



>> NIGERIA

UNIVERSAL SALT IODIZATION ASSESSMENT: TOWARDS A SUSTAINABLE ELIMINATION OF IODINE DEFICIENCY

Review Mission 27 November – 3 December, 2005



The Review team gratefully acknowledges the participation of their Nigerian Counterparts and the support and assistance of Government of Nigeria and UNICEF Nigeria in conducting this assessment

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¹ This report prepared by Dr. J. Untoro, Network for Sustained Elimination of Iodine Deficiency, based on inputs received from the external assessment team and national partners during the USI review mission, November 27-December 3, 2005.

>> Acronyms

CDPA

Community Development and Population Activities

DHS

Nigerian Demography & Health Survey

FME

Federal Ministry of Education

FMOH

Federal Ministry of Health

GMP

Good Manufacturing Practices

IDD

Iodine Deficiency Disorder

ICCIDD

International Council for the Control of Iodine Deficiency Disorders

IDD-USI TF

Task Force for Iodine Deficiency Disorders and Universal Salt Iodization

LGA

Local Governments Administration

MICS

Multiple Indicator Cluster Surveys

NAFDAC

National Agency for Food and Drug Administration and Control.

NBS

National Bureau of Statistics

NPC

National Planning Commission

NPHCDA

National Primary Health Care Development Agency

SON

Standard Organisation of Nigeria

SUBEB

State Universal Primary Education Board

UI

Urinary Iodine Concentration

UNICEF

United Nations' Children Fund.

USI

Universal Salt Iodization

WAPF

West African Popular Foods

WHO

World Health Organization

>> Introduction

An external review team² visited Nigeria on behalf of the Network for Sustained Elimination of Iodine Deficiency from 27 November until 3 December 2005 to review salt iodization programme through a review of documentation, interviews and discussions with representatives in government, academia, salt industry and food processing industry, the media and consumer organizations concerned with the national efforts. The agenda of work by the team members was coordinated by Dr Isiaka Alo of UNICEF Nigeria together with the Ministry of Health, Ministry of Education, National Agency for Food & Drug Administration and Control (NAFDAC), Standard Organization of Nigeria (SON), and WHO office in Nigeria. Annex 1 provides the details of the agenda of the review mission.

In anticipation of the review, UNICEF in collaboration with the Government of Nigeria contracted a consultant to prepare a detailed report, which in the team's view presented an overview of history and situation analysis of salt iodization in Nigeria.

A summary of the USI assessment against the programme indicators suggested by ICCIDD/UNICEF/WHO is presented in Table 1.

A list of key publications on IDD elimination in Nigeria is given in References section of this report.

Table 1. Summary of Country Program Assessments

Programmatic indicators	Country program situations	Action Plans to Sustain USI
1. Evidence of political commitment to USI and elimination of IDD	<p>There is a strong political commitment from the Government of Nigeria to sustain elimination of IDD.</p> <ul style="list-style-type: none"> • Regulations • Enforcements <p>SON at production level and NAFDAC at distributor, wholesale and retail levels.</p> <ul style="list-style-type: none"> • Micronutrient Day celebration 	<p>Securing political commitment is essential to sustain USI.</p> <p>Political commitment must be periodically renewed through re-advocacy.</p> <p>Engendering financial sustainability for USI.</p>
2. An effective functional national body (council or committee) responsible to government for the national program. It should be multidisciplinary with a chairman appointed by the Minister of Health.	<p>Public-Private-Civic Partnership to eliminate iodine deficiency, USI Task Force, provides practical and effective mechanisms to raise and sustain commitments to IDD elimination.</p> <p>The national USI TF with a clear defined roles, plays a major, driving role in demanding and reviewing monitoring information/data for planning and promotion of collaborative work.</p>	<p>Maintain the USI Task Force, an effective functional national multi-sectoral coalition.</p> <p>As the IDD Task Force 's activities are mainly related to USI interventions, the IDD TF might be merged with USI TF into IDD-USI TF with a clear coordination point and a National Officer in the Federal Ministry of Health (FMOH).</p> <p>The National USI Task Force can also provide a mechanism for support in preparing an official position and national progress reports in global forum and international meetings.</p>

² An external team consisted of Prof Dan Lantum (ICCIDD Regional Coordinator for Africa), Mr. Lorenzo Locatelli-Rossi (Salt Consultant) and Dr. Juliawati Untoro (Network Secretary) visited Nigeria from 27 November to 3 December, 2005.

