with relief. He has just received a year's worth of potassium iodate and a manual sprayer. The equipment was distributed through Zanzibar's Ministry of Health program aiming for universal salt iodization on the island with the support from UNICEF. "One kilogram of potassium iodate would cost me 70,000 Tanzanian shillings (44 USD): it's a fortune!", Mbarouk Hamad Yussaf says. "Nearly every two years, I have to buy a manual sprayer, which costs me another 50,000 Tanzanian shillings (31 USD). This is more than I can afford."

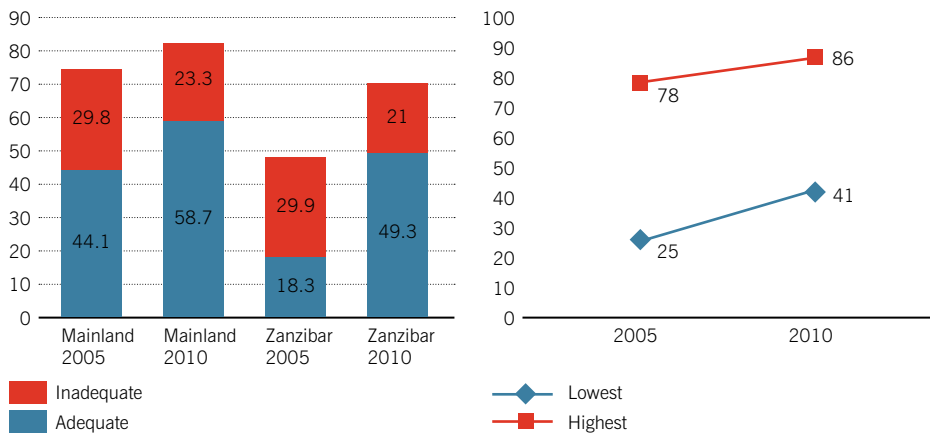
In Zanzibar, only one in two families has access to adequately iodized salt. In Pemba island, use of iodized salt is even lower. Only one in four families has access to adequately iodized salt. Yussaf's farm produces up to 50 kilograms of iodized salt per year. "We can still see the consequences of decades of using non-iodized salt in our communities. There are a lot of miscarriages among women and many children with low weight at birth" Yussaf adds. "Iodine deficiency is easily prevented if every family member uses salt that has been properly treated", says UNICEF's Representative in Tanzania, Dr. Jama Gulaid.

Mbarouk Hamad Yussaf is doing his part – he's been iodizing his salt since 2005.



Mbarouk Hamad Yussaf, in front of his salt farm on Pemba island © UNICEF/Tanzania/2013/Bisin

Figure 2A and B Coverage of adequately iodized salt by place of residence (A) and wealth quintile (B) in Tanzania. As percentages (%). Source: TDHS 2005 & 2010



Between 2005 and 2010, coverage of iodized salt increased from 73 % to 82% while coverage of adequately iodized salt (>15 ppm) increased from 43% to 59% (Figure 2A) (4). Figure 2B shows that disparities among the socio-economic groups are high but this gap has lessened between 2005 and 2010.

Iodine status in target groups

The median urinary iodine concentration (UIC)s in school-age children, women of reproductive age and lactating women are 204, 160 and 113 µg/L, indicating iodine sufficiency in these groups. However,

pregnant women had a median UICs of 136 µg/L, indicating iodine deficiency (4).

Challenges

The main challenge for the salt iodization program is weak enforcement, especially in areas where small-scale producers operate, resulting in noniodized salt being widely available. Second, although household coverage with iodized salt is above 80% nationally, the coverage of adequately iodized salt is only 47%. This shows that there is still more to be done to ensure that salt producers adequately iodize salt.

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ABOUT THE AUTHOR



Dr. Vincent Assey, a native of Tanzania, received his PhD in Public Health Nutrition from Bergen University (Norway). He is Head of Nutrition Services at the Ministry of Health and Social Welfare in Tanzania and the **ICCIDD Iodine Network Regional Coordinator for East Africa.**



Women and children benefit most from USI in Tanzania

South Africa: leading the way with 60 years of salt iodization

Pieter Jooste ICCIDD Iodine Network, Cape Town, South Africa.



These brightly colored sea water pans have been producing iodized salt near Port Elizabeth in South Africa since the 1960s.

Background

South Africa historically had widespread iodine deficiency, and endemic goiter was first reported in the country in 1927. Voluntary iodization of table salt was introduced in 1954 at a level of 10–20 ppm of iodine. But for nearly four decades there was no monitoring or reporting of its effects – it could be said that the South African scientific literature was iodine deficient during this time!

In the early 1990's, a Medical Research Council (MRC) review of the availability of iodized salt in the country indicated that less than 30% of table salt was iodized, its accessibility was uneven with little iodized salt available in rural areas, and that the low socio-economic strata had poor access to iodized salt. Salt iodization was failing. These studies led to the introduction of mandatory table salt iodization at a higher level of 40–60 ppm in December 1995.

An active and energetic coalition of

stakeholders, including the Department of Health, salt producers, UNICEF, MI, GAIN and iodine scientists, have coordinated a range of iodine activities strengthening the



Household coverage of adequately iodized salt in South Africa is >77%

salt iodization program in the country. As a compromise to accommodate technological difficulties of salt producers to achieve the required iodization level, the Regulation was revised in 2007 to allow a bigger acceptable range of 35–65 ppm.

