

Solar Salt Industry and the Salt Producers' Community of Kampot and Kep

Options for a Sustainable Business Model

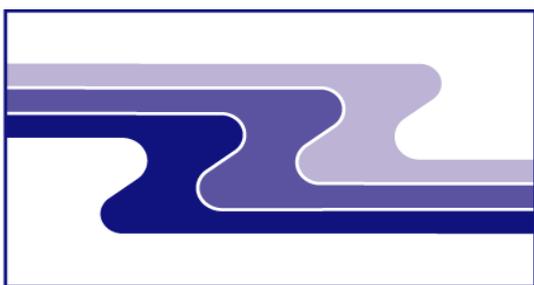
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Preface

A report prepared for UNICEF by Indochina Research Limited and Agricultural Development International.

This report¹ is a final report for the Contract SSA/CBDA/2010/00003478-0 under the National Program for Iodine Deficiency Disorders. The report presents an analysis of the business model option for salt production in Cambodia.

The findings and recommendations in this report are the result of missions conducted by IRL in Cambodia from January 10 to February 22, 2011 for UNICEF Cambodia, in support of, and in response to requests from the National Sub Committee for Food Fortification (NSCFF) and the Salt Producers Community of Kampot and Kep (SPCKK). The development of a sustainable business model for the SPCKK is related to the ongoing efforts to increase the household consumption of iodized salt in Cambodia, since the SPCKK is the major supplier of domestic salt in Cambodia.

The authors would like to acknowledge the generous contributions of the members of the National Sub Committee for Iodine Deficiency Disorders (NSCIDD), NSCFF, SPCKK and staff members of UNICEF Cambodia through the interviews conducted one-on-one as well as in groups. These constituents shared their knowledge and experience during various meetings that covered short term and long term industry sector problems, stakeholders' goals, commercial and regulatory issues, and opportunities for performance improvements. Participants included members of the Royal Government of Cambodia from various ministries and departments, salt products industry leaders and donor agencies.

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The views expressed in this report are those of the consultants and do not necessarily reflect the views of UNICEF or the Royal Government of Cambodia.

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List of Abbreviations and Acronyms

ADI	Agricultural Development International
ASEAN	Association of South East Asian Nations
CWPD	Cambodian Women for Peace and Development
FMCG	Fast Moving Consumer Goods
GAIN	Global Alliance for Improved Nutrition
ICCIDD	International Council for the Control of Iodine Deficiency Disorders
IDD	Iodine Deficiency Disorder
IFC	International Finance Corporation
IRL	IndoChina Research Limited
KHR	Khmer Riel
MAFF	Ministry of Agriculture, Forestry and Fisheries (Cambodia)
MARD	Ministry of Agriculture and Rural Development (Vietnam)
MDG	Millennium Development Goal
MIME	Ministry of Industry, Mines and Energy
MoH	Ministry of Health
MoP	Ministry of Planning
MT	Metric Tonne
NaCl	Sodium Chloride (Salt)
NCCC	National Committee for Climate Change
NCDD	National Committee for Deconcentration and Decentralization
NCN	National Council for Nutrition
NGO	Non-Governmental Organization
NSCFF	National Sub-Committee for Food Fortification
NSCIDD	National Sub-Committee for Iodine Deficiency Disorders
RGC	Royal Government of Cambodia
SITAC	Salt Industry Trade Association of Cambodia
SME	Small and Medium Enterprises
SPCKK	Salt Producers Community of Kampot and Kep
SSA	Special Services Agreement
SSTF	Salt Sector Task Force
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToT	Trainer of Trainers
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
USI	Universal Salt Iodization Program
WTO	World Trade Association

Executive Summary

1. As with other comparative data regarding Cambodia, the salt industry is relatively small. Based on the population base and the average per capita annual consumption of household table salt, the consumer volume is estimated to be 80,000 to 90,000 metric tonnes per year. The industrial consumption is considerably lower than neighboring Thailand and Vietnam due to the relatively small production base and the industrial volume in Cambodia is estimated to be 20,000 to 30,000 metric tonnes per year. If we observe the population bases of Vietnam, 90 million, versus Cambodia, 14 million, one can predict a consumer market demand for household table salt in Vietnam in the order of 500,000 to 550,000 metric tonnes per year. Due to significant production activities in the chemical industry as well as the food processing industry, Vietnam has an industrial volume of salt estimated to be an additional 500,000 to 800,000 metric tonnes; giving a total market demand of between 1-1.3 million metric tonnes. These statistics are significant regarding the market dynamics of salt trade and will be discussed in detail in this report.

2. Both Vietnam and Cambodia produce salt by the method of solar evaporation of seawater. This ancient production process is common throughout the world and the total annual production of salt is split between solar evaporation and mining of rock salt. The quality and productivity of solar salt vary widely, based upon fundamental parameters and methodologies, which will be discussed in detail in this report. Effectively all of Cambodia's salt production is in the area between the towns of Kampot and Kep, south of Phnom Penh and close to the Vietnam border. The quality and the productivity levels of solar salt in Cambodia are relatively low and the vast majority of salt production in Cambodia requires secondary processing in order to meet the common standards of purity, grain size and moisture content for household table salt.