Programmatic indicators	Country program situations	Action Plans to Sustain USI
3. Appointment of a responsible executive officer for IDD elimination program.	<ul style="list-style-type: none"> Each institution assigned their staff for USI/IDD activities. A national officer in charge for IDD/USI is being considered. Data has been shared through USI TF and an integrated database system is being planned. 	<p>A national officer would be needed:</p> <ul style="list-style-type: none"> To ensure on-going compilation of USI and IDD database. To assist the USI task force activities and national USI programs.
4. Legislation or regulations for USI, ideally covering both human and agricultural salt.	<ul style="list-style-type: none"> The Nigerian Industrial Standards for Food Grade Salt (NIS: 168/1992) specified that: food grade salt shall be fortified with iodine using potassium iodate and the minimum level of iodine ex-factory/ at port of entry of 50mg Iodine/Kg and at retail or household end of 30mg Iodine/kg. Enforcements by SON and NAFDAC. 	Use of iodized salt for animal consumption should be considered.
5. Commitment to assessment and reassessment of progress towards elimination with access to laboratories able to provide accurate data on salt and urinary iodine.	<p>Institutionalized Monitoring system</p> <ul style="list-style-type: none"> Iodized salt data from SON (factory level), NAFDAC (Distributor and Retail level) and FME (Household level) UIC data from FMOH and FME 	<p>Integrating updated database on iodized salt and UIC/TGR into a National Nutrition Information System Database.</p> <p>Regular assessment on iodized salt coverage and urinary iodine concentration towards a sustainable monitoring plan for USI in Nigeria.</p> <p>Strengthen capacity of current UIC laboratory and build relationship with an independent reference laboratory.</p>
6. A program of public education and social mobilization on importance of IDD and consumption of iodized salt.	<ul style="list-style-type: none"> Micronutrient Day celebration. USI/IDD advocacy by NAFDAC on TV and radio. Branded advocacy and promotion by salt industry (Unilever). IDD/USI is an integral part of National Education Curriculum. 	Long term strategic communications plan with objectives along with roles and responsibilities of implementing organizations in both public and private sectors should be developed.
7. Regular data on salt iodine at the factory retail and household levels.	<p>Institutionalized Monitoring system:</p> <ul style="list-style-type: none"> SON: Factory level. NAFDAC: Distributor and Retail level. FME: Household level. 	<p>Annual National assessment survey on production, marketing and consumption of iodized salt, towards a sustainable monitoring plan for USI in Nigeria.</p> <p>Expand FMOH sentinel site system (SSS) to represent a national situation.</p>
8. Regular laboratory data on UIE in school age children with appropriate sampling for higher risk areas	<ul style="list-style-type: none"> UIC data from School Children. The last UIC data is available from 2004/5 national survey. 	<p>Regular national assessment survey on UIC every 2 or 3 years.</p> <p>UIC is a more reliable indicator of iodine status in a population and should replace the TGR.</p> <p>UIC should be considered as part of FMOH Sentinel Site System and or part of the DHS. There have been on-going dialogues with National Bureau of Statistics (NBS) to include UIC as part of DHS.</p> <p>Reporting Iodine Nutrition status regularly to public (including the international community).</p>



Programmatic indicators	Country program situations	Action Plans to Sustain USI
<p>9. Cooperation from the salt industry in maintenance of quality control.</p>	<ul style="list-style-type: none"> ● Inspections at port, factory and distributor level consistently indicate 97-100% proper iodization. ■ Regular factory visit by SON (2-3x/year) to validate compliance with regulation ■ NAFDAC also monitors compliance at the port and distributor/market level, and routinely at the factory ● SON and NAFDAC have revised the packaging requirement of Food Grade Salt Standard. ● Use of the USI logo as part of the USI compliance. 	<p>Salt Industry plays a key role in sustaining Universal Salt Iodization in Nigeria. Cooperation from salt industry in Quality Control should be maintained.</p>
<p>10. A database for recording of results of regular monitoring procedures particularly for salt iodine, UIE and if available neonatal TSH monitoring with mandatory public reporting.</p>	<ul style="list-style-type: none"> ● USI monitoring data are available from SON, NAFDAC, FMOH and FME. ● NAFDAC regularly releases its findings to the public (Newsletter, Website and Newspaper). 	<p>Reporting IDD program status regularly to public.</p> <p>Integrating updated database on iodized salt and UIC/TGR into a National Nutrition Information System Database.</p>

>> Iodine nutrition and household iodized salt consumption

Iodine deficiency disorders have historically been a significant problem in Nigeria with a total goiter rate (TGR) of 20% and coverage of iodized salt of only about 40% in 1995. As part of its effort to eliminate these disorders, which have a serious impact on child development, Nigeria has adopted the USI strategy of partnership with private sector, intensive mass communication, high-level advocacy and technical interventions, building upon actions in recent years.

The efforts have resulted in a remarkable achievement. Since 1998, Nigeria has ensured that more than 90% of all salt was adequately iodized at the household level and median UIC of the population was above 100 mg/L (Table 2). Sustainable elimination of iodine deficiency disorders in Nigeria remains a work in progress but achievable. There have been series of assessment over the years and it is important that the lessons learned of the Nigeria to be documented.

Table 2. Iodine nutrition status and coverage of households iodized salt consumption (1995-2005) in Nigeria.

Year	Household iodized salt consumption and urinary iodine concentration
1995	Household iodized salt consumption 40%, TGR 20%
1998/9	Household iodized salt consumption: 98%; TGR: 11%, Median UIC: 143 ug/L (Sentinel survey)
2001	Household iodized salt consumption: 98% Multiple Indicator Cluster Surveys (MICS)
2002	National Survey: Factory: 100% salt samples contained iodine at 50-70ppm Distributor: 100% salt samples adequately iodized Retail: 98% of salt samples contained adequate iodine. Household: 98.3% of salt consumed is iodized. However only 88.6% is adequately iodized; Median UIC school children: 159 ug/L
2003/4	Household iodized salt consumption: 97% (Nigerian Demography Health Survey) (DHS)
2005	Household iodized salt consumption: 98%. Median UIC school children: 130 ug/L

>> Political commitment

LEGISLATION MANDATING IODIZATION OF ALL EDIBLE SALT IN NIGERIA

To ensure effective iodization in Nigeria, the Federal Government of Nigeria passed an Act, mandating the iodization of all edible or table salt. To provide legal backing for the effective regulation, SON produced the Nigerian Industrial Standard for Food Grade Salt, NIS: 168/1992, regulating salt iodization using the Potassium Iodate (KIO₃) as a fortificant. In addition, NAFDAC issued the Food Grade (Table or Cooking) Salt Regulations No. 14/1996, which stipulates that Table Salt shall be iodized and have a minimum level of iodine ex-factory/ at port of entry of 50mg Iodine/Kg and at retail or household end of 30mg Iodine/kg.

	As Iodine	As Potassium Iodate
At factory/Port of entry	50mg/kg	84.3mg/kg
At retail level	30mg/kg	50.5mg/kg

The Nigerian Standard for Food grade salt required that not less than 50mg/kg of iodine fortification level of salt at factory/Port of entry, at retail, must contain 30mg/kg, and that its essential composition must be 98.6 percent minimum of sodium chloride content and 1.0 percent maximum moisture content. As part of the standard, the salt is also required to be packed in smaller pack sizes of 250g, 500g and 1kg in high density polyethylene pouch.

