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UNICEF South Asia regional evaluation of progress towards Universal Salt Iodization, 1993-98

FINAL REPORT

Universal access to iodized salt by 1995...
....a goal of the second SAARC summit for children, Colombo, 1992

Adoption of a SAARC convention of iodized salt....a resolution of the Rawalpindi resolution on children of South Asia, 1996

We have today the means and the knowledge to greatly diminish the suffering of children, to promote their full development, and to make them aware of their rights.
- 1992 SAARC Colombo Resolution on Children

May 1999

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LIST OF TABLES and FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

BIS	Bureau of Indian Standards
BSCIC	Bangladesh Small and Cottage Industries Corporation
BSE	Bhutan Salt Enterprises
CIDA	Canadian International Development Agency
FCB	Food Corporation of Bhutan
GOI	Government of India
HDPE	High density polyethylene
ICCIDD	International Council for Control of IDD
IDD	Iodine Deficiency Disorders
IEC	Information, Education and Communications
IIHMR	Indian Institute of Health Management Research
IPHN	Institute of Public Health Nutrition (Bangladesh)
ISSF	Iodised Salt Support Facility (Pakistan)
JAICA	Japanese International Cooperation Agency
MI	The Micronutrient Initiative
MICS	Multiple Indicator Cluster Survey
MIS	Monitoring Information System
MOH	Ministry of Health
NPAN	National Plan of Action for Nutrition
NWFP	North West Frontier Province (Pakistan)
PFA	Prevention of Food Adulteration
PHI	Public Health Inspector
PHL	Public Health Laboratory
PPM	Parts per million
RTK	Rapid Test Kit
SAARC	South Asian Association for Regional Cooperation
SIP	Salt Iodisation Plant
SMP	Social Marketing Pakistan
STC	Salt Trading Corporation (Nepal)
TCB	Trading Corporation of Bangladesh
TSH	Thyroid Stimulating Hormone
UNICEF	United Nations Children's Fund
USI	Universal Salt Iodisation
WFP	World Food Programme
WHO	World Health Organization

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0. EVALUATION PURPOSE, METHODS AND PROCESS

0.1 The UNICEF South Asia region comprises Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Their combined population is nearly a quarter of the world's total. All of these countries, except Afghanistan, are working towards the global goal of elimination of Iodine Deficiency Disorders (IDD) by the year 2000, through the strategy of Universal Salt Iodisation (USI).

0.2 Key stimuli in the 1990s reaffirming the promotion of USI in South Asia have been the South Asian Association for Regional Cooperation (SAARC), the World Summit for Children goals and the Convention of the Rights of the Child. Article 11 of the Colombo Resolution on Children adopted by the second SAARC conference on children in South Asia in Colombo in September 1992 states,

> *"We urge that the National Plans of Action [for Children] be reinforced in a regional perspective by taking into consideration the following set of illustrative goals..."*

and section c of article 11 refers to *"universal access to iodised salt by 1995"* as one of the illustrative goals.

Furthermore, it was in Kathmandu, Nepal, that the International Council for the Control of Iodine Deficiency Disorders was formally established, in 1986, with UNICEF support.

0.3 This evaluation examines the extent to which the SAARC goal of universal access to iodised salt by 1995 has been pursued, and the supporting role of UNICEF. It is an internally focused process that could potentially serve as a preliminary step to a more ambitious evaluation involving more evaluation stakeholders such as government and private sector partners.

The aim is that:

- conclusions and evaluative judgements will assist UNICEF nutrition programme officers, their government counterparts take stock of progress and provide them with insights and ideas for how to improve their support for USI.

- it will serve as a report on progress so far for the numerous generous donors to UNICEF support for USI efforts who have not been able to see first hand what has been done with the results of their contributions.

0.4 The evaluation is coordinated by a steering committee chaired by the UNICEF Regional Monitoring and Evaluation Officer for South Asia, Roger Pearson. Members of the steering committee include the UNICEF Regional Director for South Asia (until recently, Urban Jonsson); the UNICEF Regional Planning officer, David Parker; the UNICEF Regional Nutrition and Health advisor, formerly Mabelle Arole and now Ellen Girerd-Barclay; a representative of the UNICEF nutrition section in New York, at various times one of either David Alnwick, Joanne Csete, or Krishna Belbase. A consultant to the UNICEF regional office, Amy Gilman, is the secretary to the steering committee and has coordinated checking for data submitted by country offices for completeness and facilitating requests by the primary evaluator.

0.5 The terms of reference for the evaluation were written by the regional monitoring and evaluation officer in consultation with the steering committee and UNICEF nutrition programme officers for South Asia many of whom suggested valuable modifications to earlier drafts; others also made contributions to the terms of reference including Jonathan Gorstein a consultant working for Micronutrient Initiative at the time; Stuart Gillespie, an independent consultant

working for UNICEF Regional Office on nutrition issues in 1997 and Peter Greaves, the consultant evaluator.

0.6 The primary independent evaluator, Dr. Peter Greaves, was selected as an expert in public nutrition with knowledge and first hand experience of USI programming in South Asia over the last twenty years, and familiar with UNICEF support for USI in general but not knowing the details of UNICEF support in South Asia over the last few years. He has read and summarized first, data collected by UNICEF nutrition programme officers in each country office specifically for this evaluation. He also had access to country-level studies, evaluations and other reports related to USI in South Asia written in the last few years and noted in the bibliography. He also conducted interviews with person knowledgeable with USI programmes in South Asia as he saw fit.

0.7 Information on salt iodisation at household level was collated by nutrition programme officers in collaboration with UNICEF evaluation officers based at country level and sent to ROSA in ChildInfo database software format showing source of information, proportion of salt used at household level for cooking thought to be adequately iodized by geo-coded area

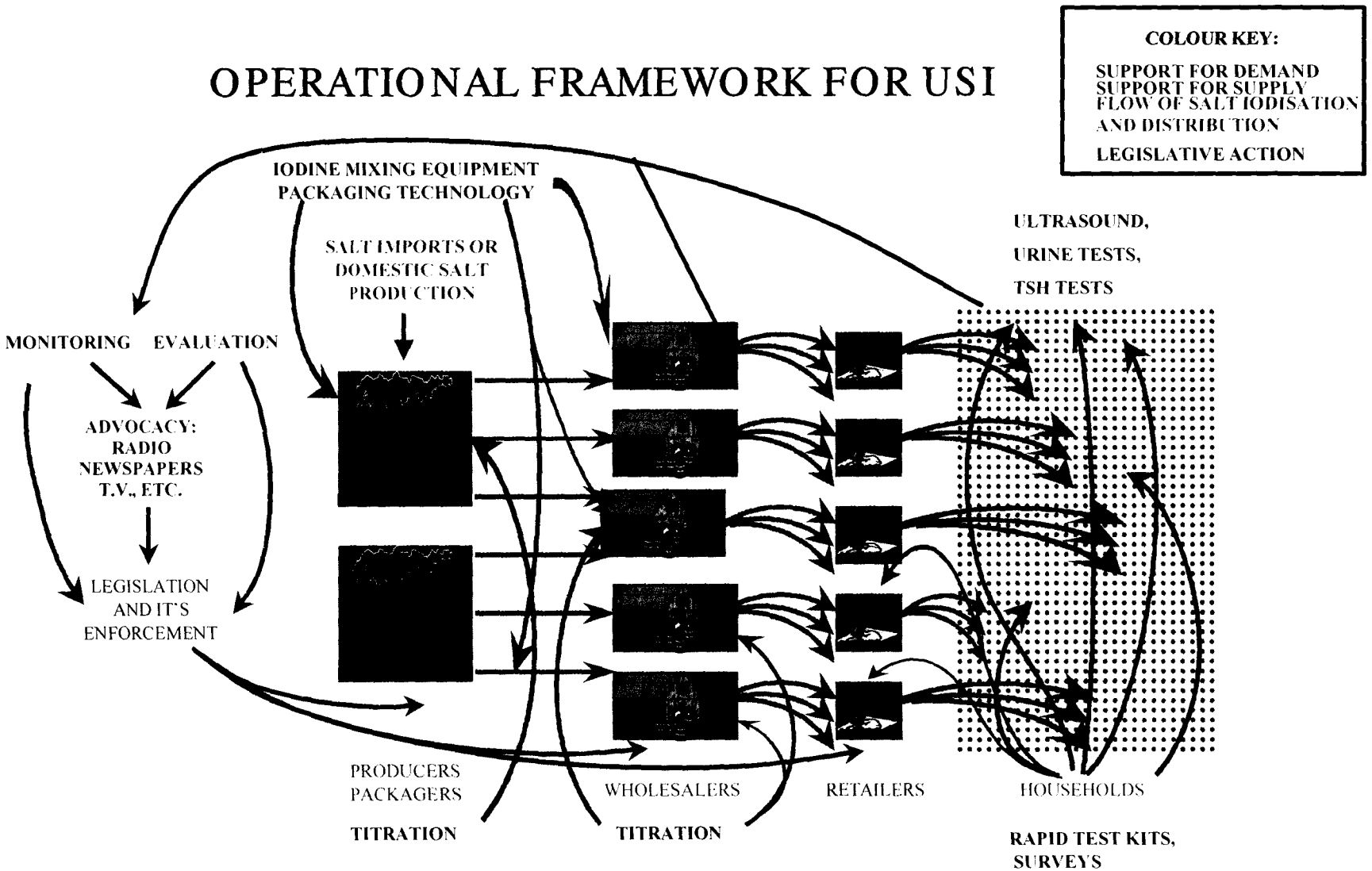
0.8 The primary evaluator's mandate has been to make conclusions and evaluative judgements on the merit of the programmes in each country but not to make recommendations. The philosophy of this evaluation is that decisions to take action are best made by persons in a position actually to take action – in the UNICEF context, mainly UNICEF nutrition programme officers in each country together with their key programme counterparts, and programme funders. And that the best way for a careful consideration of what action to take would be spoiled if well considered evaluative conclusions were supplemented with recommendations which may not be implementable with current human, organisational or financial resources available.

0.9 A draft of the primary evaluator's report was submitted to UNICEF ROSA. The regional monitoring and evaluation officer, the primary evaluator and the secretary to the evaluation steering committee further refined the attributes, criteria and standards used to determine the merit of each national effort to reach USI. The aim was to make this process of reaching judgement more transparent. A refined version of the report was produced for review by the four secondary evaluators most of whom have been actively involved in USI in South Asia. They were Dr. Frits van der Haar, Mr. David P. Haxton, Dr. Robin Houston, and Dr. Chandrakant Pandav. They reviewed the report; copies of which are provided in Annex C.

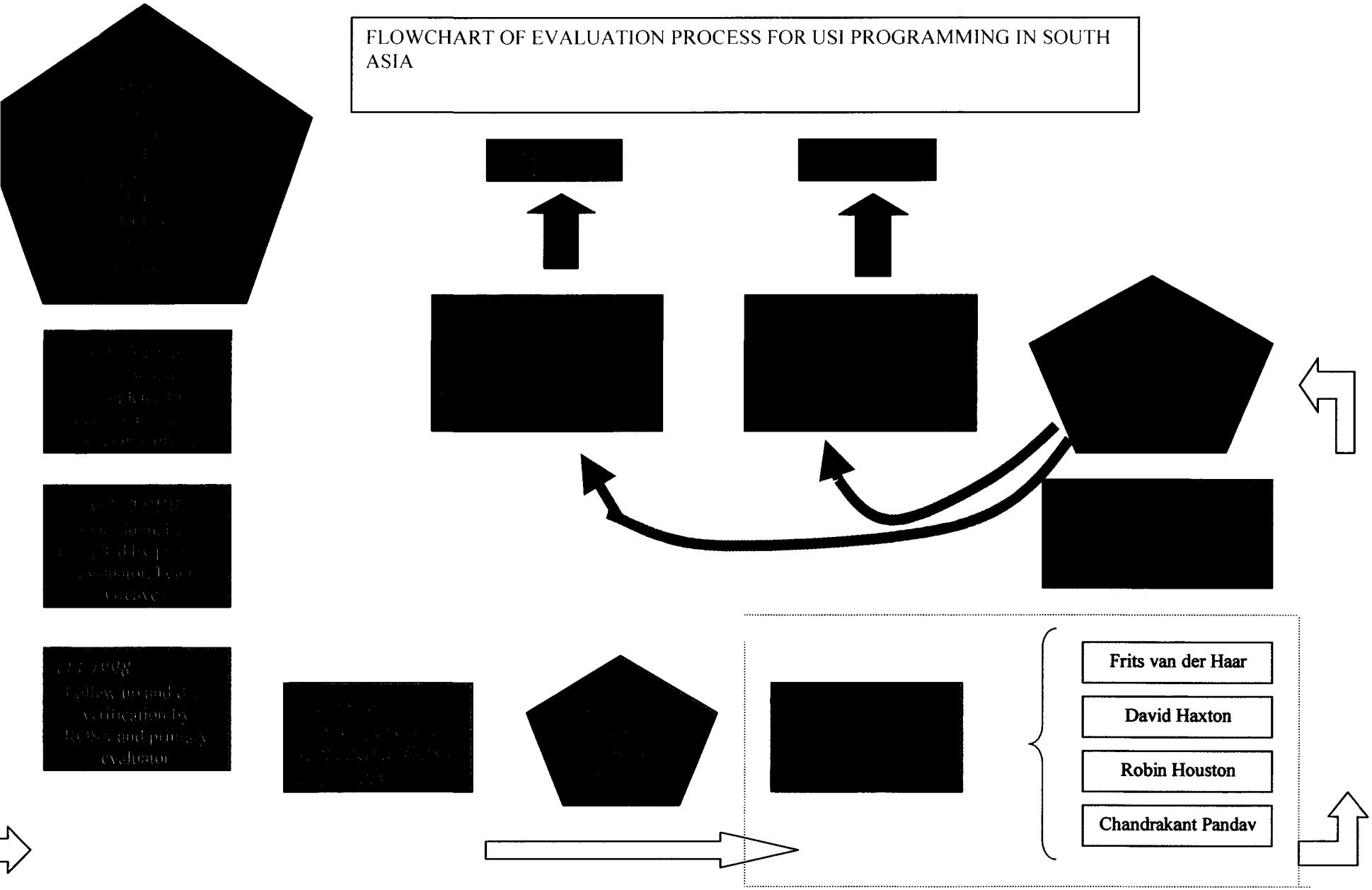
0.10 This report is produced primarily for members of the UNICEF Nutrition Initiative in South Asia (NISA) group which comprises primarily the UNICEF country level nutrition programme officers. A final report for wider circulation will be produced taking into account their views and suggestions as well as those of the UNCIEF Regional Management Team for South Asia.

0.11 The organisation of the report follows the line of programme inputs, processes, outputs, and outcomes as best as possible. Preceding each section are the questions that were sent to the country offices to elicit the information. A provisional operational framework for USI programmes, composed by UNICEF, follows the introduction for an alternative view of how different aspects of the programme are intended to fit together in order to support the goal of USI.

OPERATIONAL FRAMEWORK FOR USI



FLOWCHART OF EVALUATION PROCESS FOR USI PROGRAMMING IN SOUTH ASIA



1. OVERALL ASSESSMENT AND EVALUATIVE JUDGEMENT OF PROGRAMMES' MERIT

1.1 Table 1.3 shows the scoring system used by the evaluation to derive an evaluative judgement on the merit of national efforts to reach USI. Based on the operational framework for USI programmes adopted by the evaluation nine major attributes for a good USI programme have been identified. To derive a judgement on the extent to which attention to the attribute by the national programme can be considered good, each attribute has been sub-divided into criteria. The five evaluators used their judgement to score each criteria on a sliding scale of zero to five (zero for poor, five for excellent) based on their own knowledge of the programmes and the background information provided in this report. Table 1.1 presents the average overall score for each country programme and Table 1.2 presents the average scores for each attribute and criteria by country. Country evaluative tables and charts for each evaluator are provided in Appendix B.

1.2 Each criteria is not of equal importance in deciding a summary figure for each attribute. Criteria weighting factors reflect the relative importance given to each criterion in deciding upon a figure for each attribute.

1.3 Each attribute is not of equal importance in deciding upon an overall score for the programme. Attribute weighting factors reflect the relative importance assigned by the evaluation to each attribute.

1.4 Notwithstanding the obviously great differences between countries in terms of their size, programme and political context, it is suggested that these overall judgements are not devoid of significance. Whatever the handicaps of this procedure are with its inevitably large degree of arbitrariness and subjectiveness, it is certain that all countries in the South Asia region are well on the way to achieving Universal Salt Iodisation for elimination of Iodine Deficiency Disorders. Some countries are very markedly making great steps toward the goal and all those involved in this achievement deserve heartfelt congratulations.

