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Report No: 22277

IMPLEMENTATION COMPLETION REPORT
(39140; 3914A; 27560)

ON A

CREDIT

IN THE AMOUNT OF SDR 12.7 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR THE

IODINE DEFICIENCY DISORDERS CONTROL PROJECT

June 27, 2001

**Human Development Sector Unit
East Asia & Pacific Region**

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CURRENCY EQUIVALENTS

(Exchange Rate Effective May, 2001)

Currency Unit = Renminbi (RMB)

RMB 1.00 = US\$ 0.12

US\$ 1 = Y8.3

FISCAL YEAR

January 1 December 31

ABBREVIATIONS AND ACRONYMS

AusAID	-	Australian Agency for International Development
CAS	-	Country Assistance Strategy
CNCLI	-	China National Council of Light Industry
CNSIC	-	China National Salt Industry Corporation
GOC	-	Government of China
IBRD	-	International Bank for Reconstruction and Development
ICCIDD	-	International Council for the Control of IDD
IDA	-	International Development Association
IDD	-	Iodine Deficiency Disorders
IDDC	-	Iodine Deficiency Disorders Control
ISIDF	-	Iodized Salt Industry Development Fund
mtpy	-	Million tons per year
MCH	-	Maternal and Child Health
MI	-	Micronutrient Initiative
MOF	-	Ministry of Finance
MOH	-	Ministry of Health
NGO	-	Non-governmental Organization
NIDDEP	-	National IDD Elimination Program
PIU	-	Project Implementation Unit
SAR	-	Staff Appraisal Report
SDBC	-	State Development Bank of China
SDR	-	Special Drawing Rights
SDPC	-	State Development and Planning Commission
SIL	-	Sector Investment Loan
SOE	-	Statement of Expenditure
TT	-	Technology Transfer
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations Children's Fund
UNIDO-	-	United Nations Industrial Development Organization
USI	-	Universal Salt Iodization
WBOB	-	World Bank Office, Beijing
WHO	-	World Health Organization

Vice President:	Jemal-ud-din Kassum
Country Manager/Director:	Yukon Huang
Sector Manager/Director:	Maureen Law
Task Team Leader/Task Manager:	Janet I.Hohnen

**CHINA
IODINE DEFICIENCY DISORDERS CONTROL PROJECT**

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Acknowledgements

Background. Pioneering studies of iodine deficiency disorders (IDD) began in China in the 1960s under the leadership of Professor Ju Chen Yi and Professor Ma Tai, assisted later by Professor Chen Zu Pei and the collaboration of Australian scholars including Professors Basil Hetzel, Cres Eastman and Glen Maberley. This work provided the scientific basis for advocacy to the Ministry of Health for early control of IDD and the start of salt iodization in the 1980s. IDD control in China was encouraged by Dr. James Grant of UNICEF and followed up by representatives and technical staff of UNDP, UNICEF, WHO and UNIDO in Beijing, led by Mr. Arthur Holcombe, Representative of UNDP. Following the World Summit for Children in 1990, Premier Li Peng committed China to the global goals of Universal Salt Iodization and Elimination of IDD. China then embarked on a new IDD control project with UN support, which sponsored the National Advocacy Meeting in September 1993, to launch the National IDD Elimination Program. On this occasion State Councillor Madam Peng Peiyun requested World Bank support, which was agreed by Vice President Javed Burki.

Project Preparation and Supervision. The China IDD Control Project was identified by Jagadish Upadhyay (Senior Project Officer) as a component of the Comprehensive Maternal and Child Health Project, but was then prepared as a stand-alone project by a team consisting of N. C. Krishnamurthy (Industry Specialist, team leader), Lalit Raina (Finance Specialist), Janet Hohnen (Public Health Specialist) Dingyong Hou and Darren Dorkin (Social Sector Operations Analysts) and Yingwei Wu (Procurement Officer), with assistance of Judith McGuire (Nutrition Adviser), under the guidance of Division Chief Vinay Bhargava, Country Director Nicholas Hope and Resident Mission Chief Pieter Bottelier. The Bank task team, supported by Sector Managers Joseph Goldberg, Alan Ruby and Maureen Law, retained N. C. Krishnamurthy, J. Hohnen and D. Dorkin throughout project implementation and over time included Beijing based staff Naiqin Lu (Industry Sector); Hongwen Zhao and Shiyong Wang (Health), Jinan Shi (Procurement), Junxue Chu (Financial Management and Disbursement) and Lansong Zhang (Administrative Support), and Leon Chen (Project Operations Consultant). Consultants Cres Eastman and William Watkins participated in the Mid Term Review.

Implementation Completion Report. This Intensive Learning ICR was prepared by the task team of J. Hohnen, N. C. Krishnamurthy, D. Dorkin with administrative support of Juliana Williams, as well as assistance from Shiyong Wang, Lansong Zhang and Leon Chen in Beijing. It was translated by Mr. Chen. The ICR was based on: a field visit and report by Chorching Goh (OED); an independent review of the project conducted in October 2000 by Mr. Venkatesh Mannar, Executive Director of Micronutrient Initiative; the completion mission of the project in November/December 2000, which included a stakeholders' workshop and a meeting with UN agencies; and materials in the project files. The draft was finalized after discussion with the Government in April 2001, and two seminars in World Bank Headquarters in June 2001. The ICR was reviewed by EASHD Sector Director Maureen Law and cleared by China Country Director Yukon Huang. The Borrower's contribution is in Annex 10 and the UN agencies' contribution is in Annex 11.

Project ID: P037156	Project Name: IODINE DEFICIENCY DISORDERS CONTROL
Team Leader: Janet I. Hohnen	TL Unit: EASHD
ICR Type: Intensive Learning Model (ILM) of ICR	Report Date: June 27, 2001

1. Project Data

Name: IODINE DEFICIENCY DISORDERS CONTROL L/C/TF Number: 39140; 3914A; 27560
Country/Department: CHINA Region: East Asia and Pacific Region
Sector/subsector: HT - Targeted Health

KEY DATES

	Original	Revised/Actual
PCD: 12/02/92	Effective: 09/01/95	04/16/96
Appraisal: 01/31/95	MTR: 10/30/96	05/04/98
Approval: 06/28/95	Closing: 12/31/98	12/31/2000

Borrower/Implementing Agency: PRC/CHINA NATIONAL SALT INDUSTRY CORPORATION (CNSIC).

Other Partners:

STAFF	Current	At Appraisal
Vice President:	Jemal-ud-din Kassum	Russell Cheetham
Country Manager:	Yukon Huang	Nicholas Hope
Sector Manager:	Maureen Law	Vinay K. Bhargava
Team Leader at ICR:	Janet I. Hohnen	N.C. Krishnamurthy
ICR Primary Author:	Janet I. Hohnen; N. C. Krishnamurthy	

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

Outcome: HS

Sustainability: HL

Institutional Development Impact: SU

Bank Performance: S

Borrower Performance: S

	QAG (if available)	ICR
Quality at Entry:	S	S
Project at Risk at Any Time:	No	

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

Assessment of the objective and design of the project is made in the context of the National Iodine Deficiency Disorders Elimination Program (NIDDEP), referred to in Chinese as NIDDEP 2000, which began in 1993 to meet China's commitment to the global goals of universal salt iodization (USI) by 1996 and virtual elimination of IDD by 2000. The efficacy and cost effectiveness of targeted interventions to reduce micronutrient malnutrition, including the iodization of salt to prevent IDD, had been demonstrated in many countries. The World Bank group was supporting micronutrient initiatives in several countries when this project was being prepared, including four projects or components of other projects incorporating salt iodization, iodine supplementation by other means, or programs to eliminate IDD (A summary of the project background and context is in ref. 16, Mannar, V. Section 1).

The NIDDEP is a comprehensive multi-sectoral nationwide effort to eliminate IDD, a major preventable cause of impaired mental development and physical deformity, through making available edible salt fortified with iodine to all households in China, in line with the goal of Universal Salt Iodization (USI). It comprises several components including: organization and advocacy; health education; legislation; program planning and review; monitoring and surveillance; technical support and international cooperation; scientific research; and ensuring an adequate supply of iodized salt. The NIDDEP has been supported by many national and international partners under the leadership of the State Council. Within this broad program, the specific role of the Iodine Deficiency Disorders Control (IDDC) Project has been to assist China to develop the capacity to produce and deliver the required amount of adequately iodized salt. A major factor in the outstanding success of the NIDDEP was Government's recognition of the central role of the salt industry, and the making of a set of legal, administrative and financial decisions to support this central role.

The project's overall development objective was to help reduce the incidence of IDD in China by supporting the NIDDEP through financing investments in production, iodization, packaging and distribution of iodized salt. The project scope and outputs were clearly defined, with specific targets for physical infrastructure which formed the essential deliverables of the project. There was no revision of the development objective during the project, although the support provided to some participating salt enterprises was adjusted during implementation in line with ongoing industry rationalization.

The project objective supported one of the Borrower's disease prevention priorities and its international commitment to IDD elimination. The project was included in the lending pipeline at short notice on request of the State Council to the Bank's Country Director for China. The project's scope resulted from the decision of the Government of China (GOC) to use Bank assistance solely in the salt sector, for the physical underpinning of the key NIDDEP strategy of improved supply of iodized salt. The project objective was also consistent with the aim of the Bank's 1995 China country assistance strategy (CAS) to help alleviate poverty through social sector support, in this case through control of a high priority health problem which disproportionately afflicts the poor. At the time of project identification it was estimated that 400 million people in China were at risk of IDD, constituting 40% of the global total. In rural China

whole communities were intellectually impoverished and unable to contribute fully to their own development, due to IDD.

The project strategy of industry upgrading was also consistent with the Government's ongoing drive for economic development through enterprise reform, also supported in the 1995 China CAS. The project's facilitation of reform and rationalization of the salt industry resulted in a strong alignment of the interests of the industry and social sectors. In addition, the project's support of technology transfer in the manufacture of packaging machines matched the Government's aspirations for industrial development and import substitution.

The project objective itself was found to be achievable, although project implementation period estimated at appraisal proved unrealistic, due to the complexity and vast geographic distribution of the participating enterprises. The Bank team became aware of these complexities during preparation, but was faced with the optimistic assurances of the implementing agency and some pressure on GOC to achieve the international goal of USI by 1996. The time required to complete the technology transfer was also underestimated. In the event, as discussed below, the project was extended by two years.

3.2 Revised Objective:

The project objective was not revised

3.3 Original Components:

As described in the Development Credit Agreement (DCA), the project consisted of two parts: Part A, comprising physical projects at enterprise level, including civil works, equipment, installation, training and management support for the upgrading of existing facilities and creation of additional new capacity for raw salt upgrading, iodizing, packaging and distribution of edible salt; and Part B, a limited program of technical assistance in information systems and project management. The basic elements of the project design were straightforward, involving construction of simple buildings and the procurement, manufacture, installation and operation of equipment which was not technologically complex. However, the project overall was ambitious, complex and demanding due to the following factors:

- (a) the size and geographic scope, covering over 200 enterprises in 31 province-level jurisdictions;
- (b) the technology transfer element, involving many factors which were difficult to control during implementation;
- (c) the environment of enterprise reform and rationalization, then just gaining momentum in China, and in the salt industry given an added incentive by the project;
- (d) the in-country financial mobilization required; the Bank's initial funding amounted to less than 20% of the estimated project cost.
- (e) the lack of previous experience of the implementing agency with Bank practices;
- (f) the coordination required with other UN and bilateral partners for supply of technical assistance and machine prototypes; and
- (g) the coordination required to ensure participation of the enterprises and other stakeholders in project definition, implementation arrangements and selection of equipment.

The design included specific targets for capacity rationalization and upgrading in each province. The targets were modified during project implementation as a result of ongoing industry rationalization and re-estimation of total capacity needed and capacity switching amongst units; however the overall physical targets remained valid.

At appraisal, the major risk identified was continued consumption of non-iodized salt, which would detract from full utilization of project capacities and delay IDD elimination. Lower risks related to timely delivery of equipment, and project management capacity in relation to the scale of the project. These risks were addressed through the following elements of design and the implementation environment, which were either in place or were committed before project implementation began:

- (a) strong government commitment, with policy guidance and oversight from the highest level of the Government (the State Council) and a framework for supervision, coordination and monitoring of progress in NIDDEP at each level down to the enterprise itself;
- (b) a law prohibiting production or sale of edible salt unless iodized to the required standard;
- (c) regulations for licensing of enterprises involved in production, distribution, transport and sale of iodized salt, and for the labeling of iodized salt packages;
- (d) financing mechanisms, including a new price for standard iodized salt, with a small portion of the price channeled into the national Iodized Salt Industry Development Fund (ISIDF);
- (e) strong, coordinated support among UN agencies and other donors under the NIDDEP; and
- (f) a Government letter assuring the Bank that it would implement all the NIDDEP interventions required to ensure the project's impact;
- (g) provision for technical assistance on project management to the implementing agency.

The main limitations of the design which might have been anticipated, but might not have been avoided, were:

- (a) the short implementation period (noted above), which underestimated time needed for the technology transfer process, for mobilizing provincial authorities and enterprises to participate in the project, and for internal review and approval procedures;
- (b) the Bank's requirement for all provincial and enterprise agreements to be in place before effectiveness, resulting in an interval of 10 months rather than the estimated three months from Board approval to effectiveness. However, the delay was not material since there was provision for retroactive financing of activities started before effectiveness;
- (c) the lack of Bank funding for any NIDDEP activities outside the salt sector. This decision was made by GOC, with support of the Minister of Health, in keeping with its policy on onlending and repayment of World Bank funds, also taking into account the expected support of other agencies for health sector activities of NIDDEP. The decision disappointed Ministry of Health (MOH) staff, especially as US\$10 million of the project credit had been deducted from another health project, and MOH had expected some World Bank funds would be used for activities such as public

education, standard setting, surveillance and health worker training. This situation made it difficult in the early stages of the project, for the Bank team to maintain dialogue on plans and progress in the full range of NIDDEP activities, as mandated in the project's legal agreement. However, this early difficulty in MOH-Bank relations did not significantly affect project implementation, and the situation improved as the project and the NIDDEP progressed.

3.4 Revised Components:

The project components were not revised.

3.5 Quality at Entry:

The project's quality at entry is rated as Satisfactory based on the following features of project design and readiness and the policy and regulatory environment:

- (a) the responsiveness of the objectives and design to the priorities and strategies of the borrower (described above);
- (b) the strong organizational, regulatory and financial framework in place (described in 3.1 above);
- (c) both the project implementation unit (PIU) and the implementation plan for the first year were in place;
- (d) some procurement actions were underway, with completion before effectiveness of the evaluation of international and domestic packaging machine manufacturers, preparation of technical specifications, preliminary quotations and a procurement plan;
- (e) there was strong support for initial project activities from the UN agencies; a coordination mechanism among UN agencies was operating and was later formalized through signing of a Memorandum of Understanding (MOU) on September 14, 1995;
- (f) the monitoring indicators for the project had been agreed during negotiation and arrangements were in place for their collection;
- (g) a master plan was prepared specifying the physical facilities to be created, as well as the roles and responsibilities of concerned agencies for implementation; and
- (h) a clear financing plan was in place, with commitments to provide agreed shares from identified counterpart financing agencies.

Overall, great effort was made to ensure the readiness of the project, in the face of: (a) pressure to start implementation quickly to meet China's commitment to USI; and (b) some differences of Bank and GOC views on what constituted readiness for implementation in terms of detailed planning, establishment of the PIU, implementation arrangements, counterpart financing, etc. Appraisal was in fact postponed twice by the Bank team to allow more time to complete those actions considered essential to improve readiness. The Government also postponed approval until its own project feasibility report was revised to meet its requirements. This approval was given in February 1995.

Financial readiness:

The financial readiness of the project was evident from the following:

- (a) agreements were reached with MOF, the two main counterpart financiers, ISIDF and the State Development Bank of China (SDBC), the provinces and enterprises on the

size and conditions for their contributions to the project, including funding of any cost overruns. Signed agreements with the provinces and enterprises were a condition of effectiveness;

- (b) onlending, disbursement and repayment arrangements for the Credit/Loan were agreed involving MOF, the China National Salt Industry Corporation (CNSIC), a financial intermediary and the provinces; and
- (c) a new price for iodized salt was set by GOC (and formalized in January 1996). The resulting increased income to the ISIDF helped ensure the project's counterpart funding, as well as additional resources for industry upgrading and related activities outside the project.

Technical readiness:

The technology for upgrading the physical facilities was not sophisticated or expensive, comprising iodizing, mixing and packaging machines; basic laboratory testing methods and simple warehouse buildings with features for reducing dust and salt in the air. Assessment and selection of models of equipment to be funded had begun earlier with support of UNICEF and UNIDO. Upgrading of domestic manufacturing capability for retail packaging machines through technology transfer was an objective of the project. Standard plant designs were developed by a local engineering company (completed in July 1995) and used in the provincial feasibility studies. A program of research and development was also defined before project effectiveness, giving priority to reducing iodine losses through: (i) improving iodizing machines; (ii) increasing the stability of iodine in salt; and (iii) improved packaging machinery.

Bank safeguards: None of the specified monitorable Bank safeguard policies was applicable to this project. There were no issues of negative environmental impact, resettlement or threat to minority communities.

External factors: The project was designed under two main assumptions about external factors:

(a) the major assumption was that complementary activities of the NIDDEP would be carried out, thus ensuring that the project's support for the edible salt industry would in fact lead to realization of its development objective of improved use of iodized salt at household level and reduction of IDD. This assumption was considered reasonable due to top level political commitment, a good strategy and strong institutional arrangements for the NIDDEP, technical support and finance from other international agencies, and the commitment on this matter given by MOH to the World Bank during appraisal and negotiations (see ref.1, Staff Appraisal Report, Annex 2).

(b) the second important assumption was that the new price of iodized salt, which underpinned the financing of the upgraded capacity and distribution of iodized salt across China, would not significantly affect affordability or demand for iodized salt at household level. This assumption was based on the estimation that the price increase for quality iodized salt represented less than one percent of the household budget, in both rural and urban areas, and would therefore not be a concern for the vast majority of families. The assessment at project completion is that on balance the Government's decision to set a new higher price for quality iodized salt was the right decision, and helped to finance the needed great expansion in supply of iodized salt. However, for some

disadvantaged communities, where price may still be one of the factors affecting use, advocacy and marketing as well as compensation, price subsidy or other alternative strategies might be needed to ensure household uptake.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

The project outcome is rated as Highly Satisfactory, based on the contribution of the project to the achievement of the goals of the NIDDEP, within the relatively short period of about six years. The standard for assessing achievement of the project development objective did not change over the implementation period.

NIDDEP progress was monitored through three national surveys, conducted in 1995, 1997 and 1999 by MOH and Provincial Bureaus of Health, with national and international assistance. The surveys assessed three program indicators: the availability of adequately iodized salt at household level, and the prevalence of two biological markers for iodine deficiency, enlargement of the thyroid (goiter) and low urinary iodine excretion. The results showed that, for the country as a whole, coverage of quality iodized salt at household level increased from 39.9% in 1995 to 88.9% in 1999; while measures of goitre and low urinary iodine in school children declined dramatically in the same period.

Table 4a. Outcome/Impact Indicators

Indicator	1995	1997	1999
1. % households consuming quality iodized salt (20 ppm or over in tested salt samples)	39.9	81.1	88.9
2a. % school children 8-10 years with enlarged thyroid (measured by ultrasound)	n. a.	9.6	8.0
2b. % school children 8-10 years with enlarged thyroid (measured by palpation)	20.4	10.9	8.8
3. % school children 8-10 yrs with low urinary iodine (50 ug/L or less)	13.3	3.5	3.3

Source: Three national surveys conducted by GOC with international support (Annex 7, ref. 24)
 ug/L = micrograms per liter
 ppm = parts per million

[Note: The international criteria for IDD elimination are: (a) 90% of households consuming salt with 20 ppm iodine or above; (b) no more than 20% of school children with urinary iodine below 50 ug/L; and (c) no more than 5% schoolchildren with thyroid enlargement, by palpation or ultrasound.]

The project's health impact, through its contribution to the NIDDEP, is rated as High. The increase in household coverage of adequately iodized salt implies that an additional 50% of families in China will now benefit from greatly reduced incidence of miscarriage and stillbirth, physical deformity and mental retardation caused by iodine deficiency, bearing in mind that IDD is the commonest cause of preventable mental retardation in the world and that at the beginning of the 1990s, China was estimated to have 40% of the world population at risk of IDD. In addition, studies in China and other countries, as reported by Micronutrient Initiative, have concluded that

all children born in previously iodine deficient communities and now protected from IDD will have on average intelligence 13-5 IQ points greater than if not protected. Out of an estimated 18.2 million births per year in China, 17.2 million newborns are now protected from IDD, including about 9 million with protection provided through the increased coverage of iodized salt resulting from this project. Apart from improved reproductive health, the enhancement of learning ability and productivity, and reduction of dependency and medical costs due to disability, will make an important contribution to social and economic development.

The impact on poverty reduction is rated as Modest. The additional 50% of China's families now using iodized salt, with the benefits described above, include a large number of the poor and very poor, and to the extent that poor families and communities are more burdened by the effects of ill-health and disability than non-poor, they will particularly be advantaged by the success of the Program. Economists consider that the marginal productivity increase of improved health is likely to be higher for poorer than for richer families, which would further underline pro-poor benefits of project. On the other hand, it is known that the estimated 10% of households not yet consuming iodized salt are predominantly located in the poorer provinces and counties. These were not reached directly by the project. However, the Government has made new plans to address these areas, and as discussed below, one important resources available to assist is the ISIDF which was greatly strengthened as a result of the project.

In June 2000, an evaluation group representing six government agencies made a further comprehensive assessment of each province and concluded that China had satisfied the criteria for virtual elimination of IDD at the country level and in 24 provinces. The review identified remaining problems in the other seven provinces, especially in remote inland areas and in some coastal areas where salt is produced by small enterprises. These problem areas contain 14% of China's population. While these gaps could not have been addressed within the scope of the project as designed, in October 2000, GOC and the provinces made detailed plans to address this challenge in the next five years, through such activities as: (a) establishing small salt iodizing and packaging plants some local population centers; (b) social marketing; (c) targeted subsidies of the salt price or transport cost, and (d) incentives to reduce excess production capacity, especially among small producers. Until such strategies are well established, alternative iodine supplementaton for vulnerable groups, especially women and young children, should remain in place. The ISIDF, which has grown strong as a result of the project, is available for use in these remaining problem areas. For example, a small iodization plant has been built in Tibet and two more are planned there, using the ISIDF along with funds from WHO and the Australian Agency for International Development (AusAID).

4.2 Outputs by components:

Part A. Physical Capacity Building (Credit US\$17.29 million).

The achievement of outputs in this component is rated Highly Satisfactory, based on the completion of all physical targets of the project, including installed capacities for salt production, iodization and packaging as well as successful technology transfer for production of retail packaging machines in China (see Annex 1, Table 1 b).

In summary the project outputs were as follows:

- (a) upgrading of 1.54 mtpy low quality raw salt production in 55 enterprises, with concurrent expansion of capacity to 2.45 mtpy (compared with SAR target of 2.2 mtpy in 57 enterprises)
- (b) installation of iodization capacity at 112 locations, with increase of total iodization capacity from 3.5 to 8.1 mtpy (target adjusted down from SAR target of 8.16mtpy)
- (c) installation of new bulk packaging capacity at 29 locations to 3.76 mtpy (compared with the appraisal target of 2.93 mtpy)
- (d) installation of new retail packaging capacity at 147 locations up to 3.45 mtpy (compared with the appraisal target of 3.16 mtpy)
- (e) installation of new carton packaging capacity at 2 locations, each of 0.05 mtpy (same as the appraisal target).

Part B. Technical Assistance (Credit US\$0.14 million). The output of this small component (0.6% of the credit) is rated Unsatisfactory. The component was not fully implemented due to the following factors: (a) the project implementing agency, CNSIC, was not convinced that the planned technical assistance would be helpful, and proceeded with reluctance with the procurement process; (b) the recommended system and implementation arrangements did not meet the needs and expectations of the client; the software system, developed in English, was found to be difficult and expensive to convert into Chinese; and (c) the implementing unit did not fully put into practice the system recommended by the consultant firm. However CNSIC recognized the principles and utility of the project management systems and used some of the ideas when it requested a local software firm to undertake the development of the nationwide Salt Industry Information System. (CNSIC has commented that it is satisfied with the final outcome of this work.)

4.3 Net Present Value/Economic rate of return:

Economic and financial rates of return were not estimated at appraisal nor at the conclusion of the project.

4.4 Financial rate of return:

N/A

4.5 Institutional development impact:

The project's institutional development impact is rated as Substantial. The assessment covers: (A) impact on the implementing agency; (B) impact on the salt industry; and (C) impact on intersectoral relations and the NIDDEP.

A. Impact on Implementing Agency. The project made the following contributions to improved institutional capacity of CNSIC:

- (a) improved capacity in project management, financial management, procurement and audit procedures, which were developed in response to project needs, including World Bank requirements.
- (b) Upgrading of the management information system and improved links to all levels in the industry, although the potential of the system has not yet been fully realized.
- (c) Strengthened capacity to interact with a wide range of international partners, to represent China in international forums and partnerships and to offer support to other

- countries in operational aspects of salt iodization and IDD elimination
- (d) consolidated CNSIC's leadership and advocacy role for IDD Control in wide range of intersectoral activities and the media.

B. Impact on the Salt Industry. The project:

- (a) greatly improved overall management system and management capability of the salt industry, bringing it recognition and status among industrial sectors in China;
- (b) enhanced understanding and implementation at all levels of approaches to product quality control, cost control, marketing and communication which are integral parts of a modern industry; and
- (c) stimulated improved institutional arrangements for research and development (R&D) in the sector, and the application of R&D results in the industry, e.g., adoption of new standards and procedures throughout the industry.