3. The salt industry in Cambodia is of national interest and the Royal Government of Cambodia (RGC), in cooperation with UNICEF has implemented the Universal Salt Iodization Program (USI) in Cambodia for several years. There are multiple reports and publications detailing the progress of this program over time. The USI program has as its core objective the elimination of Iodine Deficiency Disorders (IDD) and during the implementation of the USI program RGC formed the National Sub Committee for Iodine Deficiency Disorders and subsequently passed a Sub-Decree on Management of Iodized Salt Exploitation in October 2003. The purpose of the Sub-Decree was to achieve the IDD objective and to provide technical guidelines and regulatory parameters that would set out a platform for iodized salt to become readily available to all Cambodian citizens.

4. Another significant development that occurred during the implementation of the USI program was the transition from the Salt Board in Kampot to the registration of a legal entity under the law in Cambodia. The Salt Producers Community of Kampot and Kep (SPCKK) was formed and structured such that all the smallholder producers became shareholders of SPCKK. This report will focus on the status of the SPCKK and bring forward critical analyses regarding its performance as the primary entity engaged in the objective of the Sub-Decree as well as the Millennium Development Goal related to IDD. There are operational and policy matters investigated herein and the conclusions and recommendations are directed towards the enhanced performance of the salt industry in general and the SPCKK as the sector leader among stakeholders.

5. The objectives of UNICEF, through this investigation of the salt industry, are to analyze the current status of the salt products industry in Cambodia and elsewhere and to develop

a long term sustainable strategy and business plan that will increase productivity and quality, and enhance commercial activities, all in order to comply with the USI program projections.

6. The fundamental statistics related to the salt industry in Cambodia would suggest that many of the significant economies of scale simply do not and will not exist for the foreseeable future. According to the Salt Institute, there are over 250 million metric tonnes of global salt production annually and there are multinational corporations engaged in this business. Therefore, it is appropriate to consider the option of cooperation and collaboration among the domestic stakeholders along the value chain, in order to fulfill the commercial requirements of the Cambodian market, while taking into account the global perspective of the salt industry in highly focused activities and clearly defined interventions yielding lower costs and higher quality. This report will also bring forward detailed analysis of the salt industry in Vietnam in order to understand the market dynamics in that country and the ultimate impact these have on Cambodia.

7. The strategy presented herein evolves from an acknowledgment of the limited supply base, the relatively unsophisticated production process and the lack of a unified marketing and distribution plan. This supply base will be discussed in detail within this report as there are matters of government regulations, land title, common versus private infrastructure, concessions and other commercial considerations. IRL and ADI consultants investigated the salt sector through site visits and technical audits of operating facilities. Further, the consultants held in depth interviews with stakeholders in the sector and suggest that a Salt Sector Task Force, provisionally called the Salt Industry Trade Association of Cambodia (SITAC) be established comprised of stakeholders from the public and private sectors, as well as the donor community. This Task Force (SITAC) should be guided by the NSCIDDD and should bring donor agencies such as UNDP, IFC and others to the process of developing a sustainable value chain, properly structured to supply 100 percent of Cambodia's iodized salt for household consumption. It should be noted that there are issues such as Climate Change Adaptation and Resilience, as well as the RGC's current strategy of Deconcentration and Decentralization that must be considered and incorporated into the business model. The RGC has established the National Committee for Climate Change and the National Committee for Decentralization and Deconcentration and the salt industry stakeholders must determine the best path forward regarding the overarching objectives of these committees.

8. The salt industry in Cambodia has received significant support during the period of 1996 to 2010 and various interventions were sponsored by UNICEF and other donor agencies through the NSCIDDD and other venues. This support included an iodine subsidy program which ensured that potassium iodate was supplied to the SPCKK. This program terminated as of January 2011 and UNICEF now wants SPCKK to implement a business plan that improves the commercial performance of the SPCKK and its shareholders and have the cost of iodization of household salt sustainably absorbed by Cambodia's salt producers.

9. Given that the strategy and business plan adopted by SPCKK will be based on a limited supply base, one of the first tasks of the SITAC must be to validate the cost / benefit analyses for the options presented in this report. These options include operational enhancements through investments in irrigation systems, flood control and salt refining. There are also recommendations regarding strategic alliances and expansion of the capacity base of the SPCKK regarding marketing, distribution, inventory control and quality management. This report will describe the fundamental benefits of certain investments by

the stakeholders, such as reallocating certain equipment and revitalizing selected operations, in order to meet the internal demands of an effective steady state production configuration. It is recommended that all of the SPCKK shareholders adhere to standardized production procedures and provide salt to the industry that meets rigid specifications, including maximum allowable impurities both soluble and insoluble. As the newly formed SITAC takes over management of the salt industry, there will be a committee formed to monitor and evaluate the production performance of all producers.