Table 1.1 Average Overall Scores by Country

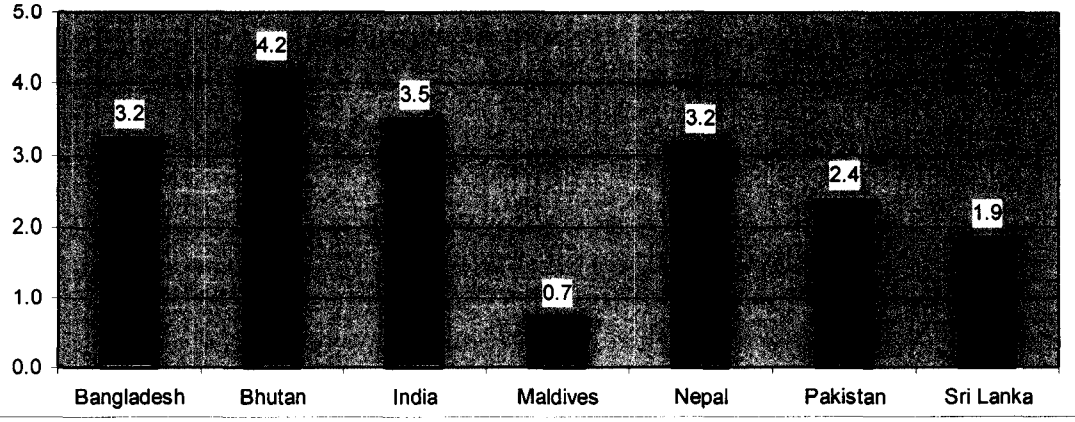


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Table 1.2 Average Country Scores for USI Programme Attributes and Criteria

(Averages are based on five evaluators and are rounded to the nearest tenth of a point)

Appropriate legislation and regulations	**3.6**	**4.1**	**3.8**	**0.1**	**2.7**	**3.1**	**3.5**	**5.0**
national in scope	0.8	1	0.6	0.1	0.6	0.4	0.6	0.8
applies to all edible salt, including salt for animals	0.4	0.4	0.3	0.0	0.3	0.3	0.3	0.5
prescribes concentrations of iodine at production, retail and household level	0.5	0.8	0.7	0.0	0.5	0.6	0.3	0.8
specifies requirements for packaging and labeling	0.5	0.5	0.5	0.0	0.0	0.4	0.5	0.8
prescribes monitoring procedures	0.5	0.6	0.6	0.0	0.6	0.7	0.7	1.0
specifies responsibilities for inspection	0.5	0.6	0.6	0.0	0.4	0.5	0.7	0.8
specifies penalties for violations	0.4	0.5	0.4	0.0	0.2	0.3	0.4	0.5
Enforcement procedures	**1.3**	**4.0**	**2.9**	**0.1**	**1.0**	**0.6**	**2.4**	**5.0**
infringements identified	1.3	2.5	2.2	0.1	1.0	0.6	1.8	3.0
successful prosecutions	0.0	1.4	0.7	0.0	0.1	0.0	0.6	2.0
Supply of iodised salt	**3.8**	**4.4**	**3.4**	**0.6**	**3.9**	**1.1**	**1.6**	**5.0**
sufficient capacity to iodise all edible salt	1.0	1.0	1.0	0.2	0.9	0.7	0.7	1.0
actual salt supply of iodised salt sufficient for needs	0.8	0.9	0.8	0.1	0.7	0.4	0.4	1.0
percentage of salt effectively iodised	2.0	2.5	1.7	0.4	2.3	0.0	0.5	3.0
Monitoring system for iodised salt at production level	**2.8**	**3.5**	**3.0**	**0.0**	**3.4**	**2.8**	**0.2**	**5.0**
plan for monitoring (internal and external)	0.8	0.9	0.8	0.0	0.8	0.8	0.0	1.0
guidelines for procedures	0.8	0.7	0.8	0.0	0.9	0.6	0.1	1.0
regular reports	0.6	0.7	0.6	0.0	0.7	0.5	0.0	1.0
effective supervision, including review of training	0.4	0.7	0.5	0.0	0.5	0.6	0.1	1.0
evidence of follow-up action	0.2	0.5	0.4	0.0	0.5	0.3	0.0	1.0
Availability of iodised salt at household level	**3.5**	**4.2**	**3.5**	**0.4**	**3.1**	**1.4**	**1.3**	**5.0**
plan for monitoring at retail and household level	0.4	0.5	0.4	0.0	0.4	0.2	0.1	0.5
monitoring system in place and operating regularly	1.0	1.4	0.9	0.0	0.9	0.5	0.3	1.5
percentage of households using adequately iodised salt	2.2	2.4	2.2	0.4	1.8	0.7	0.8	3.0
IEC activities	**3.1**	**4.7**	**4.6**	**2.4**	**4.3**	**4.1**	**3.5**	**5.0**
effective advocacy addressed to a) policy makers, b) salt manufacturers, c) public and opinion leaders	1.6	2.5	2.4	1.0	2.2	2.1	1.7	2.5
emphasizes IDD and role of iodised salt	0.8	1.0	0.9	0.7	0.9	0.9	0.9	1.0
support to training and training materials	0.8	1.3	1.3	0.7	1.2	1.1	0.9	1.5
Monitoring of IDD	**3.3**	**3.7**	**3.3**	**0.5**	**3.7**	**3.0**	**1.7**	**5.0**
recognition of USI as a component of an IDD elimination programme	0.9	1.0	0.9	0.3	0.9	0.9	0.8	1.0
plan for systematic monitoring of urinary iodine	0.5	0.7	0.6	0.1	0.7	0.6	0.2	1.3
laboratories for measuring urinary iodine, with equipment and trained staff	1.2	1.2	1.2	0.0	1.1	1.0	0.5	1.3
plan for periodic assessment of IDD status by thyroid size and function at population level	0.3	0.4	0.3	0.0	0.5	0.3	0.2	0.8
reports of outcomes	0.4	0.5	0.4	0.1	0.5	0.3	0.1	0.8

National planning and coordinating mechanisms	**2.8**	**4.4**	**3.0**	**1.2**	**2.5**	**3.0**	**1.1**	**5.0**
establishment of high-level interagency committee	1.5	1.4	1.3	0.1	1.2	1.3	0.2	1.5
evidence of effective committee action	0.5	1.3	0.7	0.1	0.5	0.8	0.1	1.5
comprehensive national plan of action	0.8	1.7	1.0	1.0	0.7	0.9	0.8	2.0
Sustainability	**3.9**	**4.6**	**3.9**	**1.4**	**3.3**	**2.7**	**1.4**	**5.0**
assured funding (through combination of external, internal and intrinsic sources)	2.5	2.6	2.3	1.2	2.0	1.9	1.0	3.0
political commitment	1.4	2.0	1.5	0.2	1.3	0.8	0.4	2.0
Total	**3.2**	**4.2**	**3.5**	**0.7**	**3.2**	**2.4**	**1.9**	**5.0**

Table 1.3 Weighting Factors for Attributes and Criteria for a 'Good' USI Programme

Attribute	Criteria	Weighting Factor for: Criteria	Attribute
1. Appropriate legislation and regulations	Legislation/regulations that:		
	• is national in scope	0.15	
	• applies to all edible salt, including salt for animals	0.10	
	• prescribes concentrations of iodine at production, retail & household level	0.15	
	• specifies requirements for packaging and labelling	0.15	
	• prescribes monitoring procedures	0.20	
	• specifies responsibilities for inspection	0.15	
	• specifies penalties for violations	0.10	
		1.00	.013
2. Enforcement procedures	Evidence of application in:		
	• identifying infringements	0.60	
	• successful prosecutions	0.40	
		1.00	0.08
3. Supply of iodised salt	• sufficient capacity to iodise all edible salt	0.20	
	• actual supply of iodised salt sufficient for needs	0.20	
	• percentage of salt effectively iodised	0.60	
		1.00	0.14
4. Monitoring system for iodised salt at production level	• plan for monitoring (internal and external)	0.20	
	• guidelines for procedures	0.20	
	• regular reports	0.20	
	• effective supervision, including review of training	0.20	
	• evidence of follow-up action	0.20	
		1.00	0.12
5. Availability of iodised salt at household level	• plan for monitoring at retail and household levels	0.10	
	• monitoring system in place and operating regularly	0.30	
	• percentage of households using adequately iodised salt	0.60	
		1.00	0.15
	•		
6. IEC activities	• effective advocacy addressed to: policy makers, salt manufacturers, public and opinion leaders	0.50	
	• emphases on IDD and role of iodised salt	0.20	
	• support to training and training materials	0.30	
		1.00	0.12
7. Monitoring of IDD	• recognition of USI as a component of an IDD elimination programme	0.20	
	• plan for systematic monitoring of urinary iodine		
	• laboratories for measuring urinary iodine, with equipment and trained staff	0.25 0.25	
	• plan for periodic assessment of IDD status by thyroid size and function at population level	0.15	
	• reports of outcomes	0.15	
		1.00	0.08
8. National planning and coordinating mechanisms	• establishment of high-level interagency committee	0.30	
	• evidence of effective committee action	0.30	
	• comprehensive national plan of action	0.40	
		1.00	0.08
9. Sustainability	• assured funding (through combination of external, internal and intrinsic sources)	0.60	
	• political commitment	0.40	
		1.00	0.10
			1.00

B

2. PROGRAMME INPUTS – ESTIMATES OF FINANCIAL INPUTS AND UNICEF STAFF TIME

UNICEF financial inputs for IDD programme and USI programme by category of activity; Total expenditure on USI 1993-97, and Estimated expenditure on USI 1998-2000 by source (with accompanying tables).
What has been the scale and what are the trends of donor support in human and financial terms over the last five years? And, for the next three years?
What is the comparative financial contribution channeled through UNICEF?

UNICEF staff time inputs. How much professional staff time, has been devoted to the IDD programme by year (1993-96) in person months or fractions thereof.

Financial Inputs

2.1 The cost of IDD elimination programmes as supported by UNICEF, and when available by Governments for the five-year period 1993-1997 is summarised as best as possible for each country in Table 2.1. UNICEF operates in cooperation with governments and the private sector, yet only UNICEF's expenses can be itemised. Government inputs include the staff time of officials, certainly significant in Bhutan, India and Pakistan. The financial input from governments is only available for Bangladesh, India and Nepal. In Pakistan, the salt industry was a major contributor in the sense that many companies installed iodisation equipment at their own expense. During this period there was only one example of bilateral assistance, from the Government of India to Nepal. There were no World Bank loans.

Table 2.1 Contributions by Sources by country on IDD elimination, 1993-1997 (US$ 000's).

Country	Total Cost	Govt.	UNICEF				GOI/ Bilateral
			GR	CIDA	Kiwanis	Other	
Bangladesh	5210	2016	2924	270			
Bhutan	89		38	11	40		
India	29863	13150	3563[a]	--		--[b]	
Maldives	12					12[c]	
Nepal	3543	354	172	176	194	852[d]	1795
Pakistan	4551		2925	1411	215		
Sri Lanka	626		190	404	20	12[e]	
Total	43894	15529	10082		469		1795

a) Information from India can not be broken down correctly by donor source, thus all expenditure is forced into GR; b) Canadian National Committee and CIDA predominantly contribute to India's IDD programme; c) Japanese International Cooperation Agency; d) Italy; Committees in Austria, Canada, Japan & Switzerland; MI (Canada); e) Norway, Netherlands.

2.2 UNICEF has been the major if not the only supporter of IDD elimination programmes in all countries except Nepal, where it contributed only about 40% of total costs. The extent to which UNICEF relied on its General Resources (GR), or on Supplementary Funding through specific donor contributions, can be seen for each country in Table 2.1. Supplementary funding was provided by Kiwanis International, the Governments of Canada, Japan, Italy, Norway and Netherlands, UNICEF Committees in Austria, Canada and Japan, the Swiss National Committee, and the Micronutrient Initiative.

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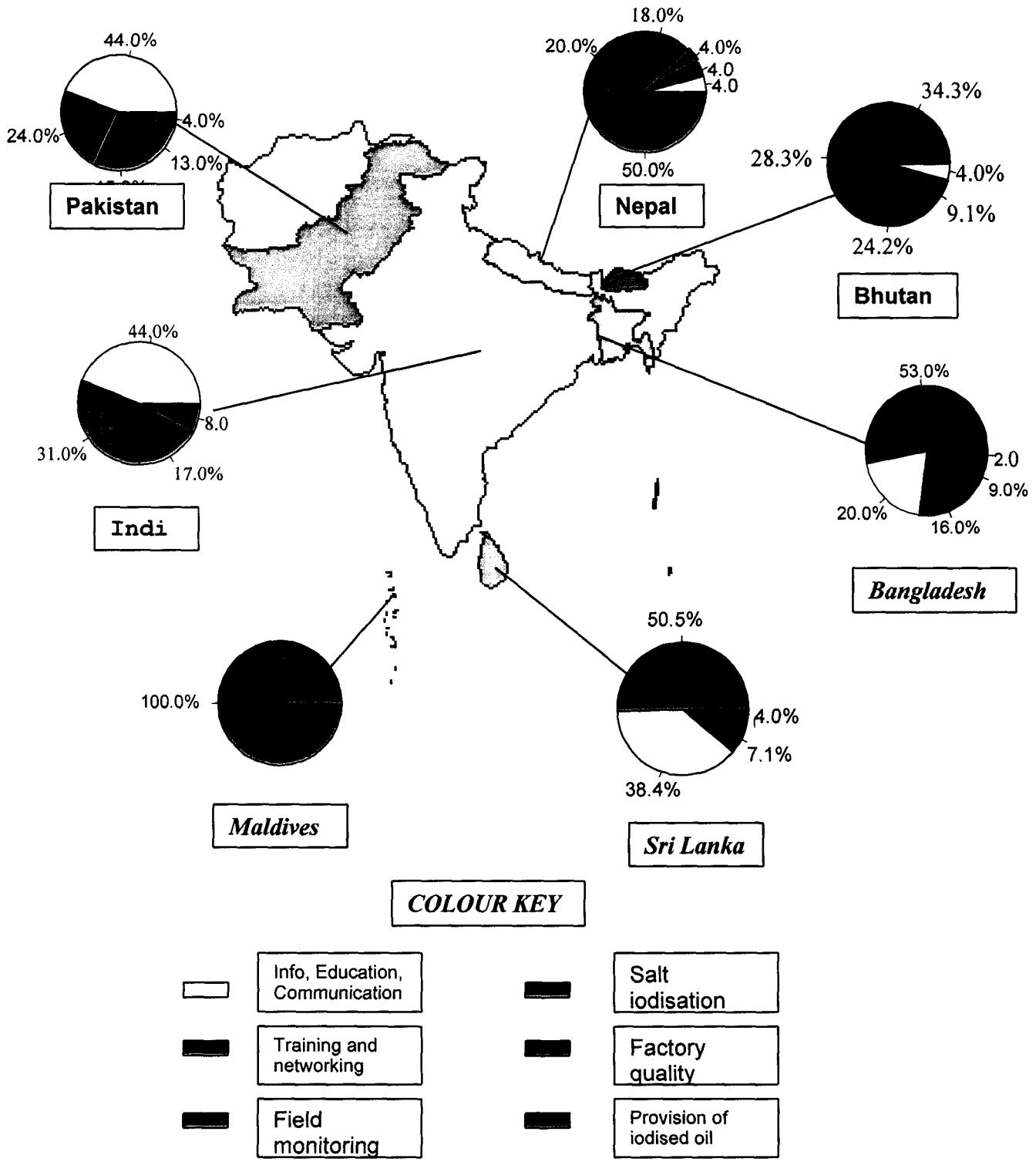
Percentage of UNICEF financial inputs, 1993-1997, allocated to category of activity by country



Note: The boundaries and names shown and the designations used on these maps do not imply official endorsement or acceptance by the United Nations.

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2.3 Expenditure for iodising salt ranged from 0.004 US$ in India to 0.15 US$ in Bhutan for 1993-1997. Table 2.2 presents the variation by country. Only UNICEF GR and SF expenditures are used because government expenditures are available for three countries only.

Table 2.2 UNICEF expenditure per capita* by country, 1993-1997 (GR and SF in US$)

Country	Per capita expenditure
Bangladesh	0.030
Bhutan	0.150
India	0.004
Maldives	0.050
Nepal	0.060
Pakistan	0.030
Sri Lanka	0.030

*Population data for 1996 taken from State of the World's Children, 1998.

2.4 UNICEF's contribution during this period is examined in greater detail in Table 2.3 in terms of six categories of assistance: Information, Education and Communication (IEC) activities; factory quality assurance by producers; field monitoring systems, special studies and surveys, and evaluations; salt iodisation supplies, including labour and administrative costs; training and networking; and iodised oil supplies. The value of total UNICEF support (not shown independently in Table 2.1) appears at the bottom of Table 2.3 in absolute figures. Comparisons between countries based on percentage spent on the various activities can be seen on page 7. Uniquely, Nepal spent half its contribution on supplies of iodised oil; in order to compare its relative contribution to other categories with the patterns in other countries, the percentages shown should be doubled. Thus, of Nepal's total inputs excluding iodised oil supplies, 36% were spent on salt iodisation, roughly similar to the proportions in Bangladesh, India and Sri Lanka but much more than in Bhutan and Pakistan. India, Pakistan and Sri Lanka spent a similar and large proportion on IEC activities. Bhutan spent the largest share on factory quality assurance, 24%; also on field monitoring and evaluation, 34% (apart from Maldives, which so far has only supported this activity). Only Bangladesh and Bhutan have made significant inputs to factory quality assurance.

Table 2.3 UNICEF financial inputs (US$ 000's), by country and category, 1993-1997, in support of IDD elimination

Category	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
IEC activities	632	4	1553	1	52	1978	238
Factory quality assurance	498	21	0	0	58	200	0
Field monitoring & evaluation	301	30	1101	10	58	702	28
Salt iodisation supplies	1712	8	620	0	247	577	312
Training	52	25	289	1	271	1094	46
Iodised oil	0	0	0	0	708	0	0
TOTAL UNICEF INPUT	3194	89	3563	12	1394	4551	625

2.5 Annual figures of UNICEF contributions by categories of assistance are in Appendix B. It is difficult to recognise in them any consistent pattern or trend. The programmes have such

different characteristics, in general and over time. Annual supply figures can also be misleading in that some non-capital items may be utilised over a period of two years or more. For example, the stock of potassium iodate UNICEF supplied to Bhutan in 1994 will probably last until the end of 1998.

Potassium Iodate

2.6 UNICEF policy with regard to supply of potassium iodate has varied between countries. In the case of **Bangladesh**, it was supplied free of charge since 1993 at the rate of 60,000 kg/year, as the government and industry were not prepared to purchase it themselves. In **Bhutan**, UNICEF supplied it until 1994 (see preceding paragraph and paragraph 3.7). In **India** (paragraph 3.9), a year's supply was given to co-operatives of small producers). In **Nepal,** UNICEF is not involved: Salt Trading Corporation (STC) purchases iodine for manufacture in India into potassium iodate, and Government of India (GOI) reimburses the costs. UNICEF supplies it in **Pakistan** (paragraph 3.20), and in **Sri Lanka** (paragraph 3.22) at a subsidised price.

Staff Time

2.7 A traditional and important role of UNICEF is the contribution to programme development and monitoring made by its professional staff. This involves personal advocacy, the preparation and critical review of plans, studies, field trips, financial accountings, the organisation of, and participation in, meetings and workshops, and related activities, all of which may demand substantial amounts of staff time. An attempt is made in Table 2.4 to summarise the amount of such time, devoted specifically to IDD issues, spent each year from 1993 to 1997.

Table 2.4 UNICEF staff time on IDD issues in person-months

Country	1993	1994	1995	1996	1997
Bangladesh	13.8	13.8	13.8	13.8	9.6
Bhutan	1.8	1.2	2.2	5.5	3.2
India	10	10	10	10	3
Maldives	0	0	0.6	0.5	0.5
Nepal	3	3	3	1.5	1.5
Pakistan	4	8	7	7	8
Sri Lanka	6	6	6	6	6

3. PROGRAMME INPUTS - SUPPLY OF IODISED SALT

Supply: Domestic production
Have all major indigenous salt producers been identified by the programme? If so by when had they been identified? How many are there?
Has the UNICEF office developed a listing of all the locations with the information necessary to be able to contact them? By when? How many of them are there?
Have all major salt refiners, crushers, iodising, packaging and distributing agents been identified? If so by when? How many are there?
To how many companies has the USI programme has supplied iodizing equipment?
Describe the terms on which the equipment is supplied? Is the company given a loan? Is the equipment a gift?