The technology transfer (TT) arrangement provided a stimulus to institutional development in the packaging industry. The technology for manufacture of modern packaging machines was transferred from a European company to a local machinery manufacturing firm as part of an equipment supply contract. The TT process, as well as the development of human resources and infrastructure at the domestic firm, was successful and led to further adaptation of the technology and related quality control, and manufacture of the machines required by enterprises participating in the project. The domestic firm is now able to manufacture machines to meet future demands within China, and will be in a position to compete in the international market, given its cost advantages.

One negative impact of the industry's reform, at least in the short term, has been loss of jobs due to closure of excessive salt production capacity, and also the conversion from manual to automatic packaging methods. Loss of low skill jobs is a common effect of industry rationalization and reform which is taking place in on a huge scale in China. As the economy is expected to continue growing at 5-7% annually in the next 5 years at least, and becoming more diversified, commensurate job growth is also expected, which would facilitate finding of alternative employment by those laid off. In addition, many provinces have provided incentives or compensation to small producers to reduce or cease production, and assisted with those enterprises to find alternative employment. However, ability to assist in this way varies among the provinces, and the persistence of excess capacity in those areas is a major challenge which may require additional higher level support. This is one area for legitimate use of the ISIDF.

Role of Government. The strong role taken by central and provincial Governments, through legal channels and regulation, has been an important institutional factor in the project's success during the 1990's; the passing of laws and licensing regulations is justified in terms of the public health and social benefit from reduction of IDD. With the industry on a more viable footing and with the expected growth of consumer advocacy and general strengthening of civil society in the next decade, the role of Government may be complemented more strongly by these other agencies. In other countries, with longer history of consumer advocacy and active civil society, the role of Government may be less prominent, but the Government role, backed by civil society, will still be critical in establishing an enabling environment for IDD elimination.

C. Impact on the NIDDEP. The project gave a compelling rationale and stimulus for effective intersectoral cooperation, within the structures set up for the NIDDEP, and reinforced the important role of the salt industry in the partnership, with mutual benefit for both the salt industry and the overall program. The other key sectors, including planning and finance, health, education, information and technical supervision, as well as local government at each level, gained practical experience of successful collaboration and problem solving with industry on a program with a social objective. Mutual understanding and support were particularly strengthened through the processes of supervision, monitoring and surveillance, mass community education and marketing, and research and development.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

Positive factors:

- (a) strong foundation of scientific analysis of IDD in China which had been used to inform and persuade senior decision makers
- (b) the global movement to achieve USI and the elimination of IDD provided both a rationale and an enabling environment for the project;
- (c) four years of groundwork by GOC and the UN agencies, leading to the 1993 National IDDC Advocacy Meeting, laid the foundation of the NIDDEP with a defined central role for the salt industry, and for World Bank support of that role; and
- (c) strong support from partner agencies during project preparation and implementation (e.g., UNICEF and UNIDO supplied consultants to the project; UNDP and UNICEF staff provided leadership in coordination of salt and health sectors at working level).

Negative factors:

- (a) some of the implementation delay was due to slow procurement and to delays by international suppliers especially in technology transfer;
- (b) low technical and management capacity of enterprises in remote areas of China; and
- (c) project implementation coincided with a period of rapid social and economic change, reform and reorganization of all levels of government; fluctuating policies on import duties and bank loan interest rates, all of which affected project implementation.

5.2 Factors generally subject to government control:

Positive factors:

- (a) international commitments made by GOC;
- (b) formulation of the multisectoral NIDDEP;
- (c) set up the legal and regulatory framework governing the iodized salt industry;
- (d) set up the financial foundation for project and later sustainability;
- (e) GOC leadership requested Bank support on a fast track basis.

Negative factor: A more proactive role of some provincial governments in calling coordination meetings and supporting timely mobilization of counterpart financing in the initial years, could have reduced implementation delays.

5.3 Factors generally subject to implementing agency control:

Positive factors:

- (a) strong leadership and successful effort to mobilize and coordinate the large number of provinces and enterprises;
- (b) proactivity of CNSIC to adjust the master plan as opportunities opened up through the project to improve industry structure and efficiency; and
- (c) CNSIC also took new initiatives during the project to improve sustainability through industry support units such as the training center and spare parts supply center.

Negative factors:

- (a) despite outstanding overall performance by CNSIC, the agency was reluctant to take advice on strengthening project management and information systems.
- (b) CNSIC did not accept the Bank team's recommendation to use credit savings for systematic market analysis or investigation of demand side factors. However they did meet annually with other sectors to review barriers to progress and have since participated in the planning of new initiatives to address the remaining problem areas (see also Section 10.2)

5.4 Costs and financing:

This section summarizes: A. the status of final project costs compared with appraisal estimates; B. project financing arrangements, C. the reasons for delay in project implementation; and D. the performance of project contractors

A. Project Costs. At appraisal, the project's installed cost was estimated at US\$108.95 million equivalent. The final cost at completion is US\$101.83 million equivalent, or 93.5% of the appraisal estimate. The total project financing required was estimated at appraisal to be US\$152.29 million. The final estimate, at US\$118.80 million, amounts to 78% of appraisal estimate. The capital costs and total financing required at appraisal and the estimate at completion are summarized in Table 5.4a. Reasons for variations greater than 20% in any item are discussed below.

Reasons for variations:

- (a) Civil construction. At appraisal, warehouse buildings were expected only to be renovated and marginally enlarged. During implementation, several enterprises decided to build new warehouses at a higher standard of construction, which accounted for most of the 31% increase in final cost.
- (b) Duties and taxes. At appraisal, it was estimated that project imports would carry 15% import duty and 17% value added tax. At project inception, the government waived duty on project imports. Import duties were reinstated in April 1996, reduced to 9% in December 1996, and again fully exempted from January 1998. As a result, actual expenditure for this item was only 15% of the appraisal estimate.

**Table 5.4a. Project Cost and Financing by Items of Expenditure
(US\$ million equivalent)**

Expenditure Item	Appraisal Estimate	Actual	Actual as % of Appraisal Estimate
Engineering and Other Services	3.69	3.98	107.9
Civil Construction	27.89	36.65	131.4
Equipment and Spare Parts	42.51	44.22	104.0
Duties and Taxes	7.77	1.16	14.9
Commissioning and Installation	2.28	7.02	307.9
Inspection	1.27	1.24	97.6
Plant and Equipment Insurance	1.33	0.14	10.5
Training	1.94	1.60	82.5
Project Management	2.31	5.37	232.5
Technical Assistance (PIU)	0.49	0.45	91.8
Subtotal Base Cost	91.48	101.83	111.3
Physical Contingencies	4.53	n.a.	n.a.
Price Contingencies	12.94	n.a.	n.a.
Subtotal Installed Cost	108.95	101.83	93.5
Interest During Construction	14.53	3.90	26.8
Incremental Working Capital	28.81	13.07	45.4
Total Capital Cost	152.29	118.80	78.0

Notes: n.a. Not applicable.

The exchange rate at appraisal was: 1 US\$ = RMB 8.45; and at project completion was: 1 US\$ = RMB 8.28.

- (c) Commissioning and installation. During implementation, the number of retail packaging machines installed at new sites was increased from 374 to 578, while the number of machines at production sites was reduced from 228 to 139. That is, a significant share of the retail packaging capacity shifted from “production” to “distribution” sites. This change was due to perceived efficiency gain by shifting from manual to machine packaging. The new supply capacities at the new locations increased the capital costs, shown as “installation and commissioning expenditures”, by 208% over the appraisal estimate. As a consequence, the total retail packaging capacity installed was about 3.45 mtpy, compared to the appraisal target of 3.16 mtpy.
- (d) Plant and equipment insurance. Provision was made at appraisal for insurance of plant and equipment insurance at 3% of the value, covering transport, storage and installation. However, Chinese practice does not require insurance during construction, so the expenditure for this item is much lower than estimated.
- (e) Project management. The increase of 133% for actual expenditure compared with appraisal for this item was due to the two year increase in implementation period and the much larger coordination effort, especially with provinces and enterprises.
- (f) Interest during construction. At appraisal, interest during construction was assessed at 6% p.a. on the outstanding Bank Loan, and 10% p.a. on domestic loans. In the event the

Bank Loan was cancelled; the ISIDF loans carried no interest, and a large part of province and enterprise counterpart financing was in the form of equity or loans at less than 10% interest p.a. As a consequence, the total burden of interest during construction was only 27% of appraisal estimate.

- (g) Incremental working capital. The appraisal estimate of US\$28.8 million for this item was based on 15 days of accounts receivables, 15 days of finished goods inventory, and 15 days of materials in process and raw materials in stock. The actual provision of about US\$13.1 million equivalent by CNSIC, based on Chinese practices, is about 45% of the Bank's estimate at appraisal.

There were also significant cost savings in procurement of packaging machines. The appraisal estimate of the unit cost of retail packaging machines was US\$136,000 each, compared with the actual cost of US\$83,700. There were also much higher estimated costs for technology transfer with supply of components for machines to be manufactured locally (at US\$5.1 million) compared with actual expenditure (US\$1.8 million) (see Table 10.a).

B. Financing Arrangements. The final contributions and relative shares of the four main project financing agencies differed from the appraisal estimates, as explained below:

- (a) The Bank's final contribution to the total project cost was smaller than estimated at appraisal due to: (i) lower foreign exchange requirements, mainly for packaging equipment and technology transfer, which led to cancellation of the Loan of US\$7.0 million on June 15, 1998. The savings also allowed procurement of additional machines and spare parts from the unutilized Credit; and (ii) reduction in the dollar equivalent of SDRs due to exchange rate fluctuation (see Table 5.4b below).
- (b) The lower than expected utilization of SDBC loans compared with appraisal was due to: (i) a higher interest rate than the enterprises could obtain from other local banks; and (ii) the complex procedures for commitment, release and disbursement of SDBC loans which deterred potential borrowers.
- (c) In contrast the higher contribution of the ISIDF to project funds was related to: (i) the improved financial position of the fund through collection of dues; and (ii) the absence of interest charges on ISIDF loans, making ISIDF more attractive.
- (d) The actual contributions of provincial governments and the enterprises themselves were lower than estimated because of lower actual project costs, as well as the increased availability of concessional ISIDF funds mentioned above.

Table 5.4b. Project Costs and Financing by Source
(US\$ million equivalent)

Source	Appraisal Estimate	Actual/Latest Estimate	Actual as % of Appraisal Estimate
<u>World Bank</u>			
IDA Credit	20.00	17.29	86.5
IBRD Loan	7.00	0.00	0.0
<u>Government</u>			
State Development Bank of China (SDBC)	22.54	17.56	77.9
Iodized Salt Industry Development Fund (ISIDF)	22.54	27.13	120.4
Provincial Governments	51.41	34.58	67.3
Enterprises	28.81	22.24	77.2
Total	152.29	118.79	78.0

Note: Exchange rate at appraisal was: 1 US\$ = 8.45 RMB; and at project completion: 1 US\$ = 8.28 RMB.

The shares of the different sources of financing were based on the Bank's estimate at appraisal that the total financing required would be US\$152.3 million equivalent (RMB 1,286.9 million). However, the total project cost as approved by the State Development and Planning Commission (SDPC) was lower at US\$116.2 million equivalent (RMB 981.7 million). This approved cost did not provide for insurance during construction and also used lower base prices and contingency provisions.

C. Implementation Delays. Three specific aspects of the project which contributed to implementation delays are discussed here briefly. They are: procurement of retail packaging machines; the project management system; and counterpart financing. A common factor in these was the number of procedural steps, many unforeseen, required for acceptance and approval by the involved agencies.

1. Procurement of Retail Packaging Machines (including Technology Transfer). The selection and award of the contract for supply of retail packaging machines followed the Bank's requirement of a two-stage bidding process. CNSIC found it difficult to accept this process, preferring single-stage bidding, and was not familiar with the Bank's mandatory sequential clearances of bidding documents, selection of bidders and award of contract. The Bank also did not complete these steps in a timely manner. The contract was awarded on November 1996, one year later than scheduled at appraisal. Technology transfer (TT) was expected to take place over the twelve months following contract award, and local manufacture of machines based on the TT to begin a few months before completion of the TT. Some lack of responsiveness and inaccuracy in documentation by the foreign supplier caused further delay. After the transfer, the local contractor was to produce two prototype machines for demonstration to end users and then modify the documents and design to suit their requirements before commencement of actual manufacture. Inadequate scheduling by the local manufacturer extended the completion time for the earlier batches of machines. The installation and commissioning of the machines at the enterprises also took longer than expected, because of delay in site preparation including

foundations for the machines and connection of utilities. At some locations, disputes about ownership of the facilities compounded the delays.

2. **Project Management System.** A system for effective project management, including cost and finance control, was developed by an international consulting firm for CNSIC under the TA component of the project, but there were numerous delays in development and use of the system. The Bank team considered that the system, if appropriately finalized and put to use, would have permitted CNSIC to monitor project implementation more closely, anticipate emerging problems, and plan remedial action. Schedule control might then have been more efficient and reduced the delays which occurred.

3. **Counterpart Financing.** Despite assurances and commitments on the shares and conditions of funding of the counterpart contributors, significant delays occurred at the beginning of the project in mobilizing counterpart funds. The delays were compounded by very complex internal procedures for annual commitment and disbursements. As a result, implementation progress during 1997 and 1998 slowed significantly, contributing to overall delays in the project.

In retrospect, the implementation schedule developed at appraisal did not make sufficient allowance for: (a) inexperience of CNSIC (the implementation agency) with Bank procedures and with implementing complex projects; (b) the Bank's own delays in clearing procurement steps; (c) the complexities of international technology transfer; and (d) the intricate procedures of some counterpart agencies for clearances and approvals. Both the Bank's and the Borrower's expectations in this regard were overly optimistic.

D. Performance of Contractors. This section summarizes the performance of the two main contractors funded by the project: one for retail packaging manufacture based on technology transfer, and the second for project management support.

1. **Retail Packaging Machine Contractor.** At appraisal, one domestic firm was identified from among several examined by CNSIC, and Bank staff and consultants, to absorb the foreign technology for manufacture of retail packaging machines. The firm had extensive shop fabrication capacity, a well staffed engineering and design office and a forward looking management. The transfer of technology to the contractor from an Italian manufacturer has been successful. At the close of the project the contractor had delivered 100 machines to the project enterprises, and had also provided 3 machines to the inventory of the CNSIC equipment supply center. As noted in Section 4.5, the firm is now capable of supplying meeting future requirements of the local salt industry and is in a position to compete internationally for supply of such machines.

The delay in technology transfer and absorption is described in section C above, and the time required for the learning and adaptation in both parties was underestimated. Several technical and commercial meetings were required to reach full understanding of the technology transfer documents, translate them and adapt them to local conditions. The local contractor had limited capacity for network planning and scheduling of fabrication and delivery of machines, which could have helped in early identification of problems and actions to address them. However, taking into account the external factors that contributed to the delay in the firm's areas of responsibility, its overall performance can still be considered satisfactory.

2. Contractor for Project Management Support and Financial Management Systems. An international consulting company was selected by CNSIC, primarily on the basis of previous work in China in industrial projects, Chinese language capability, and some familiarity with China's salt industry. The scope of work included design and development of a comprehensive, industry standard project management system, installation of the system at CNSIC's project offices, and training of personnel in its use. The project management system was to include accounting and financial control systems for project implementation. The report on the recommended system was due within five months from contract signing. However there were delays in the contract becoming effective, in finalization of the report, and system installation. CNSIC considered that the conversion of the recommended system to meet CNSIC's requirements was technically difficult and too expensive. Although CNSIC recognized the utility of the system as a whole, because of the factors mentioned, it was not used to its full potential. The contractor requested additional funding to make the necessary conversion but this was not agreed by CNSIC. As a result the contract was not implemented fully or in a timely manner.

6. Sustainability

6.1 Rationale for sustainability rating:

The sustainability of project achievement is rated as Highly Likely, based on the factors summarized in Section A below for both the National IDD Elimination Program and for the achievements of the project itself. Section B covers the main risk to sustainability, Section C addresses critical factors that will need attention in the next decade to ensure sustainability and Section D mentions as a possible continuing role for the Bank.

A. Sustainability Factors. The main factors justifying the high sustainability rating which are relevant to the NIDDEP are as follows:

1. ***Commitment of Key Stakeholders.*** International commitment by the highest level of the Government to the international community to eliminate IDD from the whole of China was made at the 1990 World Summit for Children and then adopted by local governments, public health bureaus and salt administrations at province and county level. The widespread awareness and pride of salt industry groups in their contribution to public health and social development through reduction of IDD, are important factors for sustaining this broad based commitment.

National and provincial commitment for the future was renewed at the International Re-advocacy Meeting hosted in Beijing in October 2000, when strategies and plans for extending the elimination of IDD in the next 15 years were presented. The Minister for Light Industry announced the Government's seven point plan for further progress and sustainability of IDD elimination, covering the following:

- (a) strengthen overall advocacy and planning, including
 - i) raise awareness and strengthen political support,
 - ii) meet new targets for IDD elimination by 2010,
 - iii) arrange regular progress review by the State Council and
 - iv) gradually increase the Government allocation for IDD elimination, especially within anti-poverty initiatives in the Western Provinces;

- (b) operationalize multi-sectoral collaboration;
- (c) expand enforcement of IDD elimination laws and statutes;
- (d) redouble information and education to mobilize all segments of society;
- (e) improve monitoring and evaluation, using scientific methodologies;
- (f) improve the quality of personnel working on IDD elimination; and
- (g) expand scientific research and international cooperation.

2. Continuing Strong Administrative and Institutional Arrangements. Based on the Minister's announcement mentioned above, public and institutional support from the level of Vice Premier is expected to continue. The working group of MOH and CNSIC continues to meet regularly with the provinces, with special focus on the action plans for the lagging areas. Some CNSIC project staff have been moved full time to this work since the project closed.

3. National Capacity for Scientific Leadership, Monitoring and Surveillance and Research and Development. During the last decade, in response to the needs of the NIDDEP, national scientific and intellectual leadership has developed in a range of fields related to iodine metabolism and deficiency, population monitoring and surveillance, and applied research and development in the salt industry. This capacity will contribute to the sustainability of China's own program as well as being available for assisting other countries.

4. Continuing International Support. Several agencies have a continuing stake in sustaining and deepening China's success in IDD control, including the UN agencies, the International Council for the Control of Iodine Deficiency Disorders (ICCIDD) and Kiwanis. China will also gain tremendously from its membership of the new international "Partnership for Sustained Elimination of IDD" established in February 2001, which also includes UNICEF, WHO, the Program Against Micronutrient Malnutrition, Micronutrient Initiative (MI), Europe Salt Production Association, the World Salt Association, Kiwanis and ICCIDD. The Partnership will assist with monitoring, information exchange and networking in countries where the greatest progress can be achieved.

In addition, the following factors are in place to underpin sustainability of the project's achievements within the salt industry:

5. A Strong Legal Framework. The outlawing of non-iodized edible salt and the high level of state control of the industry, through regulation and licensing of production, packaging, transport and sale of iodized salt, have been critical factors in the rapid increase in supply and use of iodized salt. These legal and regulatory provisions, along with the political will and capability of enforcement, have been effective tools for salt industry authorities at each level to reduce and control illegal uniodized or substandard salt in the market. The Government intends to maintain control over the iodized salt industry in the interests of its public benefit, at least for the next decade.

6. Financial Underpinning through the Iodized Salt Industry Development Fund (ISIDF). Sustainability requires financial support for new initiatives as well as for recurring costs and the ISIDF is seen as one of the main sources of this finance. ISIDF's financial position

improved significantly as a result of the project, and the continuation of a levy on salt producers would sustain its financial viability in the future. As noted earlier, ISIDF resources are being used for further improvements in the industry, including construction of small plants in underserved areas such as Tibet. In addition, it has been proposed by CNSIC and agreed by MOF that ISIDF will support the health sector's initiatives in consumer education and in monitoring of IDD status, in recognition that these factors are important for lasting success. It is the Government's intention to maintain the ISIDF.

7. ***Creation and Maintenance of Consumer Demand for Iodized Salt.*** The Government is committed to "redouble" its efforts to mobilize and inform all segments of society in the next phase of IDD elimination. The NIDDEP partners, including the salt industry, are aware that strong, continuing consumer demand is vital for success of the USI/IDD strategy and for the long term viability of the industry, particularly in those areas with relatively easy access to illegal non-iodized salt, which have yet to meet the criteria for IDD elimination. While the salt industry would continue its efforts to reduce the supply of non-iodized salt, lowering of demand for this salt is also very important. CNSIC, with assistance of UNICEF, intends to focus particularly on the education of salt retailers and on point of sale messages in the stores and on salt packets. Particular community and market analysis will be needed to design appropriate messages in different cultural settings.

8. ***Salt Industry Transforming into a Viable, Modern Industry.*** The upgrading and rationalization of the industry through the project has put it on a much more viable footing for the long term, consistent with the overall strategy for enterprise reform in China. The combination of increased efficiency and productivity, savings from reduced waste, modern quality control and management systems and enhanced market responsiveness, have enabled a much greater reach and coverage of quality iodized salt. Before 1994, iodized salt was produced and packaged by several thousand small work units located near centers of consumption, using very basic iodizing technology and manual packaging, and with hardly any quality control. The project helped the Government to rationalize the industry, which now involves a much smaller number of production units (213), with iodization at the point of production, and repackaging (147) units. CNSIC plans to continue phasing out older units, through further capacity integration and through incentives for uneconomic units to close and take up alternative businesses. The operation and management of the salt enterprises and the industry as a whole, have improved greatly through training of over 8,000 personnel in China and abroad, and through exposure to international practices. This program is continuing with assistance from an international salt company, financed by bilateral agencies and UNIDO. The salt pricing system has ensured the financial viability of enterprises and provided incentives for further modernization. The industry has created support services for training, for supply of equipment and spare parts, and for establishing and maintaining quality control laboratories. These structural and institutional changes have greatly increased the chances for sustainability in the edible salt industry.

9. ***Enhanced Domestic Capacity to Manufacture Equipment and Materials for the Salt Industry.*** Through technology transfer to a local company during the project, modern automated retail packaging machines can now be made in China for use in the salt industry. This domestic capability makes it more affordable for other salt enterprises to replace their old machines. Other

local manufacturers have now upgraded their machines in order to compete with the firm supported by the project. In addition domestic plastics producers have developed new formulations films suitable for the packaging of salt. These advances, coupled with a system for replenishing spare parts, established by CNSIC, will help ensure sustainability, by reducing the need to import these goods

B. Risks to Sustainability and Actions to Address those Risks. China has declared the achievement of its goal of virtual IDD elimination by the year 2000. However, as noted, this overall achievement conceals variations in provincial performance, with seven provinces yet to meet the international criteria of IDD elimination at province level. The challenge now is to identify factors that might detract from the successes achieved so far, as well as those that have prevented achievement in those lagging areas, and provide for mechanisms to ensure long-term sustainability.

The most serious risk to sustained high coverage of iodized salt at household level is considered to be the presence of non-iodized salt in the market (which takes market share from the legitimate enterprises). Despite the Government's legal, regulatory and enforcement mechanisms, non-iodized or sub-standard salt continues to provide about 5-8% of the total supply of salt in the market. The main contributing factors are:

- (a) some sections of the population are not yet aware of the dangers of IDD and the advantage of consuming iodized salt;
- (b) excess capacity for salt production in some areas. Local governments in these areas are often reluctant to close small salt producers when there is no alternative avenue for revenue or employment;
- (c) the higher price of packaged iodized salt provides an incentive to put "fake" salt into the market, which may or may not be iodized, but is outside the approved production quota; and
- (d) the policing and enforcement system is not fully effective.

Up to the present there has been no systematic study to assess the contribution of each of these factors to the presence of illegal salt in the market, and it is likely that the contribution or influence of each will vary in different settings. This type of analysis will be of increasing importance in tailoring future IDD elimination in the remaining areas where it remains more prevalent, as each setting has its own combination of demand and supply factors (see also section 10.2).

C. Critical Factors to Ensure Sustainability. Concerning the future role of the salt industry, action will be needed to maintain and strengthen the gains from the project as follows:

- (a) maintain the industry profile not only as the supplier of edible salt but also as an essential contributor to the nation's health and social development;
- (b) preserve and enhance professional standards of performance appropriate to a modern industry, through personnel training and system coordination;
- (c) maintain the capacity for training of personnel in all aspects of salt industry operations and management,
- (d) continue some mechanism for providing equipment advice and supply of spare parts

- to the enterprises
- (e) maintain and improve the use of the computerized database and management information system for the industry statistics, to permit effective monitoring and evaluation of industry performance.
 - (f) augment industry based marketing initiatives
 - (g) increase support for special measures to poor or vulnerable communities, particularly in areas that have not reached the criteria for IDD elimination; and
 - (e) maintains contact with the international agencies for assistance with specific activities such as market promotion, public education, industry efficiency improvements and training.
 - (d) maintain and improve enforcement of laws and regulations to limit the presence of non-iodized or sub-standard salt in the market;

In addition priorities for the Government will be to maintain current inter-sectoral linkages, especially the strong salt-health partnership, and also to maintain the ISIDF as a financing source also for continued consolidation of the industry and for the areas mentioned above;

The following indicators could be used to monitor the impact of the project in the future:

- (a) industry capacity in: (i) quality raw salt production; (ii) iodizing; (iii) bulk packaging; and (iv) retail packaging;
- (b) annual production of: (i) quality raw salt; (ii) iodizing; (iii) bulk packaged salt; and (iv) retail packaged salt;
- (c) quantity of iodized salt sold, compared with the estimated consumption in each county and province; (a target would be to reduce illegal salt in the market below 2% of the total sold)
- (d) proportion of households consuming effectively iodized salt (containing at least 20 ppm); and
- (e) percentage of iodized salt that meets the national standard; the target is 95% (the current standard allows concentration between 20-50 ppm at each level of the system. MOH is now proposing a range of 15-30 ppm at each level.)