In addition to the registration number on salt bags indicating that the product has complied with the national standard, NAFDAC also introduced a logo that shows the salt is iodized. The logo is a map of Nigeria in green, circled by black and three white human figures inserted in white (Figure 1). NAFDAC has currently advocated for a preference to smaller packs of salt than a big bag of 25 kg to ensure limited iodine loss during the sale and distribution. Penalties, including sealing up/closing down of factory, seizure of products for destruction, and fines and/ or imprisonment, have been part of the enforcement strategies for non-compliant salt industry.

Figure 1. National iodized salt logo

The Essence Of Life



ENFORCEMENT OF THE USI REGULATIONS

Despite of the strict enforcement of the regulation, NAFDAC recognized a lot of problems existed against sustaining 100 percent USI at all levels in Nigeria. The problems included production, sale and consumption of non-iodized locally (cottage) produced salt, which have been identified in at least four iodine deficient endemic areas of the country, including Ebonyi, Nasarawa, Benue and Taraba States, and re-bagging of Industrial Salt for sale as table salt, using empty bags of iodized salt. Others include smuggling of non-iodized salt through unofficial routes into the country, improper handling and storage of iodized salt leading to loss of iodine content and cross-contamination before reaching the point of consumption, and slackness or non-sustenance of social marketing of iodized salt.



As part of the implementation of the regulation, NAFDAC has destroyed fake products including non-iodized salt, valued at \$60million (about N 8 billion) in the last four years³. This enforcement was part of the agency strategies to create conducive environment for genuine local and foreign investors. Some of the strategies to ensure adequate and sustainable salt iodization program in the country include:

- Designation of specific ports of entry for regulated products;
- Clearance with NAFDAC before banks could process importation documents;
- Capacity building;
- Requirement that only duly registered NAFDAC products are on sale in Nigeria ;
- Stopping the importation of fake products (non iodized-salt) at source and;
- Public enlightenment.

RECOMMENDATIONS

The Nigerian experience shows that securing political commitment is essential to sustain USI and this must be periodically renewed through re-advocacy. This political commitment should also be supported by sustained budget allocation for USI activities.

³ Vanguard June 01, 2005 <http://www.vanguardngr.com/articles/2002/business/june05/b101062005.html>

>> National Coalition: A Partnership with Salt Industry

The Federal Ministry of Health, along with National Agency for Food & Drug Administration and Control (NAFDAC), Standard Organisation of Nigeria (SON) and UNICEF Nigeria after many consultative meetings with salt manufacturers, importers and distributors embarked on Universal Salt Iodization programme in 1993, as a means of introducing iodine into the diet.

In 2002, an official multi-sectoral IDD-USI Task Force was established, with the support of UNICEF Nigeria, with a secretariat at SON and participation by FMOH, FMOE, NAFDAC, National Primary Health Care Development Agency (NPHCDA), National Planning Commission (NPC), salt producers, the media, consumer organization and the Micronutrient Initiative (MI). The Task Force has defined

roles and responsibilities for each member as described in Table 3. The Task Force member institutions routinely monitor the market place through product registration, surveillance and inspection activities. It plays a major, driving role in demanding and reviewing monitoring information/data for planning and promotion of collaborative work. The results of the monitoring are shared with public. In addition to the monitoring, the Task Force also holds consultative meetings and workshops, public education and social marketing activities to ensure communications among partners and sustain awareness. This Public-Private-Civic partnership to eliminate iodine deficiency provides practical and effective mechanisms to raise and sustain commitments to IDD elimination in Nigeria.

Table 3. Roles and Responsibilities of USI/IDD Task Force Members

Institutions/partners	Roles and Responsibilities
National Planning Commission	Planning organ of government
Federal Ministry of Health Community Development and Population Activities (FMOH, CDPA)	Policy formulation, monitoring and assessment of impact of program
Standard Organization of Nigeria (SON)	Setting of standards, and compliance monitoring at factory level/port of inspection.
National Agency for Food & Drug Administration and Control (NAFDAC)	Routine factory inspection; monitoring at distributor, wholesale and retail levels, with enforcement at factory level.
National Primary Health Care Development Agency (NPHCDA)	Monitoring of iodized salt consumption and iodine status at household level
Federal Ministry of Education (FME)	Federal Ministry of Education (FMOE) Monitoring iodized salt consumption status and provide IEC on IDD/USI to school children.
Salt Industries	Ensure salt iodization.
Consumers	Advocate consumer interest/ create demand for iodized salt
International development agencies	Technical assistance

RECOMMENDATIONS

- Maintain the USI Task Force, an effective functional national multi-sectoral coalition.
- As the IDD Task Force's activities are mainly related to USI interventions, the IDD TF might be merged with USI TF into IDD-USI TF with a clear coordination point and a National Officer at FMOH.
- The National USI Task Force can also provide a mechanism for support in preparing an official position and national progress reports at global forum and international meetings. International collaboration is important in maintaining a sense of accomplishment and national honor in successfully addressing problems of global significance.



>> Information, education and communication

Social marketing and education have been part of overall IDD strategy in Nigeria. Communication through health education, schools, mass media and innovative channels is done in partnership with private sector. The use of an identifiable logo for iodized salt generates consumer attention.

IODIZED SALT IN SCHOOL PROGRAM: THE POWER OF EDUCATION TO FIGHT IODINE DEFICIENCY IN NIGERIA.