Impact of introducing mandatory salt iodization

A 1998 national survey, commissioned by the National Department of Health, showed a national median urinary iodine concentration of 177 µg/L in school children with persisting iodine deficiency in a few areas. At the same time, a MRC national study showed that 62% of households were using adequately iodized salt containing more than 15 ppm of iodine, determined by titration. A subsequent 5-year information, education and communication program increased the salt producers' knowledge of iodine nutrition and improved the accuracy of iodization. Repeated external monitoring of the iodine



Summary

Over the years, beginning with introduction of voluntary salt iodization in 1954 at a low level, followed by mandatory salt iodization at a higher level, the South African salt iodization program evolved into a nationally successful program providing sufficient iodine to women and children. However, there is still room for improvement, particularly in increasing the coverage of adequately iodized salt at the household level to the international goal of 90% and addressing the geographical variation seen in some key indicators.

content of salt through a constructive mutual interaction with salt producers, particularly in the case of the five large producers in the country. Reaching out to salt producers by conducting titration training workshops at their iodization plants improved their internal quality control.

Measurable proof of improved accuracy of salt iodization in the country was demonstrated in a 2005 national survey: the coverage of adequately iodized household salt increased to 77% and the national median urinary iodine of school children further increased to 215 µg/L. This study also showed sufficient iodine status in adult women with a median UIC of 177 µg/L. Although some geographic variation in iodine status still exists in the country, the overall indicators suggest iodine sufficiency in the population.

Other key factors

Besides the crucial role salt producers have played in the success of the program, several other process factors are also important. These include:

Iodine in processed foods: The earlier version of the iodized salt regulation did not call for the use of iodized salt in the production of processed foods, whereas this point is ambiguous in the revised version. Despite this, even before the regulation was revised in 2007, a study showed that a third of bread bakers, margarine producers and producers of salty snack flavorants unknowingly used iodized salt in their products, despite unfounded concerns about the cost, potential ill-health effects or effects on the quality of their products.

Iodine in the drinking water: The iodine concentration in drinking water, measured in the 2005 national survey, was generally low in all of the nine provinces except for two provinces where it was moderately elevated in one province (Limpopo Province) and strikingly elevated in another (Northern Cape Province). This data explains the excessively high urinary iodine concentrations observed in children and women in the Northern Cape and partly compensates for a poor coverage of adequately iodized salt in Limpopo.

Knowledge of iodine nutrition amongst the general population: A national survey showed very low knowledge about iodine nutrition in the general population. This information strengthened the motivation for mandatory salt iodization because the general population does not appear to have sufficient knowledge to make sensible decisions about procuring iodized salt for household use or for creating a public demand for iodized salt.

Sources of household salt: Nationally 78% of the population obtain their household salt from typical food stores selling iodized salt, while the balance, 22%, obtain it via unconventional channels often selling non-iodized agricultural salt. Around 30% of low socioeconomic households obtain their salt from unconventional sources compared to less than 5% in high socioeconomic households, emphasizing the vulnerability of low socioeconomic groups to the use of non-iodized salt.

ABOUT THE AUTHOR



Pieter Jooste received his PhD from the University of Stellenbosch (South Africa). He is an iodine scientist and worked at the Nutrition Research Unit of the Medical Research Council of South Africa for more than 30 years until his retirement in 2013, the last 5 years as Director of the Unit. He is the **ICCIDD Iodine Network Regional Coordinator for Southern Africa**.

Nigeria: sustaining a remarkably successful USI program

Roland Kupka, Margaret Eshiett and Venkatesh Mannar UNICEF Regional Office for West and Central Africa, Dakar, Senegal; ICCIDD Iodine Network; Micronutrient Initiative, Ottawa, Canada.

Historically a country with endemic iodine deficiency and a national goiter rate of 20% (1), Nigeria mandated in 1992 for all food-grade salt to be iodized. With demonstrated commitments from the Government of Nigeria, the salt industry, and development partners, and subsequent refinements to its salt standards, Nigeria began to make progress towards USI. In 2005, Nigeria was the first African country to be certified as USI compliant after having achieved 98% household coverage of iodized salt, a goiter rate of 6%, and a median urinary iodine concentration of > 130 µg/l between 1999 and 2004.

But this remarkable success was followed by waning support for the national IDD-USI Taskforce. Certification may have suggested to some stakeholders that continued programmatic action was no longer needed. In 2007-08, population-based surveys using rapid test kits (RTK) continued to show high household iodized salt coverage, but the proportion of adequately iodized salt appeared to have decreased (*Figure 1*).



Sustainable USI in Nigeria allows babies to grow strong and healthy

However, it is unclear if these decreases were real or spurious, given that RTKs have limited accuracy to quantify salt iodine levels. A 2010 survey covering Nigeria's six geopolitical zones reassuringly showed that urinary iodine concentrations in a combined sample of school age children and non-pregnant women were in the adequate range (2). Furthermore, available monitoring data from factory levels continued to show near

USI, and data from distributor as well as retail levels showed that coverage of iodized salt remained ≥92%.