D. Possible Continued World Bank Role. While further World Bank financial support for the iodized salt industry in China is unlikely, the Bank remains actively involved in enterprise reform in China and in reduction of IDD and other micronutrient deficiencies internationally. Two current Bank supported rural health projects in China include small subcomponents on IDD control within a set of high priority health interventions, focusing on community education, salt monitoring and surveillance. Similar initiatives would be considered for future health projects or components of poverty projects. Support for some form of continued Bank involvement has been voiced by the project provinces in the stakeholders workshop and also by international agencies. The Bank has expressed its interest, if invited, in continuing in an appropriate capacity as a member of the international partnership supporting China's continuing effort to eliminate IDD.

6.2 Transition arrangement to regular operations:

Arrangements for transition to regular operations and sustaining them are rated as Satisfactory. The Project has supported rationalization and incremental change to improve the regular operation of the edible salt industry, facilitating the industry's own ongoing comprehensive reform

agenda. As such there is no requirement for a major transition plan or for commissioning or integrating large new elements into the existing industry. CNSIC has established mechanisms with the provincial salt authorities to consider further proposals for rationalization of all older existing capacities, within the overall reform.

7. Bank and Borrower Performance

Bank

7.1 Lending:

The Bank's performance during identification, preparation, appraisal and negotiations is rated as Satisfactory.

Project Identification. The project was identified between November 1993 and February 1994 in response to a special GOC request in October 1993, linked to the NIDDEP and outside the regular lending discussions. Bank management responded promptly to the Borrower's new priority, initially agreeing to include IDD Control as a component of the Comprehensive Maternal and Child Health (MCH) Project (Cr. 2674-CHA) then under preparation. However this arrangement was not feasible due to the different preparation needs and processing schedule and the different counterpart implementation agency. In May 1994, it was agreed to prepare a stand-alone IDD Control Project, using US\$20m IDA credit, of which US\$10m was from the MCH project, and a loan of US\$7 million.

Preparation and Appraisal. Four preparation and appraisal missions were conducted between February 1994 and February 1995, by a Bank task team with strong industry, finance and health expertise and extensive project processing experience. Continuity of team membership was maintained throughout preparation, with assistance of UN funded consultants in specific technical areas. Nutrition experts in the Bank's central human development unit provided technical advice and effective management support was given by the sector and country units for the team's dialogue with MOF, SDPC, MOH and the UN agencies.

It became clear early in preparation that the project, which appeared initially as a relatively straightforward exercise in increasing iodizing capacity, would also involve packaging of all edible salt, and would take place over a vast geographic area, involving a complex mosaic of county, province and national level enterprises and salt industry authorities. Each agency had considerable autonomy in implementing and financing capital projects within a general master plan, so that full briefing and coordination was required to reach agreement on their participation. The team realized that more time than at first anticipated would be needed for analysis and project definition, and obtaining agreements and clearances before either Bank or GOC approvals would be forthcoming.

Another complex area to be tackled was that of project financing, involving the State Council's impending decision for a new price for iodized salt, and several channels for counterpart funding, each to be negotiated and committed. During preparation it was necessary to reach agreement with many agencies on specific capacities to be established and locations, as well as implementation arrangements, credit onlending and repayment obligations. The Bank team recognized the management challenge that this project posed for CNSIC, as the apex

implementing agency, dealing with the Bank for the first time, and covering all the provinces simultaneously. It was also known from previous experience in industry projects in China that project management and counterpart financing would be risky and challenging areas requiring detailed negotiation and commitment before the project could start.

The Bank team worked closely with CNSIC to develop the project Master Plan, and suggested a range of strategic design options to CNSIC. Those agreed were included in the project feasibility study commissioned by CNSIC from an engineering company in March/April 1994. The feasibility study was approved by GOC in February 1995.

The following is a summary of approaches introduced by the Bank team to the Borrower during preparation, based on the project context and lessons learned from previous Bank industry projects and China experience, which were subsequently included in project design and implementation arrangements:

(a) for the physical facilities:

- upgrade selected facilities within a broad program of capacity rationalization, including merging, closing and creating larger, standardized units in fewer locations consistent with market demand and access to primary salt, for achieving cost efficiency, reduced implementation time, ease of monitoring of implementation, and better long term control.
- reduce the cost of equipment and materials, and shorten the procurement schedule, through centralized procurement. This would also reduce spare parts inventory and permit interchangeability by standardizing machine types and unit capacities.
- reduce foreign exchange requirements and augment domestic manufacturing capacity, through transfer of technology from foreign manufacturers to selected domestic manufacturers, as part of the equipment supply contract.
- involve specialist consultants iodizing and packaging (financed by other UN agencies) to develop and recommend suitable technologies, types and design of machinery, and provide cost estimates.

(b) for implementation arrangements

- strengthen implementation capacity through a TA component covering general project management, accounting and financial management.
- establish a fully staffed PIU at CNSIC, replicated in participating provinces and enterprises.
- formalize implementation agreements between CNSIC (as apex implementing agency) and each participating province, providing that facilities would be established in conformance with CNSIC's master plan, that agreed counterpart funds would be provided, and that progress would be reported to CNSIC.
- establish monitorable performance indicators, and a clear project implementation plan which defined the roles and responsibilities of involved agencies.
- establish strong working relationship with other UN agencies, who had longer experience and complementary roles in working with GOC on the NIDDEP. This relationship was later cemented through an Inter-Agency Cooperative Agreement, now considered an example of good practice for UN cooperation in the sector.

(c) for project financing

- make the Bank's funds available to the Government (as Borrower) as a sector investment loan (SIL) for onlending to CNSIC. Initially, a line of credit loan was considered, which would have involved selection of an agent bank intermediary as the channel for Bank funds. The agent bank would appraise applications of interested enterprises received over time. This option was rejected because: (a) it would have been difficult for CNSIC to control the number of locations, the capacities installed or implementation schedule; (b) the cost and time savings of centralized procurement would not have been possible; and (c) it would be very difficult to monitor the consequent asynchronous implementation.
- ensure adequate counterpart financing through identifying sources with prior commitments for agreed shares.
- CNSIC to use Bank funds centrally to procure equipment and materials for the provinces and enterprises who would repay in cash on agreed terms.

The signing of the onlending agreement and the implementation agreements between CNSIC and project provinces were made conditions of effectiveness, to ensure that participating enterprises would all implement their sub-projects according to the overall master plan and implementation arrangements. While this safeguard was considered essential, delays were experienced in the signing of the Agreements between CNSIC and the provinces. Provision for retroactive financing was made at appraisal in case of possible delays in declaring project effectiveness.

(d) for defining the role of the project in relation to NIDDEP. The Bank team helped to establish the strong linkage between the project and NIDDEP, through:

- defining the project objective as assisting in achieving NIDDEP objective;
- obtaining GOC commitment to implement all the other interventions concurrently with the project; and
- obtaining GOC commitment to share information on NIDDEP implementation progress periodically with the Bank. These aspects were recorded in the Staff Appraisal Report, particularly in a letter from the Minister of Health (SAR Annex 2).

In the event, with the vast project scope, the Bank's Credit/Loan of US\$27.0 million equivalent amounted to less than 20% of the appraised total project cost. During preparation, the Bank team suggested two variations on use of Bank funds: (i) a larger loan to finance more imported automatic packaging machines (to reduce project implementation time); and (ii) use of about US\$1.0 million of the credit for activities of MOH in advocacy, surveillance and institutional strengthening, to give the Bank a broader influence in the Program, and facilitate more direct interaction with MOH in relation to NIDDEP implementation. However these suggestions were not accepted. GOC fixed the Credit/Loan amount at US\$27.0 million and decided it would be used for salt industry activities only. The Government would implement all remaining NIDDEP activities itself with assistance from other international agencies. With the inclusion of technology transfer and other proposed implementation arrangements in the project, as well as GOC's commitment to implement NIDDEP and the project concurrently, it was concluded that the Bank would have sufficient influence over project implementation in spite of its small share of project finance, to see the achievement of the project's development objective. In the event, this

judgement was borne out.

During preparation the Bank assisted GOC in analysis of demand side risks to the continued consumption of non-iodized salt, and concluded that the incremental price increase of iodized packaged salt compared with non-iodized packaged salt would be a very small proportion of the household food budget. It also considered that social marketing and community education under NIDDEP would help increase market demand for iodized salt, such that consumers would willingly choose iodized salt and pay the higher price. This risk was considered manageable. The other risk areas identified by the Bank concerned technology transfer, time schedule, and project management, which were addressed in the project design and implementation arrangements.

7.2 Supervision:

The Bank's performance during supervision is rated as Satisfactory. The Bank team carried out nine supervision missions with CNSIC, including the project launch in August 1995 (prior to loan signing), the mid-term review in April 1998 and the final supervision and ICR preparation mission in December 2000. The project launch included a two day seminar to explain Bank guidelines and procedures, especially for procurement and disbursement, to CNSIC and representatives from several provinces. Each supervision mission included a review of project progress reports and implementation issues, field visits to provinces and enterprises, discussions with MOH and provincial health authorities and coordination meetings in Beijing with UN agency representatives. Each mission focused on anticipated and emerging problems in project implementation, particularly in procurement, counterpart financing and project management. This may have reduced but did not prevent the implementation delays described elsewhere. While supervision mission reports assessed the project status appropriately, the team's expectations for remedial action were often over-optimistic, despite good communication maintained with CNSIC by Beijing based Bank staff. In each subsequent mission hitherto unforeseen factors emerged which had delayed agreed corrective action on problems earlier identified. This situation reflected gaps in understanding by each team (Bank and CNSIC) of the other's constraints, management approach and procedural requirements.

With respect to the NIDDEP, in the first three years of the project, MOH did not submit annual progress reports to the Bank, as agreed at negotiations and required under a legal covenant. It became understood that the reluctance of MOH to report to the Bank was due to short staffing, and to the view at the working levels (never officially stated) that since MOH was not a direct beneficiary of the Bank credit, they should not be called upon to report to the Bank on NIDDEP. Non-fulfillment of this covenant, coupled with poor ratings for counterpart financing and project management, led to the project being classified automatically as a 'problem project' for a period of time. After the Mid-Term Review in May 1998, the Bank team adopted a more pragmatic approach, relying on discussions with MOH during missions and obtaining reports on NIDDEP progress as they became available from MOH or the UN agencies.

The Bank maintained continuity of its Headquarters based team throughout the project. Satisfactory support from the World Bank Office in Beijing (WBOB) on health sector, procurement, financial management and audit was also maintained although individual team members changed. Support from WBOB industry staff was excellent in the initial two to three years, but then declined due to workload and reassignment. This left an important communication

gap between the Bank and implementing agency which was later remedied by engagement of a local industry consultant, recommended by WBOB.

7.3 Overall Bank performance:

The overall Bank performance is rated as Satisfactory. At each stage of the project the Bank team was able to make a constructive contribution to the Government's efforts in eliminating IDD, and in related human resource development and capacity building in China. Through early involvement, the Bank was able to assist the implementing agency to develop an efficient project design which resulted in major progress towards restructuring and modernizing the salt industry, including its physical facilities, management systems and financial viability. The institutional capabilities of salt industry agencies have improved, through exposure to international agencies involved in technology, operations and management of salt industry. The Bank's active continuous cooperation with the other UN agencies helped to maintain the strength of this partnership and this provided an example of how such a group can deliver coordinated, targeted assistance to a complex national program.

Borrower

7.4 Preparation:

The performance of the Government as Borrower, of the CNSIC as implementing agency, and of other agencies are presented below.

Government. The Government's performance during preparation is rated as Satisfactory. The Government's commitment to eliminate IDD through NIDDEP and the implementation of all of its components, including the project, was reflected in the establishment of a multisectoral Leading Group headed the State Council. Implementation of the project was the responsibility of the China National Council of Light Industry (CNCLI) and CNSIC, with coordination mechanisms with the MOH Department of Endemic Disease Control. The Leading Group initiated several policies in support of NIDDEP and the project and functioned very effectively throughout to secure and maintain the commitment of all concerned to the success of this major national venture. In support of the project, GOC promulgated the legal and regulatory framework governing the salt industry, which has been described elsewhere.

To ensure adequate and sustainable financing for the project and for comprehensive upgrading of the salt industry, the Government instituted a new price regime for iodized salt. Work on this new pricing arrangement was initiated during project preparation and completed early in implementation. Up to this time, there had been no difference in price between iodized and non-iodized salt, with iodate being supplied by MOH free of charge to iodizing units and the costs of iodization absorbed by the iodizing units. The new price regime permitted full recovery of the cost of iodization by such units, and also permitted payment of higher levies into ISIDF which was one source of counterpart funds. The Government waived import duty for project imports and through SDPC and MOF, also gave timely approvals to the project design, to the master plan and feasibility study developed by CNSIC and the Bank, and to the proposed counterpart financing arrangements.

Implementation Agency (CNSIC). The performance of CNSIC during preparation is rated as Highly Satisfactory. CNSIC as the apex implementing agency faced an extraordinarily complex

task in developing the project concept, the project definition and a Master Plan for all implementation arrangements. Creation of all physical facilities under the project potentially involved over 210 enterprises located in all China's provinces. All stakeholders including the enterprises and related Government agencies in the provinces had to be brought "on board". The tasks that CNSIC performed successfully included the following:

- (a) explained to all stakeholders the importance and role of the project to the Government's objective of IDD elimination, and the linkage between the salt industry and the health status improvement of the population. This was necessary to secure the commitment of the salt industry, sector agencies, and personnel at provincial, country and city levels.
- (b) developed a feasibility study with the assistance of a local engineering firm, incorporating the strategies jointly developed by CNSIC and the Bank.
- (c) identified co-financing agencies and their respective contributions.
- (d) developed a comprehensive Master Plan through iterative discussions with provinces and enterprises.
- (e) obtained assistance from other UN and bilateral agencies for financing consultants to examine and recommend appropriate technologies and types of machinery to be used.
- (f) initiated actions for development, drafting and issue by government of a series of regulations in support of the project and long-term operation of the iodized salt industry.
- (g) created a strong Project Implementation Unit at central level as well as similar units at the provincial salt administration bureaus.
- (h) initiated action and selected a local fabrication company to receive transfer of technology and subsequently manufacture a large number of retail packaging machines for the project.

CNSIC had previous experience in planning and implementing relatively small and isolated projects, whereas this project design had a broader geographic scope with a very large number of facilities to be upgraded or created simultaneously in an efficient manner. With strong leadership and vision from the top level of the agency, CNSIC rose to the challenge and successfully prepared the project by bringing on board all the actors and stakeholders, developing a clear definition of the project and implementation arrangements in cooperation with the Bank, establishing an organizational framework for coordinated implementation and information exchange among all actors, and developing a realistic system for monitoring implementation.

7.5 Government implementation performance:

Overall, the government's performance during implementation was Satisfactory. During the early implementation phase, the Government completed the formulation and promulgation of the legal framework governing the salt industry and issued several detailed regulations over aspects of salt industry management. It accorded poverty alleviation status to the project allowing SDBC to reduce its onlending interest rates significantly. The initial duty exemption on imports was withdrawn, reinstated later, and finally applied again for project imports, resulting in overall reduction in import duty expenses for the project. The Government ensured the annual audit reports were prepared, based on CNSIC-supplied data, and submitted to the Bank, albeit somewhat behind schedule. Administration of the Special Accounts in terms of timely submission of application and withdrawals was adequate. The Government has satisfactorily fulfilled its legal obligations as Borrower in the context of the Project.

Legal Covenants with the Government. The Government has been in conformance with the

covenants under the Credit Agreement, except in the matter of reporting on NIDDEP. The Government was required to furnish to the Bank, commencing March 16, 1996, annual reports on NIDDEP status during the preceding twelve months, and measures taken for the following twelve months; and review such reports with the Bank and take all measures taking into account the Bank's views on the matter. As mentioned in para. 7.2 above, because of difficulties faced by MOH in preparing such annual reports, the Bank in May 1998 adopted a more flexible approach, to obtain this information from UN and other agencies, supplemented by discussions with MOH during supervision missions.

7.6 Implementing Agency:

During implementation, CNSIC successfully carried out the following major tasks:

- (a) reviewed the provincial feasibility studies including conformance with the Master Plan prior to the enterprises implementing their subprojects.
- (b) initiated action on an iodized salt pricing system, after the Government's promulgation thereof, including an intensive drive for collection of levies to be paid by the salt enterprises into ISIDF. This resulted in major improvement in the financial position of ISIDF, allowing it to provide more than its planned counterpart share, and create a separate account for guaranteeing repayment of the Bank funds onlent by the Borrower to CNSIC. Although the funds collection and disbursement for project expenditures were slow in the initial stages, CNSIC's innovative efforts for collections of past and current dues resulted in the very strong position of ISIDF.
- (c) coordinated the activities of enterprises and provinces, and prepared consolidated implementation status reports.
- (d) provided information to MOF and the State Audit Bureau for preparation of audit reports.
- (e) established effective working relationship with MOH, especially in relation to quality control, standards, progress review and surveillance.
- (e) arranged for prototype machines (some financed by UNICEF) to demonstrate performance to the enterprises and provinces to enable them to decide on and place orders for such machines through CNSIC. This required holding several seminars and meetings with provinces and enterprises.
- (f) fully cooperated with Bank supervision missions, and arranged for site visits to various project sites.

On its own initiative, CNSIC established a permanent facility, with financial assistance from UN and other agencies, to train operating and maintenance personnel in the areas of salt production, refining, iodizing, and packaging. This facility is also being used to train personnel from other countries. During the project CNSIC also established a centralized spare parts supply facility, which stocks spare parts for the various types of machinery used for iodization and packaging, for supply to the enterprises on a replenishment basis. This reduces the procurement time for the enterprises, and so improves the continuity of production.

The sections below give specific assessment of CNSIC performance in: A. implementing technical assistance (TA); B. managing project implementation; C. legal covenants; and D. procurement.

A. Implementing Technical Assistance. The project's TA component envisaged development of a general project management system (PMS) and an industry information system. CNSIC

contracted an international project management company to develop the PMS, but in the event, did not adopt it, because of the difficulty and expense of adapting it to Chinese language and the CNSIC system of management. Active use of a suitable PMS would have helped identify emerging problems in TT and the manufacture of retail packaging machines, and allowed for more timely remedial action. Therefore the implementation of the TA was not fully successful. With Bank facilitation, the general Salt Industry Information System was developed through financing from UNICEF and other UN agencies. However, again CNSIC was not able to realize the full potential of the system and needed local TA to assist.

B. Managing Project Implementation. CNSIC put in place a project implementation unit (PIU) with an adequate number of staff, with competence in the required areas at project commencement. During implementation, CNSIC's efforts to supplement the PIU's capacity to address emerging problems achieved limited success. Distribution of work responsibilities among PIU staff was uneven with an unusually heavy load placed on the project manager. Initiation of project implementation activities and status review depended primarily on the project manager. Direct access by Bank staff to PIU members for discussion on their areas of responsibility (e.g., procurement, project accounts and financing, progress reporting) was sometimes difficult, and supervision missions had to rely primarily on the project manager. This situation seems to reflect a work culture with limited delegation of responsibilities among subordinate staff. CNSIC's senior management (Vice President and above) gave strong support to the project manager throughout the project especially for higher level intersectoral coordination, securing ISIDF counterpart financing and solving of implementation bottlenecks.

In accordance with the legal agreement, CNSIC submitted quarterly and semi-annual progress reports. For reasons mentioned above information from enterprise and provincial levels was transmitted manually rather than through a computerized system as envisaged at appraisal. In the initial years, there were problems with the quality, content and timeliness of the reports, but substantial improvement occurred over time. CNSIC's accounts were audited in accordance with the legal covenants and audit reports were submitted to the Bank.

C. Legal Covenants. CNSIC has been in conformance with all relevant covenants under the Project Agreement, except for the following:

- (a) CNSIC was required to procure goods and services only after Enterprise Implementation Agreements (EIAs) had been signed between the project provinces and salt enterprises. In the event, goods and services were financed in anticipation of the EIAs, all of which were not signed until November 1998; and
- (b) CNSIC was required to ensure that all edible salt would meet iodization standards by December 31, 1997. The universal iodization of edible salt, with lower quality, was achieved by December 1996, while nation-wide full quality iodized salt supply was achieved by December 2000.

D. Procurement. CNSIC faced several problems in procurement of Bank financed items. Delays were caused primarily by difficulty in understanding the Bank's procurement guidelines and procedures, the need to reach agreement with many provinces and enterprises on machinery to be selected on their behalf, internal approval procedures and the inexperience of PIU staff in

international procurement, the contractors' work content, and contract management. PIU staff found it a great challenge to monitor work completed by the local procurement agent and suppliers. For example, CNSIC's management of the contractors' performance for the PMS and for manufacture of retail packaging machines based on TT was not proactive in the early stages of the project, which contributed to delays. With experience, PIU management of procurement improved markedly and much credit for the cost savings on equipment procured must go PIU management and staff.

7.7 Overall Borrower performance:

Overall Borrower performance is rated Satisfactory for the above mentioned reasons.

8. Lessons Learned

This section summarizes the main positive and negative lessons from each stage of the project, as well as from the overall National IDD Elimination Program of which the project was a part.

8.1 Institutional Environment and Project Identification. The ultimate success of the project was due to three positive factors in the greater environment of the country:

- (a) strong and continuing national high level political support, linked to China's serious international commitments in human development (IDD elimination);
- (b) strong alignment of the interests of economic development and industrial modernization with the aim of delivering a social benefit through a technologically simple and very cost effective intervention at population level; and
- (c) prior sector analysis and strategy development at both national and international level, with consensus on the role and value of the proposed project.

The recognition of the synergism of the two agendas by leaders of both health and salt sectors, as well as the core planning and finance agencies and the State Council, had been fostered over the previous decade by relevant studies and limited interventions in China, supported by national and international experts. The project was conceived by this coalition of national and international interests as a specific but central strategy of the comprehensive National IDD Elimination Program. This high level of national leadership support also enabled:

- (a) reciprocal support from senior World Bank management;
- (b) promulgation of legal and regulatory measures to support both social and industry reform agendas; and
- (c) establishment of an ongoing source of finance, through the ISIDF, to underpin the project itself and provide funds for sustaining and continuing project achievements post project. This leadership commitment also enabled appropriate decision making to overcome bottlenecks and solve problems during preparation and implementation.

8.2 Project Design and Preparation. The following positive lessons can be drawn from this project experience:

- A strong Bank team with relevant country, sector and project experience, supplemented with TA supplied by other agencies
- Early and intensive involvement of the Bank team with the Government and implementing agency, to offer and facilitate acceptance of key design elements,

consistent with the development objectives of both.

- Persistence on both sides to finalize precise project definition and to put in place key enabling policy, institutional, and other implementation arrangements before commencement, even though this involved additional preparation time.. At the same time, willingness to defer actions on other issues till a later stage based on a balanced judgment and on the expectation that with good leadership and continued advocacy, momentum and buy-in would grow as implementation proceeded.
- The inexperience of the implementing agency was effectively compensated by its willingness and ability to learn rapidly, to identify the strategic opportunities of the project, and to engage strong technical support.
- Selection of the appropriate lending instrument.
- Clarity on output targets and the monitoring and reporting mechanisms.

In retrospect, negative lessons can be drawn about a certain lack of realism in three items agreed upon during project negotiations: the relationship with MOH; the implementation period; and the condition for project effectiveness.

- Relationship with MOH. It was difficult initially to maintain constructive dialogue with MOH when the project provided no funds for related activities outside the salt industry, especially when the Bank was asking MOH to provide reports on NIDDEP as required under a legal covenant. The Bank's only remedy for nonconformance was suspension of disbursement, an extreme measure that would have defeated the main purpose of Bank assistance. The requirement was not enforceable, and it fell back upon the strong relationship of the Bank with other UN agencies to allow continuing monitoring and dialogue on the overall program. Basically, making NIDDEP progress reporting a legal covenant did not contribute to the project in any positive way. A key lesson here is that funding support facilitates access, and that access across sectors is important to reinforce the interdependence of the key sectors in achieving the goal.
- The short implementation period. At appraisal all physical facilities were expected to be substantially completed by December 31, 1997, and the credit closing was set for December 31, 1998. Compared with CNSIC's own estimate of project completion by December 31, 1996, and taking into account the steps taken already by the Bank, this was considered achievable. CNSIC's completion estimate was driven by Government optimism and by pressure for China to meet a mid decade goal of universal salt iodization. However, the Bank's estimate also turned out to be optimistic and the situation was redeemed through two one year extensions, which resulted in an appropriate project completion period. The lesson for managers is that project extensions may be constructive, often compensating for unforeseen factors that come into play during implementation. In the extension period, when preoccupation with procedural issues is lessened, greater attention to development impact and sustainability can greatly increase the value and impact of the project.
- Condition for project effectiveness. The linking of project effectiveness to completed implementation agreements with over 25 provinces also seems in retrospect to have been

unnecessarily onerous, and the consequent delay in effectiveness caused management concern. While the intention was understandable, the objective may have been achieved through a more phased approach. Although delay in effectiveness did not delay implementation commencement, the condition was an irritant both to the Borrower and the Bank.

8.3 Project Implementation. Positive lessons from project implementation include:

- The importance of accommodating adjustment of output targets during implementation within a clear goal and master plan, in order to respond to the rapid changes being brought about through learning and enterprise reforms.
- The energy and creativity generated by the reform environment to establish structures to enhance the likelihood of sustainability.
- The way that initial success, shared agendas and high political recognition brought increasing willingness to move towards problem areas that could not be discussed adequately during preparation.
- The value of strong and continuing coordination of action among the UN agencies, which brought a more cohesive and technically strong support to the project and reduced the risk of fragmentation or duplication of effort.
- The value of continuity in core membership of both Bank and Government project teams.
- The importance of ensuring adequate ongoing communication from Beijing based team members, whether Bank staff or local consultants.