School nutrition programs and services help link the resources of the education and nutrition sectors in an existing infrastructure, the school. The school system in most developing countries including Nigeria is generally well structured and there is an extensive skilled workforce (teachers and administrators) that already works with the local community. School based health and nutrition services often include screening for health problems, providing simple and easy to advice about nutrition/health. As such, school health and nutrition services offer an effective way of improving the nutritional status of children, especially when they are supported by school health policies and skills based health education.

The problem and cause of iodine deficiency and the importance of iodized salt have been part of the primary and secondary school curriculum in Nigeria. The results so far have shown that this is a powerful approach to eradicate iodine deficiency. In addition to the school programme, the National Agency for Food and Drug Administration and Control (NAFDAC) in partnership with the private sector conducted a national secondary school essay contest on USI and ID elimination and the First Lady of Nigeria presented awards at the grand final of the contest.

ANNAPURNA: A PUBLIC PRIVATE PARTNERSHIP FOR PUBLIC EDUCATION

In 1999 Unilever Africa Regional Group created a separate business unit called Popular Foods to target mass-market consumers with nutritious foods at affordable prices. One of their first goals was to introduce Annapurna, a refined

iodised salt sold in small sachets to help preserve the iodine – a product originally developed for the Indian market by Hindustan Lever.

As part of the marketing campaign to introduce the products to the market, Unilever provides a Consumers/ Public education about the benefits of the new product, so advertisements on the local television and radio were organised to provide information about the brand consistent with the health information supplied by Federal Ministry of Health, NAFDAC and SON. The Annapurna awareness project in collaboration with the government and UNICEF includes participation of the traditional leaders and visiting schools especially in the rural areas. The aim of the program was to educate school children who, in turn, will educate their parents on the importance of using iodised salt. So far, this partnership to promote iodized salt has been extremely productive. A big company such as Unilever can make the market competitive and it's been very useful for the supply and demand creation for iodized salt.

RECOMMENDATIONS

- Long term strategic communications plan with objectives along with roles and responsibilities of implementing organizations in both public and private sectors should be developed.
- Insertion of essential knowledge on iodine nutrition in the training of medical practitioners and other health personnel.

>> Monitoring iodized salt and iodine nutrition

Nigeria has introduced a decentralized and institutionalized adherence monitoring and enforcement strategy at factory, wholesale, retail and household levels; coupled with intensive generic social marketing and sensitization at all levels, to increase supply and stimulate demand and consumption of adequately iodized salt amongst the population.

SON and NAFDAC have compiled regular national records of salt coverage at the factory, distributor, retailer and household levels. Both SON and NAFDAC offer titration capacity for both primary analysis and back up of qualitative iodine test kits used in the field. SON also provided inspections at ports of entry. Salt is tested in the field by NAFDAC inspectors with qualitative iodine field test-kits and failed samples are taken to NAFDAC Labs for confirmation by titration analysis. As part of its role to monitor the programme, NAFDAC regularly releases its finding to the public (Newsletter, Website and Newspaper).

While NAFDAC acknowledges some lapses in data gathering and some statistical inadequacies in the survey methodology in 2002 and 2003, these were reportedly corrected in the 2005 survey. However, all surveys are extensive covering more than 600 Local Government Administrations (LGAs) in 2002 and 2003 and improving to 771⁴ LGAs in the first 6 months report of 2005. Since 2002, approximately 20,000 salt samples have been analyzed.

Monitoring household access to quality iodized salt is via national sample of primary schools, with children bringing salt samples to class for testing. In cooperation with the Ministry of Education (FMOE), NPHCDA conducted the initial survey in 2002, but could not sustain the effort in 2003 assessment due to logistical and financial constraints. Subsequently, FMOE joined the IDD-USI Task Force and agreed to sustain annual assessments at primary schools in close collaboration with State Universal Basic Education Boards (SUBEB). The 2002 and 2005 surveys randomly selected 30 primary schools in each of the country's 6 geographic zones. In each school, 7 salt samples were randomly selected from samples brought by the students

for testing with iodine field test kits - with a selected sub-sample forwarded to NAFDAC labs for titration analysis. The 2005 school sample indicated an average of 90.5% properly iodized salt with a range from 83-98% across the 6 zones. These reinforcing results further validated the 2003 Nigerian Demographic and Health Survey which found 97% adequately iodized salt in households with only minor variation of 1-2% among urban and rural households. Preparations for the next school survey to be released in 2006 are ongoing, with some zones already reporting results.

Urinary iodine concentration has been assessed every three years since 2002 and the last survey in 2005, FMOH and FMOE with technical support from University College Hospital completed analysis of a substantial survey including more than 10,000 samples from primary school children for urinary iodine. FMOH-CDPA is working on several fronts to strengthen the nutrition surveillance system to gather ongoing urinary iodine data to be part of the integrated national nutrition surveillance system as part of its commitment to sustainable elimination of iodine deficiency.

RECOMMENDATIONS

- Integrating updated database on iodized salt and UI into a National Nutrition Information/Surveillance System. Reporting Iodine Nutrition status regularly to public (including the international community).
- Strengthen capacity of UIC laboratory and build relationship with an independent reference laboratory. Regular national assessment survey on urinary iodine concentration every 2 or 3 years. The UIC is a more reliable indicator of iodine status in a population and should replace the TGR.
- UIC should be considered as part of the DHS. There has been an on-going dialogue with National Bureau of Statistics to include UIC as part of DHS.

⁴ Nigeria is divided into 6 geo-political zones, 37 States and 774 LGAs.



>>> Ensuring iodized salt supply

In Nigeria, the private sector has been playing a key role in USI since the initiation of the salt iodization program in the country. Based on 5 g salt consumption per capita, it is estimated that Nigeria required 270,000 tons per year of iodized salt. The industrial requirement is estimated at 330,000 tons per year. The total salt requirement of 600,000 tons is imported from countries such as Brazil, Israel, South Africa, Namibia or Australia through the four ports of; Lagos, Sapele, Port Harcourt and Calabar. Most of the imported salt is in bulk and is transferred directly from ship to factory warehouse.