Drawing on the recent experiences, the national program has developed a 2013-2015 operational plan guiding actions at the levels of production, monitoring and enforcement, as well as social marketing and communications. Continued strong advocacy and leadership is needed to ensure the implementation of this plan.

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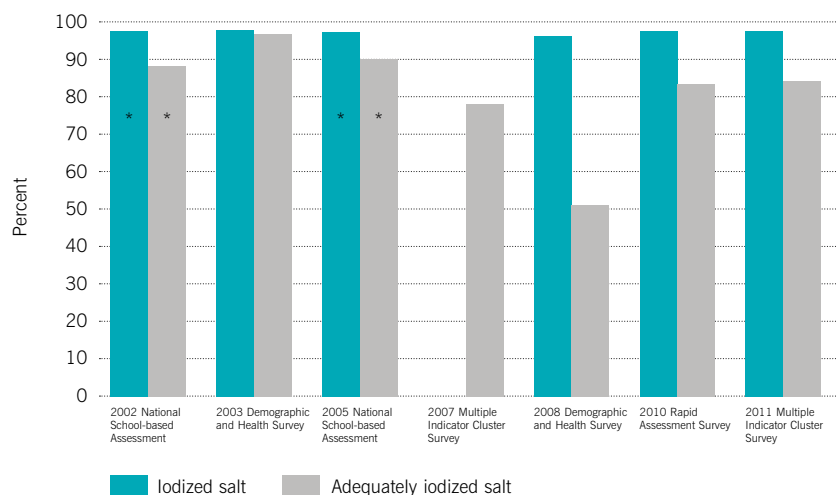
ABOUT THE AUTHOR



Roland Kupka, a native of Germany, received his D.Sc. in Nutrition and Epidemiology at Harvard School of Public Health (USA). He works in the UNICEF Regional Office for West and Central Africa and is the **ICCIDD Iodine Network Regional Coordinator for West and Central Africa**. In this function, he supports the work of UNICEF and the other ICCIDD Iodine Network partners in 24 countries.

Figure 1 Coverage of iodized salt (and adequately iodized salt) in national surveys in Nigeria 2002-2011.

*denotes that surveys used titration analyses; all other surveys used Rapid Test Kits



Burkina Faso: ensuring adequate iodine in imported salt

Banda Ndiaye, Abdoulaye Ndiaye, Robert Kargougou, Roland Kupka Micronutrient Initiative; UNICEF Burkina Faso; UNICEF Regional Office for West and Central Africa.



Better import controls mean better quality iodized salt for families in northern Burkina Faso

Burkina Faso is a landlocked country of over 16 million and an annual salt consumption estimated at about 50,000 metric tons (MT) (assuming 8g per capita daily salt consumption). About 489,000 infants are estimated to be unprotected annually against iodine deficiency. Salt consumed is mainly imported from Ghana (75%), Senegal (24%) and 1% from other countries. A number of government agencies are involved in enforcing the 2003 salt legislation that bans the distribution and import of non-iodized salt.

After an initial desk review, the Micronutrient Initiative (MI) coordinated an inclusive mapping of all key salt importers. This led an implementation plan with specific tasks assigned to each government agency charged with enforcement responsibilities, coordinated by the Ministry of Health (MOH). Standard Operating Procedures were formulated for agencies performing the inspection of salt at national borders, and at in-country distribution points. WYD spectrophotometric checkers were provided, along with training to enable officials to

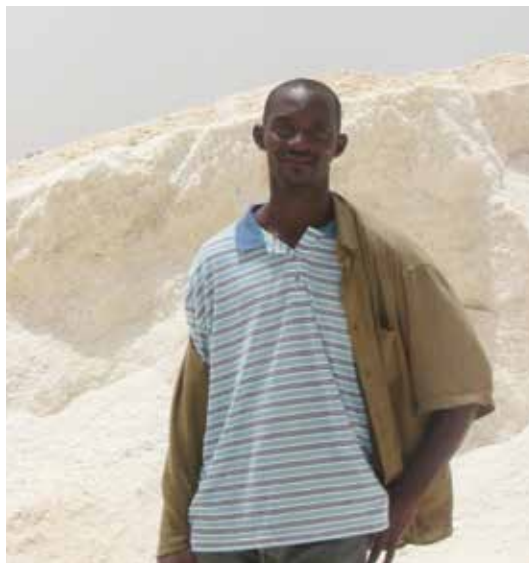
perform accurate testing of iodine concentration in salt.

Following implementation of the enforcement activities starting in June 2012 at all 18 import entry points, over 14,000 MT iodized salt were tested using WYD checkers from June to December 2012, of which none was denied entry due to inadequate iodization. Another 24,000 MT were tested from January to September 2013, of which just 70 MT (0.3%) was denied entry. All government agencies tasked with enforcement attended quarterly coordination meetings called by the MOH. The MOH also decided to include salt iodization as a key point for discussion at the December National Council and Nutrition Coordination meeting chaired by the Minister of Health and the Minister of Finance to raise the profile of the IDD program in Burkina Faso. In addition, the MOH is planning to soon carry out an IDD survey to assess the impact of recent improvements in salt iodization.

PERSONAL STORIES

Souleymane Diouf: iodized salt entrepreneur

Aynsley Morris Micronutrient Initiative, Ottawa, Canada.



