

IDD Elimination Programme in Sri Lanka Country Report

**Ministry of Healthcare and Nutrition
Colombo**

2009

Executive Summary

Iodine deficiency disorders had been identified as a major public health problem in Sri Lanka in 1986 following a survey that revealed total goiter prevalence rate of 18.2% among school children. Universal Salt Iodization (USI) programme was launched in Sri Lanka in 1995 with the assistance of UNICEF.

The annual total production of salt is approximately 139154.25 MT in 2008. Estimated annual requirement of iodized salt for human consumption in the country is approximately 75,000 MT based on the daily consumption of 10g/person for an estimated population of 20 million. Around 77% (57642.69 MT) of the annual requirement of iodized salt for the country is iodized by the large scale salt producers namely, the Lanka Salt Ltd., Puttalam Salt Ltd., Puttalam Salt Producers Welfare Society and Manthai Salt Ltd and another 7% is iodized by a major table salt manufacturer "Raigam Salt". About 13% of the national requirement of iodized salt is imported as table salt and less than 1% is done by small scale manufacturers.

After 10 years of the launch of the USI programme, Sri Lanka has achieved the required standards identified by the joint Committee of WHO/UNICEF/ICCIDD for the IDD elimination. MRI Survey conducted in 2005, revealed that the goitre prevalence among school children was reduced to 3.8% from 18.2% with a Median Urinary Iodine content of 154.4µg/L and the percentage of adequately iodized salt at the house hold level was 91.2 %.

Following factors favoured in achieving the current status of iodine nutrition in the country:

1. Political commitment
2. Appointment of Director General of Health services as the Chief Food Authority and the Food Advisory Committee as the national body responsible to the government for the elimination of IDD
3. Appointment of Director / Environmental and Occupational Health and Food Safety as the executive officer for the national programme for the elimination of IDD
4. Legislation in support of successful implementation of the Universal Salt Iodization programme.

- Food (Iodization of Salts) Regulation 1993 (came into operation on 01.01.1994)
- Food (Iodization of Salts) Regulations 2005 (came into operation on 31.12.2005) Requirement of level of iodine at the household level changed to 15-30ppm (15-30mg/kg) and a permit system was introduced.

5. Mechanisms to assess the progress in the elimination of IDD

- Impact and process monitoring by the MRI through periodical national surveys and cyclic monitoring
- Public health Inspectors and public health midwives carrying out routine qualitative testing using rapid test kits
- Field sampling and legal enforcement by authorised officers under the Food Act
- Analytical support by food laboratories
- Strict surveillance at ports through Customs for imported salt

6. Continued public education and social mobilization on the importance of consumption of iodized salt for the elimination of IDD with the support of Health Education Bureau

7. Availability of data on salt iodine levels at the factory, retail and household level

8. Laboratory data on urinary iodine in school children with appropriate sampling for high risk areas through cyclic monitoring and monitoring of thyroiditis by respective clinicians

9. Cooperation from the salt industry in maintenance of quality control at factory level and effective operation of the permit system for purchase of common salt.

Following measures would be continued in the future to sustain the achieved status:

* Maintain the quality and quantity of the adequately iodized salt production by

- continuing the permit system to ensure iodization is done in authorized places where quality control is available
- provision of technical guidance to small scale salt iodizing Industries
- regular monitoring of quality of iodized salt at the production level (quantitative testing)

- rehabilitation of Elephant Pass saltern belonging to the Manthai salt Ltd.
 - encouraging all major factories to obtain SLS Standard
 - ensure regular supply of Iodine Test Kits by encouraging local production by Institute of Industrial Technology.
- * Strengthening of the regulatory process by
 - review of legislation and modalities of implementation
 - strengthening the data base at central level and establishment of data bases at regional level
 - * Capacity building of Health staff
 - * Strengthening the monitoring mechanism by holding regular stakeholder meetings
 - * Regular advocacy and awareness programmes for the political leadership and public
 - * Conducting periodic surveys and cyclic monitoring for high risk areas and operational research

Introduction

Background

Iodine deficiency is the world's single most preventable cause of brain damage and mental retardation. Nearly two billion people in the world may be at risk of iodine deficiency, and recent estimates suggest that 15.8% of people experience some degree of goiter. Over one third (37%) of school age children worldwide (a total of 285 million) are iodine deficient. Approximately 40% of the burden is in the South East Asia Region (SEAR).

Sri Lanka

Sri Lanka is an island situated in the Indian Ocean. It is administratively divided into 9 provinces and 25 districts. Total population is 19.886 million (AHB, 2006) of which, 380,000 are children under one year of age (about 2% of the total population). There are 322 health units (Medical Officer of Health areas) with a well functioning public health infrastructure up to the grass root level. Due to the high female literacy rate (89.2%), health seeking behaviour of the general population is at a higher level. (Annual Health Bulletin 2006)

Iodine Deficiency Disorders had been identified as a public health problem as far back as 1947. Studies conducted during 1947 indicated that there was an endemic goiter belt in the south-west region extending over the whole of the Western, Sabaragamuwa, Central, Southern Provinces and part of Uva Province, which constitute the wet zone of the country. Since then several preventive measures have been taken to combat the above problem. However, in 1986, it was found that the overall goitre prevalence among school children was 18.2 percent. In response to the above situation and in line with the commitment at the world summit for children in 1990, the government of Sri Lanka initiated the "Universal Salt Iodization" programme in 1993 with the introduction of a regulation under the Food Act to iodize all salt for human consumption. Nevertheless, the programme was launched as a major implementation activity only in 1995. Salt was selected as the

vehicle for iodization because all most all humans consume roughly the same amount of salt each day and is easily available at an affordable cost. The annual requirement for iodized salt for the country is approximately 75,000 MT (10g/person/day).