Local packaging and distribution is through a handful of domestic companies. It was estimated that five major salt companies, Dangote Industries, Royal Salt, Colombia International, Unilever WAPF and Union Dicon Salt Plc, produce 8 brands with an estimated 98% market share. Only about 2% of salt consumption coming from small scale domestic producers or imported from neighboring African countries, the industrial and market environment is very favorable. Each of the major companies has their own distribution network and coordinated the network areas.

Salt in Nigeria is mostly packaged in 25Kg laminated poly woven bags while the household salt is packed in 1Kg, 500 and 250gm poly packs. There is a plan to pack in 150gm sachets. The 500gm is so far the most widely distributed in the retail/open market while the 250gm is slowly making pace. The 1Kg specifically targets the supermarkets. Today, as Nigeria's salt industry migrates to smaller packages and higher quality, government officials routinely support new product launches and explore synergies.

Nigeria's salt companies operate the necessary quality control departments to ensure standards are met, including salt titration facilities. To meet product registration and Good Manufacturing Practices (GMP) requirements, companies keep records on a number of critical quality control parameters including requiring and reviewing certificates for analysis for iodization of each shipment. Several companies conduct regular meetings with distributors to sustain awareness, receive feedback and track quality issues.

Private Sector has been providing support and collaboration to government to ensure universal salt iodization programme through internal quality assurance. Inspections at port, factory and distributor level consistently indicate 97-100% proper iodization. External quality assurance checks were done by SON and NAFDAC. SON regularly visit salt factory 2-3x/year to validate compliance with regulation while NAFDAC also monitors compliance at the port and distributor/market level.

RECOMMENDATIONS

- Salt Industry plays a key role in sustaining Universal Salt Iodization in Nigeria. Cooperation from salt industry in Quality Assurance should be maintained.
- Use of iodized salt for animal consumption should be considered.

>> Conclusions

The team acknowledges that Nigeria has succeeded in achieving universal salt iodization. The key contributing factors to the success are:

- Political commitment – Sustainable political commitment, with particular attention to advocacy, partnership and legal enforcement have been crucial elements for Nigeria to achieve the goal in elimination of iodine deficiency.
- National Public Private Civic partnership (IDD/USI Task Force)– Nigeria’s success resulted from an effective collaboration between the National Planning Commission, Ministry of Health, salt producers, consumer protection agencies, the National Food and Drug Administration and developmental agencies. The National Task Force has been providing practical and effective mechanisms to raise and sustain commitment to IDD elimination through coordinated monitoring at various levels.
- Monitoring – The salt monitoring system assures quality at production, wholesale, retail and household level. It is also linked to information on iodine status and legal enforcement. They help to build awareness at the political, governmental, regulatory, producers, distributors and community level; and progress toward goals to eliminate IDD is measured.
- Ensuring iodized salt supply – The mandatory iodization ensures universal practice and access to iodized salt in Nigeria. The public/private/civic collaboration is vital in overseeing and enforcing actions and the salt industry plays a key role in ensuring the iodized salt supply.

The review mission and the national partners agree that this success needs to be sustained and this will need a continuous concerted effort at all levels. Recommendations for sustaining the achievements are included as an integral part of each key section in this report.

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>> Annex 1

AGENDA

Date	Time	Activity	Issues	Venue	Responsible
Saturday 26 th November	Arrival of International participants				Dr A.Adeyemi and Isiaka Alo
Sunday 27 th November	10.00	Meeting of International participants	House cleaning	Hotel	Prof. Daniel Lantum (ICCIDD). Dr. A. Adeyemi (FMOH).
	14.00	Meeting of International and national participants	Review of draft agenda	Hotel	
Monday 28 th November	8.30-9.00	Courtesy Call on UNICEF	Meeting of key Officers in UNICEF Nigeria. Nigeria's USI programme.	UNICEF	Dr. Isiaka Alo - UNICEF
	9.30-11.00	Briefing by the Hon. Minister of Health; and hand-over of documents on IDD/USI to assessment team.		FMOH	Dr A. Adeyemi - FMOH
	11.00-16.00	Courtesy call on key partners (FMOE, NPC, NAFDAC, SON).	Briefing on Roles, responsibilities, and contributions to USI.	FMOE NPC NAFDACSON.	Ms. Tina Eyarú (FME) Dr. Davis Omotola (NPC) Ms. Doris Amlai (NAFDAC)
	16.00-17.00	Visit to markets (retail and chain store).	Assess level of awareness on USI	Wuse Market	Ms. Margaret Eshiett (SON)
	19.00-21.00	Reception	Test Iodine in salt	To be agreed	Mrs. Doris Amlai - NAFDAC Dr A. Adeyemi - FMOH
Tuesday 29 th November	8.00-16.00	Travel to Nasarawa State. <ul style="list-style-type: none"> Visit a Health Centre in Keffi. Visit local salt producing community in Awe 	<ul style="list-style-type: none"> Assess awareness level of USI. Courtesy call on traditional ruler of Awe. Assess awareness level of USI. Assess local production and iodization method in Awe. 	Keffi, Nasarawa State. Awe, Nasarawa State	Dr. A. Adeyemi (FMOH) Mrs. Dorsi Amali - NAFDAC
Wednesday 30 th November	8.00-13.00	Travel to Lagos/Ibadan	-	-	Dr. A. Adeyemi - FMOH Mrs. Tina Eyarú (FME)
	13.00-14.00	Visit State Primary Education Board (SPEB)	Sustainability of awareness creation and iodine assessment in schools	Oyo State SPEB	Dr. Akinosun - UCH
	15.00-16.00	Visit Iodine Laboratory	Suitability and sustainability of quantitative iodine determination	UCH Chem. Path. Iodine Lab.	Dr. A. Adeyemi (FMOH)
	16.00-18.00	Travel back to Lagos	-	-	-