Domestic salt production and salt iodisation
What is the total iodisation capacity in the country?
How many salt iodisation producers are there?
How are they organized?
What is the difference in their capacity, e.g. how many large-scale producers, small-scale producers, etc., are there?
What have been the trends in capacity over the last five years?
Describe the rate of turn over of producing, processing and packing businesses? Is it a stable business? How frequently do businesses open up and close down?

Small producers
Is a significant quantity of salt processed and distributed through small-scale producers (with capacity of less than 1,000 MT/year)?
What is the situation with small-scale salt producers in terms of their organization for iodisation? Have cooperatives been formed?
What has the USI programme done and what more could be done in order to support small producers and ensure that all salt from these groups is iodised?

Imported salt.
What proportion of all salt intended for human consumption is imported?
Have all major salt importers been identified? If so, by when? How many of them are there?
What proportion of imported salt is iodized?
What are the trends over the last five years?
Are there particular types or varieties of salt which are imported?
What proportion of the non-iodized imported salt is iodized upon importation?
What has UNICEF done to help increase the proportion of imported salt which is iodized at the source, prior to importation?

Iodising Equipment
On balance how have the two types of equipment, dry or spray mixing, stood up to the operating environment?
In the long term, which type of equipment seems to be the most cost efficient?
What balance of the two types of equipment would ideally best suit the environment in your country today?

Iodized Salt for animal consumption
To what extent is this issue being discussed and acted upon?

Domestic Production, Importation and Iodisation

3.1 Table 3.1 summarises trends in the region for the percentage of all edible salt reported to be iodised.

Table 3.1 Percentages of All Edible Salt Iodised 1994-1997[a]

Year	Bangladesh	Bhutan[b]	India	Maldives	Nepal[b]	Pakistan	Sri Lanka
1994	49			10	100	< 5	10
1995	47	100		66	100	19	40
1996	86	100			100	23	40
1997	87		73[c]		100	23[d]	20

a) Figures should relate to adequate levels of iodine, as defined by each country, but may not always do so; b) Refers to salt controlled by monopoly agency; other imports are uncertain; c) Estimated from available data; d) Other estimates suggest 34%.

Bangladesh

3.2 Crude salt is produced by small operators in the coastal areas and refined in private mills that are located throughout the country. UNICEF in 1993 decided to provide each of the salt crushing/refining mills with a salt iodisation plant (SIP), free of charge. There are thus 265 SIPs in the country, though at any given time there are likely - at present - to be about one third not in operation. This is because of the seasonal nature of the salt industry, and the fact that factories do not work to full capacity: were they to do so, throughout the year, only some 150 would be needed to meet demand. So the decision was an expedient to ensure that all salt could be iodised, taking note of the realities of the industry.

3.3 All the plants are of medium size, with a production capacity of 1000 to 5000 tons per year. So that the total annual iodisation capacity could be some one million tons (although 2.4 million tons has been claimed).[1] This is well in excess of what is required, which has been estimated as from 440,000 to perhaps 800,000 tons/year, depending on how much salt people are estimated to eat (estimates range from 10 g/person/day to nearer 20 g), and whether salt for animals are included. But against this potential must be set actual performance: in 1997 the total amount of edible salt entering the market was 500,000 tons, of which 437,000 tons (87%) were iodised. In fact the amounts reported to enter the market fluctuate widely from year to year, reaching a high of 952,000 tons in 1995, when 47% was iodised.

3.4 The salt production season occurs between December and April, and output is dependent on weather conditions. When there is a shortfall in local production, crude salt is imported from India by the government through the Trading Corporation of Bangladesh (TCB). After importation such salt is required by law to be iodised, but there are no border controls and in practice this does not happen.

Bhutan

3.5 There are no indigenous salt producers in Bhutan. Bhutan Salt Enterprises (BSE) is the only agent authorised to iodise salt in the country. (Prior to 1960 rock salt used to be imported

[1] The total installed capacity is to some extent a rather arbitrary concept, since it depends not only on the number of operating plants but also on the number of days, and hours per day, that they could be in operation.

from Tibet). In 1994, BSE was fully privatised, and able to import common salt from Gujarat in India. Table 3.2 gives figures (provided by BSE) for imports of common salt and production of iodised salt since that date. The annual requirement of iodised salt for the whole of Bhutan is a little over 5000 tons, although an estimate of 7000 tons is used as a precaution. The shortfall in supply in 1995 was presumably met by Bhutanese wholesalers and retailers buying salt from Indian traders across the border, but this may not have been adequately iodised. BSE has had problems in importing salt, caused partly by shortage of railway wagons, and by financial constraints.

Table 3.2 BHUTAN: Trends in importation of salt from India, and production and dispatch of iodised salt from BSE (000's tons).

Year	Importation of common salt	Production of iodised salt	Despatch of iodised salt
1994	4.7	4.4	4.3
1995	2.8	3.0	3.0
1996	7.8	4.8	4.8
1997	4.0	4.9	4.7

3.6 FCB no longer imports salt (see paragraph 6.2), but BSE uses for distribution the FCB network and other agents, and World Food Programme centres continue to distribute iodised salt purchased from BSE. There is now competition from the free market with India.

3.7 UNICEF provided the single iodisation plant in 1985, together with laboratory equipment for monitoring iodine content in salt, free of charge. The machine is still functioning quite well after 13 years, more than double its expected life, with only a few parts having been replaced. One reason for this could be that it has always been run well below its maximum capacity. A replacement machine is being provided by UNICEF (from Kiwanis funds) to the Ministry of Trade and Industries who will lease it to BSE on terms to be developed jointly with UNICEF. Funds received from the lease will be used to sustain salt iodisation in Bhutan. UNICEF has provided potassium iodate in the past; present stocks will last until the end of 1998.
census of all the large, medium and small salt works and iodisation plants, numbering in all about 9000. The data have been computerised, to facilitate periodic monitoring of the production, dispatch and quality of iodised salt. UNICEF supported the development of the necessary software and will supply computers to selected centres to establish the monitoring system at production level.

India

3.8 The Salt Department under the provisions of the Central Excise and Salt Act, 1954, had identified all the large and medium salt works, but not small works having an area of 4.04 hectares or less because these were exempted from licensing. The licensing system provided a ready means of identification until the Finance Bill of 1996 abolished it; the government is considering whether to

Table 3.3 INDIA: Trends in capacity to iodise salt and actual supply of iodised salt (000's tons).

Year	No. of units	Capacity	Supply
1992	519	6500	2700
1993	529	6500	2700
1994	572	7500	2800
1995	605	8000	3500
1996	699	8700	4100
1997	784	10800	4000

replace it with a system of registration. Meanwhile UNICEF has assisted a census of all the large and small salt works and iodisation plants, numbering in all about 9000. The data have been computerized, to facilitate periodic monitoring of the production, dispatch and quality of iodised salt. UNICEF supported the development of the necessary software and will supply computers to selected centres to establish the monitoring system at production level.

Salt Plant at Nayarangang, Bangladesh (1989). UNICEF/AFB-22/ Hassan S. Chandan .

3.9 Small producers (with a capacity of less than 1000 tons iodised salt/year) in five states have organised themselves into 40 cooperative societies, each of which has been equipped by UNICEF with an iodisation plant and a year's supply of potassium iodate. Their collective capacity is 0.6 million tons/year, which is 7% of the total 1996 iodisation capacity in the country (see Table 3.3).

3.10 The number of iodisation units, now about 784, has steadily risen from about 500 at the start of the decade. Over 98% are in the private sector. While the total production of salt is some 13.5 million tons/year, a substantial proportion of this is for industrial and other non-edible purposes. There is an installed capacity to iodise about two thirds of the total production (8.7 million tons in1996; 10.8 million tons in 1997), although less than half this amount of iodised salt is actually produced (see Table 3.3). Nevertheless, this is between 73-80% of the estimated needs of the country, some 5.5 million tons on the basis of a Salt Department formula equivalent to 16 grams of salt per person per day, which is supposed to include the needs of both humans and animals.

3.11 Thus, the capacity to produce iodised salt greatly exceeds the current actual production, which is already close to the internal needs of the country. However, India exports an unknown total amount of salt to several countries, which in most cases is meant to be iodised, so production of iodised salt may be less than domestic and trade needs combined. Nevertheless, potentially this trade could increase substantially. As far as imports are concerned, India only imports insignificant amounts of rock salt for medicinal and religious purposes (some 20,000 tons from Pakistan), which is not iodised.

Maldives

3.12 Salt is not produced in Maldives. Rock salt and fine grain salt are imported from India, Sri Lanka, Indonesia, Singapore and Thailand. About half is used for salting fish. Major salt importers have not been identified. Estimates for the amount of salt imported in recent years range from 900 to 4000 tons.

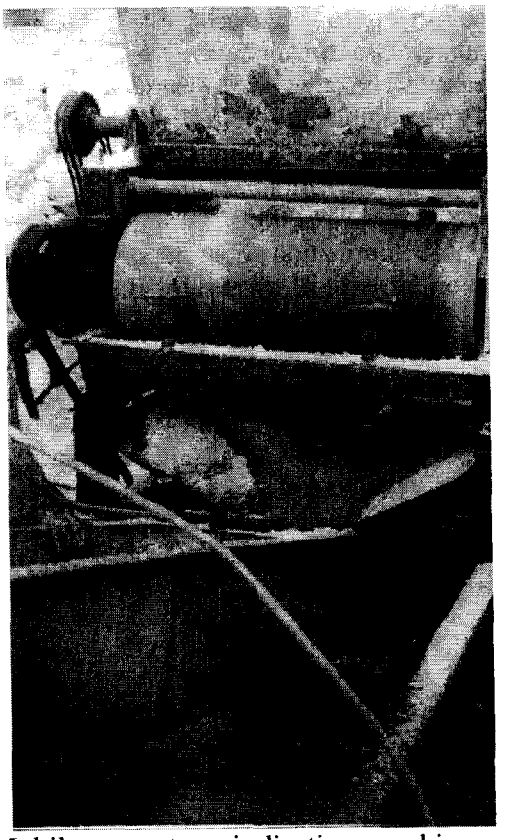
Nepal

3.13 There are no indigenous salt producers in Nepal; all salt is imported from India, apart from a very small traditional trade with Tibet. Salt Trading Corporation (STC), a quasi-

government company, is the only agency legally able to trade in imported salt from India. Most of all the 114,000 tons of salt imported from India in 1996 was already iodised, leaving only 20% (or about 23,000 tons) to be iodised by STC.

3.14 UNICEF provided two mobile iodisation plants to STC in 1996 free of charge. STC has also acquired its own units, and in recent years has had three or four units in operation, with an iodising capacity of some 30,000 to 40,000 tons/year, well in excess of actual production of some 23,000 tons.

3.15 Initially, all salt iodisation was done in India. However, starting from 1985, GOI gave STC three plants, and in 1993, it was agreed that the iodising capacity in Nepal should be increased to enable the maintenance of iodisation of a large buffer stock to counter erratic supply from India. Then in 1997 it was decided (at a policy meeting prompted by UNICEF) that all refined and crushed salt should be iodised in India, but iodisation of large crystal salt would slowly be taken over by STC in Nepal because it is difficult for India to guarantee adequate iodisation of the large uneven crystals. Currently, large crystal salt accounts for 55% of the imported salt, more than 60,000 tons of the 1996 quota. STC has purchased two additional plants, with salt crushing facilities, to extend iodisation capacity.



Mobile spray-type iodisation machine in use, Biratnagar Salt Factory, Nepal (1998).
UNICEF-ROSA/Amy Gilman.

3.16 re-iodise sub-standard imported salt identified by a strengthened monitoring system. Furthermore, up to 5% of salt is brought into Nepal by unregistered traders. The Ministry of Health (MOH) recently moved the Customs Department to issue a statement to customs offices along the border prohibiting importation of uniodised salt.

Pakistan

3.17 All indigenous salt producers had been identified by mid-1995. No salt is imported, except perhaps trifling amounts in areas bordering India. In August 1997, the salt database listed 474 salt processors with annual productions of more than 60 tons. There were three large producers (with annual production over 5000 tons) and 77 medium size producers (between 1000 and 4999 tons); the remaining small producers (less than 1000 tons/year) accounted for 52% of the total edible salt produced in the country. These small producers operate fairly independently and generally have not formed cooperatives.

3.18 The total iodising capacity in the country is estimated at about 240,000 tons/year, which would be some 70% of the total edible salt produced, although actual production of

iodised salt is about half that (nearly 120,000 tons in 1997). Other estimates suggest that the amounts of iodised salt entering the market in 1995, 1996 and 1997 were about 60,000, 70,000 and 80,000 tons respectively, representing 20 to 34 % of all edible salt.

3.19 The salt processors bought their own iodising equipment, either through bank loans or with their own funds, without help from UNICEF. However, UNICEF did provide potassium iodate, initially free and then (and now) at subsidised cost. UNICEF also provided free rapid test kits and promotional materials, and supported training on iodisation, packaging and salt quality monitoring, and on promotional events.

3.20 UNICEF support was channelled primarily through the Iodised Salt Support Facility (ISSF), which was set up in February 1994 within UNICEF as a rapid response to the decision to embark on USI made that month at a National Consultation on IDD. A year later, in March 1995, the management of ISSF was handed over by UNICEF on a contract basis to an NGO, Social Marketing Pakistan (SMP). The Facility enabled UNICEF to become more effectively operational, and avoided much bureaucratic delay. UNICEF-Pakistan believes that its initiative was catalytic, and that the success of ISSF in its role of promotion, training, monitoring and supply suggests that this experience could be relevant to other projects in other countries.

Sri Lanka

3.21 There are four major salt producers in the country, two of which were state-run salt corporations. Since early 1997 they have been privatised. The other two are associations of small salt manufacturers. UNICEF has provided iodising equipment as gifts to both the two companies and the two associations. Potassium iodate has also been given to the associations, which also have been supported with technical training and orientation.

3.22 Some fine table salt is imported, but there is little information about imports. Major salt importers have not been identified. Customs authorities have no system for checking imports of iodised salt, or the level of iodisation.

3.23 Records of the amount of edible salt entering the market fluctuate substantially from year to year, but suggest about 86,000 tons in 1995 and about 124,000 tons in 1996, 40% of which was iodised. This is equivalent to 34,000 and 50,000 tons of iodised salt, in the respected years, compared to a national annual requirement of 70,000 tons (consistent with an average daily intake of 10 grams of salt). Before privatisation, the companies produced a much greater proportion of the total than the associations, but their capacity may have deteriorated recently - perhaps temporarily during a transitional phase.

Types of Iodising Equipment

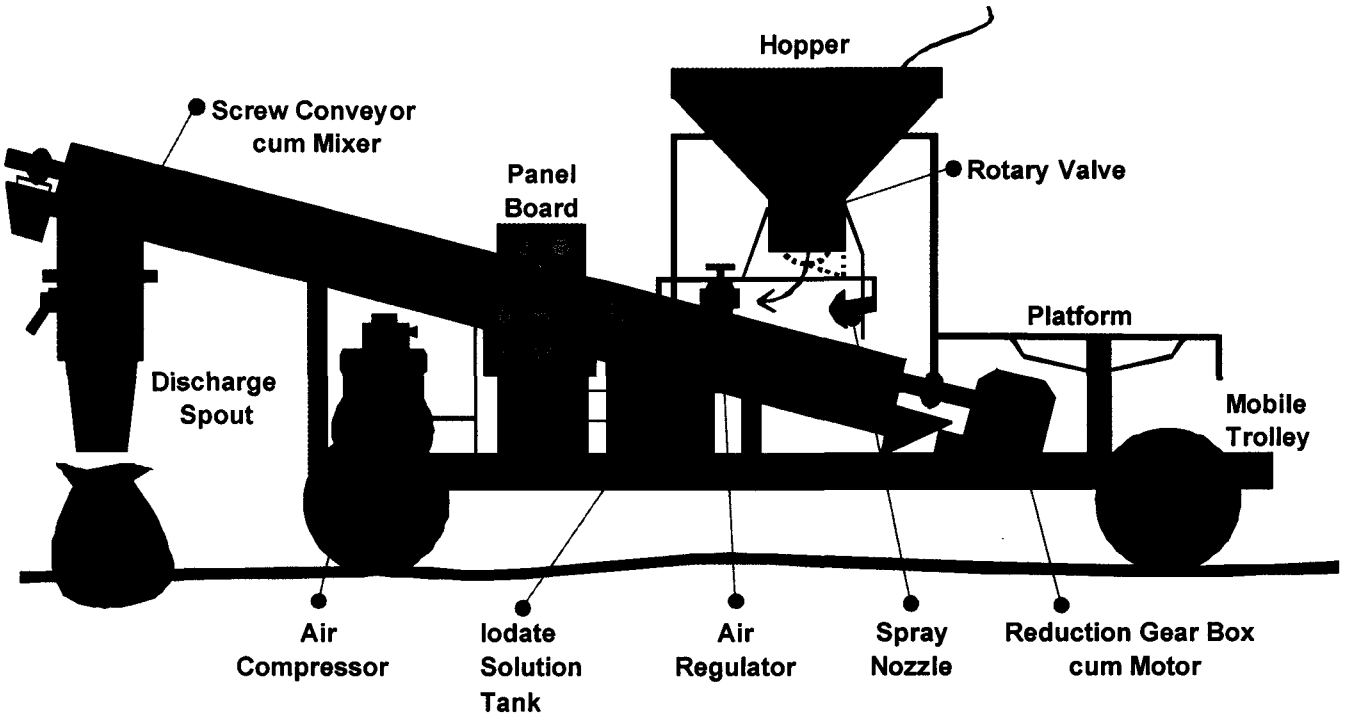
3.24 There are two basic ways of mixing potassium iodate into salt: dry mixing and wet mixing. Wet mixing, in which potassium iodate is made up into a concentrated solution in water, can be done by either dripping, or spraying, the solution on the salt at a uniform rate. The drip feed system is simple and cheap, and is often used for iodising moist crude salt crystals. Spraying gives a more even mix than dry mixing, but the equipment is more expensive and needs more maintenance and the operators need more training. Operators of dry mixing equipment may not mix for the recommended time, in order to save electricity, resulting in an uneven mix.