Negative lessons learned or reinforced:

- Onerous procedures of both Bank and Borrower for procurement, fund flows, etc.
- Delays caused by lack of awareness of the importance good project management capacity and systems; and reluctance to use early technical assistance for this purpose; or, put another way, inability of Bank team or international TA to persuade the implementing unit of these facts.
- Underestimation of the time required for technology transfer

8.4 Program-Related Lessons Learned and Applicability to Other Countries. The following are the main factors that led to the success of the project in the context of IDD elimination in China, which could be usefully applied to similar projects in other countries:

- Commitment to goal at highest political level, disseminated to all stake holders and participants ensuring their commitment.
- Comprehensive program developed and implementation management framework defined with allocation of responsibilities of all participants and coordination mechanisms.
- Leadership role assumed by very high political and administrative level that has authority over the several involved agencies, exercised through persuasion and good coordination.
- Allocation of a major role to a single agency in the salt industry as implementer of the program.
- ensuring sustainable financing for industrial development and other activities in the medium to long term.
- Local presence of international aid agencies, and maintaining contact with them and others

outside the country for eliciting technical and financial assistance, and periodic discussions with them.

- Comprehensive legal and regulatory framework and appropriate sector policies, in support of the salt industry's responsibility to supply sufficient salt of adequate quality and prevent illegal salt manufacture and sale.
- Maintaining state control of the industry, through a legal and regulatory framework, in the interests of the public health, at least until facilities for salt supply are fully in place and risks to the achievement and sustainability of IDD elimination objective are reduced to a defined level.
- Mutual recognition of the complementarity of the roles by salt industry and health authorities in achieving the common program goal; and willingness to work with and assist each other.
- The project is a successful example of food fortification for prevention of a micronutrient deficiency. Fortification may also be a feasible approach to tackle other micronutrient deficiencies.

Despite the success in substantial achievement of the program objective for the country as a whole it is noted that IDD elimination has not yet reached 14% of the population, particularly in poorer and remote areas of the country. Appropriate strategies to address the special challenges of these areas are being developed. These include: creation of small iodizing and packaging capacities near centers of consumption or alternative methods to ensure steady supply; improved social marketing; and targeted price subsidies. Until these strategies are fully effective: provide alternative iodine supplementation, such as oral capsules or injections to vulnerable groups.

9. Partner Comments

(a) Borrower/implementing agency:

This section includes short summaries of assessments or comments made by the borrower, implementing agency and a selection of national and international stakeholders. The Borrower's contribution to the ICR is in Annex 10 and the summary of UN agency involvement in NIDDEP is in Annex 11.

9.1. Borrower/Implementing Agency

As described in Annex 10 (the Borrowers report), the Government of China and CNSIC considered that the project made a critical contribution to both the modernization of the edible salt industry and to the country's achievement in elimination of iodine deficiency disorders in line with its national and international commitments. The achievements of the project include:

- meeting or exceeding all physical targets with increase of quality iodized salt from 3.0 million to 8.1 million tpy;
- increased consolidation and mechanization of all processes, with shifting of iodization from distribution and sales points to production points;
- large savings in iodate use due to greater accuracy in measurement and mixing, and improved packaging. Iodine loss during iodization was reduced below 5%, resulting in iodate savings of 10% (RMB 8 million per year), which is half of the capital cost of the iodizing machines. Reduced losses and discards from one bulk packaging machine in Sichuan covered the investment cost of the machine in two years; and

- enhanced management capacity of the salt industry through introduction of international project and management practice, establishment of the salt industry information system, quality control laboratories and procedures, and the training of over 8,000 personnel.

The success of the project is attributed to support from a broad coalition of national sectoral agencies and NGOs under the leadership of the State Council and SDPC; public awareness campaigns especially around May 5, IDD Day, and other consumer education initiatives; introduction of legislation, regulations, supervision and enforcement to support and control production, distribution and sale of iodized salt and the financing of industry upgrading and related activities; and support from the international community both before and during the project.

Through the combination of the project with related activities of the NIDDEP, China achieved its goal of virtual elimination of IDD by the year 2000 for the country as a whole and in 24 out of 31 provinces. Seven provinces, accounting for 14% of China's population have not yet reached that goal, and new action plans have been made to achieve IDD elimination in each of those provinces, with assistance from central and provincial government agencies, and international partners including UNICEF, AusAID, ICCIDD, MI and others.

CNSIC identified the following key experiences from the project: (a) the salt enterprises saw participation in the project as a way to ensure their survival and development; (b) the salt industry recognized the linkage of the social goal and industry benefit; (c) both World Bank funds and the ISIF made it easier for enterprises to obtain local financing for their investment needs; and (d) collaboration of salt and health sectors was the key to successful implementation, especially in quality monitoring and community education.

Among lessons learned, CNSIC noted: (a) delay in initial phases of project implementation due to inexperience of project staff; (b) underestimation of the complexity and the time required for technology transfer; and (c) the special challenge facing enterprises in remote and developing regions with low technical and management capacity.

Overall CNSIC concluded that the project achieved 100-110% of the project plan, ensured quality and quantity of iodized salt supply to the nation, and achieved great social and economic benefit.

CNSIC has identified the following critical factors for successful extension and maintenance of IDD elimination nationwide: (a) adoption of responsibility for IDD elimination by all salt industry personnel; (b) maintaining government control over the industry with active enforcement of the regulations; (c) maintaining 95% achievement of salt industry targets for sales, market coverage and quality of iodized salt; (d) providing an equipment service to enterprises for spare parts and new machines; and (e) continued close cooperation with international organizations.

Provincial Salt Administrations and Salt Enterprises. At a stakeholders workshop held during the ICR mission, staff of these agencies stressed the benefit of the project to overall rationalization of the edible salt industry and to modernization of individual enterprises. They noted that some aspects of the modernization resulted in cost savings while in other areas, especially the advanced retail packaging, their costs increased somewhat, but this increase was

absorbed by the higher salt price. They appreciated the value of World Bank's involvement in the project in facilitating access to local credit, and in reinforcing the social goal of the iodized salt initiative. They noted the three major challenges facing the industry in the immediate future: (a) to reduce overcapacity in salt production, including giving incentives to close small producers; (b) to provide special assistance to particular communities who were not yet taking iodized salt because of extreme poverty or beliefs against iodized salt; and (c) to maintain vigilance in enforcing regulations controlling the industry and keeping un-iodized salt out of the market. Results of the stakeholders workshop are in Annex 9.

Health Sector. During the ICR mission, Ministry of Health representatives confirmed their satisfaction with the major contribution of the project to the national goal of IDD elimination, and praised the salt industry at each level for its active collaboration in the overall Program, its participation in the comprehensive Program evaluation in every province during June 2000, and for making plans to address remaining areas which have not reached the goal. Although disappointed that none of the World Bank funds were available for health related activities under the NIDDEP, MOH greatly appreciated the contribution of the Bank to the IDD Control Project implemented in the salt industry, and encouraged the Bank to find ways to remain engaged in the ongoing work of IDD control in China, along with other members of the international community.

In the stakeholders workshop, a Provincial Health Bureau official commented that China had given great attention to endemic disease control over many decades, and the project's success was built on long efforts by the health sector, which started iodization of salt in the 1960s, and new scientific evidence in the late 1980's that iodine deficiency affected mental development. The Government had used this evidence to mobilize support of officials at all levels, which would not have been possible before 1985. The involvement of the World Bank also drew the attention of key sectors. The central strategy of large scale iodization, with regulation to ensure transport and distribution, was considered the key to the effectiveness of the intervention. Health Bureaus should continue to be kept fully informed of progress and problems. Continued monitoring of salt quality by the Health Bureaus is needed, and ISIDF funds could be used to help cover these costs, which should be covered in the health budget, not charged to the enterprises or the industry.

(b) Cofinanciers:

N/A

(c) Other partners (NGOs/private sector):

United Nations Agencies. Following a meeting with the UN agencies during the ICR mission, comments were received from UNDP, UNICEF, UNIDO and WHO summarizing their own activities leading up to launch of the NIDDEP in 1993, their contributions to IDD control since that time and their views on the role of the IDDC project (see Annex 11). The Bank's additional comments are in Para 10.1.

International Assessments. An international workshop on China's IDD Elimination Strategy in Beijing in October 1998 emphasized that the assignment of a central role to the salt industry, with strong regulatory support, was an important success factor. The conference noted that through the project, the salt industry carried out a great deal of work, resulting in significant achievement for IDD elimination in China and a valuable demonstration for the global effort to eliminate IDD.

The Micronutrient Initiative. An independent assessment of the project by the Executive Director of MI was commissioned by the World Bank in October 2000 in advance of the Completion Mission (See *Ref. 16. Mannar, V.*). The report concluded that the project's success in meeting its physical targets had allowed China to increase its production of iodized salt from 3 million tons in 1995 to 6.8 million tons in 1999. This in turn had enabled China to meet the international standard of Universal Salt Iodization (USI), with over 90% of households using adequately iodized salt. The challenge for the future is to extend USI to areas that are still below that goal.

The report concluded that through the project the salt industry had strengthened its management and operational capacity at each level to a degree unforeseen a decade ago, including project management, information system development, physical development, financial mobilization, interaction with a range of international funding and development partners, working with foreign contractors and technology transfer, and research and development. Although CNSIC at times found the Bank's requirements arduous and difficult, the process had strengthened their own capacity and, along with support from other agencies, has put China in a position to offer its expertise and technology to other countries in the full range of IDD program components, including assessment, salt iodization and packaging, surveillance and monitoring.

Because China has 40% of the global burden of IDD, the Government's action, with Bank assistance and international support, has played a significant role in the global fight against the most common preventable cause of brain damage in children. To ensure adequate iodide intake to safeguard the intellectual and social wellbeing of China's future generations, salt iodization needs to go on forever and therefore must become an integral part of the salt production and distribution system. Progress has been impressive but much remains to be done in those areas where household intake of iodized salt is still low.

Lessons from China's experience are summed up by MI as follows:

- High level of political commitment.
- Broad alliance of relevant units in government and civil society, including the All China Women's Federation and the Disabled Persons Association as representatives of the ultimate beneficiaries
- Strong national organization, including regulation, to ensure adequate production of iodized salt.
- Sufficient funding for the necessary reform and streamlining of the industry to underpin and sustain iodized salt production.
- Effective information system connecting the whole industry.
- Strong guiding and supporting role from the central agency (CNSIC)
- Salt companies should take a marketing approach to compete for consumer attention.
- Consumer education should be an integral part of the salt marketing strategy, including messages on salt packages and use of retail outlets to reach the target audience.
- Careful preparation and contracting for technology transfer.
- Plan for sustainability, so that salt iodization becomes an integral part of the salt production and distribution system.

MI report made the following recommendations for China:

- Maintain strong regulation of the salt industry until the behavioral norm of using iodized salt is established and sustained.
- Maintain the Iodized Salt Industry Development Fund to support continued rationalization, maintenance and support for provinces with inadequate access to quality iodized salt.
- Mobilize salt retailers to disseminate IDD educational messages, to accelerate the adoption of the behavioral norm of using iodized salt.

And for the World Bank:

- Draw lessons from the successful China experience for other IDD elimination projects.
- Review Bank procedures and formalities and simplify where possible.
- Consider documenting and publicizing the project achievements within and outside the Bank, to assist others and to draw attention to the WB contribution to social development and poverty.
- Consider further analysis of the project as an example of social or public good resulting from support to the industry sector.
- Consider further analysis to show the correlation between industry investment and health benefits; and between learning ability and economic return.

10. Additional Information

This section contains supplementary information on four subjects: the contribution of International Agencies to the National IDD Elimination Program; factors affecting presence of non-iodized salt in the market; the performance of counterpart funding agencies; and the utilization of the World Bank funds and final project costs.

10.1 Contributions of International Agencies As noted elsewhere, several international agencies have provided, and continue to provide, technical and financial assistance to NIDDEP, to the salt industry in general, and to the project. These include four UN agencies (UNDP, UNICEF, WHO and UNIDO), the International Council for Control of IDD (ICCIDD), the Micronutrient Initiative (MI), AusAID, the global NGO Kiwanis, Government of Netherlands, Government of Spain, and the Akzo Nobel company. Their contributions are summarized below.

From the first assessment mission of UNICEF consultants to China in 1988, and through the joint project of MOH with UNDP, UNICEF and WHO in selected provinces from 1990-94, UN agency support to China helped to set the stage for the National IDD Elimination Program which was launched by the Government with an landmark national advocacy meeting in September 1993. This preparation also provided the background for the Government's proposal to the World Bank for this project, specifically targeted to creation of capacity for iodizing and packaging of salt, as one of the main interventions within NIDDEP. These three UN agencies funded technical assistance and international study visits and fellowships during project preparation. UNIDO then joined the group with specific assistance for salt industry training, research and development. UNDP, UNICEF and WHO continued assistance to NIDDEP in the areas of program management, social marketing, surveillance, health education, quality assurance, information systems, and research and development, including provision of equipment and personnel training. UNIDO's support, with financial and technical assistance from the

Government of Netherlands and Akzo Nobel, has helped to improve technologies for salt processing, iodization, packaging, training and general salt industry management.

The details of the UN family's assistance programs, are in Annex 11. However, not mentioned specifically in the annex is particular assistance by UNICEF, UNDP, and WHO to the project, which included: (a) funding of one consultancy in iodizing, two in packaging, and one in information systems for the salt industry; (b) study tours and overseas training for CNSIC management and other personnel; (c) provision of office systems, including computers for the salt industry information system; and (d) provision of prototype machines for iodizing and packaging, which helped in selection of equipment for the project and in initial training in operations. Such assistance contributed significantly to the definition of the project as well as during implementation.

The presence of senior UN agency staff in China facilitated dialogue with Chinese counterparts, leading to improved development of programs and implementation. Throughout project implementation, UNDP played a leadership and coordination role, including the convening of regular joint planning and review meetings, and had also provided funding for the first high level advocacy meeting. UNICEF provided technical and financial support in a broad range of activities, especially for surveillance, quality control and community education and marketing. The longstanding and continuous support by the UN family to both NIDDEP and the project, in conjunction with Government commitment and actions, helped to maximize the effectiveness of the Bank's contribution and was an important factor in the overall success of NIDDEP.

From the time of its formation in the early 1990s, the International Council for Control of IDD (ICCIDD) provided technical support for the initial programs of the Government and the UN, as well as to NIDDEP, through its local expert members and through helping to form an International Working Group to provide technical advice to the Program. Micronutrient Initiative (MI) provided support, mainly through UNICEF, in advocacy, consumer education, and the design of monitoring systems. AusAID supported the establishment of the National IDD Reference Laboratory in Beijing, and in coordination with UNICEF and WHO, has helped to fund and manage an IDD Control project in Tibet. Assistance from the Government of Netherlands and Akzo Nobel company comprised the UNIDO program for assistance to the salt industry and CNSIC. The Government of Spain provided a soft loan for upgrading salt production in one location and also two prototype packaging machines.

The coordinated identification and provision of technical and financial assistance by these international agencies resulted in synergy between the agencies and efficient delivery of support to China, which is an excellent example of the way in which international cooperation can assist a country to achieve a national health objective.

10.2 Factors Affecting Continued Use of Uniodized Salt (see also Section 6.9 B). Illegal or substandard iodized salt continues to be present in the retail salt market in China. While the market share varies across the country, it is estimated overall at 8%, and this despite the legal and regulatory framework, which bans sale of uniodized edible salt, sets production quotas for each province and licenses enterprises involved in producing, packaging, wholesale distribution and

transport, and extensive institutional mechanisms to enforce the regulations. Two questions need to be addressed: how does the salt find its way into the market; and why is there a demand for uniodized salt. There are several factors operating on both the supply and demand sides, and the relative importance of these factors will vary according to the location.

1. Supply side factors include: (a) excess production capacity, and lack of control over this capacity or salt produced above the quota (in some areas this may actually be iodized salt); (b) deficient quality control in the iodizing process; (c) fraudulent packaging and labeling of uniodized salt as iodized salt by unlicensed producers to capture the difference between cost and price; and (d) enforcement mechanisms unable to plug the leaks in illegal supply.
2. Demand side factors include: (a) insufficient consumer awareness of IDD and of the benefits of consuming iodized salt, to make it truly demand-driven; (b) unwillingness to pay the higher price, however small, for packaged iodized salt, especially among poorer sections of society; (c) ready availability of raw salt near production centers, or where consumers can obtain salt for themselves from local deposits; and (d) consumer preference for unrefined, large crystal salt;

An in-depth systematic evaluation of these factors and their relative importance in particular markets would greatly inform the development of targeted strategies to improve coverage of iodized salt at household level, or as a percentage of market share. During the project the Bank team suggested using a portion of the unutilized credit for such a study, but this was not taken up by CNSIC. However, CNSIC and the provinces are aware of the importance to the viability of the salt industry of reducing excess capacity, and there is general acceptance that generation and maintenance of consumer demand will be essential for long term sustainability of the protective effect of iodized salt across the whole population. However, provincial plans for follow up action in the remaining problem areas would benefit from systematic, professional analysis of the factors mentioned, with possible financial assistance from ISIDF.

10.3 Performance of Counterpart Funding Agencies: (see also Section 5.4 B above). During preparation and at appraisal, the sources of counterpart financing and their respective shares were identified as follows (see also table 5.4b): (i) Salt Industry Development Fund (SIDF); RMB 190.43 million; (ii) SDBC, RMB 190.43 million; (iii) provincial governments, RMB 434.43 million; and (iv) project enterprises, RMB 243.43 million. The total amount and shares were based on the Bank team's estimate of total financing required of RMB 1,286.9 million. The total project capital cost approved by the State Development Planning Commission (SDPC) was however, lower at RMB 997.7 million (including cash flow of RMB 108 million). The SDPC approve capital cost was RMB 867 million (excluding cash flow) with corresponding lower counterpart contributions from provincial governments and project enterprises. Written assurances were obtained from SIDF and SDBC that they would make available their funds in a timely manner. Under the project implementation agreements with CNSIC, the provincial governments and the project enterprises also agreed to make available their designated shares. Under standard Bank conditions the Borrower would be responsible for any overruns, particularly in view of the difference between SDPC's approved project cost and the Bank's appraisal estimate.

SIDF [later designated as Iodized Salt Industry Development Fund (ISIDF)]. The primary income source of the SIDF was a levy on salt producers and processors, part of which was retained by provincial governments and part (RMB 13.5 per ton) remitted to the central SIDF, administered by a Steering Committee composed of SDPC, MOF and CNCLI representatives, and loaned to eligible borrowers for salt industry development. At project identification actual SIDF collections were found to be poor, primarily because of enterprise debts, and at appraisal, an amount in excess of RMB 700 million was due to SIDF. However, it was thought that with improved collection, SIDF should be able to provide its share of counterpart.

As a condition of onlending of Bank funds by the Government to the implementing agency (CNSIC), a separate Debt Redemption Fund was created under ISIDF, to guarantee repayment of onlent funds. Concurrently, the Government announced a new price for iodized salt, that would permit enterprises to recover their full costs and also pay RMB 25 per ton of salt into ISIDF. With concerted efforts by CNCLI and CNSIC to collect overdue amounts, the Fund's position improved slowly during 1995-1997, and then faster, with the result that it was able to contribute RMB 224.6 million in counterpart, which is more than its initial commitment of RMB 190.4 million, while also providing for the Debt Redemption Fund, and other industry support activities.

SDBC. Although SDBC agreed in advance to its counterpart share, loan commitments and disbursements quickly ran into trouble. The interest rate of 12.3% p.a. (including a discount of 3% from the originally specified rate) was considered too high by enterprises. With hardly any takers, SDBC offered to decrease the rate to 9.9% with government subsidizing the difference. After a very long time, SDBC set the interest rate at 10.1% without Government subsidy, by designating the project as supporting poverty alleviation. In the meantime, enterprises and provincial governments began seeking alternate, cheaper financing, from their own internal resources and local banks.

The procedures required by SDBC for loan commitment and disbursement were also onerous. First, annual commitments for funding for the year as part of overall total commitment were made generally only in the fourth quarter of that year. Second, the so-called 'release' of funds was conditional upon: receipt of application from the enterprise supported by provincial government; nomination of guarantor for repayment; and past progress and future annual plan in support of 'release' request. Third, disbursements were based on actual physical progress, and evidence of concurrent disbursements from the other counterpart financing agencies. These self-defeating convoluted procedures had two major effects: (i) they dissuaded borrowers from using SDBC funds and several actual borrowers accelerated debt retirement to reduce interest burden; and (ii) they delayed project implementation. SDBC's total contribution to the counterpart financing was RMB 145.4 million, which was lower than its original estimated share of RMB 190.4 million.

Provinces and Enterprises. Contributions from the provincial salt administrations and the enterprises themselves were made in sufficient amounts and timely manner. In fact, local project costs during the initial two years were met mostly from these sources, although overall funds from these sources were below estimates at appraisal, due to factors discussed elsewhere.

10.4 Bank Credit/Loan Utilization. The utilization of the Bank Credit/Loan estimated at

appraisal and final utilization are shown in the table below. As noted in Section 4B of the main text, there were significant savings, especially in the procurement of retail packaging machines, resulting in cancellation of the entire Loan portion on June 15, 1998. With Bank agreement, CNSIC used additional savings in Credit portion to finance certain additional items, totaling US\$1.35 million equivalent, as summarized in the Table 10a below.

The final World Bank Credit utilization of US\$17.29 million equivalent, including financing of additional items not foreseen at appraisal of US\$1.35 million equivalent, is significantly less than the combined Credit/Loan of US\$27.0 million equivalent at appraisal. The difference was primarily due to higher unit costs of retail packaging machines estimated at appraisal (US\$136,000/machine) compared with actual costs (US\$83,700/machine), and also higher estimated costs for technology transfer and components for machines to be manufactured locally (US\$5.1 million) compared with actual cost (US\$1.8 million).

Table 10a. Bank Credit/Loan Utilization

Item	Appraisal Estimate			*Final Utilization		
	Number or Sets	Unit Cost (US\$'000)	Total Cost (US\$'000)	Number or Sets	Unit Cost (US\$'000)	Total Cost (US\$'000)
1. Components for Iodizing Units	n.a.	n.a.	712	n.a.	n.a.	1,500
2. Bulk Packaging Machines	11	104.6	1,150	12	104.7	1,256
3. Retail Packaging Machines						
a. Type I	130	135.9	17,666	127*	83.7	10,626*
b. Type II (components and TT fees only)	122	41.8	5,100	122		1,811
c. Type IV (carton packaging)	2	365.1	730	2	304.0	608
d. 1-ton Bagging Machine	1	52.0	52	-	-	-
Subtotal Item 3			23,548			13,045**
4. Installation and Commissioning	n.a.	n.a.	701			**
5. Training	n.a.	n.a.	732			**
6. Technical Assistance	n.a.	n.a.	157	n.a.	n.a.	140
7. Additional Items Financed out of Unutilized Credit						
a. Retail Packaging Machines				6	71.5	429
b. Spare Parts for 7(a) Above				6		115
c. Spare Parts for Some Machines Under 3(a) Above						182
d. Spare Parts for 3(c) Above						27
e. Wrapping Machine for 3(a) Above						398
f. Mixers						200
Subtotal Item 7						1,351
TOTAL			27,000			17,292

Notes: * Includes 32 machines from Spain at US\$71,530 each, and 95 machines from Italy at US\$87,760 each.
 ** Includes US\$648,000 for installation and commissioning, and US\$546,000 for training of personnel.
 n.a. Not applicable.

**Table 10b. Project Financing by Expenditure Item
(US\$ million equivalent)**

Expenditure Item	Appraisal Estimate		*Final Cost 1/		Final as Percentage Appraisal	
	Bank	GOC	Bank	GOC	Bank	GOC
Engineering and Other Services	-	3.69	-	3.98	-	107.9
Civil Construction	-	27.89	-	36.65	-	131.4
Equipment and Spare Parts	24.29	18.23	15.96	28.26	65.7	155.0
Duties and Taxes	-	7.77	-	1.16	-	14.9
Commissioning and Installation	0.67	1.61	0.65	6.37	97.0	395.7
Inspection	-	1.27	-	1.24	-	97.6
Plant and Equipment Insurance	-	1.33	-	0.14	-	10.5
Training	0.70	1.24	0.55	1.06	78.6	85.5
Project Management	-	2.31	-	5.37	-	232.5
Technical Assistance (PIU)	0.15	0.34	0.14	0.31	93.3	91.2
Baseline Cost Subtotal	25.81	65.67	17.29	84.53	67.0	128.7
Physical Contingencies	-	4.53	n.a.	n.a.	n.a.	n.a.
Price Contingencies	1.19	11.75	n.a.	n.a.	n.a.	n.a.
Installed Cost Subtotal	27.00	81.95	17.29	84.53	64.0	103.1
Interest During Construction	-	14.53	-	3.90	-	26.8
Incremental Working Capital	-	28.81	-	13.07	-	45.4
Total Capital Cost	27.00	125.29	17.29	101.50	64.0	81.0

Notes: 1/ For Bank portion, difference between appraisal and actual due to cancelled Loan portion of US\$7.0 million and

Credit portion SDR:USD exchange rate fluctuations over the life of the project.

Exchange rate at appraisal was: 1US\$ = 8.45RMB; and at project completion was: 1US\$ =

8.28RMB.

n.a. Not applicable.

Differences due to rounding.

**Table 10c. Credit (Loan) Disbursements
Cumulative Estimated and Actual (US\$ million equivalent)**

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001
Appraisal estimate	9.59	20.47	27.00			
MTR Formal Revision (05/1998)	1.99	3.80	8.75	15.92	20.00	
1/						
Actual 2/	1.99	3.80	8.76	15.55	17.02	17.29
Actual as % of revised estimate	100.00	100.00	100.11	97.68	85.10	

Notes: 1/ Difference between appraisal estimate and MTR Revision due to cancellation of World Bank Loan of US\$7.0 million equivalent, June 15, 1998.

2/ Difference between MTR Formal Revision and Actual due to SDR:USD exchange rate fluctuations over the life of the project.

MTR: Mid term Review.