Souleymane Diouf, standing proudly in front of his iodized salt

Souleymane Diouf was struggling to make ends meet in Dakar, Senegal. He decided to return to his home community of Ndiémou to try his hand at salt harvesting. As an entrepreneur, he was chosen to be part of a joint Micronutrient Initiative (MI)-Cellule de la Lutte Contre la Malnutrition-Senegal Ministry of Health microenterprise project. He received guidance during the loan process to fund his idea to increase salt production and salt iodization. He underwent business training, developed a business plan and purchased equipment and land plots to expand and improve the management of his salt production field.

His hard work paid off, as he now employs over 60 people, mostly women,

and has a thriving salt production business with multiple plots. All the salt he produces is adequately iodized and is sold in Senegal and throughout West Africa. Senegal is the most important salt producing country in West Africa. Through its partnership, MI works primarily with smaller salt processors in Senegal, those who sell their salt at a lower price or barter and trade it for other goods, often to poorer families and communities who are the most vulnerable to micronutrient deficiencies.

Producers like Souleymane are organized into formal microenterprise groups, called “Groupements d’intérêt économique”, allowing them to share the costs of iodization equipment and potassium iodate. This helps producers reduce costs, ensure continued availability of crucial supplies such as potassium iodate, gives them access to a larger market and ensures that iodization is consistent. It also provides labour opportunities for hundreds of youth from surrounding villages so they can stay in their own communities where they have support networks, rather facing the uncertainty of moving to Dakar. It’s an economic development model that makes a significant impact on health.

Souleymane says that he is most proud of being able to employ the women who work for him and to see the benefits on their families and in his community as a whole. As the business grows, his employees can feed their families, buy schoolbooks and improve their quality of life.

Togo: renewing the commitment to eliminate IDD

Théophile Ntambwe, Magali Romedenne, Mouawiyatou Bouraima, Roland Kupka ICCIDD Iodine Network; UNICEF Togo Country Office, Lomé, Togo; National Nutrition Service Togo, Lomé, Togo; UNICEF Regional Office for West and Central Africa, Dakar, Senegal.

The Republic of Togo is a country in West Africa with a population of approximately 6.7 million. The first systematic assessment of iodine deficiency disorders (IDD), conducted in 1986, showed a mean total goiter rate (TGR) of 18.4% at the national level, with severe endemic goiter zones ($\geq 30\%$ TGR) in three of the four regions not bordering the Atlantic Ocean.

In 1995, the first national data on salt iodization indicated that only 1% of households benefitted from iodized salt. In response, the government adopted a USI strategy in 1996 through an inter-ministerial decree, which rendered mandatory the iodization of salt for human and animal consumption at 80–100 parts per million (ppm) of iodine at production, 50–80 ppm at importation and 30–50 ppm at market levels. Togo does not produce salt locally and therefore meets its salt needs through importation. Until recently, almost all edible salt in Togo was imported from Senegal, but recent trends indicate that the majority of imported salt now comes from Ghana.

A 2005 survey showed a median urinary iodine concentration (UIC) among schoolchildren of 174 $\mu\text{g}/\text{L}$. Titration of household salt samples showed that 93% contained at least 15 ppm of iodine. The goiter prevalence was only 2%. The most recent 2010 coverage data indicate that 84% of Togolese households have iodized salt, but that only 31% may have adequately iodized salt. In comparison to 2005, this represents a coverage decrease and may indicate that Togo has regressed in its USI goal (Figure 1).



Before the introduction of USI, many Togolese children had decreased IQ and goiter due to iodine deficiency

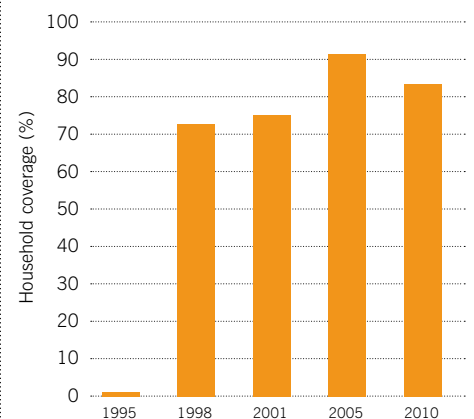
Current situation

In early 2013, the National Nutrition Service with support from UNICEF conducted a situation analysis in the country to understand the factors underlying the potential decreases in household salt iodization coverage in Togo. This analysis revealed a limited control of salt iodization at some important border points due to high turnover of custom officers as well as inappropriate technical guidance and tools for quality control of edible salt at all levels. Moreover, the roles and responsibilities of relevant parties were insufficiently defined in the previous legislation resulting in weak coordination between involved sectors.

The analysis documented that most salt is currently imported from Ghana. Salt found at local markets was generally in the form of coarse crystals, wet, and unwashed. Based on the situational analysis, it was concluded that investments have to be made to strengthen the quality control of salt at importing, wholesale, and retail levels. Concurrently, it was decided that the national salt iodization standards should be updated in line with international and regional recommendations.

As a follow up, the Ministry of Health organized a workshop in Kpalimé from 23 to 25 April 2013, with the participation

Figure 1 Trends in household coverage of iodized salt in Togo



of national representatives from the trade, customs, agriculture, academic, standards, and health and nutrition sectors. The workshop was able to develop a new guide for quality control of salt. This guide clearly defines the roles of all actors and the control procedures to follow at importation, production, wholesale, and household levels.