10. The recommended strategy and business plan also takes into account the relative position of Cambodia within the salt industry of its neighbors in Vietnam and Thailand, which is small when comparing total annual production on a per capita basis. A compounding issue is the chronology of the policies and regulations as well as international donor assistance respecting Vietnam and Thailand. Cambodia is well behind Vietnam and Thailand in its industrialization and therefore does not have a chemical sector or food processing sector or other industrial activities to increase the overall demand for salt. This in turn results in commercial disadvantages including limited access to trade credits, no investments in infrastructure and capital goods, no incentives for upgrading of technologies, developing distribution and delivery systems, development of traditional market partners and direct firm-level intervention regarding financial and operational performance and management.

11. It is important to note the relevant practical experience in Cambodia versus Vietnam and Thailand. Cambodia's neighbors rank highly in commodity exports and this leads to high volume and value added commercial activities. As Cambodia's neighbors have increased their industrial activities, certain market demands, policies and regulations have driven decisions that ensure the availability of low cost iodized salt. This report will also address the market dynamics in Vietnam and the impact of an open market there.

12. Strategically, the salt industry should be concerned about the sustainable domestic supply of quality salt in Cambodia, however based upon the investigations related to this report it appears that SPCKK has shown little inclination toward investing in technologies or methodologies or otherwise ensuring a stable supply of domestic iodized table salt for Cambodian citizens. SPCKK's production output requires secondary processing in order to meet minimum standards for household table salt. This has resulted in high cost iodized table salt for the consumer which in turn has resulted in the importation of cheaper salt from Vietnam and Thailand. Fortunately, solar salt is a renewable resource and basic production standards can be adopted to increase quality and productivity and so this trend can be reversed.

13. The consultants were not able to examine the current articles of association of the SPCKK, nor did the consultants review the annual financial statements submitted by SPCKK to the tax authorities. The financial status of SPCKK is relevant to the on-going commercial activities of the salt industry in Cambodia and it is therefore important to determine if the SPCKK is creditworthy and solvent as a legal entity. Under the law in Cambodia a community has no obligation to disclose its operations to the public; however as part of its due diligence, SITAC must become familiar with SPCKK and its constraints.

14. The ideal scenario going forward would see the newly formed SITAC offer creditworthiness and an ability to implement the strategy and business plan with a pre-described investment plan that would: (i) upgrade technology and production practices; (ii) bring fresh working capital and; (iii) improve productivity of the SPCKK members and boilers and other stakeholders along the value chain.

15. A key challenge, facing Cambodia's salt industry as a whole, is to raise quality and productivity in the sector up to globally competitive levels, or face the continued loss of its market share to low cost producers overseas and in regional locations, which offer stable, competitively priced supplies of iodized salt. Liberalization of imports of iodized and non-iodized salt should be an integral part of the strategy since it will define the playing field in terms of cost and quality, but one that offers few benefits to the SPCKK directly at this time. It should be noted however that salt must be allowed into Cambodia under the appropriate customs tax and duty tariffs established by the Ministry of Economy and Finance. Cambodia must adopt a salt supply strategy based on optimizing the total hectares of land exploited for salt, phasing out low productivity producers and practices, while transitioning enough higher productivity areas under harvest to produce the quantity and quality of solar salt needed by Cambodian citizens. This supply and processing balance is crucial to the future success of the salt industry.

16. It is technically possible for Cambodia to improve the productivity and sustainability of its solar salt to world class levels. Doing so will require a mix of investment, new codes and regulations, and private sector management driven by fair and equitable monetary incentives (taxes for government and profits for SMEs). There are several other donor agencies working on related matters such as climate change and decentralization, nutrition and health at this time. It is imperative that SITAC work closely with these groups and provide input into their projects from the standpoint of investment and funding as well as advocacy and policy reform.

17. The primary comparative advantage of Cambodia's solar salt sector is similar to any other geographical region that has significant solar radiation and appropriate topographic conditions to create solar salt pans. There is little else about Cambodia's situation to lend to its competitiveness, without significant intervention and revision of business practices and perhaps consolidation of production areas into larger salt pans with upgraded irrigation systems. There is in fact a relative disadvantage to the Kampot and Kep production areas in that the cycle of the monsoon season restricts the efficient production of salt to the period from November to April. This scenario suggests that total production during this period must meet domestic demand and there must be adequate storage facilities and secondary processing facilities to compensate for the seasonality of the sector.

18. The salt sector in Cambodia suffers from the common economic history of the region, relative to its closed market eras. Following the introduction of free economy and open markets, relatively few entrepreneurs have emerged, other than the large number of traders. Only a few companies have developed long-term advantages in technology, marketing, and innovation in design and quality in most industry sectors. Growth in the finished products sector of the chemical and agricultural industries creates demand for more and higher quality salt and this demand would normally fuel growth and profitability of the supply side. However, the near term decision to create the SPCKK monopoly and the subsequent dysfunctional domestic supply of salt is problematic and this requires special attention and a systemic remedy.

19. The solar salt sector faces many constraints, such as outdated technology and harvest practices, inadequate marketing and distribution, poor workforce development services, and a lack of credit facilities among others. The potential SMEs in the sector have additional issues regarding direct access to markets, poor negotiating skills and a lack of organized long-term purchase and sale agreements. The salt industry, in general, is

hampered by a lack of (i) expertise and organizational structure to engage in regional market dynamics (trade association); (ii) product development and quality certification; (iii) human resource development and capacity building at provincial level; (iv) sales, marketing, logistics and financial planning; (v) strategic planning and business development; and (vi) manufacturing and process integration ensuring USI program compliance.