A. The Product

- ***Achievement of change in practices by food processing industries.***

Edible common salt can neither be purchased nor imported without a permit issued by the Chief Food Authority. Thereby the production of salt, availability of common salt and iodized salt in the retail market are regulated. In this way the salt available for human consumption and food processing industry is regularly checked for iodine content. Thus the food processing industry also uses iodized salt unless there is a contraindication for its use in the process of food manufacturing. In this situation, industrial use of edible common salt is regulated by a permit system.

Non iodized salt is also used for other industrial purposes such as dying in textile industry, leather tanneries, soap manufacture, fish curing and for cleaning swimming pools. Permits are mandatory for purchase and transportation of salt for industrial use.

- ***Analysis of relationships between regulatory authorities and practices and salt producers and practices.***

There are two large scale salt producers namely, Lanka Salt Limited at Hambantota and Puttalam Salt Limited. Their annual production of salt is 106,253.750 MT in 2008. Manthai Salt Limited has two salterns at Mannar and Elephant Pass with large production capacity but out of which, only the saltern at Mannar is functioning properly. No details are available regarding

the Elephant Pass saltern. The other important producer is the Puttalam Salt Producers Welfare Society, where there are 400 small scale producers who handover the harvested salt to Puttalam Salt Producers' Welfare Society who in turn iodize and market the salt. Though the production done by the individual small scale producers is negligible, they are not exempted from the regulatory system. There are no small scale producers in Hambantota. However there are small cottage industries for iodization.

The relationship among the regulatory authorities, large and small scale producers is very cordial. Small scale producers are represented by the Welfare Society of salt producers. This cordial relationship is maintained through participation in awareness programmes organized by the government and providing required information and data to them. They in turn reciprocate by allowing the regulatory authorities inspect production and operations. Therefore there has been no difficulty in complying with the regulations.

- ***Analysis of utility and impact of product advertising and communication on public demand, consumption and understanding***

Since 1995, a comprehensive and wide-ranging programme targeting the general public on the importance of consuming iodized salt had been in place. This was done through several media channels and some of the main activities are mentioned below;

- Posters and other educational materials were developed with the objective of educating the general public (ref. annex B, Table 1)
- Awareness programmes through mass media targeting general public(ref. annex B, Table 2)
- An Island wide Quiz programme for housewives was conducted in 2006 to create awareness on selection of quality iodized salt

and it was completed successfully with wide participation of all ethnicities.(1345 Sinhala, 419 Tamil entries)

- Training of Public Health Workers with a view to conducting awareness programmes for general public.(Annex B, Table 3)
- Awareness programmes for journalists to focus their attention on the importance of the IDD programme and dissemination of messages through media to general public. (refer annex B, table 3)
- Creation of awareness among salt industry workers and other non health sectors (refer annex B, table 4)
- Annual motivational meetings with the management of salt industries in Puttlam and Hambantota. (The copies of all documentation available at D/ E & OH)
- Ministry of Education has included the information on the importance of consuming iodized salt in the education curriculum for children from Grade 5 to Ordinary Level.

Health Education Bureau (HEB of the Health Ministry is responsible for carrying out health educational and promotional activities. Nutrition education is one of the main components of their annual plan of action and activities on iodine nutrition are carried out under this component. All the programmes and activities conducted by them are well planned and monitored regularly and based on the modern concepts of communication. Time to time their programmes are reviewed and updated, according to the needs of the community and requirement of services. Therefore permanency of the communication tactics and strategies is assured. The copies of all the publications are available at the HEB for reference.

- ***Analysis of quality assurance of iodized salt production***

The process monitoring consists of

- a. Production, retail level and household level monitoring by public health staff;

- b. Verification for regulatory purposes is done by the Government Analyst's Department as well as food laboratories under the food act;
- c. Monitoring of biological indicators by the Nutrition Department of the Medical Research Institute.

The two major salt producing companies have already obtained SLS mark from the Sri Lanka Standards Institute (SLSI) for their products and these factories are also ISO certified. In order to maintain ISO status, as part of internal auditing, samples are collected quarterly and tested in the Sri Lanka Standards Institution Laboratory. Availability of technically qualified persons as resources in the above said companies has enabled the manufacture of high quality salt from its inception and has been helpful for effective salt iodization.

Regular sample testing of each batch of iodized salt at the production level is done by the salt industries and data bases are maintained by the factories and the Cooperative society. In the case of small scale producers the quality of the iodized salt is checked regularly by authorized officers as part of field surveillance. Based on these and findings at inspections done by Food and Drug Inspectors using a checklist (Ref. annex C-2) renewal for permits are considered. Data is available at the Food Control Unit of the Ministry of Healthcare and Nutrition. In addition, surveillance on iodized salt has been carried out also by the Public Health Inspectors since inception of USI.

The Food Control unit of the Ministry of Healthcare and Nutrition issues permits for purchase, transportation, export and import of salt. Before issuing a permit or before renewal, the premises /production site is inspected and certified by Food and Drugs Inspectors using a checklist (Ref. annex C-2). Therefore data on the above are systematically recorded and available at the food unit. In the years 2006-2007 one hundred and sixty six permits

were issued for small scale producers, 20 permits for local industries, 02 permits for export and 02 for imports.