Secondly, the workshop achieved a revision of the national decree on iodization of salt. As part of this revision, Togo aligned itself with the recommended sub-regional salt iodization levels of 30–60 ppm of iodine at importation and 20–60 ppm at market levels.



Salt improperly stored at a market in Lomé



Togolese children observing salt testing in house-holds

Action Plan

The workshop also defined a national action plan to strengthen the program. This plan covers the following areas:

- Quality assurance needs to be strengthened at all levels of the salt chain, especially at importation, wholesale, and market levels.



USI contributes to better pregnancy outcomes in Togolese women

This will be done by empowering public hygiene officials to take on the regulatory control of salt, equipping major border entry points with iodine testing equipment, and reinforcing national research institutions to control a range of quality factors of salt.

- Togo depends entirely on imported salt and cannot win the fight against IDD without partnering with neighboring countries, especially Ghana, its main salt supplier. Inter-country discussions and meetings will be encouraged between public and private stakeholders to join forces in the fight against IDD
- Increasing knowledge and understanding of the importance of consumption of adequately iodized salt is crucial to the success for the elimination of IDD in Togo. To this end, the National Program will engage with consumer associations and media outlets.

Conclusion

The program history shows that eliminating IDD through USI is a feasible goal in Togo and should be a permanent concern of the authorities. The shift in the origin of imported salt has eroded progress made in the past. However, the Togolese government is committed to taking on the required leadership to successfully coor-

dinate the national program, nurture the required partnerships, enforce mandatory legislation, and better anticipate changes in trade. These efforts to optimize iodine nutrition are likely going to be a major contribution to unlocking the potential of Togolese children.

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Salt production and trade in Africa

Venkatesh Mannar; Rizwan Yusufali Micronutrient Initiative; Global Alliance for Improved Nutrition (GAIN).