20. Because of a limited supply capacity for solar salt, related to land mass and weather constraints, the Cambodian salt industry cannot aspire to lead the market in volume categories. Instead, to improve its competitiveness, the industry should pursue an optimized small volume refinery configuration of 200,000 metric tonnes per year. This would reduce cost of goods sold to the level whereby domestic salt could compete on price and quality with imports. Such a near term solution would prepare the salt industry for expansion based upon growth in the industrial applications for salt. Increased iodization manufacturing capacity will require a consistent, high quality solar salt from the smallholders in the SPCKK.

21. With a reliable domestic supply of iodized table salt and open market access to imported salt, the Cambodian consumer should be able to purchase iodized salt at competitive prices. If the strategy and business plan recommended in this report are implemented, the cost of iodized salt will meet the global market and the distribution of iodized salt to all Cambodian citizens will be ensured.

22. The following strategic initiatives are initial steps of a strategy for achieving sustainable supply of iodized salt to Cambodian citizens:

1. **Capacity Building.** Institutionalize the Salt Industry Trade Association of Cambodia (SITAC) under the law to unify industry stakeholders, improve upon all commercial aspects of the salt industry, monitor and promote the industry's commercial interests, engage in advocacy, and pursue long-term strategic goals. The near term objective would see SITAC expand its capabilities beyond the current mandate of SPCKK to become the apex trade association for the salt sector and become a legal entity with a charter and Articles of Association under the Companies Act. The roles and functions of SITAC are detailed in Section 7.1.1.
2. **Enhance Technological Capabilities.** Complete a feasibility study and cost / benefit analysis for a 200,000 metric tonnes per year salt refinery and iodizing facility². Establish creditworthiness of owner operator and a financing scheme to acquire new capacities and higher production quality. Complete a feasibility study and cost / benefit analysis for upgraded irrigation systems at all seven production areas that would deliver higher quality input seawater, discharge spent brine and provide flood abatement. Complete a pilot project to reconfigure salt pans into larger units and convert to sequence evaporation in order to achieve best practices for solar salt production. Reposition Cambodia's salt industry capabilities in the market to meet specifications and standards of high quality imported salt.
3. **Enhance Supply and Distribution.** Establish a strategic alliance with a capable SME or NGO to develop an efficient and effective national distribution and inventory system for salt. The system would include a dedicated warehouse and depot in each province that would serve to maintain an appropriate level of inventory of all

² Under good weather conditions Cambodia is currently able to produce around 200,000 tonnes of salt per year.

grades of salt and would distribute salt to wholesalers and end-users. The organization managing such a system would be responsible for sales and receivables, as well as logistics coordination between SPCKK and other suppliers of salt products. The appropriate NGO would have a vested interest in the promotion of health for women and children and would have a national reach with its organizational network. Commercial agreements and obligations of the parties would be subject to negotiations and the best interests of SITAC and NSCIDD.

4. **Improve Quality Assurance.** Improve human resources and capabilities in all aspects of solar salt processing and specification standardization. Form a quality assurance within SITAC that would monitor and certify producers within SPCKK. The quality assurance would also operate an analytical laboratory in order to track batches of production and / or import shipments. The quality assurance would also oversee the iodizing process whether it becomes part of the newly installed refinery or it becomes a standalone unit operation. The quality assurance would also form a strategic alliance with the Ministry of Health or other RGC agencies that would offer access to laboratory staff and equipment as required.
5. **Improve Marketing and Communications.** Establish a marketing campaign through the strategic alliance formed to operate the distribution and inventory system. The selected NGO (CWPD) / SME would be mandated to implement a marketing and communications campaign with an approved budget. The campaign would best be aligned with on-going efforts of donor projects or ministries working on health issues or rural development issues. SITAC would be responsible for seeking out synergy and leverage opportunities for such collaborative efforts.
6. **Attract and Retain Investments.** The proposed manufacturing enhancements will require significant capital investments. Certain investments will be for individual salt producers while others will be on behalf of larger entities. The consultants recommend that financing schemes and investment programs that have been initiated in Vietnam and elsewhere be developed and brought forward. SITAC will establish a finance committee and determine the best options for bringing forward investments that would offer appropriate rates of return while achieving the fundamental objectives of all stakeholders.
7. **Public / Private Partnership.** The RGC has declared the salt industry to be of national interest and has promulgated the Sub-Decree on Management of Iodized Salt Exploitation. In an attempt to effect critical mass and concentration of efforts in the private sector, the Salt Board has been replaced by the Salt Producers Community of Kampot and Kep (SPCKK). This legal entity is a de facto monopoly and there appears to be significant shortcomings and constraints related to the effectiveness of the SPCKK in fulfilling its mandate and in performing its role in relation to the stated objectives of the NSCIDD and Sub-Decree No. 69. The mounting and launching of the Salt Industry Trade Association of Cambodia (SITAC) will expand the capacity and reach of the current SPCKK and will bring significant stakeholders to the challenge. It will be SITAC's responsibility to continuously interface with NSCIDD and other bodies of the RGC in order to implement all aspects of Sub-Decree No. 69, the Cambodian and UN MDGs, the commercial sustainability of the salt industry and its domestic producers. SITAC will become the platform and venue for matters of advocacy as well as the commercial interests of the salt industry.