AGENDA (continued)

Date	Time	Activity	Issues	Venue	Responsible
Thursday 1 st December	9.00-12.00	Visit Unilever salt factory	Production of adequately fortified salt	Unilever, Ikeja Lagos	Mr. Dayo Ashaolu (Unilever)
	13.00-15.00	Visit to Royal Salt Plc (RSL) factory	-do-	RSL, Apapa-Lagos	Mr. Rajesh (Royal Salt)
	16.00-18.00	Return to Abuja	-	-	-
Friday 2 nd December	9.00-12.00	Meeting of Int'l team.	Working on reports	Hotel.	Prof. D. Lantum (ICCIDD)
	12.00-14.00	Post-assessment de-briefing: <ul style="list-style-type: none"> • Welcome address • Opening Remarks • Overview of assessment • 'Acknowledgement' of Nigeria's achievement and 'recognition' as USI-compliant. • Recommendations for sustaining USI • Closing Remarks • Vote of thanks 	Presentation of findings and recommendations: <ul style="list-style-type: none"> • Director, CDPA • Hon. Minister. • External team • External team <ul style="list-style-type: none"> • External team <ul style="list-style-type: none"> • DG, NAFDAC • UNICEF 	Sheraton Hotel & Towers	Dr. A. Adeyemi (FMOH)
Saturday 3 rd December	International participants depart				

>> Annex 2

SALT PRODUCTION, IMPORTATION, IODISATION AND QUALITY CONTROL IN NIGERIA⁵

1. Executive Summary

From the 24th November 2005 to the 3rd of December 2005 a visit took place of an assessment team member namely; Prof. Daniel Lantum- ICCIDD Executive Director for Africa, Dr. Juliawati Untoro-Secretariat of the Iodine Global Network and myself visited Nigeria to verify the country's position on the UNICEF/WHO/MI/ICCIDD ten-point reference for Universal Salt Iodization (USI) Iodine Deficiency Disorders (IDD) compliance so that Nigeria could be certified.

This report Nigeria USI Assessment is the section of the assessment team findings that deals with salt production, import, salt iodization, quality control and other relevant issues that have to do with the feasibility of sustainability of USI and in turn the future success of iodine deficiency control in Nigeria.

Salt iodization started in Nigeria in the mid seventies and it was voluntary. Then with the World Summit for Children in 1990, the Federal Ministry of Health (FMOH) focused its attention on setting out a plan to establish the rules and regulations for USI in Nigeria. Since mandatory legislation was declared in 1993, the FMOH forged a strong alliance with all the important movers and shakers who can make the venture a success story. Those in the alliance were and still are; the Salt Industry, National Planning Commission (NPC), Standards Organisation of Nigeria (SON), National Agency for Food and Drug Administration and Control (NAFDAC), the National Primary Health Care Development Agency and the Federal Ministry of Education (FME).

There are many very successful issues in this Nigerian experience that will be highlighted in this report but it is important to note one critical point from where to start and that is to say that in Nigeria, it was through private initiative and enthusiasm, without any external request for financial or technical assistance that salt iodization took off. The industry understood the health benefit and provided the product. From this, The Federal Government has very successfully implemented a sound foundation on which the USI/IDD program is being controlled and monitored. It is a program from which all countries can learn lessons. It is a program that not only teaches what is required as a program but most important it shows how important the human factor of:

- Understanding and believing in USI/IDD
- Clear guidelines in the rules and regulations of the program
- Clear and effective understanding of who is responsible for what in the program
- Transparency and sharing cooperation between stakeholders
- "Zero" tolerance for pirates, abusers and non-compliance to the rules and regulations with stern and effective consequences
- Very good record keeping at all levels of monitoring
- Positive and healthy environment in the work relationship between public and private sectors

On the other hand, having achieved such a good and positive level of success, as the future rolls in, so will the new manager and director's change. It is hoped that they will take heed of such success and continue to not only uphold it but also continue to improve and further develop the success.

2. Overview of Salt in Nigeria

Local Salt Production: Although it would be possible to produce solar evaporated sea salt on the west coast of Nigeria, traditionally the country has always been dependant on the importation from neighboring and in greater part from far away countries. But in this vast land of Nigeria, there are very small areas where underground hot springs of "salty (brine) water" also known as brackish water are found. In the communities where these wells exist, salt is produced by means of burning wood and boiling the brine in small Chinese enamel pans till salt crystallizes and the brine totally evaporates.

In the developed world, sophisticated technology is used to transform the brine into salt while in the developing world, it is common that forests are chopped down for firewood not only for cooking but also for salt production. Nigeria is no different and as experienced during a visit to Nasarawa State, wood is now being paid for in order to produce boiled salt.

⁵ This consultant report (Annex 2) is prepared by Lorenzo Locatelli-Rossi as part of the review mission from Nigeria in 27 November-3 December 2005

The following table gives an idea as to how much salt the salt producing state produces annually and the value.

State	Quantity (Ton)	Value (Naira)	Value (US\$)
Benue	12.5	208,333.00	1,633.98
Ebonyi	6.0	100,000.00	784.31
Nasarawa	158.4	2,640,000.00	20.71
Taraba	9.24	154,000.00	1,207.84
TOTAL			
Tonnage/Year	186.14	3,102,333.00 ⁶	3,646.84

From the NAFDAC study it was further found that:

- Level of production of local salt is appreciable and serves as a means of livelihood for the communities
- Only the communities where the salt is produced consume the commodity (over 90%)
- The marketing of the local salt is largely restricted to open markets
- In shops and supermarkets, 500gm packs or 25Kg bags iodized salt can be found
- Often is the case that the bagged iodized salt is repacked into a small manually tied-up plastic bundle of approximately 100gm. And sold for ten Naira (N10) or \$0.08.