Table 10d. Capacities for Iodization and Packaging of Salt

Enterprises and Capacities by Type*	Appraisal Estimate	Actual/Latest Estimate
<i>Salt Upgrading</i>		
Capacity ('000 tpy)	2,200	2,445
No. of Enterprises	57	55
<i>Iodization</i>		
Capacity ('000 tpy)	8,160	8,100
No. of Enterprises	107	110
No. of Lines by Type I	19	51
II	52	35
III	26	17
IV	23	36
<i>Bulk Packaging (50 kg bags)</i>		
Capacity ('000 tpy)	2,929	3,762
No. of Enterprises	40	40
No. of Lines by Type I	11	13
II	35	21
<i>Retail Packaging (0.5-1.0 kg)</i>		
<u>1. Production Level</u>		
Capacity ('000 tpy)	1,418	970
No. of Enterprises	72	72
No. of Lines by Type I	86	64
II	44	30
III	98	45
IV	-	1
<u>2. Distribution Level</u>		
Capacity ('000 tpy)	1,643	2,477
No. of Enterprises	75	75
No. of Lines by Type I	44	74
II	78	70
III	245	434
<u>Retail Packaging Total</u>		
Capacity ('000 tpy)	3,061	3,447
No. of Enterprises	147	147
No. of Lines by Type I	130	138
II	122	100
III	343	479
IV	-	2

Note: tpy - tons per year

* using classification from Staff Appraisal Report

Annex 1. Key Performance Indicators/Log Frame Matrix

Table 1 a. Outcome/Impact Indicators

Indicator	1995	1997	1999
1. Percentage of households consuming quality iodized salt (> 20 ppm) (testing of salt samples)	39.9	81.1	88.9
2a. Percentage of school children 8-10 years with enlarged thyroid (measured by ultrasound)	n. a.	9.6	8.0
2b. Percentage of school children 8-10 years with enlarged thyroid (measured by palpation)	20.4	10.9	8.8
3. Percentage of school children 8-10 yrs with low urinary iodine (% iodine content < 50 ug/L)	13.3	3.5	3.3

Notes: Since the project objective was to support the national program goal of IDD elimination, health impact is included as a project outcome.

Source: Three national surveys conducted by GOC with international support (Annex 7, refs. 21-24)

ug/L = micrograms per liter.

ppm = parts per million.

Table 1 b. Output Indicators

Indicator	Projected in last PSR	Final Achievement
1. Upgrading of raw salt production facilities at 25 locations	2.45 Mtpy	2.45 Mtpy
2. Installation of iodization capacity in 107 locations	8.10 Mtpy	8.10 Mtpy
3. Installation of bulk packaging capacity at producer level	3.76 Mtpy	3.76 Mtpy
4. Installation of retail packaging capacity at producer level	0.97 Mtpy	0.97 Mtpy
5. Installation of retail packaging capacity at distributor level	2.48 Mtpy	2.48 Mtpy
6. Installation of carton packaging capacity	0.05 Mtpy	0.05 Mtpy

Notes: mtpy = million tons per year.

The total operating capacities at completion, including retained existing capacities were: (a) bulk packaging, 6.31 mtpy; (b) retail packaging at producer level, 2.05 mtpy; and (c) retail packaging at distributor level, 3.57 mtpy.

Annex 2. Project Costs and Financing

Table 2 a. Project Cost by Component
(US\$ million equivalent)

Project Cost By Component	Appraisal Estimate	Actual/Latest Estimate	Actual as % of Appraisal Estimate
Iodization Projects	90.99	101.37	111.4
Technical Assistance	0.49	0.45	91.8
Subtotal Base Cost	91.48	101.82	111.3
Physical Contingencies	4.53	n.a.	n.a.
Price Contingencies	12.94	n.a.	n.a.
Subtotal Installed Cost	108.95	101.82	93.5
Interest During Construction	14.53	3.90	26.8
Incremental Working Capital	28.81	13.07	45.4
Total Capital Cost	152.29	118.80	78.0

Notes: Differences due to rounding.

n.a. Not applicable.

The exchange rate at appraisal was: 1 US\$ = RMB 8.45; and at project completion was: 1 US\$ = RMB 8.28.

Table 2 b. Project Costs by Procurement Arrangements
(Appraisal Estimate, US\$ million equivalent)

Expenditure Category	Procurement Method			
	ICB	Other 1/	NBF 2/	Total
<i>Engineering And Other Services</i>	-	-	4.71	4.71
<i>Goods</i>				
Equipment and materials				
1. Iodization equipment	-	1.50 (0.71)	2.18	3.68 (0.71)
2. Packaging machines	37.51 (24.65)	0.08 (0.05)	12.19	49.79 (24.7)
3. Salt quality upgrading equipment	-	-	4.74	4.74
Installation and commissioning	0.70 (0.70)	-	2.06	2.77 (0.70)
Training on new equipment	0.73	-	1.59	2.32
<i>Works</i>				
Iodizing	-	-	12.16	12.16
Packaging	-	-	19.89	19.89
Salt quality upgrading	-	-	3.66	3.66
<i>Plant and Equipment Insurance</i>	-	-	1.69	1.69
<i>Project Management</i>	-	-	2.96	2.96
<i>Technical Assistance (PIU)</i>	-	0.16 (0.16)	0.43	0.59 (0.16)
Subtotal	38.94 (26.08)	1.74 (0.92)	68.27	108.95 (27.0)
<i>Interest During Construction</i>	-	-	14.53	14.53
<i>Incremental Working Capital</i>	-	-	28.81	28.81
Total	38.94 (26.08)	1.74 (0.92)	111.62	152.29 (27.0)

Notes: 1/ Other procurement methods include ISP, direct contracting, and consultant services.

2/ NBF denotes non-Bank Group financing.

Figures in parentheses are the amounts financed by the Bank.

Table 2 c. Project Costs by Procurement Arrangements
(Actual/Latest Estimate, US\$ million equivalent)

Expenditure Category	Procurement Method			
	ICB	Other 1/	NBF 2/	Total
Engineering And Other Services	-	-	3.98	3.98
Goods				
Equipment and materials				
1. Iodization equipment	-	1.50	2.12	3.62
		(1.50)		(1.50)
2. Packaging machines	13.54	0.92	26.04	40.50
	(13.54)	(0.92)		(14.46)
3. Salt quality upgrading equipment	-	-	2.50	2.50
Installation and commissioning	0.65	-	6.37	7.02
	(0.65)			(0.65)
Training on new equipment	0.55	-	1.06	1.61
	(0.55)			(0.55)
Works				
Iodizing	-	-	11.37	11.37
Packaging	-	-	16.82	16.82
Salt quality upgrading	-	-	8.47	8.47
Plant and Equipment Insurance	-	-	0.14	0.14
Project Management	-	-	5.37	5.37
Technical Assistance (TAU)	-	0.14	0.31	0.45
		(0.14)		(0.14)
Subtotal	14.74	2.56	84.55	101.85
	(14.74)	(2.56)		(17.30)
Interest During Construction	-	-	3.90	3.90
Incremental Working Capital	-	-	13.07	13.07
Total	14.74	2.56	101.52	118.82
	(14.74)	(2.56)		(17.30)

Notes: 1/ Other procurement methods include ISP, direct contracting, and consultant services.

2/ NBF denotes non-Bank Group financing.

Figures in parentheses are the amounts financed by the Bank.

**Table 2 d. Project Financing by Component
(US\$ million equivalent)**

Component	Appraisal Estimate		Actual/Latest Estimate		% of Appraisal	
	Bank	GOC	Bank	GOC	Bank	GOC
Iodization Projects	25.66	65.33	17.15	84.22	66.8	128.9
Technical Assistance	0.15	0.34	0.14	0.31	93.3	91.2
Subtotal Base Cost	25.81	65.67	17.29	84.53	67.0	128.7
Physical Contingencies	-	4.53	n.a.	n.a.	n.a.	n.a.
Price Contingencies	1.19	11.75	n.a.	n.a.	n.a.	n.a.
Subtotal Installed Cost	27.00	81.95	17.29	84.53	64.0	103.1
Interest During Construction	-	14.53	-	3.90	-	26.8
Incremental Working Capital	-	28.81	-	13.07	-	45.4
Total Cost	27.00	125.29	17.29	101.50	64.0	81.0

Annex 3. Economic Costs and Benefits

An economic rate of return was not estimated for the project at the time of appraisal, nor at closure.

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating		
	Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation					
Ident. 02/1994	4	HE, IS, OA, OO			
Prepn. 04/1994	2	IS, IS			
Appraisal/Negotiation					
Appr. 02/1995	4	EC, IE, IS, OA, PH			
Neg. 05/1995	6	DO, IE, IS, LC, OA, PH			
Supervision					
Supn 1 (Project Launch) 08/1995	6	DO, HS, IS, IS, PH, PS	S	S	
Supn 2 01/1996	4	HS, IS, IS, PS	S	S	
Supn 3 06/1996	4	HS, IS, IS, PH	S	S	
Supn 4 03/1997	3	IS, IS, OA	S	S	
Supn 5 (MTR) 05/1998	7	HL, HS, IS, IS, OA, PH, PY	U	HS	
Supn 6 04/1999	6	DO, HS, IS, PH, PS, PS	S	S	
Supn 7 11/1999	5	EC, HS, IS, OS, PH	S	S	
Supn 8 06/2000	4	DC, IS, PH, PS	S	HS	
Supn 9 11/2000	7	DO, HS, IS, IS, OA, PH, PS	S	S	
ICR					
ICR 1, 10/2000	2	IS, IS	S	S	
ICR 2, 11/2000	7	DO, HS, IS, IS, OA, PH, PS	S	HS	

Notes: 1/The IDDC Project was first identified as a component of the China Comprehensive MCH Project (Cr. 2655-CHA), and later processed as a stand alone project.

Specialist Skills: DO = Disbursement Officer; EC = Economist; FA = Financial Analyst; Health Education Specialist = HL; HE = Health Economist; HS = Health Specialist; IE = Industrial Engineer; IS = Industry Specialist; LC = Legal Counsel; OA = Operations Analyst; OO = Operations Officer; PY = Physician; PS = Procurement Specialist; PH = Public Health Specialist.

Performance Ratings: HS = Highly Satisfactory; S = Satisfactory; U = Unsatisfactory; HU = Highly Unsatisfactory.

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation	39.1	67.9
Appraisal/Negotiation	46.7	137.6
Supervision	140.6	433.4
ICR		62.7
Total		701.6

Note: Cost only includes Bank budget used for preparation and implementation.

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	<i>Rating</i>				
<input checked="" type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Physical</i>	<input checked="" type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
 <i>Social</i>					
<input checked="" type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Other (Please specify)</i>	<input checked="" type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
 <i>Health</i>					
<input checked="" type="checkbox"/> <i>Private sector development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

Lending

HS S U HU

Supervision

HS S U HU

Overall

HS S U HU

6.2 Borrower performance

Rating

Preparation

HS S U HU

Government implementation performance

HS S U HU

Implementation agency performance

HS S U HU

Overall

HS S U HU

Annex 7. List of Supporting Documents

World Bank Documents

1. China: IDDC Project. Staff Appraisal Report No. 14031-CHA. June 6, 1995.
2. China: IDDC Project. Development Credit Agreement between the People's Republic of China and IDA December 20, 1995.
3. China: IDDC Project. Loan Agreement between the People's Republic of China and IBRD. December 20, 1995.
4. China: IDDC Project. Project Agreement among IDA, IBRD, and China National Salt Industry Corporation. December 20, 1995.
5. China: IDDC Project. Mid-term Review Report. November 12, 1998.
6. China: IDDC Project. First Supervision Mission Aide Memoire. August 18, 1995.
7. China: IDDC Project. Second Supervision Mission Aide Memoire. January 30, 1996.
8. China: IDDC Project. Third Supervision Mission Aide Memoire. June 18, 1996.
9. China: IDDC Project. Fourth Supervision Mission Aide Memoire. March 21, 1997.
10. China: IDDC Project. Fifth Supervision Mission Aide Memoire. May 26, 1998
11. China: IDDC Project. Sixth Supervision Mission Aide Memoire. April 23, 1999.
12. China: IDDC Project. Seventh Supervision Mission Aide Memoire. December 16, 1999.
13. China: IDDC Project. Eighth Supervision Mission Aide Memoire. June 14, 2000.
14. China: IDDC Project. Ninth Supervision Mission Aide Memoire. December 15, 2000.
15. Goh, Chorching. World Bank. An Analysis of Combating Iodine Deficiency: Case Studies of China, Indonesia, and Madagascar. OED Working Paper Series No. 18. Winter 2001.
16. Mannar, Venkatesh. Micronutrient Initiative. China IDD Control Project: Report to Final Supervision Mission for Preparation of Implementation Completion Report. December 2000.

Government

17. China Beijing Consulting and Engineering Limited (BCEL)Engineering Company. Feasibility Study: Project of Universal Iodization of Salt to Eliminate IDD in China. April 1994.
18. China BCEL Engineering Company. Feasibility Study: Project of Iodized Salt to Eliminate IDD in China (Second Edition). November 1994.
19. China BCEL Engineering Company. Supplementary Material for Feasibility Study: Project of Universal Iodization of Salt to Eliminate IDD in China. June 1994.
20. National Office for Endemic Disease Control, Ministry of Health. Regulations on Edible Salt Iodization as a Means to Eliminate Iodine Deficiency Disorders. August 23, 1994.
21. Chinese Research Center for Endemic Disease Control. Report of 1995 China National IDD Surveillance. --, 1996.
22. Chinese Research Center for Endemic Disease Control. Report of 1997 China National IDD Surveillance. March 8, 1998.
23. Chinese Research Center for Endemic Disease Control. Report of 1999 China National IDD Surveillance. --, 2000.
24. China National Salt Industry Corporation. Borrower's Project Completion Report for IDDC Project. December 2000.
25. Government of China. Summary of National IDDC Program Achievement and Readvacy, October 2000.

Other

26. UNICEF, UNDP, WHO. Report of the National Advocacy Meeting to Eliminate Iodine Deficiency Disorders by the Year 2000. September, 1993.
27. Memorandum of Understanding on Coordination and Cooperation among IDA, UNDP, UNICEF, UNIDO, and WHO for the National Iodine Deficiency Disorder Elimination Program of the

- People's Republic of China. September 15, 1995.
28. Ministry of Health, China, CNSIC, UNDP, UNICEF, WHO, UNIDO. Programme of International Cooperation for Elimination of IDD in China by the Year 2000: Comprehensive Evaluation and Planning Mission, Report of the Mission's Observations and Recommendations. July, 1996.

Annex 8. Beneficiary Survey Results

No beneficiary survey was carried out for the following reasons: (i) field surveys were carried out by other agencies at regular intervals during the project, in relation to program monitoring and the demand oriented activities which were managed outside the project; and (ii) there were limited funds, and the choice was made to conduct a stakeholders workshop to gain more insight into the experience of the project itself.

Annex 9. Stakeholder Workshop Results

CHINA IDDC PROJECT – FINAL SUPERVISION MISSION MINUTES OF MEETING OF STAKEHOLDER WORKSHOP Nanning, China, December 8, 2000

Introduction. A stakeholders workshop was organized in Nanning, Guangxi Autonomous Region, on December 8, 2000, to assess achievements of the project; the positive and negative experiences of design, preparation and implementation; lessons learned and advice for the future, especially concerning sustainability of the success achieved so far and improved implementation in the hard to reach areas which have not yet reached the standard of iodized salt coverage and elimination of IDD.

The sixteen participants came from the salt industry of five provinces or regions, the bureau of health and bureau of technical supervision of Guangxi Region, and the central project implementation unit of the China National Salt Industry Corporation (CNSIC). It had also been planned to invite local media, industry and commerce and transport sectors, and the federations of women and of disabled persons, but these invitations were not followed up. The workshop took the form of a round table discussion, with short presentations addressing the key questions noted above, which had been sent in advance, followed by comments and questions from the group. Finally the main conclusions and recommendations of the group were summed up by the project director.

Summary of Main Points. This section provides a summary of the experience and issues presented by each of the provincial units represented, followed by the workshop summing up:

1. Hunan Provincial Salt Administration. A Deputy Provincial Governor was put in charge of project implementation. We secured funding of 46 million Yuan from four sources – World Bank (25%), ISIDF, local bank loans, and from participating firms; we strengthened the regulatory system for the whole province and strictly controlled illegal salt production and distribution; we upgraded and unified the retail packaging arrangements for the whole province, added the anti-fake logo on double-layer poly film retail packaging; and conducted technical and management training both at home and abroad. During the design stage, Hunan decided to move all iodization to production points, rather than linking it with retail packaging. The project achievement proved this decision was right. We also rationalized iodized salt production in 2 salt production firms (350,000 tpy and 450,000 tpy respectively), and closed all other small salt firms.

The new machines have greatly improved the quality standard, production rate and environmental hygiene. Now 99-100% of salt produced reaches the quality standard. However, the modernized retail packaging, with abolition of manual handling, increased overall production cost by some 30 Yuan/500g; the salt companies sacrificed some 3 million Yuan profit annually for the IDD elimination effort. In addition, the spare parts of imported machines are expensive and not easily available. However, local enterprises have already learned the maintenance of these machines and are experimenting with locally made spares. Installation of local retail packaging machines from Tianjin will be completed early 2001. Overall the upgrading has improved quality, but has not improved profit. We have reduced our profit for social benefit.

2. Quality Control Division, Guangxi Technical and Quality Supervision Bureau. The major reasons of success of this project are:

- It is a social welfare project benefiting people's health, so it is supported by government, welcomed by the people, with financial support catalyzed by the World Bank;
- Centralized IDDC Project implementation system (IDDC Office) at national, provincial and local level, concerted effort has been made by multi-agency and multi-level approach.

To sustain the project achievement, pay special attention to following key steps:

- Do not relax, continue the strict monitoring and control of iodized salt quality during the production and packaging,
- Maintain centralized salt regulatory system for salt production and distribution
- Strike harder on illegal salt business. If illegal salt still exists in the market, there will be no sustainability of IDD elimination
- Step up the education and awareness raising effort; the harmfulness of iodine deficiency to mental development of children should be known to everyone. Education to school children are particularly important in poverty stricken upland areas of Guangxi as most mothers there are illiterate and poor.
- IDDC work should not be relaxed. IDD problem is like the enemy, when gripped firmly, they die, if the grip slackens, they escape.
- Financial support should be made available to health monitoring work from appropriate mechanism.

Guangxi has made great achievement in IDD elimination during this project, thanks to the World Bank and CNSIC IDDC Office. As a technical supervision officer, I will work hard to support your work to sustain China's IDDC achievement.

In answer a question of the function of the ISIDF after the project is completed, Mr. Chen replied:

- China is a developing country, government budget cannot provide enough fund. IDD elimination is a social welfare activity, so incremental cost and investment should be financed by ISIDF;
- Maintenance and service of newly installed equipment
- Monitoring and supervision of iodized salt production and distribution
- Education and publicity activities
- Some price subsidy for poor and remote regions to keep unified salt price province-wide.

When questioned about state control, especially now China is facing WTO access, Mr. Chen answered:

- The great western area of China with large population is facing serious IDD problems. The purpose of state control is ensure health and social benefit. Also, the historical background of thousand years of state control of the salt trade in China should be taken into account.
- Our iodized salt standard should be close to international standard after China enters WTO.

Thanks to coordination of IDDC Project Office of CNSIC, the cooperation among different agencies is quite smooth, so far, seems such management system and project design have no

problems. Suggest health sector should conduct random check ups in remote areas for the sustainable management of IDD elimination.

3. Comments of Official from Endemic Disease Control Center of Guangxi. One of the most important reasons that government officials and relevant agencies paid greater attention to IDDC project implementation is the new understanding, especially after 1985, of harmfulness of IDD, that it is not just a goiter problem, but a threat to Chinese people's mental development. Such knowledge has really drawn great attention of the society.

China's IDD elimination effort was launched as early as 1965. By 1992, the goiter rate was reduced in most parts of the country, but the quality rate of iodized salt was only about 50% due to lack of funds for salt industry reform, health education and monitoring as well as regulation of the salt distribution system. Then from 1992, Chinese government started to implement comprehensive IDDC program. With World Bank support the government stepped up its effort to an unprecedented extent with respect to modernization of salt production, iodizing, packaging, health education, etc. This laid a sound material basis for the success of IDDC program in China.

I hope World Bank will continue to give support, and government give health sector more support; for example, our quarterly IDD monitoring at county, township and village levels are free of charge, but we hope to get financial support to sustain such monitoring effort.

4. Official of Guangxi Region Salt Administration. I am responsible for the distribution of iodized salt in the whole of Guangxi Autonomous Region. I would like to supplement other people's comments with my experiences:

- i) Firm commitment by the government and leaders
- ii) Strong arrangement of institutional coordination
- iii) Set up complete set of policy and legal framework, regulation, provisions and standard.
- iv) Control of salt production, transport and distribution system with special license system
- v) Establish distribution network at county, township and village levels, to insure the availability of iodized salt to all consumers
- vi) Educate school children and housewives. When we have coordinating meeting for education and dissemination, we invite representatives from women's federation. In poor area, school children will cast greater influence on their illiterate mothers.

5. Representative of Chongqing Municipality Salt Administration. Each province has its own unique characteristics; some provinces have salt surplus; in some salt production and consumption is balanced, while others provinces need to import salt from neighboring provinces partially or entirely. My comments are based on Chongqing's actual condition, in implementing the project.

Chongqing is a salt surplus municipality, with numerous small salt producers, especially in poverty stricken areas. The demands for iodized salt are 400,000 tpy, while the total production of salt was 710,000 tpy. Production costs in these small salt firms are much lower than market price set by CNSIC. To rationalize production of quality iodized salt, we need to close most of the small salt factories, but they belong to local government and are an important source of local revenue. Chongqing therefore adopted a policy of financial compensation for closure or purchase of these

firms. This ensures that local government revenue and incomes of workers remains the same after closure. Chongqing Salt Administration also provides alternative production or support for production conversion. So far, the streamlining of iodized salt production has resulted cost savings which are used to compensate small firms which are closed.

6. Representative of Fujian Provincial Salt Administration. Fujian province is a typical salt surplus province in southern China. There were more than 1.1 million tpy sea salt production in Fujian in earlier 1990s, which accounted for 50% of salt production in South China, while the consumption of edible salt in Fujian is just 250,000 tpy. The rest of the salt was supplied to 7 other provinces under the planned economy. With the new market economy other provinces developed their own salt production and Fujian salt industry suffered greatly; export to other provinces declined from 600,000 tpy to 100,000 tpy; and export to foreign countries also declined to 20,000 tpy, so overproduction of salt posed problems in the market. Cost of illegal salt production in Fujian is as low as 20 Yuan/t, while the production cost of licensed salt is 120 Yuan per ton. In addition, after other provinces reduced their demand for salt from Fujian, the accumulated salt in licensed salt firms was also huge, so these firms also tried to sell salt illegally to maintain the operation.

According to a survey by UNICEF and MOH in 1998, the qualified iodized salt coverage in Fujian were only 60%, which ranked as the 6th from bottom among the economically developed provinces. This result shocked provincial leaders, so immediate action was taken by provincial government. IDDC leading groups were set up, headed by the No. 1 head of the government at provincial, prefecture and county level; IDDC targets were part of the performance assessment of the government head. Fujian Provincial Salt Administration set up a special 7-member IDDC Office for rationalization. Such drastic measures really made a difference. Restructuring and rationalization of salt industry have been implemented; edible salt production capacity is reduced from half million tpy to 350,000 tpy in 2000. A great campaign to crackdown on illegal salt has been launched, confiscated illegal salt in Fujian accounts for more than 25% of the country's total. Over 235 salt production firms have been closed or converted to other businesses. This process of closure or conversion is full of pain and hope. The IDDC project office makes a good example of successful conversions, using video tapes to help persuade other firms to convert or close.

So far, Fujian realized its IDD elimination effort at the end of 2000 with the total investment of 91 million Yuan. Although 2.1 million Yuan of the World Bank credit is only accounts for 2.2% of the total investment, but it really catalyzed domestic funds. So the World Bank support is more significant politically than the credit itself.

7. Representative of Hainan Provincial Salt Administration. Hainan is another typical salt surplus province in China. It is also one of the 7 provinces that has not realized the IDD elimination target. There are more than 600 small salt producing firms with the total production of 250,000 tpy, but the internal consumption of salt in Hainan province is only 40,000 tpy; CNSIC will accept only 50,000 tpy, so the total surplus after CNSIC's quota, is 160,000 tpy. The good experience of Chongqing and Fujian is not applicable in Hainan for the following reasons:

- i) Government officials do not pay enough attention to this IDD elimination issue
- ii) Hainan provincial salt administration is a small organization with limited financial strength,

so we are not be able to compensate closure or conversion of many small salt producers
iii)IDD area of Hainan is located mainly in central upland of the island, which is a national level poverty area. Great effort should be made in this area for IDD elimination.
Mr. Cao sincerely hopes that CNSIC and World Bank continue to support to Hainan's IDD effort.

Summary of the Views Expressed in the Stakeholder Workshop:

A. Key Factors Contributing to Positive Achievements

- Commitment to IDD elimination as a national goal at highest levels in government, and top officials paid great attention to the project implementation. At national level, Premier Zhu Rongji and State Counselor Madam Peng Peiyun personally took charge of IDD elimination work. Accordingly, at each province, municipality and autonomous region, a deputy governor is taking charge of the project implementation work.
- Establishment of a comprehensive legal framework, which permitted unified control of the salt industry and health sector operations.
- Establishment of financial mechanism for basic counterpart financing from central government through the establishment of Iodized Salt Industry Development Fund (ISIDF) approved by the State Council in 1995.
- Availability of local counterpart financing in adequate amounts, although with some delays
- Establishment of organizational framework with clear responsibilities and coordination mechanisms among appropriate agencies at central, provincial and county levels to execute the various interventions required for IDD elimination, with financial and technical support from international agencies.
- Commitment of the full range of stakeholder agencies to the overall objective and their execution of the activities relevant to their responsibility
- Enforcement of state regulation of the salt industry, preventing un-iodized salt from entering the market through joint operations involving technical supervision bureau, industrial and commerce administrations, transport, salt industry and health sector.
- Rationalization the salt industry, close small salt firms of low quality and technical level.
- Introduction of advanced technology and equipment of iodizing, bulk and retail packaging machines as well as relevant measuring and control devices for salt iodizing and packaging.
- Technical training for salt industry personnel and staff of endemic diseases control and prevention.
- Revision of iodized salt standard and testing methods, especially the concentration of iodine of iodized salt at production, retail and household levels.
- Population awareness, developed over time, of the dangers of IDD and acceptance by the consumers of iodized salt consumption as the means of preventing it.