- ***Analysis on data of salt importation, production and iodization process, distribution, major companies, small scale producers/salt farmers, association of salt producers, prices of products and the market situation.***

Annual production of Salt in 2008

	Total Production (MT)	Amount Iodized	Percentage of the total requirement of iodized salt for the country	Industrial salt	Remarks
Lanka Salt Limited Hambantota -	77,067.250	28,475.500	37.97%	9,001.100	Part of the total production of common salt is kept in store for the next commercial year.
Puttalam salt	29,186.500	12,772.340	17.03%	8380.000	7500MT of Industrial salt is sold to *Raigam salt for Iodization
Manthai salt(Mannar)	2900.500	1394.850	1.86%	1138.750	
Co-op society Puttalam (Provisional)	30,000.00	15,000.000	20.0%	15,000.000	
Total of major producers	139154.250	57642.690	76.85%	33519.850	
Imported salt (Iodized) (Source-Food Unit)		9352.000	12.47%		
Other (*Raigam salt)		7500.000	10.0%		*Raigam salt – Large scale factory for salt Iodization.
Small Scale producers		510.000	0.68%		Calculated figures
Total Iodised Salt		74494.69			

Demand for iodized salt estimated as 75,000 MT/yr based on 10g per person per day for a population of 19.886 million. Iodized salt is available at an

affordable price even for the poorest. The current price of a kg of crystalline iodized salt is Rs. 32/= which is less than half a US dollar.

- ***Analysis on availability and procurement of KIO3***

At the inception of the programme UNICEF imported KIO3 for the purpose of iodization. Now the major salt producing companies themselves procure KIO3 from India for the manufacture of iodized salt thus there is no identifiable KIO deficiency in the country. This has been achieved through meetings held among the responsible sectors in a harmonious manner.

B. The process

- ***Analysis of political process and how that has been nurtured and sustained and with what measurable results.***

The political commitment regarding Universal Salt Iodization is remarkable. At the initial stage most of the meetings were conducted under the chairmanship of leading ministers and the important decisions were conveyed to the National Health council chaired by the Hon. Prime Minister.

In Sri Lanka a number of pilot projects on salt iodization was done before 1990. After the USI initiative in 1990, UNICEF provided Salt iodization plants to Lanka Salt and Puttalam Salt industries. Ministry of Planning, Implementation and Parliamentary affairs regulated the above programme. In the latter stages, in order to support the Salt Iodization Programme, the government has passed a law that regulates the production and distribution of iodised salt in the country. This regulation was framed under the Food Act, came into enforcement in 1994 and underwent revision in 2005. These regulations could not have been passed without the commitment and support of political leadership.

Furthermore, there is a good understanding about the importance of the Salt Iodization Programme among leading politicians in the central government as well as among provincial political leadership. It has helped the initiation of the programme island wide in all the districts and acceptance by the political leadership and the general public and sustainability of the programme in each and every setting.

- **Analysis of the history of formation of a National coalition to assure achievement of USI and sustained iodine nutrition and the current practices and issues.**

The government of Sri Lanka has initiated the Universal Salt Iodization programme in 1995 with the assistance of UNICEF. The sub committee on control of IDD was formed in 1996 for the purpose of reviewing the progress made in salt iodization and related IDD control measures. This committee comprised of representatives of Ministry of Health, Ministry of Industrial Development, Department of Customs, Govt. Analyst and leading salt producers (ref. Annex B table 6). At the initial stage, the vital decisions made at the committee meetings were conveyed to the National Health Council chaired by the Hon. Prime Minister. However the National Health Council has not met in the recent years.

The success of the programme was maintained throughout the past 13 years (1995 - 2008) due to the commitment of various agencies of the government sector, financial and logistic assistance provided by UNICEF, WHO and other UN agencies and support provided by the industry itself.

- **Analysis on laws and regulations, inspection and enforcement processes in the country for USI and some indication of practice results.**

The following Laws have been enforced in the country.

Regulation on Salt Iodization 1994 - This Regulation bans the production, distribution and sale of non iodized salt for human consumption. The iodine content of iodized salt at household level was considered at 25 ppm in the legislation of 1994.

Revised Regulation on Salt Iodization - 2005 - The iodine content of iodized salt at household level was considered at 15 ppm in this legislation.

Law enforcement is carried out by the Food and Drugs Inspectors and Public Health Inspectors who are the authorized officers under the Food Act. Revisions and amendment of the regulations are done in accordance of the findings of MRI Surveys e.g. high urinary iodine content.

- **Analysis of government oversight and procedures**

Salt Iodization programme is considered to be one of the major public health programmes in Sri Lanka. The government has given its full commitment to these programmes through various institutions in the health sector and the other related sectors. There is a National Co-ordination Committee on salt iodization at the Health Ministry with the membership of leading personalities in health, trade, UN organizations and private sector.

- **Achievement of insertion of essential knowledge on iodine nutrition training of medical practitioners and other health personnel**

Iodine nutrition is included in the medical undergraduate curriculum, Post Graduate curriculum in MSc Community Medicine and other Post Graduate disciplines.

It is also a major component in the PHI training curriculum and other PHC staff training curriculums. In addition, refresher programmes are conducted

for primary health care staff periodically to build their capacity in this respect and keep them aware on changes and new trends and approaches of the programme.

- **Achievement of insertion in animal husbandry and some indication of impact and increase of iodized salt use for animals.**

The annual animal feed production is around 500,000 MT. The requirement of common salt for feed formulation is around 500 MT. Few manufacturers utilize iodized salt directly in the manufacture and the others use common salt and add iodate at levels appropriate to different animal groups in the process of feed manufacture.

- **Analysis of national management capacities including appointment of a responsible officer for IDD elimination program.**

Ministry of Healthcare and Nutrition has the primary responsibility for the elimination of iodine deficiency disorders and for the efficient management of the programme, responsibilities are divided and allocated to the relevant units in the Ministry.

Director Environmental & Occupational Health is the responsible officer for the coordination of the implementation activities of the programme and also ensures the enforcement of the regulatory process in IDD elimination programme. The Food Control Unit functions under him and is responsible for the enforcement of legislation.