NAFDAC laboratory reports show that local salt has sodium chloride content as low as 83.4% to 98.20% (average moisture of about 6%). The low content of sodium chloride is due to the quality of brine taken from the well and the method of production.

Local salt production is not a major threat to USI/IDD. An attempt was made in the recent past to provide iodizing equipment and iodate to some communities but this proved unsuccessful for a number of reasons in particular the supply of iodate, and other important factors that include:

- Local production amounts to less than 0.1% of the countries household requirement.
- Well iodized salt is available in shops
- Various other ideas are being looked at as to how this salt can financially benefit local communities

Brief History of the Nigerian Salt Industry: In the mid-1970's a joint venture between the Government and a private Nigerian/USA company formed NASCON and the first salt processing factory was built in the outskirts of Lagos. In later years NASCON became 100% owned by Government and was briefly managed by a foreign salt company. NASCON was then privatized and renamed New Nigerian Salt Company. In the 70's scientific background knowledge concerning real impact of IDD on populations was not well known. What was understood was that iodine had some effect on the memory! Nevertheless, with this little "knowledge", the plant had the capacity

to produce iodized salt and so came the first attempt of introducing iodized salt into Nigeria.

The Nigerian salt industry has grown two fold since the 70's and is still undergoing changes. Market share is changing hands and the main market control is still to be revealed.

Nigeria Iodized Salt Market: It is estimated that Nigerians consume approximately 5 grams per day which translates into 270,000 tons per year of iodized salt. The industrial requirement is estimated at 330,000 tons per year. The total salt requirement of 600,000 tons is imported from countries such as Brazil, Israel, South Africa, Namibia or Australia through the four ports of; Lagos, Sapele, Port Harcourt and Calabar. Most of the salt is imported in bulk and is transferred directly from ship to factory warehouse. Shiploads average about 30-35,000 tons. Importing in bulk makes it more difficult for salt to be "sold off" into the market. In most cases imported salt is iodized at source at a level of about +/- 70 ppm using potassium iodate. The coarse grain iodized salt is then crushed into a finer product and then packed or bagged. From large granular to finer grain iodine levels are perfectly maintained because the standards require 50ppm at port of entry and factory. In the case that salt is imported non-iodized, again the salt arrives in bulk and strict control over its transfer is followed. Only one-processor, Royal Salt imports non-iodized due to the fact that they then wash, crush, dry and iodize prior to packing and bagging.

Estimates made by UNILEVER revealed that 96% of the household salt is sold in bulk and repacked into unbranded poly packs or sold by volume using small tin cups as a measure. Because the salt is very well iodized, from random tests at informal markets where this method of sale is practiced, qualitative tests revealed very good levels of iodate in all samples tested. In order to ensure control over this issue of "open bag" sale and "repackaging by the retailers, NAFDAC reached an agreement with all salt producers so that by February 2007 the sale of iodized salt in bulk bags (25 and 50Kg) will be prohibited at retail level. The initial agreement was for July 2005, following a one year moratorium agreed in June 2004, but producers petitioned government owing to the fact that high investment costs need to be undertaken by the industry in order to supply the market with 100% packed salt. This is a massive endeavor. Important to note that this agreement and the extension is not merely a written document that all sign up to, it is in fact a Presidential decree. To further assist the salt industry in this important change, NAFDAC has undertaken to run a "public enlightenment campaign" to drive change of public attitude and practice in buying salt especially in rural areas.

Industrial Salt: The bulk of industrial salt is consumed by the petroleum companies. They are by far the largest consumers of non-iodized salt. Documents inspected at the Ports Inspection Directorate showed that food companies such as Cadbury imports iodized salt in 50Kg bags.

IMPORTANT LESSON:
Because of the strict regulation against non-iodized salt Nigeria's food industry uses only iodized salt.

⁶ NAFDAC Technical Report 17 Oct – 6 Nov. 2004.

IODIZED SALT PRODUCERS IN NIGERIA

Nigeria's iodized salt market is sea salt only and predominantly that of a fine table like grade of salt. Other grades such as a very fine powder iodized salt is produced as a by-product in very small quantities.

Salt is bagged in 25Kg laminated poly woven bags while the household salt is packed in 1Kg, 500 and 250gm poly packs. There is a plan to pack in 150gm sachets.

The market leader has changed hands in the passed years and at present Dangote Industries leads the 25Kg market. As for the household salt, Annapurna has the largest market share. With the agreed change to supplying only packed salt (Feb. 2007), the contest as to who will become the future brand leader is an open question.

There are six main salt companies in Nigeria namely:

- 1 Dangote Industry: A very large Nigerian company involved in other industries such as sugar, flour, cement and transport.
- 2 West African Popular Foods (WAPF): is a joint venture between UNILEVER and Dangote Industries. UNILEVER holds the international salt brand called Annapurna. It currently refines and packs salt in 250 and 500gm sachets.
- 3 Royal Salt: The only company (before WAPF) that has a salt refinery and for this Royal Salt also aims at premium quality. They pack Annapurna in 1kg sachet for WAPF. The company is also a market leader in Kenya especially in the 250 gm pack.
- 4 New Nigeria Salt: Formally known as NASCON, Dangote group has bought the company over.
- 5 Union Dicon Salt PLC: Dicon was an important leader in the initial years of USI in Nigeria.
- 6 Colombia International: Produces two brands; Cassava Salt and Super Power King.