The participants of the workshop pointed out that the World Bank funds played a critical role and catalyzed the establishment of IDSF and allocation of local counterpart financing for the project.

B. Main Problems or Barriers Faced in Implementation

- Delay in transmitting message to the population about the insidious influence of iodine deficiency on mental development, and mixed messages equating iodine with intelligence, leading to confusion among some consumer groups, that persists in some areas.
- Lack of experience in implementing projects of this magnitude and complexity; dealing with international technology and equipment suppliers in procurement, Bank procedures;
- Problems with delivery and responsiveness of the international suppliers
- Delayed process of ownership restructuring between salt production side and distribution side, delayed the physical implementation of the project, especially involving retail packaging.

C. How to Ensure Sustainability

- Do not relax, but strengthen and continue consumer and stakeholder education, especially among school children and through salt retailers. Improve education messages on salt packages
- Develop and implement policies favorable to poorer sections of the population including targeted price subsidies, and increased opportunities for economic development.
- Maintain state regulation and control of the salt industry for the foreseeable future.
- Ensure financial support for recurrent health sector expenditures for IDD control

Stakeholders Workshop - List of Participants

Name	Position	Institution
Central Level Participants		
Guo Wenhui	Project Manager	China National Salt Industry Corporation
Li Gongli	Vice Manager	China National Salt Industry Corporation
Zhang Yan	Intepreter	China National Salt Industry Corporation
Weng Xiaoya	Interpreter	China National Salt Industry Corporation
Chongqing Municipality		
Huang Daomo	Deputy Controller	Salt Industry Administration Bureau
Liao Daixin	Deputy Manager	Shuote Co., Limited
Fujian Province		
Liu Shizhong	Deputy Controller	Provincial Salt Industry Administration Bureau
Guangxi Zhuang Autonomous Region		
Xia Zhengxin	Manager	Provincial Salt Industry Administration Bureau
Zhang Zhongyun	Deputy Manager	Provincial Salt Industry Administration Bureau
Zhang Qing	Deputy Manager	Provincial Salt Industry Administration Bureau
Yin Chongtian	General Manager	Provincial Salt Industry Administration Bureau
Chen Lishan	Controller	Quality and Technology Inspection Bureau
Lin Guixing	Deputy Controller	Prov. Health Bureau, Disease Control Dept
Wei Jinping	Manager	Prov. Health Bureau, Supervision Department
Hainan Province		
Cao Shimin	Deputy Manager	Prov. Salt Industry Administration Bureau
Hunan Province		
Xie Qiushi	Deputy Manager	Xiangheng Salt Mineral Plant

Additional Annex 10. Borrower's Report

Project Report

China Iodine Deficiency Disorders Control Project

Part I: General. The salt industry is a traditional business with more than 400,000 personnel in more than 1300 production and distribution enterprises. In recent years, annual production remained 28 to 29 million tons, in which sea salt represents 68%, well-rock salt represents 24% and lake salt 8%. Every year 7 million tons of edible salt is produced.

Edible salt iodization is a major intervention in China to eliminate iodine deficiency disorders (IDD) by 2000 and sustainable development afterwards, which concerns improving people's quality, social development and boosting the economy. The China IDDC Project is an integrated project involving food salt management system, production technologies and marketing. Physical components under the Project include financing, selection, procurement & installation of equipment and associated technology, domestic equipment manufacturing, civil construction, research and development (R&D) on iodization and packaging etc. The objectives of the Project are rationalizing production, level-off production and distribution, producing quality iodized salt, iodization and packaging modernization and ensuring market supply. The Project is the first of its kind in the history of salt industry in terms of the size of investment and large sum of enterprises involved.

Through the efforts made in these years, much progress has made in IDD elimination. Average iodine content in salt is now equal to or above 20mg/kg. Coverage of iodized salt at household level has increased from 39.9% in 1995 to 88.9% in 1999. Total goiter rate in children through palpation and Ultra sound has decreased from 20.4% in 1995 to 8.8% in 1999. The year 2000 nation-wide assessment of 31 provinces shows that 24 provinces, or 77.4% of the total areas have basically achieved their phase targets. The figure demonstrates that IDD phase objectives have been basically achieved and people's level of Iodine nutrition has been improved significantly.

Part II: Project Initiation and Approval. The Project started when China was making dramatic advances in economy, new demand-supply relationships and ever-changing economical systems. China is opening up. The Project involves many financing sources and implementing agencies, which are a challenge in the fast changing environment. The Project has received support from the State Council, State Planning Commission (SPC), and State Economic and Trade Commission (SETC). The World Bank and international agencies also assisted during Project concept, approval and implementation.

A Domestic Approval

1 Support from State Council and various sections

- 1.1 The State Council. During September 1994 to June 1995, the State Council and its secretariat convened many times discussing and finalizing financing, setting up Iodized Salt Industry Development Fund (ISIDF), pricing, setting loan interest rate of SDBC, import duties and VAT, food salt monopoly. It was clearly decided that SPC directed the Project and China National Council for Light Industry (CNCLI), China National Salt Industry Corporation (CNSIC) and provincial salt companies took part in the Project.
- 1.2 SPC Coordination. SPC met several times with MOF, MOH, SDBC and CNCLI to discuss physical issues, e.g. establishing ISIDF, iodized salt pricing and loan rates.
- 1.3 Support From Other Sections. IDD elimination is a systematic effort involving legislation, managerial mechanism, production technology, equipment upgrading, marketing, social mobilization

and quality monitoring. SPC, SETC, MOF, MOH, CNCLI, State Family Planning Commission, Federation of Women, Federation of Disabled People, Ministry of Education, Ministry of Broadcasting and Television, State Administration of Industry and Commerce, State Administration of technology inspection, Public Security, Justice, Railway and Ministry of Transportation all contributed to the success of the Project. MOF supported in establishment and utilization of ISIDF as well as in the World Bank loan on-lending. SETC and China National Customs Bureau approved favorable treatments on imported equipment. SDBC offered favorable loans to the Project. MOH extended much help in the Bank loan/credit application and in iodized salt social mobilization to eliminate IDD.

2 Project Proposal and Approval

- 2.1 July 1988. Dr. Mannar of UNICEF headed a team named "Survey on China Salt Iodization" to visit China. Major findings are that 330 million people were living in endemic areas and universal salt iodization is essential for IDD elimination. Major recommendations included raw salt upgrading and equipment improvement in terms of iodization and packaging.
- 2.2 Oct.-Nov.1993 Iodized Salt Office of CNSIC compiled Project Proposal (draft) with concept of capacity building of 8 million tons/year in 30 provinces.
- 2.3 Dec. 2nd, 1993 MOH and CNCLI sent a joint letter to SPC proposing applying to the World Bank for additional funding for IDD elimination and including IDDC Project in the 1994-1996 master budget. On Feb. 19, 1994 sent a letter to SPC proposing to include IDDC Project costing 27 million USD in the Comprehensive MCH Project (Health VI).
- 2.4 On March 20, 1994 CNCLI/CNSIC submitted revised Project Proposal to SPC. The total cost was estimated as 980 million Yuan (including foreign currency of 26.473 million USD), SDBC share of 190 million Yuan, ISIDF 190 million Yuan, and salt enterprises 248 million Yuan capital and 115 million Yuan as working capital. The project would establish iodization & packaging capacity of eight million tons per year (tpy). The revised proposal was approved by State Planning Commission on Sep. 5, 1994.
- 2.5 Mar. 11, 1994 CNSIC entrusted China BCEL Engineering Company to develop the Feasibility Study. The First Edition came off in late April. Project arrangement and implementation schedule were discussed at the National Salt Conference and National Iodized Salt Conference on Mar. 15-18, and Mar. 23-31, 1994 respectively. On June 30, 1994 China International Consulting Co., entrusted by SPC, approved the Feasibility Study.
- 2.6 On June 20, 1994 the General Office of the State Council issued a notice officially approving the Project and indicated that the Project consisted of facilities upgrading, iodization, packaging, quality control and training in every province. It called upon leaders at various levels to be responsible for directing, organizing and ensuring financing of local Project share.
- 2.7 On Sep. 28, 1994 the State Council convened on the Project and released a meeting minute confirming: 1) NIDDEP mobilization; 2) Bank loan onlending to CNSIC and further onlending to provinces; 3) Counterpart financing incl. SDBC, ISIDF and local enterprises and 4) sectoral coordination.
- 2.8 Oct. 12-14, 1994 the Second Iodized Salt Conference was held to finalize project capacity distribution, financing plan by province and Feasibility Study. In Oct.-Nov. 1994 BCEL submitted the revised edition to CNCLI and SPC.
- 2.9 Dec. 18, 1994 CNCLI sent comments on Feasibility Study to SPC. On Jan 5, 1995 CNCLI made request to State Council concerning Project Funding.
- 2.10 On Feb. 25, 1995 SPC approved Feasibility Study. On Aug. 24, 1995 SPC submitted a proposal to the State Council requesting 1) setting up ISIDF and iodized salt pricing; 2) SDBC loan rates; 3) duty exemption and 4) food salt monopoly measures.
- 2.11 In July 1995, BCEL completed preliminary designs as a reference for provincial designs.

2.12 During July to Nov. 1995, CNCLI reviewed the Feasibility Study by provinces. Consequently On Nov. 20, 1995, CNCLI proposed to SPC for Project startup. On Oct. 20, 1996 SPC approved the proposal and issued financing plan for year 1996. On Dec. 16, 1996 CNCLI issued fixed assets investment plan for year 1996.

B. World Bank Loans

- 1 On Dec. 1993 to Feb. 1994 MOH and CNCLI submitted request, through SPC, to the World Bank for additional funding for IDDC project as a component of MCH (Health VI) Project. On Nov. 10, 1994 CNSIC submitted a Project Proposal (draft) to the Bank as loan application.
- 2 From Feb. 1994 to Feb. 1995, the Bank carried out four appraisal missions on proposed IDDC Project. The Bank agreed to the ideas presented in the proposal and decided to offer a loan for imported equipment.
- 3 Negotiation was held in Washington in May 1995 among MOF, CNCLI, CNSIC, MOH and the Bank. Six documents were released after negotiations: 1) Project Agreement; 2) Loan agreement; 3) Credit agreement; 4) Memorandum; 5) Presidential letter to the Board; and 6) Staff Appraisal Report (SAR). The Board finally approved the project in June 1995.
- 4 In Dec. 1995 the Government of PRC entered into the loan agreement and credit agreement with the Bank. The onlending agreement was signed between MOF and CNCLI/CNSIC in January of 1996.
- 5 On March 4, 1996 CNCLI submitted relevant legal documents to the Bank, including: 25 copies of letters issued by each provincial government addressing provincial salt companies vesting the responsibilities of carrying out provincial project and 25 copies of letter of confirming the responsibility issued by provincial salt companies. Also included in the legal document package were 85 copies of enterprise agreements.

Part III: Project Objectives. The objectives are based on previous production and distribution, selecting appropriate sites to set up central salt producers to supply iodized food salt in a unified way, termination of iodization at distribution areas, decreasing iodine losses, packaging of all iodized salt, 50% of salt being packaged mechanically, every province organizing its supply in a unified way, plant upgrading, setting up provincial quality monitoring stations, social mobilization and training. The targets are:

- 1 Iodization: Installation 120 units of iodization machines in 107 sites in 24 provinces, arriving at total capacity of 8.1 million tons.
- 2 Bulk packaging: Installing 46 machines in 40 sites arriving at total capacity of 3.64 million tons.
- 3 Retail packaging: Installing 742 machines in 147 sites arriving at total capacity of 3.039 million tons.
- 4 Plant upgrading and warehouses
 - 4.1 Upgrading: 2.2 million tons of plants in 57 sites needing upgrading.
 - 4.2 Warehouse capacity building and reconstruction.
- 5 Iodized salt quality and information networking.
 - 5.1 Quality and Information network
 - 5.2 Training

Part IV: Financing Arrangement

1 The World Bank Loan. In 1996 to May 1997 the Bank approved procurement of bulk packaging, retail packaging and iodization machines with total amount approved of 15.94 million USD. In June 1999 procurement of pre-mixers, spare parts to retail packaging machines and retail packaging machines with total amount of 0.954 million USD was approved by the Bank. The Bank approved the procurement of case packers with total amount of 0.398 million USD in Feb. 2000. In June 1998 the Bank cancelled the

loan portion of 7 million USD. The original credit of SDR 1270 million was equivalent to 17.3 million USD due to changes in exchange rate. Total amount of procurement approved by the Bank was 17.29 million USD. It is expected that all these amount would have been disbursed by the end of 2000. During implementation the availability of Bank loan has been very good, which also facilitated availability of counterpart financing.

2 SDBC Loan. In May of 1995 SDDB committed to supply loan of 196 million Yuan to 19 provinces. In August 1996 SDDB decided to offer favorable rates to the Projects. The favorable treatment terminated in second half of 1997 and went back to normal treatment. Accumulative financing plans from 1996 to 1998 was 169.3 million Yuan. By the end of 1999 expenditure in 15 provinces totaled 136.67 million Yuan. The gap was filled by ISIDF and/or enterprises.

3 ISIDF Establishment and Utilization

- 3.1 In Jan. 1996 SPC approved to set up ISIDF, contributed from after-tax profit of 25 Yuan/ton at wholesale price at production levels.
- 3.2 Original share of ISIDF was 190.43 million Yuan. Combined with additional funding of 9.8 million Yuan approved by SPC in 1999, total share is 200.23 million.
- 3.3 CNCLI released the ISIDF financing plan for 1996-2000 at the amount of 200.23 million Yuan. Cumulative expenditure is 200.23 million Yuan. Up to 1999 another 14.7653 million Yuan of ISIDF was advanced as interest and tariffs.
- 3.4 The final 2000 cumulative disbursement for IDDC Project out of ISIDF was 225.3 million Yuan.
- 3.5 In 1999 and 2000, 200 million Yuan was disbursed through other projects to set up warehouses, which filled the gap left due to insufficient funding from enterprises and SDDB and the part of funding played an important role in continuation of IDDC Project.

4 Funding by enterprises has been satisfactory and civil construction went on as scheduled.

5 Import duties and VAT. When the Project was initiated imported goods financed by the Bank were duty free. The practice ceased in April 1996. Based on CNSIC's request SETC and Customs decided on Dec.1996 to levy half rate (18% to 9%) on imported goods in 1997. However VAT was still payable. From Jan 1998 the duty exempt policy was revived, but the new policy did not cover imported parts and components. By the end of 1999 8.3329 million Yuan of ISIDF was advanced. Ending 2000, cumulative amount advanced is 9.6 million Yuan for import duties.

Part V: Implementation

- 1 Iodization. Through central bidding, 139 iodization units, including 103 from CNSIC and the Salt Research Institutes (SRI) at Tianjin and Zigong, and 36 locally made, were installed in 112 licensed producers in 24 provinces. Total capacity of 8.1 million tpy was built. Plants and warehouse were reconstructed or extended. The target for iodization capacity has been 100% achieved. Iodization machines made by SRI, Zigong and CNSIC (improved version of machines by CIXI) could dose within 2 seconds after detecting weight and could function within deviation of 7ppm plus and minus. Quality rate is over 95%. All the indicators comply with contract terms. These machines were enjoyed by the end users. Some local made machines, for example by Zhejiang, are operable; however mixing is not so good.
- 2 Bulk Packaging. Twelve baggers from Chronos Richardson and one bagger from Spain were imported. Together with 19 baggers made locally, total capacity installed is 3.762 million tons, which is 103.55% of original plan.

- 2.1 Selection, procurement, installation and commissioning. By international competitive bidding (ICB) 12 units of 50kg baggers were introduced by Chronos Co. The machines arrived in April 1997 and installed in Yangkou Salt Works, Caiyangzi Salt Works, Chuandong Salt works, Denguan Salt Works, Gongjing Salt Works, Ziliujing Salt Works, Xiangli Salt Mine, Xiangheng Salt Mine and Chuan Salt Plant. The performance has been good with output of 12 bags/min with precision of 0.5%. Many laborers were saved and hygiene conditions ensured.
 - 2.2 Local baggers selection, procurement, installation and commissioning. 19 local machines were procured centrally. 12 were made by Changsha Scale factory and 7 by Beijing Shihua Co. These machines were installed in Sichuan, Qinghai, Hebei, Liaoning, Jiangsu, Guangxi and Yunnan. The output is 10 bags/min with precision of 0.5%. Many laborers were saved and hygiene conditions were ensured.
- 3 Retail packaging. The capacity finally achieved by order would be 3.447 million tons, which is 113.43% of original plan. It is expected that by 2000 3.135 million could be installed, which is 103.16% of the original plan.
- 3.1 Selection, procurement, installation and commissioning of imported machines. Through ICB, 127 machines were ordered in 1997 (32 from Spain and 95 from Italy). Additional six Spanish machines were procured in 1999, giving a total of 133. In Nov. 1997 three prototypes (one Spanish and two Italian) were air shipped to China and tested. The suppliers made some revisions based on customers' comments before they made batch deliveries in 1998 and 1999. The precision is within 1% and sealing rate is 98%. Output is 55-65 pouches/min and 55 pouches/min respectively for Italian and Spanish machines. Performance complies with contract terms. In Hubei, Shenzhen and Shanghai these machines are running continuously (three shifts a day) in good shape.
 - 3.2 Two retail machines donated by Spanish Government and one by UNICEF have been installed and commissioned.
 - 3.3 Type II machines based on technology transfer. TF2 Factory was selected through bidding as recipient of Italian technologies. Two prototypes were delivered in Sep. 99, installed in Wuhan and Harbin, tested and accepted. 98 units would have been manufactured by the end of 2000.
 - 3.4 Selection, procurement, installation and commissioning of local machines
 - 3.4.1 Fully automatic machines. Through bidding 33 units by Wuhan Leader Co. and Guilin Packaging Factory were ordered.
 - 3.4.2 Semi-automatic. Through bidding, 446 units of two types were installed. One is electric weigher (Tianjin and Xinxiang) with output of 15-17 pouches/min. The other kind is volumetric (Jiangyin and Wuxue) and output is 40-45 pouches/min (precision is within 1% and sealing quality is 95-98%).
 - 3.4.3 Cartoning machines selection, procurement and installation. Through bidding, Mingozi delivered two machines in Nov. 1997 to Guangzhou and Jiangsu. They were installed and accepted in Sep. 2000.
- 4 Plant upgrading and warehouse construction
- 4.1 Plant upgrading. Altogether 55 production lines were upgraded, giving a total yearly capacity of 2.445 million tons, which is 111.41% of original plan.
 - 4.2 Warehouse construction and improvement. Better storage conditions and consequently decreased iodine losses resulted from plant and warehouse construction and renovation.
- 5 Iodized salt quality and information network
- 5.1 Quality, Information Network
 - 5.1.1 Provincial Quality Monitoring Stations. Under the Project, new stations were established in

Heilongjiang, Jilin, Liaoning and Gansu. Existing stations were equipped with new equipment and sufficient workers. All these stations have individual capacity of comprehensive analysis.

5.1.2 Information Network

5.1.3 In second half of 1998 China Salt Industry Info Network was put into operation. The network offers, among others, iodized salt quality information. UNICEF and UNIDO donated more than 100 units of PCs and printers during construction.

5.2 Training. In Feb. 1995 Salt Engineering Dept. of Tianjin Light Industry College compiled training material of half a million words in two volumes (legislation and technology). In 1995 1095 persons took part in nation level training held in Tianjin, Sichuan, Hubei, Jiangsu and Guangdong. In 1996 900 persons took part in provincial training and 3300 finished training in enterprises. In 1997 to 2000 training was carried out for producers in the areas of operation of iodization and packaging. Uncompleted statistics showed that 4000 persons took part in the training and skills in operation and maintenance were improved. Along with domestic training, 150 persons were sent to Great Britain, Spain and Italy in ten groups to be trained there and perform pre-shipment inspections. In 2000 China Salt took part in the 8th Salt Symposium and received training in the Netherlands.

Part VI: Technology Transfer and Absorption of Foreign Technology and Management Experience

- 1 Successful technology transfer of retail packaging machines. Per the requirements for the Project and according to status in China, production of iodization machines and 50-kg baggers could utilize domestic technologies and thus no foreign technologies were needed. When retail packaging machines were introduced there were no such machines operating in salt industry. Through ICB, technology of SASIF of Italy was introduced to China. As recipient, Tianjin Huate Co (TF2) manufactured 100 units of machines on the technology. All the machines conform to original machines, with only half the cost of the originals. More than four million Yuan were saved. Spare parts could also be offered from local sources and local technologies also are upgraded.
- 2 During Project implementation oversea fellowships, visits of foreign specialists, participation in salt symposium and quality monitoring network financed by UNICEF and UNIDO all contributed to quality management and reporting system.
- 3 Consultation under a contract of 139,500 USD, ICF Kaiser assisted CNSIC in developing a computerized system consisting of information flows.

Part VII: Project Implementation Units. The Project was directed by SPC and implemented by CNCLI, CNSIC, provinces and enterprises. CNSIC has established IDDC Project Management Office on Sept. 30, 1993 to undertake organization and management of IDDC project implementation. Various provincial salt industrial corporations have also established IDDC project office to undertake the coordination and supervision of the implementation of their respective project activities. Details of the project implementation management works are summarized as follows:

I. Work out the Project Implementation Plan:

1. Finalization of principles and engineering activities for iodized salt production capacity and production locations;
2. Worked out and submitted the salt iodination project proposal to State Development and Planning Commission (SDPC). Entrust China Qingxin Engineering Company to conduct the feasibility Study of Salt Iodination, then evaluated through discussion at China National Salt Industry Conference, National Salt Iodination Workshop, as well as appraised by China International Consulting Corporation, China National Council of Light Industry, submitted to SDPC for approval.
3. Worked out the project plan to use the World Bank Credit and Loan.

II. Allocation of Project Funds

1. Assisted the World Bank to evaluate the project four times, undertake 8 supervision missions of the IDDC project implementation. Transferred the World Bank credit to project provinces timely for equipment procurement and installation. Organized and completed the annual audit of the World Bank IDDC projects in 1997 and 1998 respectively.
2. Secured the loans from State Development Bank (SDB): With great effort made by IDDC Project Office of CNSIC, successfully secured the following preferential policy from SDB: Commitment of provision of the loans up to 190 million Yuan in 1995. The annual interest rate is 15.3% with 3% of deduction for 5 years. In 1996, SDB provide preferential policy of poverty alleviation to IDDC project, adjusted the loan interest to 10.08% for five years loan. In 1997, government adjusted the financial policy, reduced loan interest significantly for all banks, so the preferential loan policy of SDB no longer applied.
3. Established Iodized Salt Industry Fund in 1996 after State Council approval on September 26, 1994, then transferred such fund to various provincial IDDC project in the form of loans in a timely manner.
4. Obtained the reduction and exemption of import duties and VAT: According to regulations stipulated by State Council on April 1, 1996, the imported equipment by using the World Bank loans should pay import duty and relevant VAT. CNSIC applied to the State Council in 1997 requesting the reduction of import duty from 18% down to 9%. In 1998, government resumed the preferential policy of exemption of import duty and VAT to the project financed by the World Bank loans.

III. Organize study on Equipment and Industry Process

1. Study on equipment and process of Iodination of Salt: Organized the Design Institutes of Salt Industry of Tanggu and Zigong to conduct R & D work for automatic iodizing equipment, using nuclear scale to control the flow speed of the salt on convey belt to which iodine liquid is sprayed to salt. After many tests, reduced the delay time from more than 20 seconds to around 2 seconds, increased the iodination accuracy to more than 90%, reduced iodine losses to less than 3%.
2. Study on packaging equipment and process: Organized Beijing Huashi Co. to conduct R&D for bulk packaging machines, and companies of Tianjin, Xinxiang and Wuxue for semi-automatic retail packaging machines, companies from Jiangyin and Lide for fully automatic retail packaging machines.
3. Research on packaging materials and supplementary equipment of retail packaging machines: Organized companies of Jiangyin and Rentian to develop supplementary equipment of feeding system, mixing as well as anti-fake logo sticking machine.
4. R&D on iodine quantity meter: Organized the Institutes of Tianjin Optical Apparatus and Tanggu Salt Institutes to jointly conduct R&D to develop Type WYD Iodine Meter.

IV. Selection, procurement and installation of the equipment:

1. Organized overseas technical study tour to more than 14 packaging machine manufacturers and 2 salt production firms to evaluate technology of packaging machines for the final selection and procurement of most suitable machines for IDDC project.
2. Equipment Procurement and Installation:
 - 2.1 By using the World Bank credit, procured the equipment through ICB process. CNSIC prepared bidding document, organized bidding and evaluation of bids, identified the final bid awards.
 - 2.2 Completed absorption of technology from Italy for the manufacture of 0.5-1.0 kg retail packaging machine (Type II).

- 2.3 Through domestic competitive bidding process to procure the equipment by using domestic funds.
3. Organized the inspection and test of imported equipment as well as overseas training for the operation of such imported equipment.