Nutrition Department of the MRI is responsible for the impact monitoring by tracking of biological indicators and conducting cyclic monitoring.

Health Education Bureau has been given the responsibility to conduct health educational and promotional activities in consultation with Director (E&OH).

- **Analysis of financial commitments of State authorities, central budgets and expenditure patterns, including private sector and civic sector commitments. To what degree the nation is positioned with national resources to sustain iodine nutrition forever.**

Iodine nutrition programme is carried out with the involvement of several departments and units in the Ministry of Health care and Nutrition such as Food Control unit, Nutrition Department of MRI, Health Education Bureau etc. The allocation from the health budget to those units & departments are also used to facilitate the Iodine Nutrition Programmes and related research though there is no separate allocation for Iodine Nutrition. These funds were provided annually on regular basis as it helps the sustainability of the programme. This is further supported by significant and regular contributions by UNICEF and WHO.

- **Analysis of impact of international aid and collaboration.**

UN agencies like UNICEF and WHO were always in the forefront to give their fullest support, which immensely helped to achieve the objectives of the Universal Salt Iodization Programme within a short period, by providing financial and material assistance.

UNICEF had come in a long way to support Ministry of Health for capacity building of laboratory and other health workers at peripheral and national levels, to monitor the iodine content of salt and evaluate the impact of the programme. Assistance had also been provided for the establishment of National Reference Iodine Laboratory and the network of laboratories that include 14 hospital laboratories in the provinces. Awareness programmes and

educational activities were carried out with assistance of UNICEF, WHO and the World Bank. ICCIDD has given technical support to the Medical Research Institute and Salt Manufacturers especially for the Hambantota Lanka Salt Ltd. to obtain the ISO certification. During the post-tsunami period, Micronutrient initiative has provided financial support to Lanka Salt to rehabilitate the saltern and the factory.

- **Analysis of potential for success without international aid.**

Iodized salt production is entirely in the hands of the private sector. As this is a profitable venture, prospects of investment are very high and these opportunities can be made use of in sustaining the USI and further improving the quality of the product. This has already been witnessed by the advent of new factories, solely for iodization of salt with quality control systems.

The monitoring mechanism is firmly embedded within the system of the central Ministry and the Provincial authorities. This is supported strongly with appropriate and timely legislation with adequate infrastructure for effective enforcement.

The well distributed primary healthcare network guided by the Health Education Bureau of the central Ministry ensures regular awareness and education of the public. These messages are based on scientific evidence gathered by the Medical Research Institute which is a center of excellence under the purview of the central Ministry of Health.

C. Household access to Iodized salt and Iodine nutrition status.

The impact of the utilization of iodized salt was assessed during national surveys conducted by Medical Research Institute during 2000 and 2005. These findings were used in designing and implementing awareness activities as well as for the modifications of the legislative process.

- **Achievement of government practices and procedures for obtaining, analyzing, publishing and using data and information.**

Regular monitoring of biological indicators through two national surveys was conducted by the Medical Research Institute in 2000 and 2005 and the following factors were assessed -: the prevalence of goiter in the primary school children in selected provinces (20.1% in year 2000 and 3.8% in 2005); iodine nutritional status of school children by measuring urinary iodine levels(145.3 µg/l in 2000 and 154.4 µg/l in 2005) and the percentage of household using adequately iodised salt (49.5% in 2000 and 91.2 % in 2005) (ref Annex A table 2 and Annex c table 1). Iodine content in salt at retail and production levels (both in major producers and small scale producers) and drinking water has been analysed.

There were several surveys carried out in this regard and results of these surveys were published and available for reference. (refer Annex c table 1) . A survey carried out by Kumarasiri et al in 1998 investigated the Iodine content of commercially available iodized salt in the Sri Lankan market and Premawardana et al (1998) investigated the thyroid volume, urine iodine concentration, anti-thyroid peroxidase and anti thyroglobulin antibodies in primary school children and heel pad blood samples were taken from infants to investigate the neonatal hypothyroidism.

The Food Control unit has assessed the process of the Iodination programme in Hambantota by checking salt samples. All the reports regarding above surveys are available for reference and summarized in table 1 of the annex C.

- **Analysis of commitments to assess and reassess the progress towards elimination with access to laboratories able to provide accurate data on salt and urinary iodine.**

There are two fully equipped food laboratories and supported by government analyst, city analysts of Colombo and Kandy Municipal Councils along with the MRI. All these labs carry out testing of iodine content on request. The labs situated in provinces also carryout testing of iodine levels of salt on request.

- **Regular data on salt iodine at the factory retail and household levels and regular laboratory data on UIE in school age children with appropriate sampling for higher risk areas.**

Survey reports published by the MRI in 2000 and 2005 initiation of the salt iodization programme has shown that there is wide spread usage of iodized salt by the community and according to 2005 survey findings around 91.2% of the salt used at the household level were adequately iodized. It is a tremendous improvement when compared to the household usage of iodized salt in 2000 (49.5%). It is observed that the amount of salt iodized by the industry also has shown an increase in trend over the past ten years.

- **Achievement of public health laboratories related to iodine nutrition, their management, quality control practices and procedures.**

After initiation of this programme, National Reference Iodine Laboratory was established at the Medical Research Institute and equipped to carryout necessary lab tests with the support of UNICEF. The lab staff at the national level and provincial level also trained in this regard.

- **Program infrastructure, oversight committee, staff, budget, type and number of laboratories and annual number of samples processed.**

National Reference Iodine Laboratory at MRI - at the central level

14 provincial labs were involved in assessing the iodine content of salt. Public Health Inspectors were also trained to do the qualitative assessment of iodine content using iodine test kits.