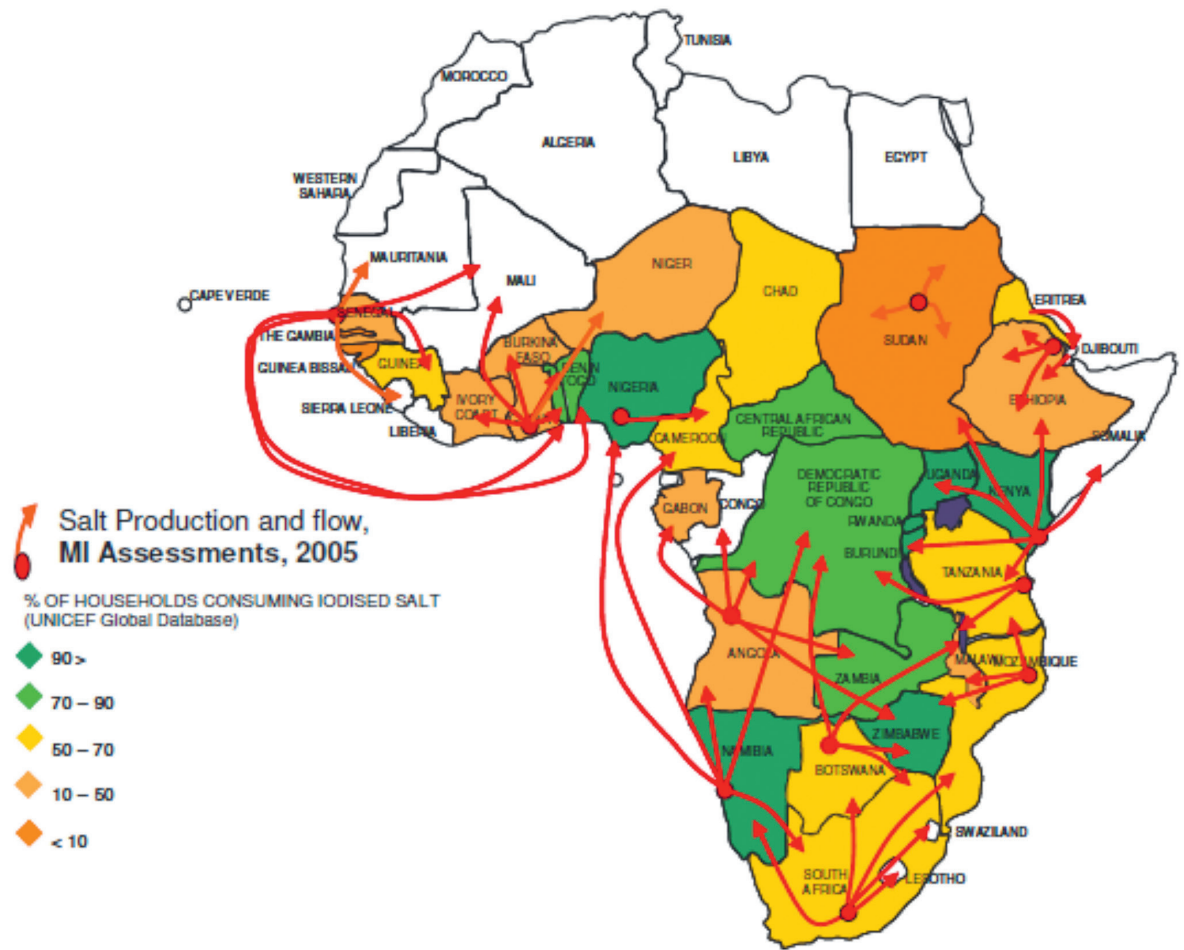


Figure 1 Main sources and the flow pattern of salt across Sub-Saharan Africa

Of around 181.5 million tons of global salt production, around 5 million tons is produced in Africa. Salt production techniques in many Sub-Saharan African countries are conventional and in some areas primitive. In Eritrea, there are two major government owned sea salt operations on the Red Sea coast and several privately-owned small and medium sized operations. In Ethiopia a cluster of small producers has grown around Afdera and Dobi in the Afar region that is

the source for the entire country. Kenya and Tanzania produce sea salt and inland lake and subsoil brine salt. Mozambique and Angola’s production is slowly gaining momentum.

There is almost no salt production in the entire Central and West African region except for Ghana and Senegal. These two countries meet the requirements of most of the region. Countries like Nigeria prefer to import their requirement of table salt from

outside the region – principally Namibia and South Africa but also from Australia, India and Brazil. South Africa, Namibia (*Photo 1*) and Botswana are the main sources of salt in southern Africa. The main sources and the flow pattern of salt across Sub-Saharan Africa are shown in Figure 1. This prompts the development of a regional strategy to ensure that salt is iodized at the production sources.

The following key challenges need to be addressed to move towards USI across the continent:

- To harmonize cross border trade in iodized salt, there is a need for governments across sub-regions (at a minimum) to agree on uniform iodization standards, removing trade barriers, build capacity and monitor programs.
- International agencies should continue advocacy at the highest political level, and capacity building of national and regional bodies.
- All producing countries must adequately iodise salt produced in their country with pre-shipment certification and entry port authentication. Salt producers should organize themselves as associations to effectively coordinate the USI efforts.
- In salt-importing countries legislation backed with adequate border control is important. Importing countries can apply pressure on salt producing countries to supply iodized salt.
- Where there is local production, competition in the market through abundant supply of lower grade salt results in lower prices of salt for producers which creates pressure to cut costs even by small fractions and iodization is usually the first cost cutting step.
- The cost of transportation often overshadows iodization costs and therefore small producers are able to compete only in local markets with non-iodized salt. Weak transport infrastructure also favours informal distribution networks. This creates opportunities for unscrupulous traders to collect salt from small producers and reach markets, which are not accessible by producers.
- There are regional barriers to trade which sometime prevent growth in the salt industry. This is seen in West Africa where the trade between Anglophone and Francophone countries is restricted through economic policies and this limits the marketability of salt produced in Senegal and Ghana.
- Iodization technology is not a standalone step. It should match the production setup and be integrated into production process. Producer ownership has to be created through a contribution by the producer for the units or technical services. When paid for, it will be maintained



Photo 1: These colorful salt pans in Namibia supply iodized salt to many African countries

and used with responsibility.

- Small producers can form collectives and make their business more profitable, which in turn leads to growth. Cooperatives need a horizontal support model that includes training and business development services like microfinance, branding and marketing of salt, improved resource utilization and reduced wastage.
- An assured and consistent supply of potassium iodate is key to the success of an iodized salt program.

Every country has own unique system of salt production, distribution and consumption. Angola, Botswana, Ethiopia, Ghana, Mozambique, Namibia, Senegal, South Africa, Sudan, and Tanzania are the ten key salt producing countries in Sub-Saharan Africa. The salt produced in these countries has a wide reach and potential to make the greatest impact on iodized salt coverage in the region.

Engaging small-scale salt producers

Rebecca Spoher, Greg Garrett Global Alliance for Improved Nutrition (GAIN), Geneva, Switzerland.



Small scale salt production in Djegbadji, Benin. Artisanal salt farmers here dig off the top layer of soil near their homes then filter water through the dirt to draw out salt. They later boil the water to collect the salt. ©Sunday Alamba.

One common constraint to national USI programs is the supply of salt by scattered small-scale producers. Often small processors cannot afford inputs needed to adequately iodize their salt. And governments often do not have the resources to regulate a fragmented industry.

GAIN piloted an approach to facilitate viable salt iodization among small-scale salt producers. The pilot demonstrated that as long as strong financial and technical support is provided, issues around iodization for small-scale artisanal salt farmers that typically lack adequate iodizing technology and quality assurance measures can be addressed. However, the pilot indicated that long-term financial viability among artisanal farmers is difficult to achieve after financial and technical support is withdrawn, especially where regulatory monitoring is not in place.

In Ghana, small-scale production covers up to 40% of the market of 400,000 MT/year. From 2008 – 2012, GAIN, as part of the GAIN-UNICEF USI Partnership Project piloted a model in Nyanyano, Ghana to organize small-scale producers into a collective “Salt Bank Cooperative” (SBC). The Nyanyano SBC was established in 2010 with 43 members, an elected board, and 3 full time employees. The SBC purchased salt from its members in order to process, iodize, quality assure, package, and sell through existing market channels, and redistributed sales surpluses back to members.