23. The logic underlying these initiatives assumes that the salt industry in Cambodia will be more productive, competitive and more profitable if its stakeholders act as a unified body with significantly enhanced operational performance and expanded capabilities in key areas. A properly functioning trade association is as a collection of companies participating in commercial transactions and agreements and representing every segment of the business value chain, including all goods and services relating to a final product entering the market. For the Cambodian salt industry, this organization would link companies from the private sector with ministries and provincial departments having a vested interest in near term and long term success of the sector. Stakeholders would include all related and supporting industries, service providers, as well as financial institutions and regulatory bodies.

24. At present, the salt industry in Cambodia does not exploit the interdependence, mutual good faith, or long-term commercial commitments necessary to bind its stakeholders and potential strategic partners to bring efficiencies and drive profits. Salt companies outside of Cambodia, which operate in the global arena and satisfy market demand with highly efficient manufacturing parameters, have the potential to capture a significant portion of the Cambodian salt market. As Cambodia's industrial sector expands, the consumption of salt for manufacturing will grow and reflect similar ratios of consumer table salt to industrial salt as currently exists in Thailand and Vietnam. These industrial applications for salt will necessarily require high quality and consistent reliable standards of production.

25. To become more sustainable and less vulnerable to market dynamics, members of Cambodia's salt industry must stop relying on the status quo of its monopoly and related government policy and regulations regarding SPCKK's current mandate. The stakeholders must expand upon the capabilities of SPCKK and address the other crucial business matters such as standardized production specifications, marketing and distribution, access to finance and sales planning, working together on strategic initiatives to become more competitive in terms of price and quality. In pursuing and implementing such strategic initiatives, members of SPCKK and SITAC will begin to work efficiently and effectively as a unified industry association, reducing costs and improving performance along the supply chain, reaping financial rewards from appropriate investments, and helping to achieve the long term objectives of the NSCIDD, UNICEF and other donor organizations.

1 Introduction

26. Universal Salt Iodization (USI) is the most reliable, cheap and safe method for the prevention and elimination of Iodine Deficiency Disorder (IDD). IDD has long been recognized as a significant public health problem in Cambodia. In 1997, the results of a national survey showed a total goiter rate (TGR) of 12 percent among 8-12 year-old school children. In recognition of this problem, the Royal Government of Cambodia (RGC) initiated a National Sub-Committee for the Control of Iodine Deficiency Disorders (NSCCIDD) in 1996, focusing on USI as the primary intervention strategy to improve the iodine status of the population.

27. The production of iodized salt started in 1999, though with limited success to produce sufficiently large quantities. In 2000, only 14 percent of households were found to use iodized salt. Due to the lack of sufficient legislation and enforcement of the existing legislation, many small to medium salt producers in the coastal provinces of Kampot and Kep continued to produce non-iodized salt. The situation changed dramatically with the promulgation of Sub-Decree No. 69 on "The Management of Iodized Salt Exploitation" on October 20, 2003 (effective October 2004).

28. The Salt Producers Community of Kampot and Kep (SPCKK) was formed in 2004 with the participation of 167 salt producers. SPCKK is responsible for the coordination and management of the iodization of salt, as well as for marketing and sales of all salt. The salt producers are shareholders of the SPCKK, with the size of share proportional to the size of their operations.

29. While IDD results have shown drastic improvements over the years, with more than 71 percent of households currently using iodized salt in Cambodia, in 3 provinces (Kep, Kampot and Monduliri) the median UIE (Urinary Iodine Excretion) remains below 100µg/l; indicating an inadequate intake of iodine. The two primary drivers of this are 'leakages' of non-iodized salt from salt production sites and cross-border importation of non-iodized salt. Given the Cambodian market can generally be sufficiently supplied with domestically produced salt, local iodized salt production is therefore a key to this public health situation.

30. The salt industry in Cambodia has received significant support during the period of 1996 to 2010 and various interventions were sponsored by UNICEF and other donor agencies through the NSCIDDD and other venues. This support included an iodine subsidy program which ensured that potassium iodate was supplied to the SPCKK. This program terminated as of January 2011 and UNICEF now wants SPCKK to implement a business plan that improves the commercial performance of the SPCKK and its shareholders and have the cost of iodization of household salt sustainably absorbed by Cambodia's salt producers.

31. The development of the business plan aims to: (i) serve as a means for raising investment capital; (ii) address vulnerability to weather and competition; and (iii) ensure successful takeover of salt iodization costs.

32. The outline of this report is as follows; Section 2 presents the Competitive Environment of the Salt Industry, Section 3 presents a Regional Perspective of the Salt Industry, Section 4 presents the Current Situation in the Salt Industry in Cambodia,, Section 5 presents a SWOT Analysis, Section 6 presents Key Factors Affecting the Sustainability of the Salt Industry and finally Section 7 presents Strategic Initiatives for Improving the Cambodian Salt Industry.