Part VIII: Capacity Building of the Salt Industry

I. Achievement of the IDDC Project:

1. Build the capacity of production of 8 million tpy of iodized salt, improved iodized salt quality, ensured adequate supply of quality iodized salt in China from 3 million tpy in 1995 to more than 7 million tpy in 2000, make great contribution to IDD elimination effort in China.
2. Upgraded equipment in China's salt industry: Upon completion of IDDC project, China's salt industry basically realized the mechanization of iodizing and bulk packaging, while for retail packaging, 50% of capacity realized mechanization. Retrofitted 55 salt production lines, constructed warehouses for iodized salt and workshop buildings, improved the production and storage conditions. Also, improved the salt quality supervision and testing stations at provincial levels, established information systems of China's salt industry, significantly upgraded equipment level of China's salt industry.
3. Upgraded management level of salt industry: As mechanized production process of iodizing and packaging, requires management method of production and sales of iodized salt be improved accordingly. Hence, CNSIC organized training program at national, provincial and enterprise level for more than 8000 personnel's in the areas of management of iodizing, production and packaging technology as well as management knowledge. During the implementation of the World Bank financed IDDC project, CNSIC learned the extensive international and the World Bank project implementation and management practice and experiences to direct the engineering construction and enterprises management. The establishment of Salt Industry Information System and quality supervision network has greatly upgraded information management level of salt industry in China.
4. Increased production and improved quality of iodized salt, and met with the demands for IDD elimination: By the end of 1995, all the provinces and autonomous region, except Tibet, realized salt iodination. The supply of iodized salt from 3.3 millions in 1993 increased to 3.63 tpy in 1994 and in 1995, realized salt iodination nationwide of 5.39 million tpy. Such achievement has been continuously consolidated and increased consecutively in 1996, 1997, 1998 and 1999, realized 6.05 million tpy, 6.2 million tpy, 6.5 million tpy and 6.67 million tpy respectively. According to the random sampling test to salt production and sales enterprises by China National Technical Supervision Bureau, quality rate of iodized salt has been improved from 50% in 1993 to 94.14% in 1999, and the supply of iodized salt from 50% of the planned target to 98.2% in 1999. In addition, CNSIC gradually shifted salt iodizing from sales side to production side; all iodized salt is supplied with retail package.
5. The employment of iodizing machine improved the quality of iodized salt from 94% to 98%. Iodine losses during iodizing process is reduced to less than 5%, national average savings of iodine consumption is around 10%, which is equivalent to 8 million Yuan, about 50% of the capital investment of the iodizing machines. Besides, to meet the requirement of 0.5 kg retail packaging machines, CNSIC has increased granular degrees and reduced salt powder concentration of the salt; hence, salt quality is increased.
6. Satisfactory performance of 50 kg bulk packaging machines: For instance, 50 kg bulk packaging machines in Leshan Salt Plant in Sichuan, not only reduced the labor load, but also reduced financial losses caused by inaccuracy of baseline weighing scales. The error was reduced from 500 g to 50g for each bag of 50 kg; the saved amount is more than 100,000 Yuan, which means the investment for bulk packaging machines is recovered in about 2 years.

7. The employment of 0.5 kg retail packaging machine, reduced labor load, improved working conditions, increased accuracy of the weight, improved hygiene of the table salt, reduced broken rate of the package, so the loss of iodine is reduced. The cost of mechanized retail packaging is increased slightly, but selling price of the iodized salt is increased accordingly, so the investment can be recovered.

Part IX: Audit

1. 1997 World Bank IDDC Project Audit: In 1998, State Audit Administration (SAA) completed the World Bank IDDC Project Audit for 1997. Since there was no time to audit provincial project status, SAA issued audit report of "Refuse to comment".
2. 1998 World Bank IDDC Project Audit: In June 1999, SAA completed auditing work for the World Bank IDDC Project for 1998. SAA concluded that financial spending of IDDC project is basically accurate, and complies with relevant regulations. But SAA reserved their opinion for the financial statement of the project as follows:
 - 1) CNSIC reported expenditures is 659,880.21 DR less than monthly report of the World Bank disbursement compared with MOF account;
 - 2) IDDC project account of CNSIC should be improved, progress of the project in provincial levels are different, management system need to be strengthened;
 - 3) Other issues, such as project activities beyond the project budget, engineering project losses, idling of the equipment, etc. should be addressed.

CNSIC corrected the problems. The World Bank IDDC account management by CNSIC and provinces is strengthened; project activities of Hubei Province beyond the scope of World Bank IDDC funds are already picked out of the project account. Modification of iodizing machines is already completed, idle equipment is listed as spare, and the performance of imported retail packaging machines already reached the requirement of contracted conditions.

3. 1999 World Bank IDDC Project Audit: In June 1999, SAA completed auditing work for 1998 World Bank IDDC project, and concluded that expenditure of 1998 is basically correct, complying with relevant government regulations and provisions. But SAA issued the auditing report as "reserve opinion" type, which refers to expenditure of 497,000 Yuan by Dingyuan Salt Mine; Anhui Province has no reliable supporting receipt. Although such expenditure does not use the World Bank credit, IDDC Project Office of CNSIC urged Dingyuan Salt Mine to provide receipt. Since the project in Dingyuan is close to completion, the World Bank will ask for the result of response to SAA's audit report.

SAA audit report also pointed out that the expenditures listed in various financial reports of CNSIC are consistent, but not consistent with the progress report submitted to the World Bank. The reason is that the progress report to the World Bank is an instant report prior to final year-end financial summary report in which the figures are adjusted with the summary of actual spending. CNSIC will improve the accuracy of the report to the World Bank. Besides, carton packaging machines are already installed and commissioned at sites. CNSIC requests project beneficiary enterprise to set up a separate account for the World Bank IDDC project.

Part X: Support from International Community and National Organizations

- I. Support from the International Community: The rapid development of China's IDD elimination benefited from international support. International Council of IDD Control, WHO, UNICEF, UNIDO, UNDP and Micronutrient Initiative have provided support, which played a very important role for China's IDD elimination effort. UNICEF has played an important role in supporting testing and quality control of iodized salt; UNIDO, Dutch Government, Aksonobel Co. of Holland

and Spanish Government, also provided valuable financial and technical support for China's IDDC project.

1. Assistance from UNICEF: UNICEF has financed China's IDDC project for many times, financed overseas training in the United States, study tours to Europe and United States for iodizing and packaging equipment and process, participating international IDD elimination conferences and workshops. UNICEF also financed key intervention project to eliminate IDD in 8 provinces, financed network construction and training as well as study of Tibet IDD status. UNICEF constantly work with Ministry of Health, to publicize and educate the importance of iodized salt for IDD elimination, played important role in enforcement of salt concession (or monopoly), raised public awareness and consciousness of using iodized salt as well as popularization of iodized salt supply.
2. Assistance from UNIDO: UNIDO sent IDDC experts to China many times, provide technical exchange and support to China's IDDC project. TA project from UNIDO including establishment of Information Network of Chinese Salt Industry, development of office automation, computerization and modern accounting system as well as application of modernized iodizing and packaging machines, organize Chinese salt expert to participate in the training courses in Alksu Co. and attend World Salt Conference.
3. Assistance from WHO and Australian Government: Provide technical support and lab equipment to salt iodizing plant in Lhasa and Changdu, Tibet, facilitated the significant progress of IDD elimination in Tibet.
4. Assistance from Spanish Government: By introducing Spanish technology and equipment of iodized salt, build a 50,000 tpy salt refining workshop in Tangu Salt Institute.

China's salt industry and CNSIC appreciate kind support and great contributions of international community to China's IDD elimination effort. We sincerely hope to keep such excellent cooperative relationship.

II. Support from National Organizations

1. Government attaches great importance to coordination among different departments with wide participation of general public for IDDC activities.
 - 1) Chinese Government attaches great importance to the health of Chinese people. In 1990, Chinese government ratified the World Declaration of Children's Survival, protection and development, set forth the target of IDD elimination. In September 1993, State Council convened Advocacy Meeting of IDD Elimination by the Year 2000 in China, and worked out the Plan of IDD Elimination by the Year 2000 in China, laid sound foundation for China's IDDC Project.
 - 2) In order to ensure the supply of quality iodized salt, step up the management of production and sales of iodized salt, State Council issued Document #13 (1994) in February 1994, decided to impose edible salt concessionary practice. State Council also has promulgated Management Provisions to Eliminate IDD by Iodizing Salt and Method of Salt Concession. These important regulations and provisions as well as relevant provincial regulations of salt industry, provided important legal framework for IDD elimination and salt industry management.
 - 3) IDD elimination work is a systematic engineering, concerning legal regulation, management system, production technology, marketing, social mobilization and quality control. Measures of salt concession and iodination, have been supported by State Development and Planning Commission (SDPC), State Economic and Trade Commission (SETC), Ministry of Finance (MOF), Ministry of Health (MOH), State Administration of Light Industry, State Family Planning Commission, All China Women's Federation, Chinese Association of Disabled Persons, Ministry of Education, Ministry of Radio, Film and Television, Ministry of Public Security, Industrial and Commerce Administration, Technical Supervision, Ministry of Railway as well as Ministry of

Communications.

- 4) In order to raise the awareness of general public for IDD elimination by iodized salt consumption, the Chinese Government designated every May 5th as the National IDD Elimination Day, launching education and publicizing campaign to publicize the harmfulness of IDD and function of IDD elimination by iodized salt, and whole society's awareness of IDDC and self protection to prevent IDD has been increased. Salt industry companies at various levels actively participated in the education campaign of IDDC Day. At the same time, during the process of marketing and sales of iodized salt, consumer education for IDD elimination, has achieved good result.

2. Successful Implementation of the Salt Concession

- 1) Streamline the management of the salt concession system: salt concessionary system, physical system is an important organizational guarantee. In past few years, CNSIC actively cooperated with various local government departments concerned, to streamline the management system of salt sector. Up to now, all 31 provinces, municipalities and autonomous regions in China have established provincial level salt administration and salt industry corporation. Prefectures, cities and counties also established corresponding salt administrations and salt companies. Hence, a nationwide systematic salt concessionary management system has been set up.
- 2) The core for salt concession is the "three-license management", namely, Production License of Edible Salt, License of Salt Wholesales, and License of Salt Transportation. CNSIC organized the salt sector to implement three-license management, issued 112 salt production licenses in whole country, 6037 whole-sale licenses and 140,000 salt transportation licenses. Meanwhile, adopt bi-annual license renew system. Some provinces also issued retail licenses for iodized salt, ensured adequate supply of quality iodized salt.
- 3) Step up the enforcement measures, to control and purify salt market. CNSIC established enforcement force of more than 25,000 staff in China, to protect consumer's legal interest, rectify production and sales of iodized salt. Since 1997, about 361,000 cases of violation have been handled, intercept various illegal salts of 694,000 tons and some 70 violators are punished by relevant Chinese laws.
- 4) Adopt "five-unifications", namely, unified management, unified planning, unified supply, unified financial accounting and unified levy of Iodized Salt Industrial Development Fund. CNSIC mainly focusing on unified planning, expand sales network and quality control measures, maintain the seriousness of state planning; hence guaranteed steady increase of iodized salt supply and sales. In some areas where illegal salt entering market significantly, CNSIC adopt the management measures of "sending the iodized salt to the consumers", helped to curb the illegal salt smuggling.
- 5) To strengthen salt concession, CNSIC launched annual check up campaign since 1997. Based on provincial self check up, CNSIC organized supervision mission composed by officials from SDPC, Railway, Communication, Technical Supervision, Administration of Industry and Commerce, visited various provinces and salt production, transport and sales enterprises, carefully checked three licenses, reviewed salt concession implementation, got clearer understanding of salt concession implementation status of China.

Part XI: Project Impact to China's IDD Elimination Effort. CNSIC, in coordination with Ministry of Health, has been monitoring the impact of iodized salt through completed quality control and monitoring system and management method of CNSIC system, ensure quality of the iodized salt during production; sales firm tightened quality control over the process of iodized salt purchase, out of warehouses to ensure the quality iodized salt get into market. Salt enforcement forces stepped up the supervision and crack down of illegal salt smuggling into market. All these measures cleaned the salt market, which is the foundation of IDD elimination. The Health departments also conducted monthly check up to production firms, sales firms, retail points as well as households, which facilitated improvement of iodized salt. According to

bi-annual survey result by health department, following data are obtained:

I. Iodized salt coverage, goiter rate and urine iodine concentration in 1995: According to survey and analysis of National IDD status, quality rate of iodized salt of the household among 25 surveyed provinces was 39.9% (based on the index of iodine concentration no less than 20 ppm), children's median urine iodine concentration reached or exceeded 100 mg/l were 24 provinces, provinces of urine iodine less than 100 mg/l are: Shanghai, Guangdong, Jiangsu, Hainan and Tianjin. Total goiter rate (by palpation) was 20.4%.

II. Iodized salt coverage, goiter rate and urine iodine concentration in 1997: According to survey and analysis of National IDD status, supply rate of iodized salt accounted for 94% of the total demands, quality rate of iodized salt of the household was 81% (based on the index of iodine concentration is no less than 20 ppm), children's urine iodine concentration (middle figure) reached or exceeded 100 mg/l by all provinces (except Tibet). Total rate of goiter rate (by palpation) were 10.86% and 9.61% (by ultrasonic) respectively. Other measures such as provide iodine pill to special groups to supplement their iodine need.

III. Iodized salt coverage, goiter rate and urine iodine concentration in 1999: Survey and analysis of National IDD status by health department, supply rate of iodized salt accounted for 93.8% of the total demands, quality rate of iodized salt of the household was 88.9% (based on the index of iodine concentration is no less than 20 ppm), children's urine iodine concentration (middle figure) reached or exceeded 100 mg/l by all provinces (except Tibet) with the average figure of 309 mg/l. Total rate of goiter rate was 8.8% (by both palpation and ultrasonic). Health education and popularization have been improved. "Iodized Salt is one of measures to ensure the IDD elimination in China" for such achievement

IV. Joint Appraisal in June 2000. The Ministry of Health, State Administration of Light Industry, Ministry of Education and other government functionaries conducted joint appraisal mission to all 31 provinces of China, and concluded that:

1. Seventeen provinces and municipalities that realized IDD elimination target are: Beijing, Shanghai, Tianjin, Heilongjiang, Jilin, Hebei, Henan, Shanxi, Shandong, Anhui, Jiangxi, Hubei, Hunan, Jiangsu, Zhejiang, Guangdong and Guangxi.
2. Seven provinces and municipalities that basically realized IDD elimination target are: Liaoning, Inner Mongolia, Ningxia, Shan'anxi, Fujian, Yunnan and Guizhou.
3. Seven provinces and municipalities that NOT realize IDD elimination target are: Tibet, Xinjiang, Gansu, Qinghai, Chongqing, Sichuan and Hainan. In terms of population of these seven provinces and regions, it accounts for 14% of the total population of China.

Based on such survey and appraisal result, Chinese government can declare to international community that China has already realized China 2000 IDD elimination target.

Part XII: Sustainability of the Project. To materialize the major measures of salt iodization, it needs unremitting effort. The evaluation result in 2000 shows that China has basically achieved IDD elimination target by 2000. But due to the vast territory of China and uneven economic development between regions, there are 7 provinces (municipalities and autonomous regions) or 325 counties that are still not yet realize the IDD elimination target in 2000, current status of IDD elimination in some of these seven provinces, either with large salt lakes, poor economic development or in southern coastal area, are still have big gaps with the planned target set forth by central government.

Therefore, continuous effort for IDD elimination should be made despite realization of national IDD elimination target in 2000 from country's point of view. To consolidate the achievement, sustainable IDD elimination mechanism should be established with suitable measures, to popularize the supply of iodized

salt in those regions and provinces of serious IDD status. As for those provinces and regions where IDD elimination target is already met, effort should be continuously made to sustain IDD elimination. Hence, the next step of work to sustain IDD elimination in China is as follows:

1. All staff of China salt industry, under the leadership of government of various levels, working closely with relevant departments, social organizations, to undertake tasks of supplying quality iodized salt to Chinese people.
2. Maintain the Salt concession system. In some provinces where salt concession is not yet fully established, should work out the salt concession regime as soon as possible. Strictly follow government planning to produce and supply iodized salt with major effort focusing on implementation of iodized salt sales planning and retail selling network construction.
3. Strengthen the management of “three-rates”, namely, rate of realization of planned sales target of iodized salt, quality rate of iodized salt, and coverage of iodized salt in the market. All three rates should exceed 95%. Step up the quality control measures of iodized salt, especially to toughen the quality control and supervision measures in wholesale enterprises.
4. Step up law enforcement, crack down on illegal salt and fake salt business to prevent it entering the market. In line with regulations of Salt Concession and other relevant laws and regulations, reinforce the capacity of salt administration and enforcement task forces, implement inter-provincial joint enforcement and supervision campaign. strike harder to illegal salt, and clean and regulate the salt market. At the same time, continue awareness education to consumers, to increase iodized salt coverage.
5. Streamline the salt industry, close or convert some small salt production firms, or those firms at unreasonable locations, adjust or reduce some of the raw salt production, so that the salt production will be determined by sales to keep balance between production and sales.
6. Set up CNSIC Equipment Company, to undertake centralized procurement of spare parts for imported equipment, establish spare parts inventory and service center, to ensure smooth operation of imported machines.
7. Continue close cooperation with international organizations, further improve technology and equipment for iodizing and packaging so as to provide sounder material basis for IDD elimination effort.

Part XIII: Experiences and Lessons Learned from Project Implementation

I. Experiences:

1. The implementation of the IDDC project has been successful and achieved projected target. But progress has been somewhat delayed mainly due to longer period of technology transfer, conversion and absorption.
2. The role of the World Bank is smooth, played key functions of facilitation to the project.
3. The successful establishment of ISIDF has greatly helped in availability of domestic counterpart funding for the project implementation. It lays sound foundation for the development of salt industry and further investment for IDDC project.
4. The availability of loans from the State Development Bank ensured central government counterpart financing for the project.
5. Project enterprises consider the participation of IDDC project, in production, packaging and sale of iodized salt are pre-conditions of the survival and development of their enterprises. Meanwhile, Chinese salt industry has undertaken the social responsibilities and social benefit of IDD elimination, and actively allocate self financed portion of the project component, to ensure the smooth implementation of the project.
6. Support and financing from international organizations catalyzed project formulation and implementation, especially in the area of quality control of iodized salt production and sales,

network construction and provided a strong voice in education and media campaign, has contributed greatly for the project.

7. Collaboration between salt industry and health department is the key to the successful implementation of the project. Health department has played important role in strengthening the iodized salt quality supervision and monitoring, as well as increasing the coverage of iodized salt. Health department also actively educate and publicizing the health significance of iodized salt consumption to general public.

II. Problems or lessons learnt:

1. Due to higher requirement to the project management and complicated procedures of the World Bank project management, staff of Project Management Office (PMO) of salt industry could not get used quickly, causing some delay in progress.
2. Underestimation of the complexity of technology transfer, delayed progress. During the process of technology transfer, two original prototypes of retail packaging machines were installed first; after trial run, CNSIC and Tianjin Factory prepared comments and suggestions for revision, convinced that with these revisions, the machine will be suitable for Chinese salt industry. Then went through all procedures of signing the contract, endorsement from the World Bank, supplier provided technical document and drawings, training, import key component, digest the technical document and drawings for manufacturing of the machines, prototype testing and commission, and formal production of 100 retail packaging machines as well as site installation and commissioning.
3. Some enterprise in developing regions of China with poor technical capacity and backward management, delayed the implementation of the project.

Part XIV: Conclusions of and Comments on the Project Implementation

- I. Comments on the project by International Workshop 1998: In October 1998, the International Workshop on China IDD Elimination Strategy, emphasized that the salt concession is a major measure of the success of China's IDD elimination effort. Through the project implementation, Chinese salt industry has undertaken a great deal of work, made significant achievement for IDD elimination in China, and such achievement is also of demonstration significance to global IDD elimination effort.
- II. Summary of China IDD Elimination 2000 and Re-advocacy, October 2000, emphasized that consumption of iodized salt is a fundamental measure for IDD elimination. At this conference, UNICEF awarded "Global Contribution to Children of The World". Afterwards, UNICEF organized UN agencies and other international organizations to participate in a workshop, introduced to them in detail the achievement made and experiences gained by Chinese salt industry in past few years. All participants of the workshop agreed that iodized salt is the key to the success of IDD elimination. China has made great progress in salt production, iodizing and popularization of iodized salt supply, and iodized salt production capacity is over 8 million tpy which laid sound foundation for IDD elimination by iodized salt. Achievement made by Chinese salt industry filled whole nation with joy.
- III. National Evaluation made in June 2000 concluded that 24 provinces of China with 86% of total population in China has materialized the IDD elimination target, and Chinese government declared that the target 2000 for IDD elimination has been met. This is the result of IDDC project implementation.
- IV. Actual achievement of the project accounts for 100% - 110% of the project plan, ensured quality and quantity of iodized salt supply to the nation.

- V. Future Efforts. It is suggested that Government continue the support and investment for IDDC project and further strengthening of international cooperation, to retrofit the iodizing equipment, increase 2 to 3 million tpy of retail packaging capacity, so as to realize the complete mechanization of retail packaging of iodized salt in China.
- VI. This IDDC project has achieved great social and economic benefit.

Attachment 1. List of Supporting Documents

1. Compendium of Advocacy of National IDD Elimination Program (NIDDEP 2000), October 1993.
2. Activities on National IDDC Day, since May 5th, 1994.
3. The National IDD Elimination Program (NIDDEP), August 1994.
4. Approval of IDDC Project Proposal by SDPC, No. SDPC/NCLI[1994] 1183, September 5, 1994.
5. The Management Provision of Salt Iodization and Eliminate Iodine Difficiency, October 1, 1994.
6. CNSIC's Project Proposal of IDDC Project Proposal submitted to the World Bank (draft), November 10, 1994.
7. Iodized Salt and IDDC, Training materials, edited by Salt Industrial Department, Tianjin Light Industrial Institute, February 1995.
8. SDPC's Approval on IDDC Project Feasibility Study, No. SDPC/NCLI [1995] 199, February 25, 1995.
9. Agree to submit the legal assurance document for the IDDC Project Implementation to the World Bank by NCLI/CNSIC, No. [1996] 14, March 3, 1996.
10. Onlending Agreement between MOF and NCLI/CNSIC for IDDC Project, January 8, 1996.
11. Method of State Controlled Salt Industry, May 27, 1996.
12. SDPC approval of Commencement of IDDC Project and Capital Investment Plan of 1996, No. SDPC (Investment) [1996] 2453, October 20, 1996.
13. The Impact of S & T Achievement and IDD Elimination in China during the 9th Five Year Plan Period, March 15, 2000.
14. Summary of National IDDC Project Achievement and Readvocation, October 27, 2000.

Additional Annex 11. UN Agency Programs

Programs for Elimination of Iodine Deficiency Disorders in China Summary of Contributions of the UN Agencies

This section summarizes the contributions made by UNDP, UNICEF, WHO and UNIDO to IDD control in China, both before and during the National IDD Elimination Program, as well as specific support given to the IDD Control Project. (Please refer also to Section 10 of the main ICR text.)

A. UNDP Contribution to the IDD Elimination Programme in China

- In 1991, the IDD programme (CPR/91/434) was formulated as joint programme cooperation between the Government of China, UNDP, UNICEF and WHO, with the overall objective to support the elimination of IDD in China by the year 2000. Starting implementation in 1993 the project was completed in 1996. A comprehensive evaluation of this joint first cycle IDD elimination programme was conducted in 1996. Total UN agency inputs were US\$1.96 million including \$1.29 million from UNDP; \$576,500 from UNICEF and \$89,000 from WHO.
- The design of the project included plans, through high level multisectoral advocacy, to build on the international and national commitments to bring greater awareness of the nature and extent of the IDD problem within China and among potential donors and investors. This was primarily accomplished through the National Advocacy Meeting to Eliminate IDD in China by the Year 2000, held in September 1993.
- The National Advocacy Meeting for IDD was the first major programme activity of CPR/91/434 and engendered high political support for a National IDD Elimination Programme (NIDDEP) in China. For the first time the salt industry was recognized as a key player in the NIDDEP with the crucial job of supplying the main programme intervention, iodized salt.
- While formulated as a multisectoral programme, assistance under CPR/91/434 was mainly directed towards the Ministry of Health (MOH) as the key counterpart agency to support the NIDDEP in the areas of communication, advocacy, surveillance, training, R&D and technical assistance, with the national programme director (NPD) located in the National Office for Epidemic Disease Control, MOH. With World Bank support targeting the national salt industry as a main player (through upgrading of salt production facilities and provision of salt iodization and packaging equipment), this approach complemented the UNDP/UNICEF/WHO project. Both projects were regarded as part of the NIDDEP.
- In 1995 an MOU was signed between the World Bank and UNDP, UNICEF, UNIDO, WHO to coordinate assistance of the respective agencies relating to the NIDDEP and to advise each other of matters concerning the NIDDEP and other matters of common interest. UNDP played an important role in convening and chairing the coordination meetings initiated under the MOU.

- There is an interagency consensus that the UNDP supported project CPR/91/434 was instrumental in bringing about a comprehensive multisectoral approach for universal salt iodization in China (in contrast to targeted interventions concentrating on problem areas) and mobilizing the necessary international and national support for a concerted approach. Notably, it is felt that the joint UNDP/UNICEF/WHO programme paved the way for the World Bank to join the original UN partners in their support of the NIDDEP and initiate the World Bank supported IDD Control project. In this sense, the joint UNDP/UNICEF/WHO project may be regarded as the forerunner of the WB supported project.

B. Progress Report on IDD Elimination Project of GOC-UNICEF Cooperative Programme.

UNICEF contributed to an UN-wide effort from 1990-1992 to advocate the cost-effectiveness of IDD elimination through salt iodization. The principle input was the hiring of a long-term consultant for IDD activities, and supporting visits of external experts to work with GOC. The first formal cycle of the China-UNICEF IDD elimination programme was initiated in the year 1993. The comprehensive evaluation of the first cycle programme was completed in 1996. The second cycle of the China-UNICEF IDD elimination programme was from 1996-2000. Starting in 1998, UNICEF also provided direct support to the China National Salt Industry Corporation (CNSIC) to improve salt quality monitoring at production, and iodized salt distribution and marketing.