3.25 The machine provided to **Bhutan** in 1985 was of a standard continuous spray type. It has operated for 13 years (though not used to full capacity), double its expected life, and has stood the test of time as well as the operating environment. It requires regular cleaning. only

problem has been uneven spraying resulting from the blocking of the spray nozzle, which has had to be cleared several times. In **India**, over 90% of the machines are spray type; the remainder are drip feed, a method found to be very cost-effective. The two plants given to STC, in **Nepal**, are also of the spray type. They were handed over in 1996 and are in good working condition. The **Sri Lankan** machines are of spray type. In **Pakistan**, the policy has been to promote dry batch mixing, except for a few large processors that use conveyor belt equipment with automatic drip or spray. The batch mixing equipment has been sturdy, but due partly to the negligence of operators wide variations in iodine content have been noticed. In 1996, the drip feed method was tested in a small group of processors; the results showed it to be more cost-effective and reliable than the dry batch mixing method. The equipment is cheaper and it requires less labour to operate. The local UNICEF view is that the processor should be able to choose what method he wishes to use, and that the primary emphasis should be on quality assurance.

Conveyor belt of a stationary iodisation machine, Biratnagar, Nepal (1998). UNICEF-ROSA/Amy Gilman.

Mobile Spray Iodisation Plant



B

Salt for Animals

3.26 An implication of USI is that all salt required for human and also animal consumption should be iodised. If only the salt for human consumption is iodised, the non-iodised salt for animal consumption may be more readily purchased by many people because it is cheaper. The availability of two types of salt also poses a major problem for the law enforcing agencies, for they cannot take legal action against those selling non-iodised salt since it can be claimed that this is solely being used for animal consumption.

3.27 It is of course also true that animals receive great benefit from iodine supplementation in deficient areas, and the economics of animal husbandry is substantially improved. In many countries it is difficult to have separate grades of iodised salt for animals, and a separate monitoring of iodine intake of animals may be necessary to determine if certain species will require additional supplementation through feeds or salt licks.

3.28 In **Bangladesh**, all edible salt for human and animal consumption is required to be iodised. In **Bhutan**, the use of iodised salt by animals is strongly advocated, and the raw salt imported from India includes an allocation for animals. In **India**, the estimates for requirements made by the Salt Department take account of the needs of animals; however, the Prevention of Food Adulteration (1954) Act pertains only to human consumption, and a separate order from the animal husbandry sector would be required to ensure availability of iodised salt for animals. The issue is planned for discussion with agricultural universities in 1998. **Maldives** is said to have no animals. In **Nepal**, there is no special salt for animals, and as all salt - at least that handled by STC - is iodised, the salt used by animals is iodised too. In **Pakistan**, there has been little discussion of the issue, and in **Sri Lanka**, virtually none.

B

4. PROGRAMME INPUTS AND PROCESS - THE ROLE OF THE PRIVATE SECTOR

Role of the private sector: Would you characterize private sector support to have been strong, indifferent, or even obstructive? Illustrate your judgement.

Bangladesh

4.1 The private sector plays a critical role in that all the salt crushing and refining salt mills belong to it.

Bhutan

4.2 Private sector support for USI has been exceptionally strong. The proprietor of Bhutan Salt Enterprises (BSE) states that managing the salt iodisation plant provides him with two benefits, one a business opportunity, the other an opportunity to serve his fellows by providing iodised salt to prevent the serious consequences of IDD. Between 1994 and 1996, when BSE had difficulty procuring common salt from India and the monitoring system had almost broken down, it was the commitment of BSE to IDD control that maintained production of iodised salt.

India

4.3 The private sector was initially indifferent, but has become more positive as a result of persistent advocacy, with Information, Education and Communication (IEC) materials emphasising its role in this public health programme; and also as a consequence of more and more orders prohibiting the sale of non-iodised salt. This itself provoked some negative comment, which was given prominence by some sections of the press. (See paragraph 8.15).

Nepal

4.4 The Salt Trading Corporation (STC), which has a monopoly on salt trading in Nepal, is a quasi-government company with some private ownership. The government is represented on its Board, but the behaviour of STC is in many ways characteristic of a private company. That is to say, its objective is to maximise profit, and if that can be achieved while accommodating something additional - in this case salt iodisation - there are likely to be no serious problems. In fact, STC has not been an obstacle to salt iodisation, and while it is doing a reasonably good job it has not taken much initiative to accelerate the process. Its early collaboration with GOI over many years led to little progress. UNICEF has since started asking questions and playing an important role in stimulating action and ensuring that STC knows that its performance is closely monitored.

Pakistan

4.5 The private sector has been critically important. Firstly, the private sector salt industry has been generally strongly committed: salt processors themselves bought their own iodisation equipment. Secondly, important components of the programme, such as IEC and support to processors in the form of subsidised potassium iodate, have been handled by an NGO - with UNICEF backing (see paragraph 3.21). But there have been problems. Some salt processors who initially did not agree to iodise their salt became envious when they realised that those who had done so were making good profits. It is thought that they may have been responsible for instigating rumours that the programme was linked to family planning. Some newspapers published misleading information.

Sri Lanka

4.6 Since the salt industry was privatised in 1996-97, UNICEF proposes to focus support on the two major companies that produce about 80% of all the salt in the

Salt fields, Chittagaon,Cox's Bazar, Bangladesh (1992). UNICEF/AYI-21A/Shehzad Noorani.

country. The new post-privatisation managements have faced financial constraints and have had a low commitment to salt iodisation.

5. PROGRAMME PROCESS - NATIONAL PLANS AND COORDINATION SUPPORTING USI

Coordination with the government:
Is there a national task force for IDD?
How often do they meet?
How efficiently do they function -- for example, are minutes of meetings recorded?
Is there a national plan of action on the elimination of IDD and achieving universal salt iodisation and what are its main features? To what extent is the plan useful as a basis for developing workplans and to what extent is it adhered to?
What are the roles of government and private sectors in terms of policy making, legislation, price and quality control, marketing and communication, etc.?

Bangladesh

5.1 The National Committee on Control of IDD is chaired by the Secretary, Ministry of Health and Family Welfare, with members from Institute of Public Health Nutrition (IPHN), Bangladesh Small and Cottage Industries Corporation (BSCIC), Salt Mill Owners Association, Salt Growers Association, Ministry of Commerce, Ministry of Industries and UNICEF. An Advisory Committee is headed by the National Coordinator of International Council for Control of Iodine Deficiency Disorders (ICCIDD), Bangladesh, and has a wide membership, including UNICEF. Meetings are held monthly and minutes kept, but activities are limited to publication and distribution of an IDD Newsletter, and support to surveys, studies and training. They do not include as yet review of progress towards meeting targets.

5.2 The National Food and Nutrition Policy, adopted in 1997, post-dates a National Plan of Action on Nutrition (NPAN) approved in 1996. The Plan aims to eliminate IDD by 2000 through USI, with reference to the WHO/UNICEF/ICCIDD guidelines and indicators.

Bhutan

5.3 The National Commission for Control of IDD meets periodically, when problems arise. It met twice in 1996, and planned a meeting in 1997. The current Chairman is the Secretary of Health and Education. Minutes are kept and most of the major decisions regarding IDD are made at the meetings.

5.4 Although there is no national plan of action as such, the programme follows the approach formulated in the 1980s, with the following components:

a) Salt iodisation and distribution,
b) Monitoring iodine levels in salt, by titration and rapid test kits, and
c) Evaluations - in 1991/92, 1996 and planned for 2001.

Iodised oil injection was discontinued in 1991. Annual workplans are largely influenced by the recommendations from the 1996 evaluation.

India

5.5 India has established a National Task Force, chaired by the Secretary, MOH, and a Technical IDD Control Review Committee chaired by the Director-General of Health Services; but they have not met.

5.6 The National IDD Control Programme is useful for advocacy purposes with State Governments and for developing workplans to achieve the goal of virtual elimination of IDD through USI; these provide broad guidelines for programme managers even if they are not strictly adhered to.

Maldives

5.7 A national plan of action for elimination of IDD has been incorporated in the Nation Plan of Action for Nutrition (NPAN). This will be of limited use until there is more political commitment for elimination of IDD.

Eight-year old boy with cretinism. UNICEF/93-BOU0049/Maggie Murrey-Lee.

Nepal

5.8 The National Coordinating Committee for IDD comprises the Ministry of Health, STC (Salt Trading Corporation), the Indian Embassy (GOI) and UNICEF. In 1996, it met twice, in 1997 once. Minutes are rarely recorded and really important issues seldom discussed. This is because the GOI prefers to continue with bilateral negotiations with STC, which have been the norm since the National Goitre Control Programme was established to iodise all salt - with strong support from GOI - in 1979. This tradition continues after the programme was integrated with the Goitre and Cretinism Eradication Programme (GCEP) under the Ministry of Health (MOH) in 1993.

5.9 There is at present no generally agreed comprehensive national plan, although there have been parallel agreements between government, STC and UNICEF, and between government, STC and GOI. It is expected that a five-year Government of Nepal plan covering all aspects of IDD elimination, regardless of the source of the inputs, may shortly be signed, but GOI may not be a partner and may continue its bilateral deals. GOI appears to have its own agenda, perhaps related to enhancing trade generally between the countries. The support it offers is substantial, including massive subsidies to transport iodised salt to remote areas, and salaries of many STC staff whose work extends beyond that related to salt iodisation.

Pakistan

5.10 The Planning Commission organised the first national consultation on IDD in 1994, with UNICEF support, and it coordinates the IDD Control Programme. Political commitment is there, but could be improved, as witness the delay in enactment of national legislation.

5.11 There is a National Coordinating Committee, which met six times in 1997. Meetings are fairly efficient, and minutes are recorded and discussed. All components of the programme are reviewed by the Committee.

5.12 Although there is no formal plan of action, there are a number of guidelines that cover the following components: a) Demand creation through communications and social mobilisation; b) Support to salt processors and distributors; c) Quality control and monitoring; and d) Policy and legislation. The 1996 appraisal of the programme identified the need for a comprehensive document for a national IDD control programme. This is currently being prepared by the government with UNICEF support.

Sri Lanka

5.13 At present, there is no national task force for IDD. There had been a national sub-committee, which met regularly until 1996, although few of its decisions were implemented; at that time the Ministry of Plan Implementation stopped activities following the transfer of a Director-General. However, in late 1997, the Cabinet appointed the Ministry to handle all nutrition issues in the country and it is expected that the committee will be re-vitalised with participation of the Secretaries of the concerned agencies.

5.14 The National Nutrition Plan of Action, which is awaiting approval by the Cabinet, includes a component on the elimination of IDD.

B

6. PROGRAMME PROCESS – DEVELOPING LEGISLATION AND STRENGTHENING ENFORCEMENT

Legislation
Has legislation been developed detailing that only salt with a specified amount of iodine can legally be marketed for human consumption?
What punishment can be given to those found to be breaking the law?
Do legal guidelines exist for monitoring salt at the point of production and other points in the salt distribution network?
What are there regulations regarding the quality of packaging for salt?
What pending legislation, if any, is in the process of being enacted?
What has been the role of UNICEF in the process of strengthening legislation?

Enforcement
What types of food items are well inspected by the food inspectors, if any? What are the constraints to strengthening the efficiency with which food inspectors can perform their job?
What has UNICEF done to support the food inspectorate?
Has anybody ever been convicted for breaching regulations with respect to salt iodisation, packaging or retailing of salt for human consumption? Give examples of the types of punishments that have been enforced.
Are there any cases pending in the courts?
What more could be done to strengthen the enforcement of legislation?

Bangladesh

6.1 A law on Control of IDD formulated in February 1989 came into force in January 1995, banning the importation, manufacture, storage, distribution or display of edible salt other than iodised salt. All salt manufacturers were required to register. Guidelines were included for monitoring iodised salt at different levels of distribution. Penalties for infringement were revocation of licence and either a fine or three years imprisonment or both, but no case has ever come up before the courts. Salt is a very political commodity, and governments have been wary of prompting price increases. UNICEF has advocated for the enactment of the law, and is now concentrating further on the enforcement issue.

Bhutan

6.2 In 1970 the National Assembly resolved to import iodised salt, which was to be sold at the same price as non-iodised salt. Subsequently a salt iodisation plant was set up in the country and in 1981 the Government banned imports of all salt except through the Food Corporation of Bhutan (FCB). Until 1994, FCB was responsible for procuring common salt from India, supplying it to Bhutan Salt Enterprises (BSE) for iodisation, and getting it back for distribution through its own network. Then in 1994, BSE was privatised and now obtains salt itself; FCB no longer imports salt. The National Commission for Control of

Sealing one-kilo plastic bags of iodised salt, Biratnagar Salt Factory, Nepal (1998). UNICEF-ROSA/Amy Gilman

IDD (NCCIDD) is likely to revise the regulations and associated penalties soon, to reflect these changes.

6.3 Penalties specified in 1986 for violating the salt ban and dealing in non-iodised or inadequately iodised salt included confiscation of illegally imported salt, a fine and full or partial suspension or cancellation of the trade licence. The Ministry of Trade and Industries has penalised several shopkeepers for infringements, most recently in mid-1997. But in recent years there appears to have been some relaxation in enforcement, particularly for iodised fine table salt available in one kg packs in urban areas. Bhutan has no food inspectorate.

India

6.5 Public Health in India is constitutionally a State subject, and State governments are empowered to issue notifications banning the sale of non-iodised salt for human consumption under the provisions of the Prevention of Food Adulteration (PFA) Act, 1954. By the end of 1997, 29 of the 32 States and Union Territories had issued total bans; two had issued partial bans (applicable to certain districts); and one, Kerala, had issued no ban at all. UNICEF has advocated for the whole country to come under the ban, and an amendment to the 1954 Act that would make this compulsory is under consideration.

6.6 The PFA Act provides that manufacturers or traders who deal in sub-standard salt are liable to a fine and imprisonment (from six months to three years). The Salt Department of the Ministry of Industry has been designated by the Government of India (GOI) as the "nodal agency" for monitoring the quality of salt at its production point, and ensuring its equitable distribution in the country. The Department has a network of field officers who take samples of salt at production points and selected railway stations where salt is unloaded. Transgressors can also be denied privileges of moving salt by rail.

6.7 Food inspectors are expected to examine all articles of food periodically, including salt, but in practice salt receives very low priority: not more than two or three samples are drawn per inspector per month. The ratio of food inspectors to population varies from state to state, and in general their numbers are too few to do an effective job, but the main constraint appears to be related to the self-interest of the inspectors. Several cases are pending in various courts for violation of the Act, including 40 against iodised salt manufacturers in Gujarat, the premier salt producing state.

Maldives

6.8 No legislation has yet been developed despite UNICEF advocacy relating to the importation of iodised salt and on-going discussions at the MOH. A fledgling enforcement infrastructure exists in the form of a food inspectorate that currently examines such articles as frozen poultry and meat products. UNICEF has supported training workshops for food handlers in Malπ.

Nepal

6.9 The Food Act, amended in 1996, has provisions on salt quality which relate to all salt, and on iodised salt (specifying levels of iodine) which are only applicable to packed salt. The Act is monitored by food inspectors (under the Ministry of Agriculture), but at present they are only entitled to check salt at retail level. No penalties are specified for those breaking the law, and no legal guidelines exist for monitoring salt at different points in its distribution.

6.10 The Ministry of Health (MOH), with support from UNICEF, has developed a comprehensive Salt Act which addresses these issues, and it is expected that it will become law soon. UNICEF has encouraged food inspectors to participate in advocacy meetings and

training workshops; if their mandate is extended by the new Act to enable them to provide external verification of the monitoring system of STC, their role will become much more significant. While STC remains the only official salt trader the problem of poor law enforcement is not so critical, but if the government removes its monopoly the need for improved legislation and enforcement procedures will become pressing.

Pakistan

6.11 Two of the four provinces (Balochistan and North West Frontier Province (NWFP) have amended pure food laws to ban non-iodised salt; Punjab has asked the federal government to pass national legislation; Sindh has been silent. The process of enabling national legislation has been hampered by a mischievous rumour that iodised salt may be a family planning device. In the two provinces that have banned non-iodised salt the law provides that violators are liable to imprisonment, but the monitoring and enforcement of food laws by provincial food inspectors is extremely weak, as is the case with many other laws.

6.12 UNICEF has actively promoted provincial and more recently national legislation, including support to drafting and to consultative meetings, while being mindful of the political environment. More success has been obtained at the district level: in NWFP two districts have achieved considerable success in banning the availability of non-iodised salt, through the initiative of District Commissioners. UNICEF plans to mobilise such local level initiative in other districts.

Sri Lanka

6.13 Regulations governing the iodisation of salt (1993) came into effect in July 1995. It is illegal to market non-iodised salt for human consumption. Penalties for infringement are a fine and also imprisonment for a period between three months and three years. Public Health Inspectors (PHI) and Food and Drug Inspectors are supposed to examine all food items, including salt, but are constrained by the lack of an institutionalised regular monitoring system, and by their frequently close ties with the communities in which they work. Due to poor monitoring and enforcement of the law some non-iodised salt is falsely labelled as iodised salt. Retailers who were caught dealing in non-iodised salt had consignments confiscated by PHIs during a raid, and were fined - but for only a quarter of the maximum sum stipulated, and they do not appear to have been imprisoned. In October, 1997, there were about 150 cases pending in court. (And see paragraph 7.24.)

6.14 UNICEF has supported the MOH in training all 1000 PHIs on IDD and salt monitoring, and also training of technicians from the 14 government laboratories. Effective enforcement requires a strengthened reporting system from PHIs to provincial supervisors and the central Ministry; increased capacity of the laboratories, to reduce presently substantial delays and ensure rapid reporting of test results; monitoring of salt at production sites; and training of health staff to strengthen monitoring at field level.

Prescribed Levels of Iodine in Salt

Table 6.1 Concentrations of iodine (in ppm) in salt required by law or directive at various levels

Country	Production	Retail	Household
Bangladesh	45-50		15-20
Bhutan	60	25	15
India	30	15	15
Maldives	-	-	-
Nepal	50	30	
Pakistan	20-80	10-50	
Sri Lanka		25	

in each country regarding the minimum concentrations of iodine (in the form of potassium iodate) in edible salt required at different levels of the distribution chain. Only Maldives as yet has no stipulated levels at all, and Nepal, Pakistan and Sri Lanka have no stipulations for household salt. Sri Lanka needs to have a legal requirement at the point of production if effective control of the industry is to be attempted, and

6.15 Table 6.1 summarises the regulations inadequately iodised salt prevented from reaching the market. Pakistan is the only country that, through its government guidelines for monitoring, sets an upper and a lower limit for the concentration of iodine in edible salt, despite - or perhaps, because of - there being no national legislation. There have been cases in Pakistan (and doubtless elsewhere) of iodine concentrations in salt at production level exceeding 100 or 200 ppm. It is would therefore be wise to stipulate an upper limit, because of the potential problem of iodine-induced hyperthyroidism (and see paragraph 11.2).