Major salt producers are having salt laboratories at their factory level to check the iodine levels of each batch of salt produced. Salt iodized by most of small scale industries in Puttalam area are using the facilities provided by the Laboratory of Puttalam Salt Producers Welfare Society and some use the iodine test kits.

- ***A summary of lessons learned***

Universal Salt Iodization is a novel strategy which we have adopted in 1995. This is one of the most successful public health programmes conducted in the recent past. Support and commitment rendered by the political and government leadership in this regard was achieved as a result of targeted advocacy and awareness programmes. There was a committed support from the UN organizations such as WHO & UNICEF to carry out this programme by providing technical, financial and logistic support.

Different stakeholders such as Health, trade and finance, education, law, animal husbandry, academic and professional bodies showed dedication and unequivocal commitment for the Universal Salt Iodization programme in Sri Lanka and helped to achieve the current status. The media too supported the programme and rendered assistance when needed.

Legislative enforcement and the commitment of primary healthcare staff in implementing this programme at the grass root level led to the success of the programme. Permit system introduced as a regulatory strategy, for salt producers is functioning properly without any interruption. The regular awareness campaigns conducted throughout the country and high literacy rate among females led to a favourable behavioral change of the community.

Even though the salt manufacture and iodization is governed by the private sector companies, there is a strong public and private sector partnership towards a common goal of achieving the Iodine Deficiency Disorders elimination status in the country.

Action plan for sustainability for the IDD elimination programme

Key Activities	Sub activities	Indicators	Situation in 2009	Target by 2015	Responsibility
To increase the quality/ quantity of the iodized salt production	.Encourage all major factories to obtain SLS Standard	Achieved SLS Standard	50 % (2 factories)	100%	Major salt Industries,
	.Provision of technical guidance to small scale salt iodizing Industries	No of industries provided with technical guidance	75%	100%	Major salt Industries, Government
	Regular checking of quality of iodized salt at the production level (quantitative testing)	No of a)major factories b) small scale factories regularly checking iodine content	100% 60%	100% 100%	Industries
	Rehabilitation of Elephant Pass Saltern belonging to Manthai salt	Increase number of major salt producers			
Strengthening of the regulatory process mechanism	Preparation / update of legislations and circulars	Enacted Legislations Circulars prepared	100% 100%	100% 100%	Government
	Proper Implementation of the available legislations	Properly implemented legislations	75%	100%	All the officers authorized under the food act
	Strengthening the data base at central level	Data bases established	In progress	100%	E&OH Regional Health

	Establishment of data bases at regional level				Authorities
	Training of Health Staff on proper implementation of legislations	No of training programmes conducted per year	40%	100%	E&OH (FCAU)
Monitoring / Evaluation	Monitoring of biological Indicators	No of monitoring programmes conducted per year			MRI
	Quantitative and qualitative monitoring of salt	No of samples checked for quality per month in each MOH area	75%	100%	All the officers authorized under the food act
	Evaluation of the progress of the programme through regular stakeholder meetings	No of quarterly meetings conducted	100% of the target	100%	E&OH
Capacity building of Health staff	Training	No of training programmes conducted	-	100%	E&OH
	Field visits	No of field visits done	-		
Creation of awareness among general Public	Preparation of IEC material	No of IEC materials prepared	-	70% out of planned	HEB
	Annual awareness creation through public health staff	No of programmes conducted by the health staff		80% out of planned	HEB/ E&OH
	Annual awareness creation through Print and Audiovisual media	No of articles published in news in print media per year No of programmes telecasted/ broadcasted	-	80% out of planned 50% out of planned	HEB

Research	KAP Survey on consumption of iodized salt	Survey conducted	-	100%	E&OH unit
	Salt consumption survey to be conducted	Survey conducted		100%	E &OH unit
	Study of Iodine availability in salt	Study completed		100%	ITI
	Annual Surveys on Iodine Nutrition	Survey conducted	Budget submitted	100%	MRI
Strengthening political commitment	Annual advocacy programme for parliamentarians and provincial politicians	No of politicians sensitized	40%	80%	HEB

Annex A :

1. summary of country Program assessments by WHO. Unicef, ICCIDD indicators for sustainable elimination of ID

Summary of Country Program assessments

Programmatic indicators	Country program situations	Action plan to sustain USI
1. 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.	√	
2. Evidence of political commitment to USI and elimination of IDD.	√	
3. Appointment of a responsible executive officer for IDD elimination program.	√	
4. Legislation or regulations for USI, ideally covering both human and agricultural salt.	√	
5. Commitment to assessment and reassessment of progress towards elimination with access to laboratories able to provide accurate data on salt and urinary iodine.	√	
6. A program of public education and social mobilization on importance of IDD and consumption of iodized salt .	√	
7. Regular data on salt iodine at the factory retail and household levels.	√	

8.Regular laboratory data on UIE in school age children with appropriate sampling for higher risk areas.	√	
9Cooperation from the salt industry in maintenance of quality control.	√	
10.A database for recording of results of regular monitoring procedures particularly for salt iodine, UIE and if available neonatal THS monitoring with mandatory public reporting.	√	

Table 2

**Progress of Indicators towards elimination of IDD in Sri Lanka
(Source MRI surveys 2000 & 2005)_**

Indicators	Goal	Before Iodization	5years after Iodization	10 years after iodization
Goiter %	< 5	18.2	20.1	3.8
Median Urinary Iodine	100 – 199	-	145.3	154.4
% of adequately Iodized salt at household level	> 90	-	49.5	91.2