2 Competitive Environment of the Salt Industry

33. Cambodia's salt industry is centuries old, however, recently it has evolved under specific parameters related to health matters, rather than classic commercial and economic drivers. Since 1996 the salt industry has been driven by the external forces associated with the Universal Salt Iodization Program (USI) and Iodine Deficiency Disorder (IDD) and the objectives of UNICEF and other donors as well as the NSCID, the NSCFF and various RGC ministries with interests in the health and wellbeing of Cambodia's citizens.

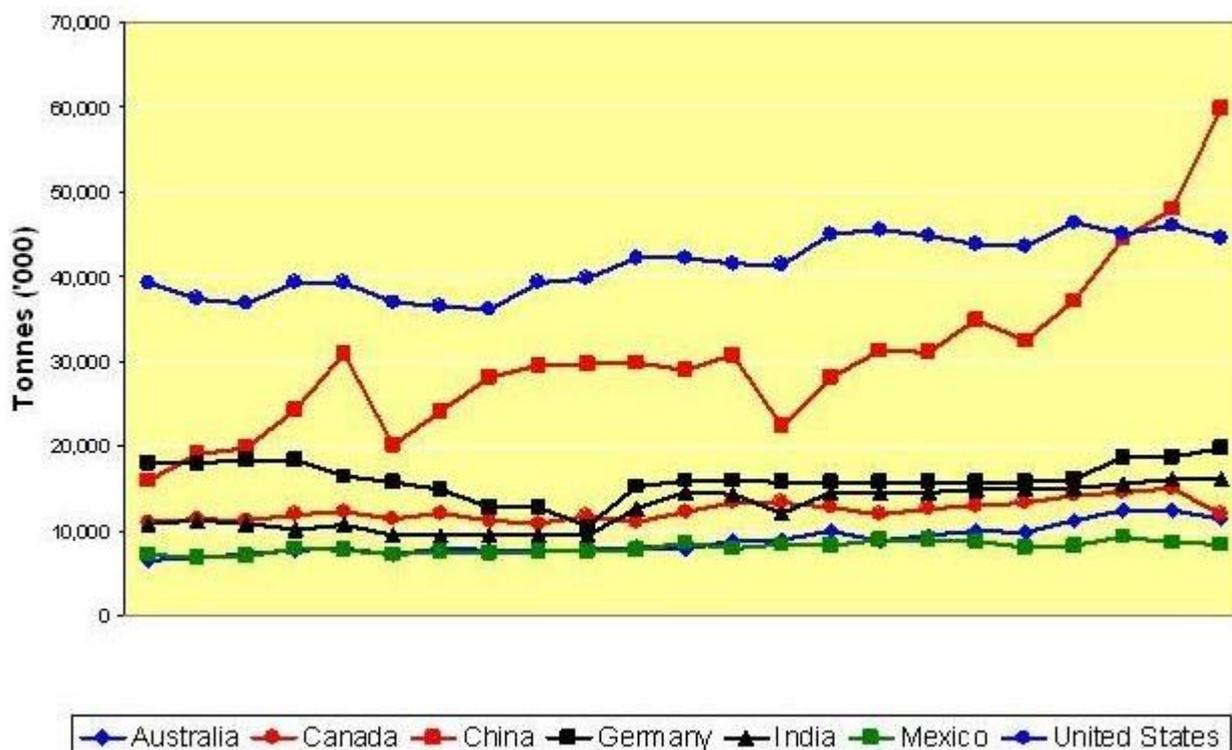
34. These same parameters have influenced the salt production in many emerging economies and as a result Cambodia's neighboring countries have been assisted by donor programs such as the Global Alliance for Improved Nutrition (GAIN). In such cases that UNICEF and other donors have contributed significantly, the USI program has catalyzed both growth and standards in the salt industry. There have also been influences at the ASEAN level and with WTO accession with open market conditions within the Customs Tariff Codes. In Vietnam, Thailand and elsewhere in Southeast Asia, salt is imported and exported in large volumes. This is driven primarily by market forces of quality and price rather than the USI program objectives.

35. In recent years there has been significant downward pressure on the global market price for industrial salt. Salt is a high volume, low value global commodity. According to the Salt Institute, global production is in the order of 250 million metric tonnes per year. The largest producers are China and the United States, with approximately 100 million tonnes combined; see Figure 1. These major producers along with India, Germany, Canada and Australia control over 60 percent of all salt produced and sold; see Table 1. As of the middle of 2010 the international prices for bulk industrial shipments were between US\$ 30 and 40 per tonne based upon quality. In Vietnam the Ministry of Industry and Trade set a policy to allow importation of salt by large manufacturing and processing companies because the price of commodity salt was cheaper than domestic solar salt. This in turn caused an increase in inventories among the salt producing communes throughout Vietnam who were and are looking for export markets for their production.