Packaging Regulations

6.15 **Bangladesh** has packaging guidelines, mainly for labelling with batch number and date of manufacture, but these are not being followed. In **India**, the Packaged Commodities Act, 1971, provides specifications for iodised salt packed in 1 and 0.5 kg pouches; for bulk packages of 50 and 75 kg the Salt Department specifies packaging requirements. Neither **Nepal** nor **Maldives** has regulations regarding packaging.

6.17 **Bhutan** has no written regulations, but following a meeting in February 1996 of a task force (comprising representatives of the Ministry of Trade and Industries, Ministry of Agriculture, Bhutan Chamber of Commerce and Industries, Ministry of Health and Education and the proprietor of BSE) packaging improved significantly. Salt currently is packed in good quality high-density polyethylene (HDPE) 37.5 kilo-bags with labels clearly showing batch number and date of production. The task force also urged BSE to begin producing fine table salt in one-kilo packs.

6.18 **Pakistani** and **Sri Lankan** guidelines state that iodised salt should be packed in polythene bags labelled conspicuously with the following information: a) specification as "iodised" or "iodated"(Sri Lanka) salt, with registered trade mark/name; b) name and address of manufacturer/distributor; c) weight of salt; d) date of manufacture (Pakistan) or expiry (Sri Lanka); e) batch number; f) advice to "use without washing" and "store away from sunlight and heat" (Sri Lanka), or "store in covered container in a cool dry place (Pakistan); and g) the maximum retail price (Pakistan).

7. PROGRAMME PROCESS - QUALITY OF IODISED SALT

Salt Monitoring - Quality control at point of production:
Does a monitoring plan exist to ensure that all salt produced or imported meets minimum standards?
Does this monitoring plan including activities at the point of production? Retail level? Point of consumption?
For monitoring at the point of production, how often is monitoring done?
Are there clear guidelines for corrective actions when inadequacies are identified?
Is there a system of record keeping and are records inspected or reviewed periodically through an external verification process?
To what extent is the problem of inconsistencies in mixing procedures (in terms of mixing time and content of potassium iodate used) realized and what has UNICEF done to help mitigate the problem? What more could UNICEF do?
To what extent has UNICEF been involved in trying to improve laboratory techniques to ensure the most appropriate and reliable means for testing iodine concentration? What more could UNICEF do?
Does UNICEF endorse the use of rapid test kits or titration at the point of production/importation, retail, household?

Packaging
What proportion of packagers are producing high quality salt packages?
What has UNICEF done to support better packaging of salt?
What is the difference in cost between good quality and poor quality packaging?

Bangladesh

7.1 A monitoring plan exists at production and retail levels. Factories are expected to test salt samples hourly with filter paper kits supplied by UNICEF. Every 15 days salt samples are collected from the salt factories by salt inspectors of the Bangladesh Small and Cottage Industries Corporation (BSCIC) for transportation to Dhaka, where their iodine concentration is estimated by titration; however, there is no effective system for periodic external review. District level Salt Committees (headed by the Deputy Commissioner) need to be motivated to take action.

7.2 A 1996 evaluation found that there were large variations in iodine content between different batches of salt from the same factory. Although guidelines for corrective action exist, together with a system of record keeping, they are not strictly followed.

7.3 UNICEF endorses both the paper strip method for internal monitoring, and the titration method for external monitoring. The filter paper strip method is semi-quantitative providing an estimate of iodine concentrations by comparison with a standard colour chart. For titration, UNICEF has provided technical and financial support to establish nine laboratories in the seven salt processing zones in the country. Once these become functional, salt samples will be tested there, instead of having to undergo the lengthy process of transportation to the salt testing laboratory in Dhaka.

Bhutan

7.4 Monitoring at all levels was somewhat neglected in the process of BSE becoming privatised, but the 1996 evaluation strengthened the monitoring plan at all three levels, production, retail and household. BSE is required to maintain a fully equipped laboratory staffed by a full-time technician, for monitoring the iodine content of the salt it processes by titration; internal control records are made available to supervisors. A laboratory technician

from the local hospital makes weekly visits to provide an external quality check, and the central Public Health Laboratory (PHL) arranges periodic visits.

7.5 It is not clear if guidelines exist for appropriate responses by BSE staff when inadequacies are detected. However, the primary supervisor at the hospital reports to the PHL who in turn reports to the Nutrition Programme Officer in the Health Division who is responsible for taking corrective action.

7.6 To mitigate problems of uneven iodine levels during the iodisation process UNICEF has advocated the need for constant monitoring at the plant by BSE staff, as well as by concerned authorities from the Health Division. UNICEF is considering discussing with the division the possibility of increasing the number of technicians at the local hospital, so that better external quality control services could be provided. UNICEF has supplied laboratory equipment to BSE, and supported regular training of technicians at the PHL in the titration method, and UNICEF staff make regular visits to the salt plant to monitor performance and encourage staff.

India

7.7 A monitoring plan exists in respect of iodisation units authorised by the Salt Department, but since authorisation is not now mandatory several other units also produce iodised salt. The abolition of the licensing system has weakened the monitoring capacity. Furthermore, there is no mechanism to monitor the infiltration of industrial non-iodised salt into the edible market, or the movement by road of salt iodised by unauthorised units.

7.8 Monitoring at the point of production is done internally by the manufacturers themselves and externally by the Salt Department and the Prevention of Food Adulteration authorities. Manufacturers are expected to draw samples each hour for testing in the laboratory at the production site, before clearing a lot for dispatch. Records are maintained and are periodically inspected by the Salt Department. The Salt Department draws samples from the lot, and in the event of failures corrective action is taken according to guidelines in force. PFA authorities undertake quality checks according to provisions of the 1954 Act, and can initiate legal proceedings in cases of substandard quality.

Titration laboratory for testing iodine content in salt, Biratnagar Salt Factory, Nepal (1998). UNICEF-ROSA/Amy Gilman.

7.9 Reasons for wide ranges in iodine concentration in salt include poor supervision of the spraying process (variable concentrations of potassium iodate solution, nozzle clogging, etc.). UNICEF has supported the Salt Department in organising training programmes on the proper maintenance of iodisation plants. The capacity of the Salt Department to undertake effective supervision and refresher training is another issue.

7.10 Another reason for the wide variation can be pressure of time: manufacturers tend to reduce mixing time when a rake of railway wagons has to be loaded within a stipulated time. Railways have been requested to make more even provision of wagons, and manufacturers to keep adequate stocks of iodised salt before placing indents. UNICEF has actively supported advocacy on these issues, but the problem of smooth and timely rail movement remains.

7.11 Quality control measures at production level are not satisfactory. UNICEF has given specific support to strict monitoring and to sensitising persons involved in the production process. A plan of action has been initiated in consultation with the Bureau of Indian Standards (BIS) and the Salt Department. Additionally, UNICEF may consider how to identify constraints to the mobility of inspectors, and explore ways to overcome them.

7.12 UNICEF has promoted the use of rapid testing kits at production level, for frequent assessments, together with titration at periodic intervals. A survey by the Indian Institute of Health Management Research (IIHMR) in 1996/97 found that 92% of manufacturers used titration to estimate iodine concentration in salt and 71% also used testing kits.

7.13 UNICEF has supported training of laboratory staff of the Salt Department and also of the salt processors. The existing laboratory facilities of the Department are to be modernised with technical support from BIS, UNICEF assisting with equipment and BIS with advanced training of personnel.

Nepal

7.14 The system introduced in 1997 aims to monitor salt at the five STC entry points when it arrives from India. Monitoring is also done when the salt is dispatched from the entry points to the 17 depots spread around the country, and when it arrives at, and leaves, the depots. All of this monitoring is done with rapid test kits, on the principle of lot quality assurance sampling. "Lots" have been defined both for arrival and dispatch in terms of truckloads (150 to 200 75-kg bags). From each lot, 11 samples of salt are taken and analysed. If more than one sample is found to be inadequate, the lot is rejected.

7.15 For salt iodised in Nepal, monitoring is done by titration, on an hourly basis. Between titrations, salt is checked with rapid test kits.

7.16 Any salt found to be inadequately iodised is re-iodised. (This never happened before the monitoring system was put in place.) Lots rejected because of inadequate iodine content are stored until the total quantity reaches 40 tons (equivalent to about one day's iodisation by one plant), and then 30 samples are taken and analysed by titration. The average iodine content is used as a basis for re-iodisation. Records are kept at each monitoring point and monthly reports are sent to STC headquarters in Kathmandu. An external verification system is not yet in place.

7.17 The monitoring system has revealed large variations in the iodine levels in imported salt. Discussions between STC and the Indian Salt Commission have led to determination to correct this; one outcome was the recommendation that large crystal salt should be iodised in Nepal (see paragraph 3.16). The issue will be addressed in future contracts between STC and the Indian Salt Commission.

7.18 The GOI has supported the establishment of laboratories for titration at the STC entry points. UNICEF itself has not provided equipment or support for training.

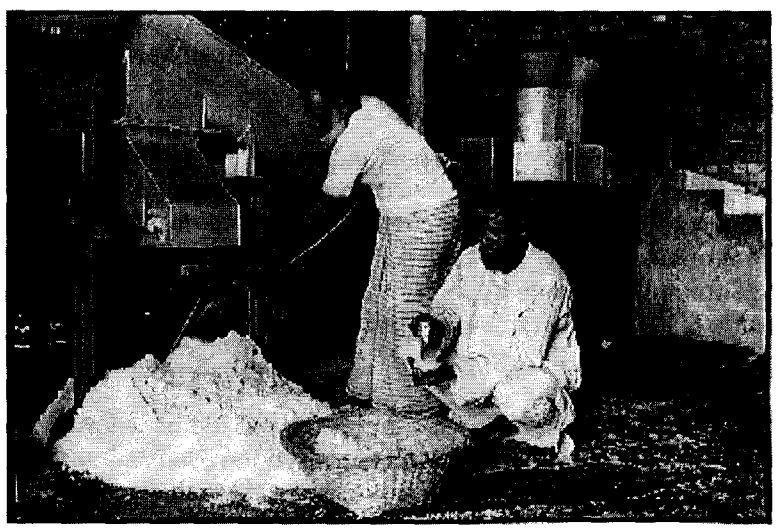
Pakistan

7.19 The monitoring plan is addressed to production, stock and retail levels. Salt processors are advised to check every batch of iodised salt with rapid test kits. Additionally, about 100 samples are collected each month and sent to a central laboratory for iodine determination by titration. Processors are advised of the results, and given training, if necessary; but there is no effective enforcement.

7.20 Record keeping of batch sampling is not systematic. Rapid test kits are used only to determine whether salt does contain iodine, or does not. It is not clear whether there are any precise instructions about what action should be taken if a sample has no iodine. Field staff from ISSF visit each salt processor at least once every three months, to review the iodisation process. (The number of field staff varies from 10 to 14; UNICEF provides their full salaries as part of its agreement with SMP; see paragraph 3.21). Presumably, they inspect the records and provide an external verification function.

7.21 There is wide variation in iodine content in salt at production level. Of 269 samples taken in September 1997, 74% were within the recommended range of 20 to 80 ppm, 20% less than 20 or between 81 and 100 ppm, 5% between 101 and 200 ppm, and 1% between 201 and 500 ppm. UNICEF is supporting the introduction of the drip feed method of iodisation, which in a pilot phase was found to give less variation than the dry batch mixing method. UNICEF believes it would be useful to have a reliable low-cost qualitative test kit that salt processors could use, as titration is not considered a feasible method because of the smallness of the factories (although half the salt is produced in plants that have an annual production of more than 1000 tons.)

7.22 UNICEF has helped to establish titration capacity at central laboratories, and the importation and production of rapid test kits for use at production, stock and retail levels. It also advocates for, and supports, better internal and external monitoring. The current external quality control system is inadequate, but there appears to be no ready solution to its problems.



Nabin Salt Industry, Bangladesh (1997). UNICEF/CBI-1A/ Shehzad Noorani.

Sri Lanka

7.23 There is at present no institutionalised monitoring system to ensure that all locally produced salt meets minimum standards. UNICEF is actively engaged in advocating for one to be set up, with priority emphasis on the point of production.

7.24 Manufacturers have done some random checking with rapid test kits, but not systematically, and there is no system of record keeping. The MOH is tolerant of some inadequacies as long as the salt is iodised to at least some extent and is reluctant to enforce legislation strictly.

7.25 UNICEF is having discussions with private salt producers and government, and may provide support in the form of equipment and training. Subjects for discussion include quality standards, use of a government logo for quality assurance, and possible provision of a mobile laboratory to test iodine concentrations in salt at all levels from production point to households.

Packaging Standards

Bhutan

7.26 BSE uses high-density polyethylene (HDPE) bags of 37.5-kg capacity for crystal salt and plastic bags for one-kilo packs of fine table salt. Although the quality of the HDPE bag has improved recently, it is still far below that of the laminated jute bags that UNICEF provided in the past. BSE is reluctant to use high quality bags because they would increase the salt price by a significant margin. UNICEF has urged BSE to produce and market one-kilo packs for the urban market.

India

7.27 Approximately 25% of all iodised salt produced is now packed in one kg pouches, which retain iodine well. Refined iodised salt, which accounts for 50% of all packed salt, is of consistently good quality due to the strict processing procedures followed by the salt refining units.

7.28 UNICEF has advocated for the use of appropriate and standardised packaging materials, and also for standardised messages on IDD to be printed on packages, together with the "Smiling Sun" logo.

7.29 The difference in cost between good and poor quality packaging is Rs 0.20 to 0.25 per kg. This compares to the selling price of iodised salt in poly packs, which varies from Rs 0.80 to 1.25 per kg at the point of production. The cut in the profit margin consequent on good packaging is said to be about 20%.

Nepal

As a result of UNICEF's promotion of better packing, STC since 1995-96 is only using high-density polythene bags. Jute bags are no longer used. The large crystalline salt and most of the crushed salt is packed in large (50 – 75-kg) bags, and part of the crushed salt and all the refined salt is packaged in one kg bags. UNICEF has provided 25 sealing machines for the one-kilo

Iodisation Plant at Nabin Salt Industries, Bangladesh (1997). UNICEF/CBI-27A/ Shehzad Noorani

7.30 .bags, and 35 million polythene bags for a start-up period.

7.31 The problem is that there is a popular preference for the large crystal salt, which cannot be packed in the small bags. The 75 kg bags are handled roughly, often with hooks (which tear them), and are exposed to sun and rain for long periods. In the market place, they are frequently kept open for a long time and the salt gets dirty. Consequently, consumers often clean the salt prior to use, washing out the last traces of iodine. To address this problem, two approaches are being attempted: 1) to try and increase the demand for finer salt in one kg bags (which is proving difficult), and meanwhile, 2) to use 10 kg bags instead of the 75 kg bags for the large crystal salt.

7.32 UNICEF recognises that it would not be realistic to expect the salt producers to accept a cut in their profit margin: higher costs would be passed on to consumers. For the bags alone, the cost of shifting from 75 to 10 kg bags would increase the price of the product by 130%. Increased labour costs would push the price up further. STC is researching the selling price of iodised salt in 10-kg bags, and the public reaction to the increase.

Pakistan

7.33 About 47% of the salt processors produce high quality packages. UNICEF has supported this through training and orientation provided by ISSF field staff. The difference in cost between good and poor quality packs can be 100% or more. The overall cost of good packaging is less than 10% of the total cost of the packaged salt. It is claimed that the effect on the profit margin of good packaging would be less than 5% of the total cost.

8. PROGRAMME PROCESS – STIMULATING DEMAND FOR IODISED SALT

Rapid Test Kits
Have rapid test kits been instrumental in fostering demand for iodized salt at community level? Explain how you think they have helped?
To what extent do you think they have been useful as advocacy instruments at national level?

Advocacy
Have national efforts been taken to increase awareness about the importance of IDD and that iodized salt can be used to prevent IDD?
Has there been advocacy at the national planning level?
Is there political commitment, including support of medical organizations influential political leaders and the private sector salt industry for the IDD control program?
Have there been any problems soliciting the support of different political groups, organizations or private salt producers, and if so, has UNICEF done anything to rectify these problems?
Have social mobilization campaigns been developed to inform and motivate consumers on IDD and the use of iodized salt?
What has been the role of the salt industry in these campaigns?
What has been the role of the media?
What has been the role of government?
What has been the role of UNICEF? What has been the role of other development agencies?
What has UNICEF's role been in IEC efforts?

Rapid Test Kits

8.1 All countries in the region (except Maldives so far) use rapid test kits for indicating the presence of iodine in salt. Table 8.1 shows the number of kits that have been supplied by UNICEF in recent years and the approximate percentage their cost represents of UNICEF's total financial input to the elimination of IDD. There is some variation in nomenclature, and the appropriateness of the term "kit" has been questioned on the grounds that what is actually used is usually a small plastic bottle – phial or tube - containing a solution. A drop of solution when dripped on to salt produces a blue spot if the salt has been iodised with potassium iodate. (A different solution is needed for potassium iodide). In India, two kits are provided, for the second of which the term "kit" does seem appropriate, since it consists of two tubes of testing solution and also a tube of a different recheck solution which has to be used additionally for the alkaline salt that is available in some states.

8.2 Of more substance are the different understandings of the extent to which the rapid test can be semi-quantitative, or whether it is effectively only qualitative.

8.3 In Bangladesh, semi-quantitative "filter paper strips" are used for internal monitoring of salt quality (in terms of acceptable iodine levels) in each production unit. They do not appear to be used at other parts of the distribution chain.

In **Bhutan**, kits are said to have been very useful advocacy tools at national level. At community level, health workers and teachers of community and primary schools have used kits to monitor iodine content in salt in shops and households, but the population at large cannot use them because most are unable to read the instructions.

Table 8.1 Number (000's) of Rapid Test Kits and approximate percentage of total support to IDD elimination provided by UNICEF.