Annex B

**Table 1
IDD Awareness Materials**

Year	Type of education material	No of copies	Funding
1994	Sapatha *,Vol. 35, 3-4 (Poor Nutrition – brain development and Behaviour) Sapatha *,Vol. 35, 1-2 IDD- A major public health problem in SriLanka	Sinhala	UNICEF
1995	Booklet (What you should know about iodine deficiency disorders)	English and Sinhala	UNICEF
	Sapatha *How to overcome malnutrition	Sinhala and Tamil	UNICEF
1996	Sapatha *,Vol. 37(all topics were on Iodine Nutrition) IDD- A major public health problem, Effects of iodine disorders, IDD, History, present situation and solutions, Thyroid gland, Reasons for goiter, Production of iodized salt, how to overcome IDD, Regulations and acts for iodization	Sinhala and Tamil	UNICEF

	of salt)		
	Poster – (Is your child week in school performance)	Sinhala and Tamil	UNICEF
1997	Health and nutrition, Vol 2 (Health and Nutrition)	Sinhala	UNICEF
1999	Sapatha *,Vol. 37-3 micro nutrient deficiencies	Sinhala and Tamil	UNICEF
2003	Posters – Is your child doing properly at school (with Boy feature and with girl feature)	Sinhala – 6000 copies Tamil – 4000 copies	UNICEF
	Sapatha * Volume 12-2 - Iodine deficiency and development of the child	Sinhala and Tamil	UNICEF
	Health and Nutrition **(Volume .2 – micronutrient deficiencies	Sinhala and Tamil	UNICEF
2006	2 Wall charts- correct usage of iodized salt	30,000 prints In Sinhala and Tamil	UNICEF
2007	Poster on iodine nutrition- (your child is leading)	In Sinhala and Tamil	UNICEF
	Wall chart (Iodine – for active and energetic life)	In Sinhala and Tamil	World Bank
	Leaflet (Iodine – for active and energetic life)	In Sinhala and Tamil	UNICEF

*publication for health workers, **- publication for school children

Table 2
Summary of district based awareness programs conducted for health staff

District	year	Number of programmes	No. of participants	Categories of participants
20 DPDHS areas (Trincomalee, Homagama, Vavunia, Mannar, Kalmunai, Kalutara, Ratnapura, Galle, Matara, NIHS, Kegalle, Kurunegala, Gampaha, Hambantota, Kadugannawa, Monaragala	2007	20	30 X20	MOOH, SPHI, HEO PHNS, PHI, SPHMM, PHM and other PHC staff
HEB	2006	1 (training of trainers)	84	Health education officers and MOs

		work shop)		
	2006-2007	1	30	Regional Epidemiologists and MO MCH
Health programmes conducted by the regional primary health care staff targeting general public, school children and house wives	1995-2007 time to time	-	-	-

Table 3
Summary of awareness programs conducted for other sectors

District	year	Number of programmes	No. of participants	Categories of participants
Puttalam	2009	1	25	Small scale producers
Puttalam	2008	1	50	Employees of Salt Industry (Puttalam salt, Rigam Salt and Puttalam salt producers welfare society)
Hambantota	2008	1	50	Employees of Salt Industry
Colombo	2008	1		Employees of Manthai salt
Media seminar at HEB	2006	1	50	Media personal from print and audio visual media
Puttalam and Hambanthota	2005	2	50	Employees of Salt Industry

Table 4
IDD Awareness Programmes by mass media

Year	Type of the Programme	Channel
1995 to 2007	Various topics on iodine nutrition time to time	Radio (suwasetha) health programme
	Discussions with medical experts on IDD- Several	ITN, Rupavahini, Sirasa and Swarnavahini
2005	2 tele programmes – Implementation of iodine regulation in Srilanka Universal Salt Iodization	ITN Rupavahini

2006-2007	Iodine Nutrition	Pahandora -ITN
2007-2008	Preparation of a tele spot on iodine nutrition	
2009	Telecast of the telespot on iodine nutrition	Rupavahini – Nugasevana

Table 5

Summary of salt situation

year	Salt situation		Iodized	Non Iodized	Total(mt)
1999	Total production				50984
2000	Total production				
2001	Total produced / imported (total salt available in country)	Total			120,000
	Industrial (non-food grade)	Total			30,000
	Food grade (including animal salt)	Total			90,000
		Local Production			83.000
	Import			7000	
2002	Total production*			12735.35	75490.05
2003	Total production*			10904.16	77215.4
2004	Total production*			21677.45	80777.30
2005	Total production*			25321.175	69800.954
2006	Total production*			31769.05	92730.4
2007	Total production*			39440.25	85595.50

*- details are not available for small scale producers

Table 6

Consultative/steering meetings held for the review of I.D.D. programme and key milestones of the programme

Type of meeting	Venue	Date	Key issues addressed
Preliminary meeting (at the initiation)	Chaired by Hon. Deputy Minister of finance ,Planning and ethnic affaires	12- 05-1995	For identification of issues and constrains in the production of iodized salt
Regulation on Salt Iodization		1994	Prohibited production, distribution and sale of non iodized salt for human consumption.
Formulation of a sub committee on control of IDD		1996	In view of reviewing the progress made in salt iodization and related on control measures
Consultative meeting on IDD	Ministry of Plan implementation and parliamentary affaires	21-03-2000	Nutrition week activities highlighting the importance of consumption of iodized salt Subcommitee was formulated to studiy the modalities of IDD survy by MRI
Consultative meeting on IDD	Ministry of Plan implementation and parliamentary affaires	23-05-2000	Issue of rock salt to small sale producers for iodization Methodology of Urinary Iodine Survey Machinery for salt industry Monitoring system
Review of I.D.D. programme	HEB	24-07-2001	Overview of the IDD control programme
Sub committee meeting on control of IDD	Ministry of Plan Implementation	18- 09-2001	Need of iodization of all common salt produced by large scale producers and selling them to small scale producers for packaging only Arrange a mass awareness programme by Unicef
Sub committee meeting on recommend strategies to improve control of IDD	Lanka Salt Limited , Narahenpita	25- 09-2001	Need of stronger system of monitoring iodized salt in the market
Annual review meeting of Unicef assisted nutrition programmes	Ministry of Plan Implementation	23-11-2001	
National committee meeting	Ministry of Health	16- 10-2003	Need of identifying deficiencies of the programme for correction