The overall goal of the programme is virtual elimination of IDD by the year 2000 in China and setting up a mechanism of continuous elimination of IDD. The strategies for achieving the goal are to strengthen social mobilization, promote health education, reinforce coordination and management, energize preventive activities, support personnel training, intensify surveillance and improve quality assurance for iodized salt.

1. **Advocacy, Social Mobilization and Health Education.** In 1993 a national advocacy meeting was held in Beijing and during that time firm commitments were given by Premier Li Peng and Vice Premier Zhu Rongji to the National Program for Elimination of IDD in China. In addition, legislation was enacted for universal salt iodination as the means to achieve eradication of IDD. "The National Programme of Iodine Deficiency Disorders Elimination in China by the Year 2000", and the "Regulation on Edible Salt Iodization as a Means to Eliminate IDD" were approved by State Council in 1994, setting up a mechanism for virtual elimination of IDD with the efforts of different government sectors and society.

An Exhibition of large photos on IDD control, named ALERT was held in the China Revolution Museum at the end of 1996. National IDD Control Day identified as mass campaign of IDD health education. IEC material was developed and disseminated to primary school and public. An International Workshop for the Strategy of IDD Elimination in China was held in Beijing, in October 1998; and in October 2000, a re-advocacy meeting was held, also in Beijing to celebrate the USI goal reached for nation as a whole by 1999 and to mobilize further political support and commitment.

2. **Conducting National epidemiological survey on IDD and establishing national surveillance system of IDD prevalence and iodised salt.** The first national survey was conducted in 1995. According to the national plan of IDD surveillance, the National IDD survey was conducted in 31 provinces and regions supported by UNICEF. In line with the Nation IDD Surveillance Plan, each province acted as a basic unit. The unified methodology of PPS (full*) was utilized and each province chose 30 counties as samples. All the data of indicators for assessing IDD status including clinical and biochemical and monitoring were collected. The second national survey was done in 1997 and the third in 1999. The data showed household use of iodized salt increased from 39.9% in 1995 to 89% in 1999. In addition, the prevalence of goiter (total goiter rate in school children, 8-10 years of age) was reduced from 20.4% to 8.8%.

Table I. Comparison of IDD Elimination Indicators of the Three Surveys

Major Indicators for Assessing IDD Status	1995	1997	1999
Quality Iodized Salt Coverage at Household Level (≥ 20 mg/kg)	40%	81%	89%
Median Urinary Iodine (ug/l)	164	330	306
Prevalence of Goiter	20.4%	10.9%	8.8%

In-depth monitoring and surveys were conducted in problem provinces. According to data analysis from the third National TDD Survey in 1999, eight provinces in where the coverage of iodized salt was less than 80% at household level were identified as high-risk provinces. Intensified monitoring of iodized salt was also supported by UNICEF in all counties of these provinces to map the high risk counties and find the reason of non-iodized salt consumption. The results of this intensified monitoring were used to design the interventions in these areas to increase the coverage of iodized salt.

3. **Laboratory monitoring system.** This effort supported the establishment of an IDD laboratory for each province and a National IDD Reference Laboratory. UNICEF and AusAID provided assistance for the establishment of a National IDD Laboratory Network. The objective is to establish a scientifically reliable, long-term functional surveillance system for nation wide IDD monitoring. This surveillance system includes 3 components:

- A. Samples collection network;
- B. Laboratory network, including health and salt industry laboratories, research capacity building, technical support and services, and standardizing of national methods;
- C. Information management and reporting network: this network will be connected with the network in MOH.

Fourteen new project provinces were selected in addition to the ten provinces of the first cycle. Total 24 provincial IDD labs have the capacity of TSH test and test of urinary iodine level and all prefecture IDD labs have the capacity of urinary iodine (UI) test and salt iodine test.

4. **Set up routine iodized salt monitoring system and reporting network.** Technical and equipment support provided for provincial IDD Control Center to formulate the routine reporting system.

5. **Personnel training and overseas experience exchange.** Training of IDD management and technical personnel at provincial, prefecture and county levels has been carried out every year. Laboratory technicians at NRL and provincial levels were sent to Australia and USA. Some teams visited Thailand, Indonesia to learn experience outside and joined international conference.

6. **Funding input.** From 1993 to 2000, UNICEF input US\$7,844,000 mainly used in supply such as transportation, computer, lab equipment and non-supply supporting mentioned above for supporting IDD programme in China.

Although great progress toward IDD elimination has been made in China, there are still eight provinces where iodized salt coverage is less than 80%. UNICEF will continually cooperate with China Government to support IDD elimination programme in the new cycle of cooperation. The advocacy program will continue to promote USI at province level. Integrated intervention of IDD in high-risk areas, especially western provinces and coastal provinces. Through the approaches of strengthening intensive management and comprehensive interventions such as health education, to improve people's awareness of IDD, increase the coverage of iodized salt at household level to reach the 90% target for all parts of China.

C. **WHO Contribution to IDD Elimination in China**

A major programme for the elimination of IDD in China was completed in 1995 with UNDP, UNICEF and WHO funding the project. A positive evaluation of the first phase of the national action plan in China revealed progress in achieving the targets. This prompted the development of another plan, finalized in 1997, to implement the second phase.

Under the 1996-97 regular budget, WHO provided the Government of China total funds of USD287 769 for policy workshops, technical support of consultant in the finalization and operationalization of the second phase of the national IDD programme, training on methods of programme evaluation, fellowships on laboratory techniques. technical support of consultants for the establishment of a national reference laboratory for IDD monitoring and surveillance and for logistical support in the form of laboratory reagents and computers. In 1998-1999 further financial support was provided to China in the form of training courses to improve national capability in the IDO programme management and evaluation. Fellowships were also granted to deserving programme officers. Computers and a vehicle were provided to strengthen data management. A workshop to standardize IDD surveillance methods was also held with WHO financial support.

In 1999-2000, with the help of consultants and partner institutions, WHO developed a proposal for the elimination of IDD in Tibet. This was submitted to AusAID and funded for a three-year period, for 1.25 million US\$. The project was launched in May 2000. An additional contribution has been obtained from AusAID, to strengthen the health promotion component and sustainability of the project, and the monitoring/evaluation component, through additional laboratory support. WHO has also contributed additional funds for the training component in 2001. The Institute of Clinical Pathology and Medical Research (ICPMR), Westmead Hospital, Australia, is responsible for the provision of technical assistance, project direction and external

coordination through its Project Coordinating Committee.

In Tibet, IDD is still a problem of severe proportions, with goiter rates ranging from 30% to 80%, very low urinary iodine (25-60 ug/l) and an average IQ in children of only 85 points. A large number of Tibetan children suffer from serious intellectual impairment as a consequence of iodine deficiency. The programme has several components, including health education and health promotion: production and distribution of iodised salt; delivery of iodised oil capsules (IOCs) to women of reproductive age (WRA) and children under two years; quality assurance for iodised salt; strengthening of laboratory capabilities; monitoring and evaluation; management support and coordination.

The programme has made a very good start. Eight Tibetans, representing 5 sectors, have been trained in health education. Training courses on the distribution of IDD have been conducted and the distribution of IOCs has started. The suitability of salt produced at a site in Eastern Tibet has been investigated, to decide if a salt iodation plant should be established in this location. A quality control laboratory has been set up in the Lhasa salt factory to monitor the quality of iodised salt produced. Pilot iodised salt monitoring programmes for schools and households have been developed and will be conducted in 4 sites in 2001. Almost all the equipment required for the project has been purchased and delivered. Project managers and laboratory managers have been trained. A baseline epidemiological survey was completed before starting the distribution of IOCs.

Workshops on IDD were also conducted in other provinces of China during 2000. WHO is collaborating with CDC, Atlanta, UNICEF, PAMM, the MI, and other agencies and institutions in establishing a global network of reference and resource laboratories on IDD. This will help countries implement good quality assurance programmes in the laboratory testing of iodine levels in salt and urine, to monitor the effectiveness and efficiency of IDD prevention programmes. China's National Reference Laboratory on IDD, established with support of UNICEF, WHO and ICPMR (Australia), is a good model for other countries to consider.

D. UNIDO Technical Assistance to the World Bank supported IDD Control Project

With expansion of the original UNDP, UNICEF and WHO-funded project (CPR/91/434) into a NIDDEP plan in 1993/44, UNIDO became involved due to the plan's new interventions vis-à-vis the salt industry. The original intention was that UNIDO would provide technical assistance (TA) to the World Bank's loan program geared towards CNSIC and the salt research institutes in Tianjin and Zigong. UNIDO work started in 1994 and 1995 with special industrial service (SIS) funds, and cost-sharing with UNICEF and CNSIC, and included a comprehensive study tour of Chinese officials to Mexico, USA and Europe followed by international TA in iodization, packaging and storage technologies, data information systems and quality standards. After this financial limitations prevented synchronization with the project work program for a couple of years. However, a contribution from the Netherlands of US\$455,000 enabled UNIDO, together with the Dutch company Akzo Nobel, to complete the intended TA to CNSIC in the 1999-2001 period. The objectives and achievements of UNIDO's activities in the China NIDDEP have been:

Purpose (Immediate Objective 1): To enhance the capacity of CNSIC in planning, managing

(administratively and financially) and monitoring the production and distribution of high quality iodised salt, and specifically, in performing the following functions and activities:

- advising on the proper transfer of technologies, including iodisation and packaging;
- assisting in meeting the quality standards as required by the health authorities,
- identifying needs and advising industry and small scale producers;
- advising on appropriate quality of packaging, storage and distribution (bulk and retail)

Purpose (Immediate Objective 2): To strengthen training and R&D programmes in selected institutions in order to provide support to production and iodisation units in the fields of iodisation, packaging and storage stability and analytical techniques as well as to provide modern training opportunities.

Achievements:

Improved and operational capacity established, enabling CNSIC to:

- coordinate with various salt producers in the country to keep track of supply/demand;
- provide necessary technical advice to various salt companies through provincial salt companies;
- keep close interaction with clients (the distribution centres) concerning required amount of salt, and especially, in trouble shooting exercises;
- collaborate with R&D institutions on research projects for developing and adapting appropriate salt technology, packaging and distribution;

Upgraded and strengthened research capability at the Salt Scientific Research Institute at Tianjin, to carry out R&D work on:

- effects of various forms of packaging on the loss of iodine;
- iodine stabilisers in iodised sea and lake salt (washed salt)
- simplified and rapid analytical methods to trace iodine in washed salt.

Upgraded and strengthened research capacity at Zigong Design and Research Institute, to carry out R&D work on:

- iodisation processes: a. Impact of various ingredients in edible salt on the iodine stability in iodised salt; b. Iodine stability in iodised salt using different stabilisers; c. Iodine stabilisers for vacuum salt.
- position and form of automatic iodisation equipment
- the sulfur dryer in relation to the mixing effect of iodisation and loss of iodine
- industrial chemical analysis

Upgraded and strengthened capacity at Department of Salt Engineering, Tianjin University of Light Industry (TULI) to undertake R&D work on

- iodisation process
- automatic iodisation equipment: a. Iodisation position and form; b.

Standardisation of equipment for iodized salt production

- rapid analytical methods for iodine determination and packaging materials
- industrial chemical analysis

Additional Annex 12. Executive Summary

China Iodine Deficiency Disorders Control Project - Implementation Completion Report

Executive Summary

Background. Iodine deficiency has been a major scourge in China for thousands of years, and there is a history of efforts to prevent and control the serious physical deformity and mental retardation (cretinism) which, with thyroid enlargement (goiter) are the hallmarks of this condition. In the early 1940s goiter was found to be endemic in 39 counties in Hunan province and in the Chengdu area. Studies in the 1960s showed over 15% of school children in several provinces were severely retarded. Overall it was estimated that 50% of China's population lived in so called endemic iodine deficient areas. New studies in the 1980s, in China and elsewhere, revealed a broader range of iodine deficiency disorders (IDD) and showed that even mild deficiency has effects on mental development, with shift to the left of IQ distribution curves of 10-15 points in affected populations, resulting in reduced productive capacity for very large numbers of people. This understanding brought a change in approach to IDD prevention from targeting endemic areas to protecting the entire population, and the most cost effective intervention for this mass approach was shown to be the fortification of edible salt with iodine.

In 1990 China participated in the World Summit for Children and then ratified the World Declaration of Children's Survival, Protection, and Development, which set a mid decade goal of universal salt iodization and aimed to eliminate IDD by year 2000. Chinese experts and leaders, with assistance of international agencies, then developed the National IDD Elimination Program (NIDDEP), which was launched at the National Advocacy Meeting in September 1993, with leadership of the State Council. The NIDDEP is a comprehensive multi-sectoral nationwide initiative covering: organization and advocacy; health education; legislation; program planning and review; monitoring and surveillance; technical support and international cooperation; scientific research; and improved supply of iodized salt.

The Government of China requested World Bank assistance with improving the capacity of the salt sector to provide sufficient iodized salt for the country, as a central strategy of the NIDDEP, and at the same time passed laws and regulations mandating iodization of all edible salt, setting a new price for quality iodized salt, and levying a proportion of salt producers' revenue for a reconstituted Iodized Salt Industry Development Fund (ISIDF). Regulations for licensing of production, packaging and transportation of salt were also strengthened. The Bank agreed to the Government's request to confine its assistance to the salt industry, on the basis of support by other UN agencies to the complementary activities of the NIDDEP, and the Government's commitment to ensure that these activities would be carried out. A memorandum of understanding was signed by the World Bank and four UN agencies to confirm the coordinated arrangements for international support of the NIDDEP.

Project Objective and Scope. The project's development objective was to help reduce the incidence of IDD in China through improved production, iodization, packaging and distribution of iodized salt. The project's scope and activities were designed as part of a master plan for

rationalizing and upgrading of the salt industry which involved consolidation of production and iodizing units, reducing excess and inefficient capacity through closing smaller units, installing modern machinery for iodizing and packaging salt, and improving project management and management information systems. Within the project the Bank funded the foreign exchange costs of equipment, including technology transfer for manufacture of retail packaging machines, training and management support, as well as a limited program of technical assistance in information systems and project management.

While the physical elements of the project were straightforward and the technology involved was quite simple, the project overall was complex and demanding due: to its wide scope, covering over 200 enterprises in all provinces; the in-country financial mobilization required; the coordination of support from UN and other international agencies; and also the rapid changes occurring in the economic and organizational environment, which presented both challenge and opportunity for industry reform. Because of this complexity, great effort was made by all parties to ensure the project's financial, organizational and technical readiness. The Government provided a very strong enabling environment for the project through the overall NIDDEP and the UN agencies provided both general support and specific technical assistance in preparation and early implementation.

The project was prepared during 1994, appraised in February 1995 and approved by the Board of the Bank in June 1995. The mid term review was conducted in May 1998 and the project closed in December 2000, which was two years later than originally scheduled. The performances of the Borrower and the Bank were rated satisfactory throughout the project; the performance of the implementing agency (CNSIC) was rated highly satisfactory during preparation and satisfactory during implementation.

The final project installed cost was \$101.83 million equivalent (93% of the appraisal estimate) and the final total project financing required was US\$118.8 million equivalent, or 78% of the appraisal estimate. The Bank's contribution was an IDA credit of US\$ 17.29 million equivalent, or about 15% of the final project cost. An IBRD loan of US\$ 7.0 million equivalent was also included in the Bank's assistance but was canceled in 1998 due to savings in procurement, especially for packaging equipment. The Credit was onlent by the Ministry of Finance to the implementing agency (CNSIC). Counterpart funding was provided from the ISIDF, the State Development Bank of China, and from the participating provinces and enterprises, some of whom borrowed from local banks.

Project Outputs, Outcome and Impact. The achievement of project outputs and outcomes are both rated as Highly Satisfactory. All the physical targets were met or exceeded and the technology transfer was successful. The production of quality iodized salt in China rose from about 3 million tons per year in 1995 to more than 6.7 million tons per year in 1999, which was 98% of the target. The proportion of households in China with adequately iodized salt rose from 39.9% in 1995 to 88.9% in 1999 (and estimated to have reached 93% in year 2000), and the percentage of school children 8-10 years with low urinary iodine declined from 13.3% to 3.3% in the same period.

Table 4a. Outcome/Impact Indicators

Indicator	1995	1997	1999
1. % households consuming quality iodized salt. (20 ppm or over)	39.9	81.1	88.9
2. % school children 8-10 years with enlarged thyroid (measured by palpation)	20.4	10.9	8.8
3. % school children 8-10 yrs with low urinary iodine (50 ug/L or less)	13.3	3.5	3.3

Source: Three national surveys conducted by GOC with international support
ug/L = micrograms per liter; ppm = parts per million

Through its contribution to the NIDDEP the project has had a significant health impact. The increased availability of iodized salt means that an additional 50% of China's families will benefit from reduced incidence of miscarriage and stillbirth, physical deformity and mental retardation caused by iodine deficiency. This is a great improvement, considering that IDD is the commonest cause of preventable mental retardation in the world and that at the beginning of the 1990s, China was estimated to have 40% of the world population at risk of IDD. In addition, it is estimated that children born into previously iodine deficient communities will have on average intelligence 10-15 IQ points greater than if they had not been protected. The enhancement of learning ability and productivity, and reduction of dependency and medical costs due to disability, will make an important contribution to social and economic development.

The project's overall impact on poverty reduction is rated as modest. The additional 50% of China's families now using iodized salt, with the benefits described above, include a large number of the poor and very poor and economists have concluded that the marginal productivity increase of improved health is likely to be higher for poorer than for richer households. On the other hand, the estimated 10% of households not yet consuming iodized salt are predominantly located in the poorer provinces and counties and were not reached directly by the project. However, the Government has made new plans to address these problem areas, and an important resource available for this effort is the ISIDF which was greatly strengthened as a result of the project.

The project had a substantial institutional development impact through: (a) the forging of intersectoral alliances under NIDDEP, in working to a common goal. The assigning of a central role to the salt industry stimulated its strong espousal and advocacy for the social goal of IDD elimination and gave it a new role in national and international arenas; (b) building the capacity of CNSIC, as the implementing agency, to manage complex projects, transforming its information management and monitoring capability and establishing support services for the industry in training, equipment and spare parts; and (c) catalyzing the restructuring of the old, fragmented, inefficient edible salt industry into a modern, efficient industry capable of delivering adequately iodized salt to meet all domestic demand.

Factors Contributing to Project Success. The following are the main factors that led to success of the project as well as the NIDDEP:

- strong foundation of scientific analysis of IDD in China which had been used to inform and persuade senior decision makers

- high level of commitment by all stakeholders through effective dissemination of IDD elimination goal and strategies to all sectors and levels.
- functional program management structures put in place with clear responsibilities and coordination arrangements, led by highest level of government
- salt supply given central role in the overall NIDDEP and a single agency within the industry made responsible for coordinating all salt industry activities and deliverables.
- comprehensive legal and regulatory regimes enacted and enforced, prohibiting manufacture and supply of non-iodized salt
- strong financial arrangements for funding of salt industry activities under the project, and related non-project activities
- early Bank technical dialogue for joint development of efficient and practical project design and implementation arrangements
- strong leadership, coordination and proactive approach by external agencies, especially the UN.
- technical and financial assistance to program interventions and project elements through local presence and representation
- competent project implementing agency that showed its ability to learn on the job.

Project Sustainability. The sustainability of the project achievement is considered highly likely based on continuation of the relevant success factors mentioned above and the enhanced viability of the industry resulting from the project. The commitment of all sectors and provinces was renewed in a Readvocy Meeting in Beijing in October 2000, at which the Government's seven point plan for IDD elimination in the next 15 years was presented, and those seven provinces with remaining low coverage of iodized salt made specific action plans, to be supported by UN, especially UNICEF. CNSIC has moved ex-project staff to this activity. The Government has also agreed to maintain the ISIDE, and the salt industry will pursue its rationalization with further reduction of excess capacity.

The main risk to sustained coverage of iodized salt at household level is considered to be presence of non-iodized salt in the market, presently estimated at 5-8% of total supply. The main contributing factors are: excess capacity, especially among small salt producers with very limited alternative employment; lack of consumer awareness or consumer preference for traditional alternatives; and the price differential between qualified and fake or substandard salt. A critical factor in long term sustainability will be strengthening of awareness and demand for iodized salt from household consumers. This will require both in-depth analysis of factors which constrain consumers from valuing or buying iodized salt, and professional communication and marketing initiatives to address those concerns.

Lessons for Other Countries. Each country has its own history and context in relation to the elimination of IDD. The experience of China highlights issues to be addressed in any successful program, although the balance of roles and emphasis in addressing them will vary. The following are the major conditions for success, and their relative importance depends on individual country contexts, such as whether the country is a major producer of salt, the type of ownership of salt enterprise, etc:

- the program should be based on sound analysis of the country's IDD status, including quantification of the negative impacts and social costs of IDD on population, to create awareness among leaders and develop top-level support for addressing the problem;
- market and social analysis is also needed to understand what constraints will need to be overcome in order to ensure consumer acceptance and preference for iodized salt
- advocacy to a broad range of stakeholders to mobilize them for IDD elimination
- develop and put in place a comprehensive strategy identifying all key interventions to be implemented concurrently, clear responsibilities for each, and coordination mechanisms led by a senior government authority which can give leadership to the other agencies, at least during the program implementation
- assign the salt sector a key role with full responsibility given to a single agency to coordinate actions to assure supply
- develop a set of indicators for monitoring implementation and impact with systems for periodic surveillance and reporting
- provide technical assistance and full financing of all interventions through local and international agencies
- institutionalize arrangements for agency and donor coordination

The Role of the World Bank. In China, the Bank was invited to support an important but specific and limited element of the overall IDD elimination effort, the supply side. The Bank's assistance has been successful because of the strong coordinated framework for all sectors provided by top Government leadership and by UN agencies. Bank was not the lead external agency, but became an important partner among the agencies supporting the Program. For the salt industry, the Bank was the largest external financier, but Bank funds were only 15% of the overall project cost. Technical and financial support from others was also critical to project progress and eventual success. The value of World Bank participation included the following: (a) adding weight and legitimacy to NIDDEP in dialogue with core non-health agencies (such as finance and planning), as well as in intersectoral coordination, and mobilization of provincial and local governments; (b) skills and experience in technical and strategic aspects of project design and preparation; and (c) provision of financial support which was helpful, especially for foreign exchange costs, but also improved the ability of enterprises to borrow from local banks.

Conclusion. The positive experience of the Bank's involvement in the project suggests that it should be possible to adopt a multi-sectoral approach, together with coordinated international support, to implement IDD elimination initiatives elsewhere, and also to address other micronutrient deficiencies. On a broader level, the project is an outstanding example of the achievement of a population health impact through primary intervention in a non-health sector. A critical success factor was the alignment of the social goal with the salt industry's own reform agenda and the leadership assumed by the salt sector in pursuing that social benefit. The role played by the health sector in scientific analysis, policy development, advocacy, coordination, community education and monitoring and surveillance can also be seen as a model for future action in other public health challenges which must be addressed through action in other sectors.

Annex 13: Government Letters

中国盐业总公司
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电话 (Tel): 86-10-63272165 Ext.; 传真 (Fax): 86-10-63272289; E-mail: CHINASAL@public.gb.com.cn

FAX TRANSMISSION

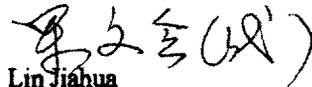
总页数(of pages):No: 1
收文传真(To fax No): +1-202-522 3394
收文人(Attn): Dr. Maureen Law, Sector Director, Human Development Sector Unit, East Asia and Pacific Region, the World Bank
抄送(cc): Mr. Zhou Yong, Ministry of Finance; Dr. Hao Yang, Ministry of Health
发文人(From): Mr. Guo Wenhui, China National Salt Industrial Corporation (CNSIC)
日期(Date): June 27, 2001
发文内容(Subject): China IDDC Project Implementation Completion Report (ICR)

Dear Dr. Maureen Law,

After several rounds of discussions and revision between CNSIC and the World Bank for the Implementation Completion Report (ICR) of China Iodine Deficiency Disorder Control Project, we think that the final version of the ICR you have sent to us, are objective, informative and comprehensive, summarized the good experiences and lessons learnt from the implementation of this important public health project through the industrial intervention. It is also our great pleasure that the World Bank rated this project as one of the most successful projects, and your plan to use this project as the good example to be publicized to other countries for their IDDC effort.

With the successful implementation of this project, CNSIC has been benefited greatly, the industry is modernized, capacity of the CNSIC and the industry as the whole has been build up greatly, the financial mechanism of the ISIDF, will be an sound bases to sustain the IDDC program in China. We hope that the World Bank will, together with other UN agencies, continuously support China's IDDC effort, and CNSIC will further develop our fruitful and enjoyable cooperation that benefit our children and the society as the whole.

Thanks once again for all your kind support and help, and as always, we remain,



Lin Jiahua

Vice President

China National Salt Industrial Corporation (CNSIC)

June 29, 2001

Maureen Law
Director
Human Development Sector Unit
East Asia and Pacific Region
The World Bank

**Iodine Deficiency Disorders (IDD) Control Project (Cr. 2757-HA)
Implementation Completion Report**

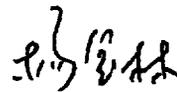
Dear Dr. Maureen Law:

Reference is made to the final draft of Implementation Completion Report (ICR) of Iodine Deficiency Disorders (IDD) Control Project, which was closed on December 31, 2000.

After a careful review of the ICR of the above project, we wish to extend our high appreciation for the comprehensive coverage, objective analysis and constructive recommendations in the Report. We completely share with you the overall assessment of the achievements, outcomes and lessons learned as presented in the Report.

Best regards.

Sincerely yours,



Yang Jinlin
Director

Division II, Intl' Department
Ministry of Finance

CC: Jenet Hohnen, Senior Public Health Specialist; Tel: 202-458-1217; Fax: 202-522-3394