36. According to the investigations associated with this report the domestic prices in Cambodia remain relatively high with the price of SPCKK salt to wholesalers in Phnom Penh at 250 – 260 KHR or US\$ 0.065 per Kg (US\$ 65 per tonne). This wholesale price is an open invitation to Vietnamese traders who recognize the opportunity to bring reasonable quality salt at significantly lower prices into Cambodia along with the fruits, vegetables and other market goods that already cross the border on a daily basis.

37. In 2009 as the global economic crisis drove down prices, Cambodia was faced with another complication; severe flooding in Kampot and Kep, with the annual production of salt falling to 25,000 tonnes. This was well below the domestic demand and SPCKK officially imported salt from China to deal with the shortfall. Unofficially, other production from Thailand and Vietnam found its way onto the Cambodian market. In 2010 the production scenario recovered with 210,000 tonnes of output from the SPCKK members. Unfortunately the combination of trader activities from 2009 along with downward pressure on prices took its toll on SPCKK members with many producers selling only 30 percent of their 2010 outputs. Indeed, today the SPCKK storage sheds are full and the member producers are not working the salt pans at typical cycles.

38. Members of Cambodia’s salt industry are concerned about the competitiveness and long term viability of their industry compared to the salt industry of regional producers as well as international importers. Among other conclusions drawn in this report it is critical that regional competitiveness studies should be concluded in order to validate the proposed strategic interventions and to confirm the long term strategy for increasing quality and productivity and reducing costs. Under the aegis of SITAC, industry stakeholders and vested interest departments and agencies must build capacities beyond SPCKK’s current skills and expertise and work together to improve performance both in the salt pan fields and also in the marketplace.



Source: Salt Institute

Figure 1 World Salt Production 1985-2007

Table 1 Top 10 Producers of Salt, 2004-2007

Country	2007	2006	2005	2004
China	59.8	48.0	44.6	37.1
United States	44.5	46.0	45.1	46.5
Germany	19.8	18.6	18.7	16.0
India	16.0	16.0	15.5	15.0
Canada*	11.8	15.0	14.5	14.1
Australia	11.4	12.4	12.4	11.2
Mexico	8.4	8.5	9.2	8.2
Brazil	6.9	7.3	6.7	6.5
France	6.1	7.0	7.0	7.0
United Kingdom	5.8	5.8	5.8	5.8
All Other	65.5	55.4	58.5	40.6
Totals	257.0	240.0	238.0	208.0

Note: For Canada see Figure 1 back to 1948

Source: Salt Institute

3 Regional Perspective of the Salt Industry

3.1 Vietnam as a Salt Competitor

39. The consultants have selected to investigate Vietnam for purposes of placing Cambodia's salt industry into a regional perspective. Vietnam was selected because it is currently engaged in exporting activities to Cambodia for many products including salt. Further, there is reliable information available about the salt industry in Vietnam. The following reports offer a collective illustration of the dynamics of Vietnam's salt industry:

Box 1 Salt Production from Bac Lieu Province

With the next production season all set to start, farmers in Bac Lieu Province have 134,000 tonnes of black salt still in stock, according to the province's Department of Agriculture and Rural Development. During the last season at the beginning of this year, Bac Lieu, which, at 3,500 Ha, has the largest salt-production area in the Cuu Long (Mekong) Delta, produced a record output of more than 266,000 tonnes, or two times the quantity produced a year earlier. Of this, nearly 90 per cent was black salt.

In late June, the Ministry of Agriculture and Rural Development had ordered the Northern Food Corporation to buy salt from farmers in Bac Lieu who had around 200,000 tonnes in stock. The corporation assigned the Bac Lieu Salt Trading Joint-Stock Company to buy 30,000 tonnes.

To help farmers build warehouses to store their stocks, the provincial People's Committee has provided more than 400 of them interest-free loans worth a total of USD 68,000.

Source: Vietnam News 2010

Box 2 Improving Investment in Infrastructure

Tightening salt imports and providing soft loans to poor households for salt making are among the measures proposed by the Ministry of Agriculture and Rural Development to ease the difficulties faced by the industry. The Social Policy Bank will lend salt makers USD 2,000 – 2,500 per hectare for 36 months if the proposals are approved by the Government.

The ministry is also calling for prioritizing investment in infrastructure in salt making areas and increasing the use of technology in production. The Government is set to continue developing salt fields in the central region, especially in Ninh Thuan, Binh Thuan, and Khanh Hoa Provinces, to increase their productivity and quality.

The ministry said attention should be paid to developing facilities to store salt. There are more than 15,200 Ha of salt fields in the country from which output is expected to reach 1.1 million tonnes this year, including more than 300,000 tonnes for industrial use. In the first six months the country imported 230,000 tonnes of common salt for more than USD 11 million.

Source: Vietnam News 2010

Box 3 State Role in Purchasing Salt

The Northern Food Corporation yesterday began its first round of buying 30,000 - 40,000 tonnes of salt from farmers in the Cuu Long (Mekong) Delta province of Bac Lieu. Ho Xuan Hung, deputy minister of Agriculture and Rural Development, on Tuesday ordered companies to buy salt from the local farmers, who have 200,000 tonnes of salt in stock.