National committee meeting	Ministry of Health	12-12-2003	Issue on revised draft of food regulations Availability of test kits
National committee meeting	Ministry of Health	25-07-2004	Important issues arising from findings of the MRI survey Quality of salt produced by the small scale producers
Amendment to the regulations		2006	The iodine content of iodized salt at household level was considered at 15 ppm in this legislation
Consultative meeting to review and develop new strategies for the salt iodization programme	Trans Asia hotel	5-09-2006	
Consultative meeting to coordinates activities for Nutrition week (Iodine – the salt life)	Ministry of healthcare and Nutrition	1-03-2006	
Sub committee meeting	Ministry of healthcare and Nutrition	2-11-2007	Declaration of IDD elimination status
Steering Committee Meeting	Ministry of healthcare and	03- 2009	Strengthening of the monitoring system – preparation of a new circular
Steering Committee Meeting	Ministry of healthcare and	-24- 05- 2009	Local production of iodine test kits

Annex C

1. Surveys conducted by different stakeholders on IDD in Sri Lanka

Organization	Year	Main areas investigated	Samples	Results	Conclusions
Kumarasiri et al,	1998	Iodine content of commercially available iodised salt in the	38 packets of iodised salt from 11 different brands, randomly purchased	All samples were iodised but 68.6% of the packets were outside the range stipulated by the SLSI.. In 52.8% mean	More stringent measures should be adopted to ensure that manufacturers and importers of iodised salt

		Sri Lankan market	from retail outlets in 5 different areas	iodine content was above recommended upper limit of 40ppm & in 15.8% below the recommended lower limit of 20ppm. 31.6% of packets were within the accepted range. None of the labels had all the required information.	conform to the required specifications.
Premawardana et al, 1998	1998	Thyroid volume, urine iodine concentration, antithyroid peroxidase and antithyroglobulin antibodies Heal pad blood samples from infants Salt samples	367 school girls aged 11-16 y from high, intermediate and low goiter prevalence areas and 612 infants	Median TV- 4.8 - 8.6ml Median UI 105-152µ/l Prevalence of TgAB- 14.3-69.7% Iodine content in salt- 0-27ppm No neonatal hypothyroidism	Benefits of salt iodization is clearly visible Identified priorities were strict monitoring of salt iodization Monitoring for possible iodine induced thyroid function. Investigation of causes for high prevalence of TgAB
Food Control Administration and Govt. Analyst's Laboratory	2001	Impact of the Iodination program in Hambantota	Private salt industries	Range of iodine level = 2.9ppm to 266.7ppm	Wide range of iodine levels among the samples and unsatisfactory hygienic conditions.
MRI	2000 - 2001 Cross sectional	1. prevalence of goiter in the primary	Grade 1 & 2 school children (6733 children	Goitre prevalence rate of 20.9% in Sri Lanka. Grade 1 - 20.1% Grade 2 - 0.8%	Grade 1 goitre higher in females 20.4% than in males 15.2%. Grade 2 goitre was

	I school based study	health school children in the provinces	examined)		also more prevalent in females.
		2 iodine nutritional status of school children by measuring urinary iodine levels	Urine collected from 2630 children 8 – 10 yr old age group. 300 samples from each province except North (250 samples) & Eastern (280 samples)	Median Urine Iodine levels 145.3 µg/L (cut off value = 100 µg/L) Range 4.6 to 3206.4	65% of children bio-chemically sufficient in iodine. 44.4% deficient in varying degrees and 1.8% severely deficient in having urinary iodine levels below 20 µg/L
		3. Level of iodine in the salt at retail levels		Median Iodine level 30.7 ppm with a range of 5.3–418.9mg/kg	Only 41.1% of salts had iodine values within the permitted range (25-50 mg/kg). 18.6% of salts had a high iodine values than the permitted range (>50mg/kg)
MRI	2000 - 2001	4. To determine the knowledge and practices on iodized salt among the retail shop owners.	398 retail salt traders from whole country.	66.1% respondents had knowledge of goiter. 95% knew about iodised salt. 57.5% knowledge from mass media, 28.9% from health personnel & 8.6% from other sources. 72.9% knew about salt legislation in Sri Lanka. Only 34.7% of	

				sakts in shops were tested by PHI's for the last 6 months.	
		5. To assess the level of iodine in the drinking water.	Samples of water from different available sources in the area around the school. (eg: tap, well etc)	Median Iodine level 49.5 µg/L within a range of 3.1-251.4. North central having a 60.9 (14.0-173.3) and Western province 6.4 (4.3-10.2)	
MRI	2005 - 2006 Cross sectional school based nationwide study. (Follow-up survey after 5 years of preliminary survey)	1. Prevalence of goiter in the primary school children in the provinces	A multi-stage stratified sampling technique used to identify the sample. Study population consisted of male and female children in the age group of 6 to 9 years (grades 2,3 & 4). Total sample size 1800.	3.5% Grade 1 Goitre, 0.3% Grade 2 Goitre. Total Goitre rate (TGR) 3.8 % for the entire country. Highest TGR in Central Province 10.3% and the lowest in Southern and Northern provinces (0.5%).	High prevalence in the Central Province is of special significance as this province is situated at the highest elevation from the sea level ranging from 250-2500 sq.meter. Highest rate of Grade 2 goitre 1.5% was also detected in Central Province.
		2 Iodine nutritional status of school children by measuring urinary iodine levels		Median Iodine concentration in the country 154.4 µg/L with a range of 6.1-1754.8 with a confidence limit of 190.7 - 206.7	34.7% of the children had urine iodine levels in the adequate range & 29.9% with lower values and 35.5% with higher values(18.7 more than adequate and 16.8% 300 µg/L. or more) Of those who had lower values only a small percentage (0.1%) had very low values of <20