Country	1993	% of total	1994	% of total	1995	% of total	1996	% of total	1997	% of total
Bangladesh	375	<1	375	<1	375	<1	375	<1	375	<1
Bhutan	<1	2	<1	67	0	0	<1	1	2	4
India	188	16	591	17	339	10	765	52	18	3
Nepal	0	0	0	0	10	3	15	1	8	1
Pakistan	0	0	50	2	75	1	70	1	60	2
Sri Lanka	0	0	5	6	10	1	5	6	35	43

8.5 In **India**, rapid testing kits have been used extensively for advocacy, as part of an IEC package of materials targetted at groups including producers, wholesalers, retailers, consumers, NGOs and school children; and for monitoring iodisation at production and at consumption (household) levels. As the key tool for the district MIS, the kit has been responsible for creating a demand for iodised salt, which has had significant influence on retailers, wholesalers, and producers. The simple colour change has been an effective advocacy device by creating interest and awareness amongst consumer and community workers, and also at higher levels up to and including members of the Indian Parliament. Furthermore, this increased public awareness has itself created market pressure that has led to greater production and distribution of iodised salt. Within the salt producing states of Gujarat and Rajasthan, which depend on non-monitored road movement of salt , the establishment of district MIS has led to significantly greater availability of iodised salt at household level and marked reduction in infiltration of non-iodised salt in the market.

8.6 In **Nepal**, experience has shown that the kits can be very useful for advocacy at all policy making levels. The simple fact of a salt sample changing colour (or not) arouses the interest of people, for example, district officers, journalists, etc. But at community level, the kits are used only for surveys, not for advocacy purposes. There are plans to use them in schools to enliven discussion of IDD control.

8.7 In **Pakistan,** the rapid test kit has been found to be a simple, easy-to-use and cost-effective tool for: a) Showing the presence of iodine in salt, a method which householders and retailers can use for themselves; b) Conducting surveys in households and shops to determine the extent of salt iodisation; c) Enabling school teachers to promote the use of iodised salt, by inviting students to bring salt samples from their houses, and demonstrating which were iodised; d) showing religious and other leaders how they could monitor availability of iodised salt themselves, without external expert assistance. The kits can undoubtedly be used to demonstrate at any time or place whether salt is or is not iodised, but their precise role in creating demand at community level for iodised salt, or supporting advocacy for iodisation at national level, is difficult to identify.

8.8 In **Sri Lanka,** the main use of kits seems to be by public health inspectors for monitoring salt in shops and at storage and production sites. They are also used by facilitators at community level for advocacy purposes and in schools to increase awareness amongst children.

Advocacy and Information, Education & Communications (IEC)

Bangladesh

8.9 Despite advocacy and planning meetings at national level to create awareness of IDD, political commitment is not strong. At thana (smaller than district) level advocacy meetings have been held through BSCIC. UNICEF has provided financial support for these meetings and for producing communications materials about IDD.

Bhutan

8.10 The significance of IDD has been incorporated in school curricula, primary as well as secondary, and also emphasised in the non-formal education curriculum and the Religion and Health programme.

8.11 The success of the IDD control programme in Bhutan is largely due to political support at the highest level. The Supreme Head of the religious body signed a statement on 30 August 1997 supporting the elimination of IDD through USI. On that day leaflets about IDD were distributed to all schools in the capital, and to the crowd gathered for the National Women's Football Finals. BSE contributed banners with the slogan: "Healthy People, Healthy Nation, Use Iodised Salt", free packets of iodised salt and leaflets in the three local languages, and uniforms for an exhibition football match between teams representing IDD Control on the one hand and Family Planning on the other.

8.12 The radio and weekly newspaper frequently highlight messages relating to nutrition, including control of IDD. The Health Division has been a leading advocate for informing the public from the inception of the programme, with UNICEF an active partner. However after the 1991-92 survey, which showed that 97% of households used adequately iodised salt, there was a significant slackening of effort, probably because of complacency that all was well. Advocacy picked up after the 1996 survey (see paragraph 9.4). UNICEF supports the development, printing and distribution of all IDD related IEC materials.

India

8.13 Following the development of an advocacy database and materials, state level meetings were held to increase awareness about the importance of IDD, and the role of iodised salt. At the national planning level in 1992, advocacy was intensified, and the name of the programme was changed from the National Goitre Control Programme to the National IDD Control Programme. During 1993 to 1996, there was advocacy to shift the programme focus from the health sector to the industry sector, and an advocacy and planning meeting in January 1994 ushered in the UNICEF supported USI programme.

8.14 There is high level political commitment to the programme (Cabinet members, Chief Ministers of some States), and in 1997 the National Human Rights Commission declared elimination of IDD to be a "human right". In general the bureaucracy, the medical and scientific community and professional bodies, and the private salt industry, support the IDD control programme.

8.15 However, a few professionals have highlighted occasional cases of hyperthyroidism, causing some misgivings amongst the public. They, together with some NGOs and a lobby of small producers, opposed the programme. UNICEF organised special meetings with these groups, with the participation of appropriate experts, and assisted the small producers to establish iodisation units. This allayed some fears, but did not stop all opposition, particularly in the south. The opposition was expressed partly in misleading statements in the press indicating a need to mount periodic briefing seminars involving media representatives, NGOs, professional bodies, and others. There has also been court litigation. Not all the

opposition has a rational basis, but for that which is rational reassurance might be better obtained by setting an upper limit to the level of iodine permitted in salt, ensuring rigorous monitoring and control of iodine levels, and insisting on effective - and transparent - enforcement.

8.16 Social mobilisation campaigns have been held to inform and motivate consumers to use iodised salt. These have sometimes involved schools, youth groups and NGOs. State level efforts have intensified on the annual IDD Days. Some salt producers participated in these campaigns in salt-producing states. The contribution of the media has been limited to a few television spots, radio programmes and press reports, though these have been extensive on IDD Days. Government has paid for TV time. The Salt Department and State governments have organised a number of meetings.

8.17 UNICEF has been the only developmental agency to have contributed to these advocacy efforts. UNICEF has been active in conceptualising the advocacy/communications strategy, developing appropriate materials, disseminating information, and organising meetings. The IEC strategy has focussed on the message: "Produce, procure, sell and consume only iodised salt", but IEC materials also refer to the implications of iodine deficiency. However, this latter aspect has not been developed extensively because of lack of interest shown by the Ministry of Health in the central government.

Maldives

8.18 Since the first IDD survey in 1995 showed that IDD is a public health problem in the country, of a mild to moderate degree, UNICEF has been advocating with the concerned authorities for the use of iodised salt. Support has been given to several workshops on atolls for creating awareness of IDD, and to the production of pamphlets on IDD for the Department of Public Health.

Nepal

8.19 Advocacy activities at the national level include special sessions for Members of Parliament. The government bureaucracy is highly politicised, and key individuals within ministries are changed with each change of government, which happens quite frequently. Despite this, a number of individuals in different government positions have supported IDD control efforts.

8.20 Most important has been the interest shown by the leaders of the STC, and their commitment to USI, which they see as an opportunity to maximise their profits. They have been generally successful in lobbying for political support for decisions favourable to their commercial interests, though not necessarily best for the sustainability of USI.

8.21 An IEC package has been developed and distributed to target groups including journalists, teachers, and health workers. Radio spots and newspaper advertisements have also been developed and used; rallies, banners, and cinema slides are amongst other activities undertaken in many parts of the country. The STC has been involved in the preparation and distribution of the materials, and the media have been involved on a commercial basis. The Nutrition Section of the MOH has been the focal point for all the IEC planning and development, but UNICEF has been the main motivator and key supporter. No other development agencies have been involved.

Pakistan

8.22 National efforts to increase awareness of IDD and the role of iodised salt have been made through conferences, workshops, and the mass media, as well as by interpersonal

communication. While political commitment is weak, the support of the private salt sector is exceptionally strong.

8.23 Nevertheless, there have been problems. The family planning rumour (see paragraph 4.10) may have been spread by some salt processors who initially did not wish to iodise their salt but later became envious when they saw the profits made by those who did. Some newspapers harmed the programme by publicising wrong information. UNICEF has responded by reorienting the social mobilisation and communications strategy to address the rumours, and demanding full support from the government. Salt processors are now given more equal treatment. Earlier, they had been supported by UNICEF in marketing their own brands of iodised salt, sometimes promoting competition.

8.24 Some salt processors have taken advantage of social mobilisation campaigns, designed to inform consumers about IDD and the use of iodised salt, to promote their own particular brands of iodised salt. Radio and TV, and to a lesser extent the press, have been heavily involved in such campaigns. The government has coordinated the process, particularly at planning and monitoring levels.

Adult male with goitre feeding a. child
UNICEF/G8.6-CAR-24/Shehzad Noorani.

8.25 UNICEF's role has been to promote national mobilisation through the creation of the ISSF (see paragraph 3.21), through which it has channelled its technical and financial support. Starting in 1998, the MOH is taking the lead in communications and demand creation, which is expected to give greater credibility and government ownership to the programme. The ISSF will then deal mainly with supply support, including internal quality monitoring, and availability at retail stores.

Sri Lanka

8.26 UNICEF has assisted the MOH to hold workshops on IDD awareness at the national level, but there cannot be said to be significant political commitment. This absence of commitment is the primary reason for the slow progress of USI in the country. It has been difficult to obtain cooperation from government agencies, or from the private salt sector. However, it is expected that this situation will change now that the Ministry of Plan Implementation and Parliamentary Affairs is in charge of coordinating all nutrition programmes including IDD control. The Ministry will provide the chair for the national sub-committee on IDD.

8.27 UNICEF has assisted the government in increasing the awareness of consumers about IDD and iodised salt, through a three-phase mass media campaign in 1995-96 and the publication of leaflets, booklets and posters. This led to increased demand for iodised salt.

8.28 UNICEF has been the main development agency working for USI in Sri Lanka, and has played a key role in the social mobilisation campaigns, endorsed by the government. It has worked with concerned local agencies in developing messages and materials, including training manuals, which have been published with UNICEF's financial and technical support.

B

9. PROGRAMME OUTPUT AND OUTPUT MONITORING - SALT AT RETAIL AND HOUSEHOLD LEVEL

Demand: Types of salt at the retail level
Are different types of salt available? If so how many types? Describe?
What proportion of the population prefers non-iodized salt. What are the factors in the preference?
To what extent is non-iodized salt available at the retail level?
What is the variation in price of different types of salt?
What trends have there been in the pattern of supply and demand for different types of salt particularly with regard to iodized vs. non-iodized salt?
What has been the role of UNICEF to increase the demand for iodized salt, especially for types of salt that will retain iodine, e.g. small crystal (refined) packaged salt?
To the most geographically disaggregated degree possible what do household surveys (or other monitoring systems) tell us about the proportion of households consuming iodized salt?
How has this changed during the last five years?
Is there information on whether there are population pockets where access and/or use of iodized salt is currently not achieved?
How large are these pockets?
What are the short term and long term solutions to ensure these populations obtain sufficient iodine in future?
Is UNICEF support required to ensure these populations will soon be obtaining sufficient iodine in their diets? If so what kind of support?

Bangladesh

9.1 There has been an increasing trend in use of iodised salt at household level as a result of advocacy and social mobilisation at all levels, despite the price of iodised salt being on average some 50% higher than non-iodised salt (Tk 6-9/kg compared to 4.5-5.5/kg, wholesale prices). Some two thirds of households (rural and urban) now consume iodised salt.

9.2 Estimates from surveys are available, for 64 districts in the six divisions of the country, for the percentage of households using sufficiently iodised salt, in 1994 and 1997. In 1994, in four of the divisions the percentages for all the districts were below 20, mostly well below. Three years later, with the exception of three districts in one division, the percentages in all the others had increased substantially, and in 1997 ranged in the respective divisions from 12 to 88, 57 to 82, 29 to 96, 67 to 94, 43 to 84 and 30 to 97. In 1997, figures were also available for the divisional urban areas, and were generally high: 82, 88, 89, 91, 86 and 70.

9.3 However, in some hard-to-reach areas (hill tracts, coastal areas and island districts) iodised salt is not readily available, and a special strategy needs to be developed for them. This could perhaps include reconsideration of supplementation with iodised oil, by capsule or injection. But in the long term, USI is the solution.

Bhutan

9.4 A small UNICEF survey of shops in three major towns in 1996 found about 12 different brands of salt, mostly powdered or fine table salt. In eastern and southern towns large packs of crystalline salt are also available. In the 1996 national survey, all salt samples from retailers contained some iodine, but adequate levels (> 25 ppm) were found in only 74%.

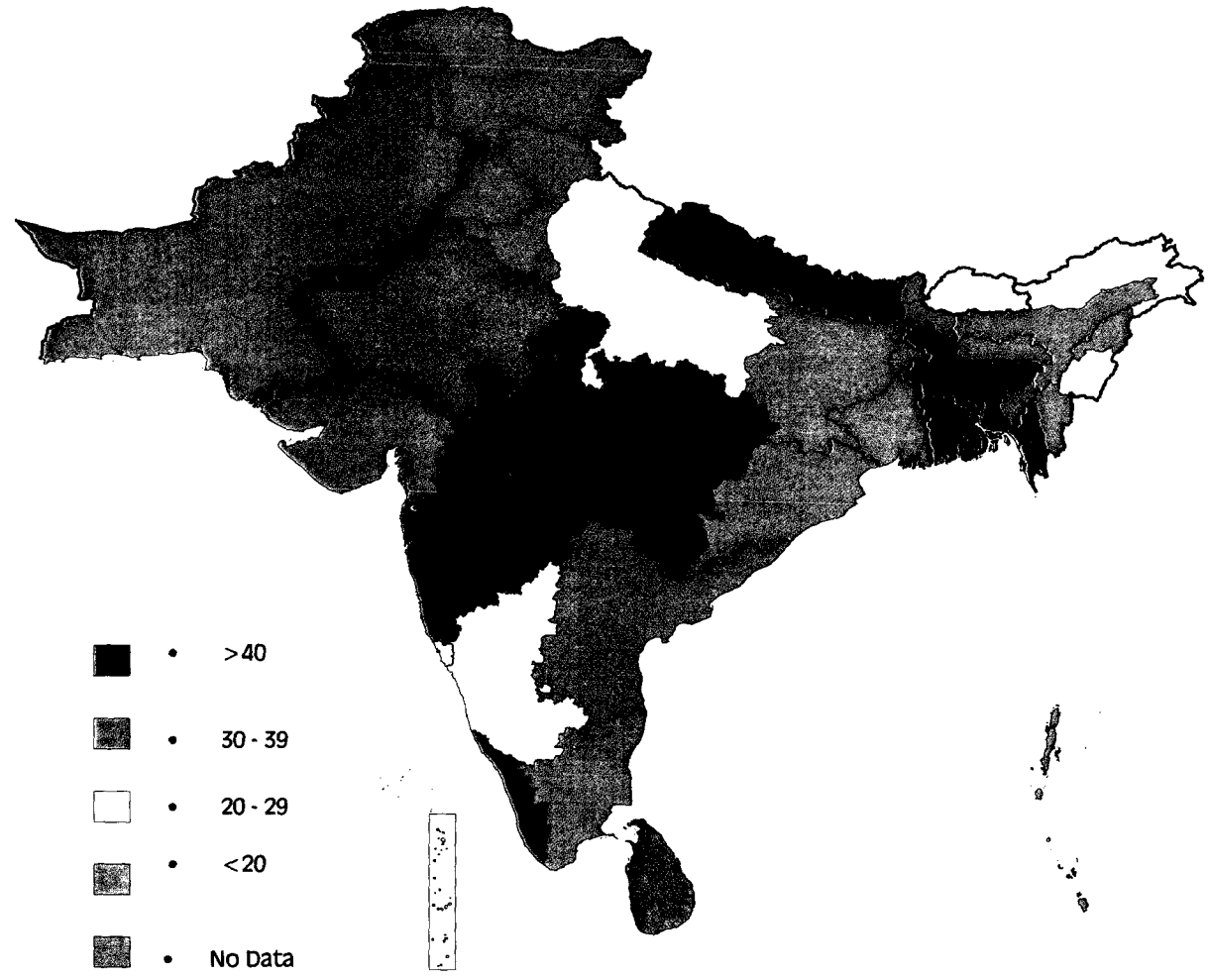
9.5 The price of large (37.5-kg) packs from BSE varies by up to 100% depending on location. On a per kilogram basis, fine table salt, in one kg packs, from BSE sells for a price just over the bulk-cost range, but equivalent Indian brands are two to three times more expensive.

B

Iodine Deficiency Disorders by South Asian regions, 1993-1995; Goitre rates in school children and adults

Sources
Bangladesh National Iodine Deficiency Disorders Survey in Bangladesh,Dhaka University/ICCIDD/UNICEF, Bangladesh, 1993
Bhutan MDIS Working Paper No. 1, WHO/UNICEF/ICIDD, 1993
India National Family Health Survey, International Institute for Population Sciences, India, 1993
Maldives National IDD Survey, Department of Public Health, Maldives, 1995
Nepal MDIS Working Paper No. 1, WHO/UNICEF/ICIDD, 1993
Pakistan The State of the World's Children, UNICEF, 1995
Sri Lanka MDIS Working Paper No. 1, WHO/UNICEF/ICIDD, 1993

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.