The following table shows the 2005 market share of the Nigerian salt market:

25Kg Bag

Company	Brand	Market Share	Comments
Dangote Ind.	Dangote	55%	
Royal Salt	Uncle Palm	< 20%	Of which 10% goes to bakeries
Union DICON	DICON	These companies share the remaining 20% market	These groups of companies do not have a regular supply of salt.
New Nigeria	New Nigeria		
Colombia Int.	Super Power King Cassava Salt		

Sachet Salt (in small packs)

Company	Brand	Market Share	Pack Type	Comments
Royal Salt	Uncle Palm	3%	0.5 & 1Kg for UNILEVER	Also packs Annapurna brand in 1Kg
WAPF	Annapurna	5%	250, 500g & 1kg	Leading market brand
Dangote Ind.	Dangote	0%	500g	Just started
Union DICON and Colombia	Unknown	0%	Unknown	Plan to enter market

With the exception of WAPF, all of the manufacturers sell iodized salt in 25Kg bags.

Reasons being;

- Iodized salt is distributed predominantly (90-95%) in 25Kg.
- Packed salt accounts for less than 10%

The 500gm is so far the most commonly seen in the retail/open market while the 250gm is slowly making pace. The 1Kg specifically targets the supermarkets.

IODIZED SALT DISTRIBUTION

Because of the size of Nigeria, companies must make use of a highly sophisticated network for distributing products. Each of the major companies has their own network. For instance, Dangote has six regional offices and a fleet of 1,300 trucks. Besides using their own means of distribution they also rely on agents. Probably WAPF is the only company that has a much different distribution network. Together with the vast array of Unilever world known household consumables of detergents, soaps, oral care, personal products, foods, etc, WAPF's Annapurna iodized salt brand is distributed throughout the country.

As many random visits were made to informal markets and during such inspections good quality iodized salt was always to be found. Furthermore, as part of WAPF product marketing strategy, they have mapped all IDD endemic areas (also those of iron and vitamin A deficiency) as they intend to target these areas and monitor distribution, off-take and consumption.

INTERNAL QUALITY CONTROL AND QUALITY ASSURANCE

Three major iodized salt producers were visited; Dangote Industry, Royal Salt and Unilever, and West African Popular Foods. The three companies account for about 80% of the country's iodized salt supply. Points of inspection during the visit were:

- Warehousing of raw salt.
- Method of processing the salt.
- Packing or bagging systems.
- Storage of finished product.
- Quality control laboratory.
- QC records and method of sampling/testing.
- Evidence of external QC.
- Correspondence with SON/NAFDAC and or other agencies.

The first observation of these factories is that they all had well-kept

and clean premises both external and internal and all employees were properly dressed and where necessary proper protective clothing/masks were used.

Appropriate measures were taken in warehousing the raw salt either iodized or non-iodized. All raw salt is being housed under a shed that gives proper protection to the product from rain, light and external contaminants. The floors were properly cemented and clean.

Machines and equipment is well maintained and there was no sign of "quick-fixes" to the items nor oil spills or unprotected electric wires. Noise levels were also acceptable.

Incoming raw salt is being quality checked by a third party. The product is shipped with QC certification. The product is then sampled randomly and laboratory tested.

At factory level, in house quality control is on going and routine on a daily basis. Although the rapid test kit is often used, any sign of weakness in the sample, the titration method is then used. Records were inspected and found to be very much in order. All records are logged using the titration method only.

Proof of external inspections was also found in the files. Correspondence between SON and salt company are examples of the positive interaction between the private and public sector. In such correspondence SON advises the company as to what changes need to be made. The letter also refers to previous visits and compliments the company because of its compliance to standard obligations and to previous recommendations.

Packing material and finished product comply with international standards. Storage of the goods was also compliant.

It is important to note that most of the documents inspected were given upon request and were not pre-arranged by the visited company or agency.

- NAFDAC embarked on the USI program in 1993 after UNICEF/WHO recommended it as the main strategy for controlling IDD. NAFDAC monitors product in the market place and also does some routine factory inspection. The organization is known for its "Zero tolerance" attitude and steadfast attitude to quality salt iodization. NAFDAC operates 6 geo-political and 4 special zonal offices and 6 laboratories around the country, for adherence monitoring and enforcement at factory, wholesale and retail levels.
- SON main scope is to audit production/factories. SON was established in 1971 and is a member of the International Organization for Standardization. In 1989 SON developed a booklet in which all the requirements for the certification are clearly stated. The standard is accompanied by a mark of quality NIS or National Industrial Standard. SON standards are the basis for the quality assurance in all salt factories. After extensive tests, in 1994 NIS 168 was published for mandatory salt iodization using iodate instead of iodide. SON has eleven zonal offices called Quality Assurance Directorate. These are the offices that monitor the salt factories.

Judging from what was seen during the inspection visits to: a) the major production factories of iodized salt; b) the offices of both NAFDAC and SON; and c) formal and informal shops and markets; it can be easily and clearly concluded that:

- All salt manufacturers comply with good standard of manufacturing practice and supply of quality-iodized salt.
- Documentation at all offices was found to be consistent with QA and QC practices.
- All persons involved were very well informed about the USI/IDD program.
- Informal and formal markets and shops were stocked with good quality iodized salt.
- Factory directors/managers were all in agreement as to how the Federal Government is managing and coordinating the USI/IDD program.
- Although local salt production has a very small negative impact on USI/IDD it is a natural resource that ought to be utilized. Tree felling must be stopped and alternative more environmental friendly methods of production must be used. By no means should the salt be collected and sent to major producers for processing.

It is recommended that:

- All stakeholders continue to work together in order to maintain such high level of compliance to the USI standards.
- That year-end reporting should be made available not only to those at present involved but also to external agencies such as the Global Network so that the good news can be made public and the web site can monitor Nigerian success.
- At factory level that spectrophotometer replaces titration, as it is rapid and more practical.
- While the move from 25Kg packs to smaller packs is most welcome it must be monitored very closely as this may cause shortage of iodized salt supply in the short-term (before full compliance by all manufacturers).
- Local salt production should be used for the production of iodized/mineralized salt for animal consumption. This type of salt is part of the USI/IDD program.