					µg/L. Seven provinces has shown zero values below 20 µg/L
		3. To determine iodine levels in the salt at household level.	Each school child who participated in the Goitre assessment was requested to bring a sample of salt from his/her house, test kits were used to determine the level of iodization.	Median Iodine content of Salt samples at household level was 28.0 ppm in a range of 3.1-96.8 ppm. With a confidence limit of 30.1-31.5	Over 90% of households had access to adequately iodized salt indicating 91.2% samples had iodine levels within the permitted range i.e.15ppm. 61.0% of salt samples had iodine values higher than the permitted range (>25ppm) & only 8.8% had lower values.
		4. To identify the factors related to the salt producers.	The salt producers who are close to the selected schools which were studied were visited by the investigators. 12 salt producers were visited and they were interviewed	Major salt producers in Hambantota and Puttalam with over 200 small scale producers. Average annual production of salt in the country is estimated at about 130,000 metric tons. Edible salt around 95000 metric tons per year. The estimated per capita salt consumption of salt is around 15g per day including losses. Method of	Salt producers should verify the salt quality prior to purchase from salterns. Register all the salt producers under the Ministry of Health for easy follow-up. Arrange the facilities to obtain rapid test kits for salt producers and establish laboratory facilities to determine the iodine levels in

			ed. Salt samples were brought from the producer for analysis at MRI by the titration method.	iodization, Awareness of ill effects of iodine deficiency, Knowledge on benefits of consuming iodized salt, Awareness on regulations of salt, Method used to check iodine in salt, Difficulties in obtaining rapid test kits and expiry date of the test kit used by the producer were the characteristics assessed in salt producers.	salt at production.
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Kumarasiri, JP, Fernandopulle B M R, Lankathillake M A L K N, (1998) Iodine content of commercially available iodised salt in the Sri Lankan market. Ceylon Medical Journal, 43, 84-87.

Premawardana, L.D.K.F, Silva, D.G.H, Wijayarathna, C.N, Jayasingha, .A, Smyth, P.P.A, Parks, A.B. & Lazarus, J.H (1998) Goitre, urine iodine and thyrod autoimmunity in Sri Lanka- the currant position and the way forward.

2. Checklist for Inspection of Iodized salt manufacturing plant

Date and Time of Inspection

1.General Information

i. Name and Address of the Manufacture –

. Contact Numbers –

ii.

Brand Name	Type of Salt	Packet Size	Price

iii. Production Capacity :-

(Monthly)

iv. No of Workers –

- v. Business Registration Number
- vi .Whether license obtained from the local authority available; Yes/ No
- vii. Has a permit been issued previously? Yes / No

2. Premises

- i. Permanent Building Yes/ No
- ii. Floor area adequate Yes / No
- iii. Designed for smooth operation Yes / No
- iv. Secured by fence/ parapet walls Yes/ No

3. Equipments

- i. Whether they are in good condition Yes/ No
- ii. Facilitate easy cleaning - Yes/ No
- iii. Whether equipments are adequate Yes/ No

Remarks-

4. Storage Facilities

- i. Raw material storage satisfactorily Yes/ No
- ii. End Product Yes/ No
- iii. Packing Materials Yes/ No

Remarks –

5. Method of Iodization

- i. Iodization is done (Manually, Mechanically / Automatically)
- ii. Type of salt (Granules, Powder/ free Flow)
- iii. Whether washing facilities are available (Yes/ No)

6. Quality of the Product

- i. How is the moisture content verified before iodization ?
- ii. How are the impurities removed before iodization ?

7. Packing & Labelling

- i. Is common name in two languages ? Yes/No
- ii. Is date of expiry in two languages ? Yes/No
- iii. Date of Manufactory Yes/No
- iv. Batch No / Code No Yes/No
- v. Packing material Transparent Yes/No
- Opaque Yes/No
- vi. Thickness of packing material
not less than 75 µm Yes/No
- vii. Words "Use without washing"
in two languages Yes/No
- viii. Words "Store away from
Sunlight" Yes/No

8. Laboratory facilities

- i. Are laboratory equipment available ? Yes/No

ii. Are trained personnel available ? Yes/No

9. General observations (In deficiencies)

10. Recommendations for improvements

.....
Signature

.....
F&DI/

.....
Date

Availability of Supportive documents

	Annex	Table	Supportive documents available at
1	Annex B	Table 1 IDD awareness materials	Health Education Bureau
		Table 2 Details on Awareness programmes for health staff	Environmental & occupational Health Unit Ministry of Healthcare & Nutrition
		Table 3 Awareness programmes for other sectors	Environmental & occupational Health Unit Ministry of Healthcare & Nutrition
		Table 4 Awareness programmes by mass media	Health Education Bureau
		Table 5 A Summary of salt situation 5B Salt production in 2008	Environmental & occupational Health Unit Ministry of Healthcare & Nutrition
		Table 6 Details on meetings	Environmental & occupational Health Unit Ministry of Healthcare & Nutrition
	Annex C	Table 1 Survey findings	MRI E& OH unit (Some Data)
2		Checklist for Inspection of Salt Manufacturing plants	Copy available at the E& OH unit
	Other	Permits issued by the FCU	

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