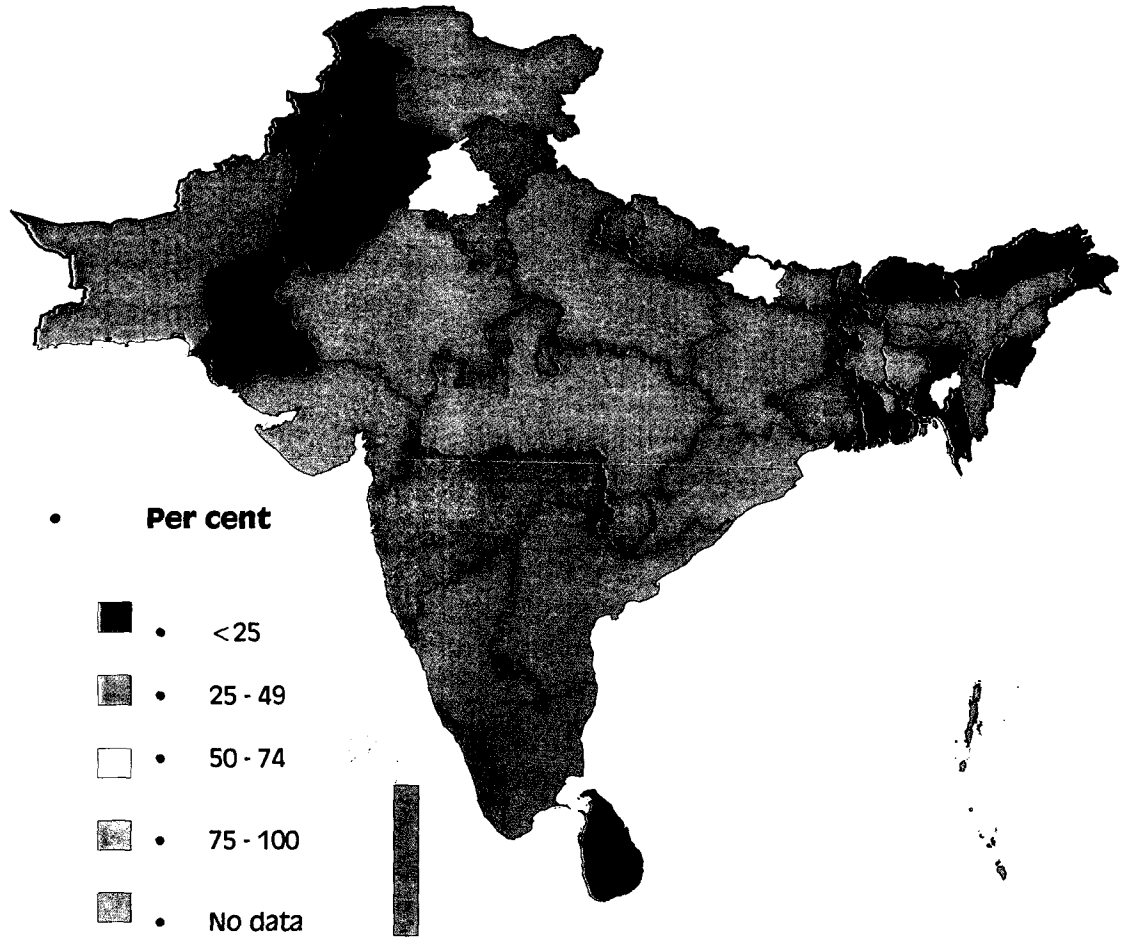


B

Household use of iodised salt in South Asia, 1995-96

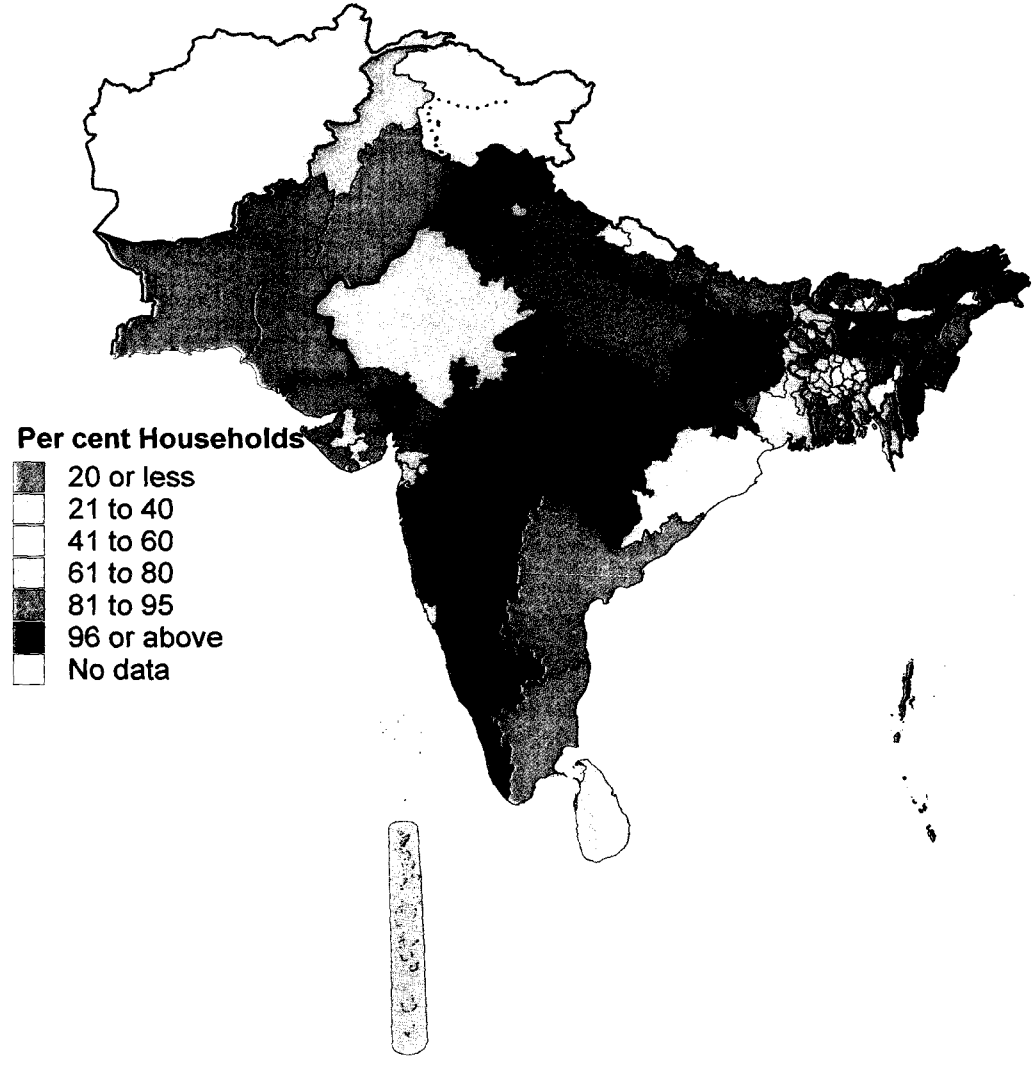
Sources
Bangladesh Progotir Pathey 1996, Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Bangladesh, 1996
Bhutan Progress of Nations, UNICEF, 1995
India Annual Salt Commission Report , India, 1995
Nepal Nepal Multiple Indicator Survey 1995, National Planning Commission, HMG Nepal in collaboration with UNICEF, 1995
Pakistan Multiple Indicators Cluster Survey of Pakistan, Ministry of Health, Pakistan in collaboration with UNICEF and Gallup Pakistan, 1995
Sri Lanka Survey on Vitamin A Deficiency and Selected Indicators, Medical Research Institute, Ministry of Health, Sri Lanka, 1995

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.



B

Household use of iodised salt in South Asia, 1997



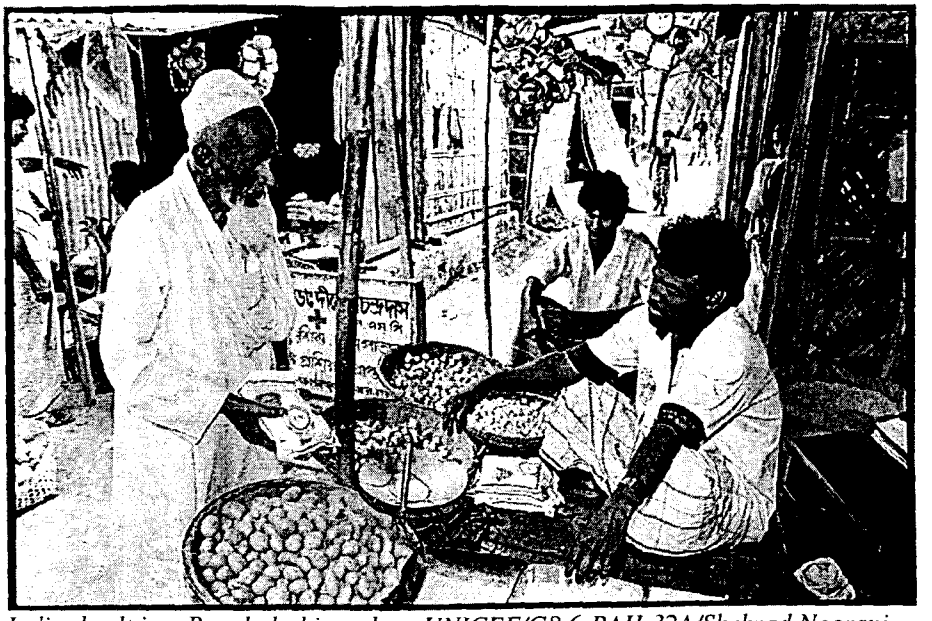
Sources

Bangladesh Progotir Pathey 1997, Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Bangladesh, 1997.
Bhutan Second Quarterly Report of the Health Monitoring System, Ministry of Health, Bhutan, 1997.
India Monthly Monitoring of Iodised Salt Reports, National Iodine Deficiency Disorders Control Programme, Director General of Health Services, Ministry of Health and Family Welfare, Government of India, 1996-97.
Maldives 1997 Statistical Yearbook of the Customs Department, Republic of Maldives, 1997.
Nepal Family Health Survey, 1996, Family Health Division, Department of Health Services, Ministry of Health, Nepal; New Era; Demographic and Health Services, Macro International Inc., 1996.
Pakistan 1996 Appraisal of IDD Control Programme, UNICEF and Nutrition Section, Planning and Development Division, Government of Pakistan, 1996.
Sri Lanka Survey of Vitamin A status and selected mid-decade goals, 1995, Medical Research Institute, Ministry of Health, Sri Lanka.

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.

B

9.6 It is said that the salt that used to be imported from India in the 1960's was generally unacceptable to the population because of its taste and colour. Since 1985, when Bhutan started to iodise salt itself, the factor influencing demand for non-iodised versus iodised salt has been the price, in the sense that non-iodised salt from across the border with India is likely to be cheaper than iodised salt from BSE. Since the IDD programme started, UNICEF has supported the production and distribution of IEC materials to increase demand for iodised salt, particularly, fine table salt in one-kilo packs for the growing urban population. Most of the rural population prefer the 37.5-kg packs because of their convenience for transportation and storage, and IEC materials stress the need for proper handling of the large packs.



Iodised salt in a Bangladeshi market. UNICEF/G8.6-BAH-32A/Shehzad Noorani.

9.7 An evaluation in 1991-92 found that 97% of households used adequately iodised (> 15 ppm) salt, but this dropped to 82% in 1996 as a result of the process of privatisation of BSE and the temporary breakdown of monitoring, both at the salt plant and in the field. According to present regular monitoring reports there are no population pockets that have no access to iodised salt. The monitoring system involves every health facility collecting 10 random samples of household and retail salt per month from their catchment areas. Reports are compiled on a quarterly basis. The second quarter of 1997 shows that the percentage of households with sufficiently iodised salt ranged from 80 to 100 in 15 areas, with one area having 67%.

India

9.8 Three main varieties of salt are available at retail level: loose, crystal salt; loose or packed crushed salt; and packed powder salt. Rock salt and block salt are sold in very small quantities. Most people in rural areas prefer the crystal variety, to which they are accustomed, and which is cheaper. The Indian Institute of Health Management Research (IIHMR) study showed that about three quarters of retailers stock only iodised salt, so that a quarter would sell non-iodised salt, but not necessarily exclusively. Iodised salt is about 70% more expensive on average than non-iodised salt (Rs 4.3/kg against Rs 2.5/kg, for common salt).

9.9 UNICEF has strongly advocated the merits of refined packaged salt, use of which was less than 10% around 1995 but has risen to about 25%.

9.10 Assessments of the availability of iodised salt at household level by rapid test kit come from the District Monitoring Information System (MIS). This information system usually operates through the primary health care network, but sometimes through women's groups or youth clubs, and also from the Multiple Indicator Cluster Surveys (MICS) introduced by UNICEF for monitoring progress towards selected goals, including that for USI. Data pertaining to 1996 show that in 12 of the 22 state/Union Territories for which data were available, 90% or more of the household salt samples were iodised; in a further six, iodine was present in half or more of the samples. At that time, in three of the states less than 25% of household salt was iodised.

One- kilo bag of iodised salt with the Bangladeshi emblem for the IDD control programme. UNICEF/93-BOU0023/ Maggie Murrey-Lee.

9.11 Analysis of household data shows the availability of iodised salt to have increased significantly in states where salt is supplied by rail, but less so in states where supply is by road, and where district MIS are weak or non-existent. In general, supply of salt is not satisfactory in certain southern, south-eastern and northern states, some eight in all. Data are available for the last two years for districts of selected states, but there appears to be no comprehensive information about population pockets, such as hard-to-reach tribal areas, which currently do not have access to, or use, iodised salt.

Maldives

9.12 The proportion of imported salt said to be iodised was 2% in 1993, 10% in 1994 and as much as 66% in 1995, but it is doubtful if most of that was adequately iodised. A small survey in 1995 of household salt showed that only 8% was adequately iodised (>15ppm); 49% had some iodine, but insufficient; and 43% had none. (But there were only 39 samples, from 3 companies).

Nepal

9.13 The presence of non-iodised salt in the market is due either to losses of iodine from the products processed by STC, or to unofficial importation of salt. Part of that coming from India is not iodised despite claims sometimes made on the packs; all of the salt coming from Tibet is non-iodised.

9.14 A 1995 study showed that 12% of salt tested in 288 shops throughout the country had no iodine. A national (rural and urban) survey in 1996 using rapid test kits found that only 7% of salt from 8000 households contained no iodine; 28% had some; and 65% had a sufficient quantity.

9.15 Three main types of salt are available: refined, sold only in one kg bags; crushed, sold in both 1 kg and 75 kg bags; and large crystalline salt only in the big bags. (The large crystal salt comes in a number of forms, with different names, crystal sizes, and colours, depending on the source). Prices depend on location, but in Kathmandu valley early 1998 prices of one kg salt (in N.Rs) are as follows: for large crystal, 2.5 to 4.0; for crushed, 4.0; and for refined, 7.0 to 8.0. Information from STC, which handles some 95% of the available salt, all iodised,

suggest that there is a slight decline in demand for large crystal salt, down perhaps to 50% of sales, and rise in demand for crushed salt, to perhaps 40%, and a small rise (so far) for refined salt to perhaps 10%. UNICEF has supported IEC efforts to increase demand for fine salt packed in small bags.

9.16 It seems that iodised salt is presently not reaching the remote parts of 15 districts, inhabited by nearly one million people. Of these, about 65% constitute the target group for supplementation through iodised oil capsules, which will probably continue until iodised salt is generally available. (See paragraph 10.5).

9.17 A parallel policy has been to subsidise the transportation of iodised salt to some of the remote areas. The GOI has been paying the costs until recently, when the Government of Nepal took over. The policy has been controversial. Some have argued that the overall drive for USI justifies subsidisation to ensure availability of iodised salt throughout the country. Others point out that salt is but one of several essential commodities (along with sugar, rice, cooking oil) transported by the government to remote areas for political reasons; it is not essentially an IDD intervention, and in fact the salt tends to remain close to the distribution points. It has been agreed that both the supplementation and the subsidised transport should remain until a forthcoming micronutrient survey provides information on the efficiency of the two strategies. Another possibility, which UNICEF will be supporting, and may be more sustainable, is to explore the feasibility of iodising salt imported from Tibet, either in Tibet itself or in Nepal.

Pakistan

9.18 The 1996 Appraisal found that 32% of households were buying salt in pouches labelled "iodised", though rapid test kits showed that only 23% of all packets did in fact have any iodine. Nevertheless, 68% were choosing to buy non-iodised salt. This low demand for iodised salt is attributed to suspicion because of its often poor quality; alleged unavailability at retail stores; rumours linking iodised salt to family planning; and the difference in price between iodised and non-iodised salt, iodised salt being some 10 to 40% higher.

9.19 Apart from rock salt (particularly popular in Punjab), non-iodised salt is available in loose and packet form, packets being rather more popular (especially in NWFP). Iodised salt is also available in both forms, but loose forms are very much more popular than packets. Although the situation varies between the provinces, most retailers have ready access to iodised salt, but very few (5%) stock it exclusively; about half stock both iodised and non-iodised salt, and 45% non-iodised only. There is evidence that the family planning rumour has had a less damaging effect on the demand for good quality (granular) iodised salt than on the less expensive powder form. UNICEF has supported a national social mobilisation campaign since the beginning of the programme in 1994, aimed to increase demand for iodised salt, especially refined packaged salt which retains iodine well.

9.20 There are likely to be some areas in Balochistan (and perhaps elsewhere) where there are population pockets with no access to iodised salt. There are few salt processors in this province, and additional field staff may be needed to promote the production and use of iodised salt.

Sri Lanka

9.21 There is a general perception that most people in rural areas prefer rock salt to iodised salt. In urban areas powdered salt is becoming popular. At retail level non-iodised salt is widely marketed and is available in 0.5 and 1 kg packs. Iodised salt, both crystal and powder, is also available in 0.5 and 1 kg packs. Iodised salt seems to be only some 20% more expensive than non-iodised.

9.22 A survey in 1995, which covered the whole country except the northern and eastern Provinces, included examination of household salt with rapid test kits: 26% of households had adequate amounts of iodine in their salt, 20% had some iodine, and 54% had none. Labels are an uncertain guide: a recent assessment in one district found that most of the salt labelled as iodised did not in fact contain any iodine at all.

10. PROVISION OF IODINE BY MEANS OTHER THAN SALT

Iodine supplementation by means other than salt iodisation
Where does it remain necessary to provide people with iodine capsules or injections?
For how long will this probably remain the case?
What criteria are used to determine whether iodine capsules can be phased out with IDD control efforts relying exclusively on salt iodisation?

10.1 Several countries have had experience of providing iodine directly to targetted groups of the population by means of iodised oil, either by injection or by mouth. No country in the region has had significant experience of other means, such as adding iodine to drinking water (as in Thailand), or to irrigation water (as in China).

Bangladesh

10.2 An iodised oil (lipiodol) injection campaign was started in 1985 by the government with World Bank funding in hyperendemic areas, but it was stopped in June 1997 as demand for iodised salt picked up. Iodised oil capsules, to be taken orally, have not been used in Bangladesh. However, a campaign to administer capsules or injections could form part of a special strategy to reach populations presently without access to iodised salt (see paragraph 9.3).

Bhutan

10.3 Injections of iodised oil were administered to women of reproductive age in the border area from 1988 until early 1991. The decision was made to stop the programme, since the salt iodisation plant had been established in the country for some years. An assessment in 1991-92 showed that iodised salt was reaching 95% of households, which would seem to provide retrospective justification for the decision.

A woman with goitre, Bangladesh.UNICEF/HQ97-0269/Shehzad Noorani.