GAIN provided the SBC with a working capital loan and extensive training. This resulted in the establishment of the only iodization facility in the region and only iodization cooperative in Ghana, strong awareness and know-how of iodization in

Nyanyano, and in the production and sales of iodized salt. However, despite this success, the NSB did not reach financial viability, which according to one of the business models, had been forecasted for September 2013. Sales margins of only 7.9% were too small to cover the operational costs of the bank and it functioned with losses. The pilot project demonstrated several key learnings and recommendations which can be applied in other contexts when working with small-scale salt iodization projects:

- Do not restrict the model to a cooperative if another organizing approach works better.

If a cooperative is agreed, ensure the concept is fully embraced by all members.

- Understand the market environment, existing salt trade flows, consumer preferences, and geographic location.
 - Establish a business plan jointly between investors, SBC management, and the board. Define a competitive advantage rather than attempting a monopoly.
 - Start small, then scale up fast in order to first prove the business model before locking in working capital in excess machinery.
 - Train members on finances, cooperative issues, and general business management.
- The Nyanyano Salt Bank Cooperative pilot demonstrated that iodization is among small-scale salt farmers is possible with continued financial and technical support.

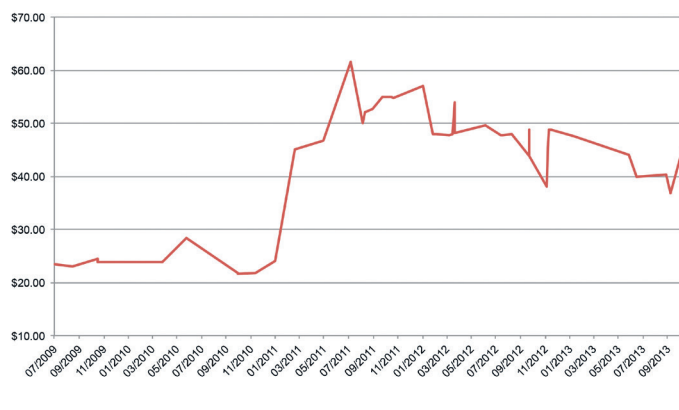
Sustainable supplies of potassium iodate for Africa

Greg Garrett, Roman Przewlofsky Global Alliance for Improved Nutrition, Geneva, Switzerland.

Establishing sustainable supplies of potassium iodate (KIO₃) is critical for the viability of national salt iodization programs. Various approaches can be utilized which are tailored to the national context. Prices of KIO₃ have fluctuated greatly over the last few years (*Figure 1*).

Governments and donors continue to donate or subsidize KIO₃ for numerous national programs worldwide. In order to ensure a sustainable supply of KIO₃ which can absorb price peaks and which are primarily financed by industry, various approaches have been established.

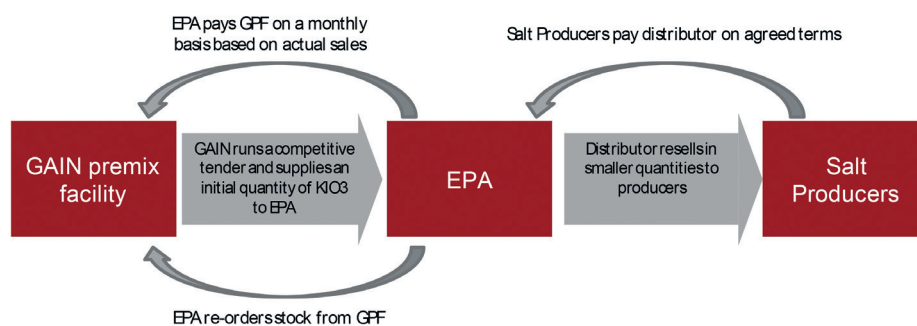
Figure 1 Price trends of potassium iodate.
Source: GAIN Global Premix Facility, since 2009



A privately operated fund for KIO₃ supply in Ghana

In Ghana, in response to critical shortages in the supply of KIO₃ and to end ongoing dependence on donor funds, GAIN established a revolving fund for the procurement and distribution of KIO₃. GAIN strengthened Environmental Processing Associates (EPA) to operationalize a fund using a consignment model designed by the GAIN Premix Facility (GPF). EPA now regularly supplies small- and medium-scale producers

Figure 2 Ghana revolving fund for potassium iodate



with KIO₃ adequate for their production volumes. The costs of KIO₃ are fully recovered via sales to industry, including a small management fee, which is used to pay for storage, distribution and to replenish the fund with fresh stock. Since its establishment in 2011 the fund has distributed 6.5 MT of KIO₃ or 145 kg per month, enough to produce

21,000 MT of adequately iodized salt per year. The primary success factors of this supply solution are that KIO₃ pack sizes are tailored to small- and medium-scale producers, delivery to the production sites are done by the agent, aggregated demand is forecasted regularly, and long-term customer relations are built due to steady supply.

A government-controlled fund for KIO₃ supply in Ethiopia

Since early 2012, in Ethiopia, GAIN has

provided technical assistance and KIO₃ seed stock to the Ethiopian government to establish a KIO₃ cost recovery system. It fully replaced a donation/subsidy based system in January 2013. The annual turnover of the fund which has been hosted by the Ethiopian Pharmaceutical Fund and Supply Agency (PFSA) totals 24 MT, enough to ensure salt is iodized for 84 million Ethiopians. This new scheme is working well evidenced by the fact that the government has submitted an order for the procurement of 14 MT of new KIO₃ in mid-2013 using funds collected from salt producers.

Lessons Learned

A well-designed revolving fund for KIO₃ transforms donation-based systems into sustainable business-oriented models. Exemptions of tax and duties are important to free fund operators from unnecessary burden. This has been achieved with registering for concessionary tax rates in Ghana and exemptions due to government control of the fund operator in Ethiopia. Most importantly, in order to ensure KIO₃ systems are viable in the long-term, effective regulatory monitoring of salt iodization laws is critical.

Bouillon cubes carrying iodine in West Africa

Rebecca Spohrer, Banda Ndiaye, Abdoulaye Ndiaye, Roland Kupka Global Alliance for Improved Nutrition, Geneva, Switzerland; Micronutrient Initiative, Dakar, Senegal; UNICEF Regional Office for West and Central Africa, Dakar, Senegal; ICCIDD Iodine Network

In industrialized countries, industrially-processed foods account for as much as 75% of dietary salt intake, and using iodized salt in those foods can improve population iodine status. In West Africa, processed foods are likely to provide increasing amounts of dietary salt, especially in urban areas (1). Furthermore, seasoning products in the form of bouillon cubes and powders are increasingly popular. To illustrate, in Senegal, the estimated daily consumption of stock cubes per person is 8.6 g in urban and 4.3 g in rural areas (2). In Cameroon, 96% of households use stock cubes at least once a week with an average weekly consumption frequency of 14 times (3). These products are composed of 50-70% salt alongside dehydrated stock, solid vegetable fat, flavor enhancers, and spices. To better understand the role of these products as vehicles for iodine in West Africa, 13 different brands/flavors of bouillon cubes and powders pro-

duced by five manufacturers in Senegal were collected and tested for iodine content and other variables of interest.

All of the samples tested were found to contain iodine, ranging from 1.3 to 20.0 mg/kg. Five brands from three manufacturers contained iodine over 10 mg/kg; this translates into 100 µg iodine per 10 g cube. Results on moisture content and iodine losses during storage and cooking are being analyzed. Preliminary results suggest that after 6 months in humid storage conditions, average iodine retention remained high.

In interviews undertaken with manufacturers, the producers indicated that they have used iodized salt since their involvement in stock cube manufacturing (1997–2008) in order to comply with legislations and company norms. All five producers reported procuring only iodized salt, although only three claim iodine content on their packaging. Three producers test their

procured salt using rapid test kits or external laboratories. No producer added iodine separately or as a replacement for using non iodized salt.

These analyses indicate that bouillon cubes are important sources of iodine in Senegal and possibly other West African countries. Thus careful monitoring of the quality of iodized salt supplies to bouillon cube manufacturers is needed.

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Bouillon cubes and seasoning powders used by many West African households contain iodine

Join the exciting USI and IDD symposia at the Micronutrient Forum meeting in Addis Ababa, Ethiopia June 2-6 2014

Rethinking communication for salt iodization

The final mile to achieving USI in Africa will cross a different landscape than initial efforts that established USI. Communications strategies in iodine programs will need to adapt to a challenging new environment.

Jack Bagriansky, Ruth Situma UNICEF, New York, USA

Reaching the remaining African households that do not yet have access to iodized salt will require new communications strategies that fit the changing USI program environment. To date, successful USI programs were mainly driven by national regulation which motivated larger producers, who usually produced refined packaged salt sold disproportionately in urban markets. These companies typically respond to national regulations and their consumers are relatively easy to reach via traditional marketing channels. But the work ahead lies mainly among smaller informal, un-registered and often seasonal enterprises, typically beyond the reach of government food control. In this very different supply chain, past messages focusing on industry compliance with regulations, corporate social responsibility, value addition or expanding market share may not be appropriate.

In countries adopting decentralization, local government, especially in salt producing and trading areas, emerges as a key channel for enforcement of national regulations, capacity building and raising consumer awareness. The work ahead involves securing their commitment and developing local options for their participation. In markets with limited penetration of iodized



Communicating the benefits of USI on child health remains a key program message ©UNICEFNYHQ2010

salt, consumers will be lower income, more rural, less literate and more difficult to reach. In most cases, they purchase non-iodized or poorly iodized salt not because they are unaware but simply because distribution systems do not provide affordable high-quality iodized salt.

Sustaining the remarkable USI achievements in Africa will be a challenge. Past communications to establish USI targeted government to secure policy commitments, industry to change production and business practices and consumers for “product

launch” to ensure acceptance. Future communications to sustain USI will require a more targeted and strategic, albeit less intensive communications approach. Clear recognition of the contributions of key government and industry stakeholders can sustain their commitments as well as ensure new players are aware of USI. And as the market and consumer habits change to include increasing consumption of processed foods, opening new channels to the food industry will be required to ensure their products use only iodized salt.

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For further details about the IDD Newsletter, please contact: Michael B. Zimmermann, M.D., the editor of the Newsletter, at the Human Nutrition Laboratory, Swiss Federal Institute of Technology Zürich, iccidd.newsletter@hest.ethz.ch.

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