India

10.4 It has been the declared policy of GOI that the elimination of IDD should be achieved solely through the strategy of USI. The use of iodised oil has been regarded as too expensive and unsustainable. However, the State of Sikkim, which had an especially high prevalence of goitre and cretinism, received a gift of iodised oil capsules in the late 1980s, before iodised salt was readily available. This was provided to women of childbearing age.

Nepal

10.5 Iodised salt does not yet reach remoter areas where some million people live (see paragraph 9.15). This situation will continue until the road system can be improved to facilitate movement of iodised salt from the lowlands, and the importation of non-iodised salt controlled. The feasibility of iodising Tibetan salt will be examined. Meanwhile, since the early 1980's, iodised oil supplementation has been provided each year to children below 15 years of age, and women below 45 years in these areas. In 1998, this target group for supplementation comprised about 625,000 people. Initially injections were used, but the change to oral capsules annually was made in the early 1990s. The programme is likely to continue until there is evidence that iodised salt has penetrated those areas and is in regular use. The forthcoming national micronutrient survey will provide essential evidence on this

point.

Pakistan

10.6 In 1991-1992 an iodised oil capsule distribution programme was implemented in some of the highly endemic areas in the north of the country, with partial support from UNICEF. However, since the launch of USI in 1994, the capsule programme was discontinued. This decision was taken on the assumption that there would be universal access to iodised salt in all parts of the country within a short time.

11. PROGRAMME OUTCOME - MONITORING OF IDD

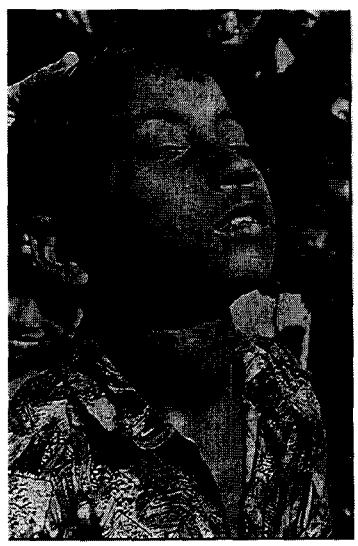
IDD monitoring
To what extent have laboratory capacities been built in order to facilitate the monitoring of IDD? How has UNICEF helped build capacity?
Has UNICEF been, or is planning to become involved in measuring TSH, urinary iodine or measuring goitre size using ultra sound?

11.1 It must not be forgotten that USI is a means to an end, and that end is the elimination of Iodine Deficiency Disorders (IDD) as a significant public health problem. Therefore, important as it is to monitor a process indicator, namely the presence of iodine in salt at different levels of distribution, it is essential to monitor periodically the outcome, in terms of the iodine status and IDD status of the population. Outcome indicators (WHO 1994) are:

a) Urinary iodine, as a proxy for iodine intake, applicable only to groups of individuals;

b) Thyroid size, in school children, best estimated by ultrasound as glands become smaller (and thus more difficult to palpate accurately) as a result of control programmes;

c) Thyroid function, assessed by measuring the concentration of thyroid stimulating hormone (TSH) in the blood of newborns.



Monitoring goitre at a primary school, Bangladesh. UNICEF/93-BOU0048/ Maggie Murrey-Lee.

11.2 An important reason for regular and systematic surveys to monitor urinary iodine way is to check whether iodine intakes are becoming too high, or too low, for whatever reason. This will guard against the risk of iodine-induced hyperthyroidism associated with iodine levels in salt on the one hand, or the re-emergence of IDD in areas where it had been controlled, on the other. If the median urinary iodine level from a representative sample of the population at risk is not within the recommended range, 100-200 :g/l, salt iodisation levels and factors influencing the amount of iodine ultimately consumed should be re-assessed, with particular attention to: a) Salt quality and iodisation procedures; b) Factors affecting iodine losses from salt: packaging, transport, storage, and cooking; c) Food habits in relation to salt intake and cooking practices. Salt iodine levels may need adjustment to progressively ensure a satisfactory average intake. (WHO/UNICEF/ICCIDD consultation, 1996)

11.3 Most countries in the region have laboratories able to estimate urinary iodine (Bangladesh, Bhutan, India, Nepal, Pakistan). UNICEF has promoted their use, and has helped strengthen some (Bangladesh, Nepal) with equipment and training. WHO has provided equipment and supported training (India). Also in India, UNICEF has advocated that the MOH should establish a system for monitoring progress towards elimination of IDD, using urinary iodine and TSH, but in general it seems that such a system is not operational anywhere in the region in any institutionalised sense.

11.4 Several countries have done surveys in recent years that have included IDD assessments. In **Bhutan** (1991-92), urinary iodine tests were done in the country, but blood spots for TSH were sent to Atlanta for analysis; the use of ultrasound was not considered. In 1995, a survey was done in **Maldives**; urine samples were analysed for iodine in India. In **Nepal**, urinary iodine is being done in the country and blood spots sent abroad; palpation was

used to estimate thyroid size, with ultrasound used on a sub-sample. It is thought that impact studies of this type may be done every fifth year. In **Pakistan**, a 1994 study on TSH was supported by UNICEF, with analyses done overseas. There are no plans to establish a facility able to do this in Pakistan. Ultrasound may be considered in the future.

12. SUSTAINABILITY

Sustainability
To what extent are governments or the private sector taking on the costs of USI currently borne by donors?
In general, summarise the main constraints to sustained universal salt iodisation in your country?

Other Micronutrients
To what extent has the USI endeavor accelerated progress towards developing strategies to fortify food items with other micronutrients?

Transfer of Costs

12.1 The issue of sustainability is central to prospects for the future. In the long term USI has to pay for itself. That is to say, ultimately, costs associated with iodisation, borne by the producer, must be passed on to the consumer in the price paid for iodised salt. The feasibility of this is of course one of the great strengths of this strategy for eliminating IDD. Whether the government should maintain a commitment, with attendant financial implications, to periodically monitor IDD status is another matter; but certainly external donors cannot be expected to fund such activities indefinitely.

12.2 The expenditures estimated to be needed by programmes for IDD elimination during the three-year period 1998 to 2000 are shown in Table 12.1, directly comparable to past expenditures over 5 years shown in Table 2.1. The need for continued donor support during this period is evident. Proportionately, the total programme costs are estimated to come down in Bangladesh and Pakistan, but to increase in the other countries, especially Maldives, which will virtually be starting from scratch.

12.3 In **Bangladesh**, the government share of the costs is expected to increase from 39% in the earlier period to 54%, the UNICEF inputs correspondingly falling. In **India,** the direct costs of iodisation (plants, iodate, monitoring at production level) are largely borne by the private salt producers themselves. UNICEF; however, continues to support promotional activities such as advocacy, sensitisation, and strengthening of the monitoring system - both at production level and especially at the level of the consumer through the district MIS. In **Pakistan**, UNICEF has sought to make the programme more cost effective, and has been able to make significant cost reductions in 1997 without loss in performance. At the same time it has been encouraging increased involvement of the government, particularly MOH, with the prospect of government financial allocations after 1998, though these may be limited to IEC activities.

Table 12.1 Estimated expenditure on IDD elimination, 1998-2000 (US$ 000's)

Country	Total	Govt.	UNICEF				GOI/ Bilateral
			GR	CIDA	Kiwanis	Other	
Bangladesh	2676	1436	490	750			
Bhutan	74				74		
India	8536	7941	595[a]				
Maldives	90	30	50			10[b]	
Nepal	4406	487	1152[c]				2767[d]

Country	Total	Govt.	UNICEF				GOI/ Bilateral
			GR	CIDA	Kiwanis	Other	
Pakistan	1733		1000		733[e]		
Sri Lanka	625		105			520[f]	
Total	18140	11330	3392	750	807	530	2767

a) For 1998 only; further information is not available, b) JAICA; c) Likely UNICEF support, depending availability of funds, including specific donor contributions; d) Traditional GOI support, highly tentative; e) Intended, but not yet committed; f) Unspecified supplementary funds.

12.4 In **Bhutan**, the BSE is already fully responsible for the costs of operating and maintaining the iodisation plant. In **Nepal**, the programme is highly dependent on outside support, including bilateral assistance from GOI. In **Sri Lanka** also, there is at present no immediate prospect of government or the private sector taking over from donor support. The government has no budget specifically for IDD though it does cover personnel and administrative costs in the salt industry, and the monitoring and training activities of the MOH.

Perceived Main Constraints to Sustained USI

12.5 UNICEF in several countries identified a number of constraints that are commonly held to jeopardise the sustainability of USI. They include: a) Difficulty in mobilising government funding (Pakistan, India, Nepal); b) Absence of legislation, or its enforcement (Sri Lanka, Maldives); c) Lack of support from MOH (Sri Lanka, India, Pakistan); d) Problems in ensuring regular supply of iodine (India).

12.6 Some constraints appear to be more country specific. For example: a) Monitoring availability of iodised salt at household level remains a vertical effort, and should be linked to other national programmes reaching the community (India); b) Need for a practical method to ensure quality control of iodised salt at factory level, in view of limited scope of current options (Nepal); c) Continued preference for large crystalline salt, which is difficult to iodise, with consequent need to increase demand for fine salt in small packs (Nepal); d) Shortage of trained human resources, and open border with India as free trade allowing imports of non-iodised or inadequately iodised salt is difficult to monitor (Bhutan).

Relevance for Other Micronutrients

12.7 The USI initiative in South Asia is the first pan-regional food fortification programme. However, it cannot really be said that the USI experience has itself actually accelerated progress towards developing strategies to fortify food items with other micronutrients.

12.8 In **Bangladesh**, the NPAN includes fortification as a strategy, but as yet there appears to have been no action. In **Bhutan**, a consultant raised the issue of other micronutrient fortification in March 1997, but senior officials in the Health Division have reservations. In **India**, some action has been taken to initiate the fortification of flour with iron, and sugar with vitamin A. In **Nepal**, a study in 1997 on the feasibility of fortification showed that cooking oil was the most promising vehicle for vitamin A: it is widely used and production is reasonably centralised. Attempts are to be made to find out how producers can be encouraged to proceed. In **Pakistan**, there has been much discussion and some planning regarding fortification of wheat flour with iron. It is claimed that lessons learned from USI experience will be relevant to designing and implementing a programme.

13. CONCLUSIONS

Legislation and Enforcement

13.1 Whereas most countries would seem to have fair to good legislation, most have poor enforcement records. However, poor enforcement of food laws is not peculiar to USI programmes, but seems to be a general characteristic of the region.

13.2 The variation between countries in the concentration of iodine at production level required by five of the seven countries may or may not be justifiable. At household level only three countries have stipulated concentrations, which are virtually the same.

Supply of Iodised Salt

13.3 In the countries where most if not all salt is produced indigenously, Bangladesh, India, Pakistan and Sri Lanka, the capacity to produce iodised salt, in terms of the availability of appropriate equipment, is generally underused. That is to say, actual production of iodised salt does not match potential production, though overall it may be close to needs. Thus, there is no major problem of supply as such - though its quality is another matter. This has been achieved by quite different means, the two extremes being Bangladesh, where UNICEF donated all the equipment required by some 265 producers, and Pakistan, where UNICEF donated none, the industry being persuaded to make its own investment.

13.4 In Bhutan, Nepal and Maldives all salt must be imported, and in the first two of these countries iodisation is now done chiefly within their borders by single agencies. But in all of them inspection procedures at points of importation need to be strengthened or established to ensure that imported iodised salt is of satisfactory quality.

13.5 Estimates of the production or supply of iodised salt only have significance in relation to requirements. In the past, attempts were made to compute these on the basis of various assumptions relating to supposed habitual salt intakes; whether, and if so how, the needs of animals were included; and much concern was given to how iodised salt should be distributed most expeditiously to areas of greatest need. It seems that the "new freedom" introduced by the advent of USI has not been fully grasped, since these concerns cease to have relevance when all edible salt, including that for animals, is to be iodised. If this is actually achieved, questions of the amount produced and its distribution can be left to the operation of normal market forces. The only relevant statistic becomes the percentage of food grade salt that is adequately iodised, which WHO/UNICEF/ICCIDD recommend should be 90% or more. On this criterion only Bhutan and Nepal qualify, with Bangladesh running close (see Table 3.1).

13.6 With regard to the types of iodising equipment, most countries have used the spray type, with only Pakistan using dry mixing. Both India and Pakistan have some limited experience with the drip-feed method, which is claimed to be cost-effective and reliable.

Monitoring of Iodine Levels in Salt at Production

13.7 Most countries have a monitoring plan for production level with guidelines for procedures and (sometimes) follow-up action. However, these are not always followed, and supervision is generally weak. External verification is not done systematically. Usually a combination of rapid test kits and titration is used, but while frequent reference is made to support to training there appears to be little or no assessment of the quality of that training and of performance in practice. This would be an important aspect of effective supervision.

Packaging and Price

13.8 There is a trend towards improved quality of packaging and also smaller (1-kg) packs of refined salt, especially in urban areas. Although this trend is likely to accelerate, at present there remains a preference in some rural areas for cheaper larger packs of coarser salt. There are variable estimates for the effect of better quality packs on prices and profit margins. Yet, in the long term, increased costs are bound to be passed on to the consumer, and prices will be controlled through competition between suppliers in a free market - itself a trend throughout the region.

Use of Iodised Salt by Households

13.9 The ultimate test of the success of a USI programme is whether 90% or more households have access to and habitually use salt with the prescribed levels of iodine. Most countries have monitoring systems in place or have done surveys, and the results are especially encouraging in Bangladesh, Bhutan and most Indian states. However, districts in some Indian states as yet do not have access to iodised salt, and remote areas in Balochistan, Bangladesh and parts of Nepal have difficulties with access which may require special strategies that could involve use of iodised oil supplements.

13.10 Rapid test kits (RTKs) are very widely used for advocacy and for monitoring purposes, though the experience in each country is rather different. Bangladesh uses them (or perhaps a variant) for semi-quantitative assessment in production units (paragraph 8.3), while most countries value them as qualitative indicators at many levels. But there seems to be general endorsement of their potential in creating awareness and mobilising demand.

Advocacy

13.11 In all countries, UNICEF has placed great stress on advocacy and IEC activities, which in India, Pakistan and Sri Lanka accounted for some 40% of the total value of UNICEF support. Advocacy traditionally has three targets: policy makers, to persuade them of the need to establish regulations governing the manufacture and monitoring of iodised salt (and periodically of IDD status); salt manufacturers themselves; and the general public, including those who influence public opinion, such as teachers, religious leaders and media personnel.

13.12 There is little dispute about the need to inform and motivate policy makers and manufacturers. With regard to the third group, the argument has been that public awareness of the significance of IDD, and of how it can be prevented by using only iodised salt, is necessary for the creation of demand for iodised salt without which there will be no sustained supply. A counter argument has been that where universal salt iodisation is the policy (so that in principle consumers should not be faced with a choice) this is not necessary, since supply can be assured through a combination of clear law and regulations concerning fortification, orientation and training of salt manufacturers, systematic monitoring of salt quality at production/importation, and strict enforcement procedures promptly applied. There are environments in which such an approach is feasible, where fortification itself can be successful, "doing good by stealth" (Alexander Pope), without the public knowing anything about it. But the consensus seems to be that conditions in South Asia at the present time are such that the pressure of public opinion is needed to sustain commitment and performance, and the country experiences tend to confirm this view. They also confirm the value of RTKs in this regard.

Use of Iodised Oil

13.13 Bangladesh, Bhutan, Nepal and Pakistan at one time or another have all had government programmes for supplementation with iodised oil, though only the Nepal programme is still operational: it is likely to remain so until there is evidence that iodised salt is reaching its beneficiary population. Bangladesh may consider re-establishing an iodised oil programme for pockets of population that do not currently have access to iodised salt, as a temporary expedient. But the strong view in all the countries is that the most sustainable way of eliminating IDD is through the iodisation of salt.

Monitoring of IDD

13.14 Preoccupation with the priority to establish USI seems to have led to the relative neglect of its ultimate justification, namely the elimination of IDD. While assessment of thyroid size and function need be done only periodically, monitoring of urinary iodine should be systematic and more frequent (see paragraph 11.2). While most countries claim the facility to measure iodine in urine it seems that none have an institutionalised system for regular monitoring linked to review of programme components that may need attention.

The Private Sector

13.15 The private sector has a critical role in all the countries, especially now since virtually the entire salt industry has been privatised. In general, the sector has become extremely supportive, encouraged by what it perceives as a public health responsibility, by increasingly strong regulation, and by the opportunities it recognises for profit. This represents the key to the sustainability of the programme.

National Plans and Coordination

13.16 The conventional thinking has been that a national high-powered intersectoral committee is necessary to establish overall policy, ensure appropriate coordination between sectors, oversee the development of a comprehensive national plan of action, and periodically review implementation. However, experience in the region suggests that in practice this may not be so important: abstract logic must give place to reality. Much has been achieved despite the absence or poor performance of national committees.

13.17 UNICEF tends to have adopted a more pragmatic approach to key actors, such as Ministries of Industry and the private salt sector, in order to promote USI. This approach has highlighted the importance of the role that can be played by a committed agency that is on the spot and able to question, advocate, follow-up and probe. This is a role that UNICEF is perhaps uniquely qualified to fill; no other development agency has this capacity.

Donor support and sustainability

13.18 Sustainability requires assured funding, through a combination of external (from outside the country), internal (effectively from government) and intrinsic (from consumers, through price mechanisms) sources. Apart from India's substantial bilateral assistance to Nepal, it seems that the only external donor during the period 1993 to 1997 was UNICEF. No other agency is identified. Furthermore, the value of UNICEF support greatly exceeded that of governments, where government expense has been shown (Table 2.1).

13.19 Projections for the period 1998 to 2000 (Table 12.1) show a small increase in the relative contribution made by government, though only in the case of Bangladesh does it

exceed 50% of the total programme costs. However, there is some unreality in these figures in that they do not include an estimate of the costs borne by industry, which are often substantial. In the long term most costs, for a sustainable programme, must be borne by the industry, i.e. by the consumer, but it is clear that external funding will be needed at least through the year 2000. Thereafter, governments may need to continue support for monitoring IDD.

13.20 In general, it should be the government's responsibility to ensure the three ultimate requirements for a successful USI programme in the context of IDD elimination: good law, good monitoring, prompt action. The extent to which governments will shoulder such responsibility will depend on their degree of political commitment, another requirement for sustainability. With the exception of Bhutan, the expression of political commitment in the other countries is less than impressive.

13.21 A further requirement for sustainability is that countries should have ready access to potassium iodate (or iodine) at a reasonable price. UNICEF might have a role in this respect.

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