Hung made the request after he conducted a working visit at salt fields in Bac Lieu, which has the largest salt production area in the Mekong Delta. Under the purchase round, the corporation will buy salt at prices in accordance with market prices, and priorities will be given to buying salt at the fields from farmers and co-operatives.

Ho Minh Xiem, chairman of the Bac Lieu Trading and Salt Joint-Stock Company, said his company had bought black salt at fields for USD 0.025 per Kg and white salt for USD 0.050 per Kg. Bac Lieu has produced a record high total output of more than 266,000 tonnes in a total area of 3,500 Ha in this year's salt production season, according to the provincial Department of Agriculture and Rural Development.

Source: Vietnam News 2010

Box 4 Providing Interest Subsidies for Salt Producers

The Government has approved an interest-rate subsidy of 100 per cent for loans for salt producers, which will be effective until the end of the year. The Ministry of Agriculture and Rural Development (MARD) green-lighted a plan that allows for up to USD 68,000 in loans to be provided to producers that are using at least one hectare that have a one year contract.

Nguyen Tan Khuong, chairman of Dong Hai District People's Committee in southern Bac Lieu Province, said the State would provide interest-free loans for farmers to buy construction materials so they could build warehouses to store salt before the rainy season, when production declines. With these warehouses, farmers would be able to store the salt, which would help stabilize prices. The Government also required MARD to thoroughly inspect all of the projects that will build storage spaces. Projects that will potentially be completed by the end of this year, but have been able to secure capital, will be given priority when applying for loans.

The Government also mandated that the Northern Food Corporation buy and store 200,000 tonnes of salt by September 30, of which 20,000 tonnes would come from the northern part of the country and 180,000 would come for the central and south. The head of the Agro-forestry and Fishery Processing and Salt Industry Department, Le Xuan, said the current El Nino has caused the dry season to begin in the southern provinces earlier than usual.

According to the deputy head of the Ministry of Industry and Trade, Nguyen Thanh Bien, the official quota for imported salt in 2010 is 260,000 tonnes.

In the first five months of this year, 725,000 tonnes of salt were produced, which was almost double the amount that was produced during the same period last year. At the moment, salt prices are deflating. One Kg of salt in the northern provinces range from USD 0.030 - 0.050, which is 40 per cent lower than the prices from last year. More than 300,000 tonnes of salt produced has not been sold by farmers. MARD expects that Viet Nam's total salt output in 2010 will reach more than 1.0 million tonnes, which would meet the domestic demand.

Deputy Minister Bien said Viet Nam had to import salt in order to abide by its commitments to the World Trade Organization. The salt that Viet Nam is importing is high-quality, which is used in the food production industry. This type of salt is not produced in the domestic market.

Source: Vietnam News 2010

Box 5 Import Quotas for Salt into Vietnam

The Minister of Industry and Trade revealed that in the first five months, Vietnam has imported 50,000 tonnes of industrial salt. The total salt volume that had been imported from the quota was 90,000 tonnes, causing effects on the domestic salt price and inventory. The 2010 import quota of salt products was 260,000 tonnes, in which industrial salt counted for 180,000 tonnes and the remaining 80,000 tonnes for health care and household usage.

In the first five months of this year, Vietnam has produced 773,000 tonnes of salt, which is 176 percent against the same period of last year.

Source: Vietnam News 2010

Box 6 Declining Prices hit Salt Production

Though salt makers in the Mekong Delta have a bumper crop this year, the bottom has dropped out of the market, with sea salt fetching only USD 0.015 – 0.020 per Kg leaving salt-making households are in dire distress. The price middlemen will pay for salt has fallen steadily from USD 0.080 to 0.010 per Kg in March 2009. It's a problem of oversupply and foreign competition.

Tuoi Tre reporters, who visited salt fields in An Ngai commune in Ba Ria-Vung Tau, saw only a few workers harvesting salt, while nearly a dozen others sat idle nearby. These people see no purpose in harvesting the salt, because there are no buyers.

Nguyen Van Gia said "it is now very sunny, excellent weather for making salt, but no one wants to work, because they know they will not be able to sell the salt." The salt makers have abandoned their fields," he

added. Phan Thanh An added, sighing, "I have nearly hundred tonnes of salt unsold. I've left it in the field. The salt this year is not salty, but bitter".

In a normal year, one hectare of salt field can produce 70 - 80 tonnes by the evaporation of sea water, but this year the sustained dry, sunny weather has enabled higher production – an average of 100 tons per hectare for the season.

According to the Ministry of Agriculture and Rural Development, by April 18, Vietnamese salt makers had harvested 514,000 tonnes of salt, 66 percent more than in the same period of 2009.

Tran Quang Phung, General Director of the Southern Salt Group, agrees that the increase in salt output has made the salt price drop. However, its not just Vietnam's internal demand and supply that's affecting the market. The domestic salt price has also been influenced by a more liberal import policy, he explains, that have brought 170,000 tonnes of imported salt onto the market.

Source: Vietnam News 2010

Box 7 Higher Production and Imports Depress Prices

Higher production and imports of salt have pushed down the price on the local market and led to lay-offs. In the first four months of this year, the country produced 350,000 tonnes of salt, twice that during the same period last year, according to the Ministry of Agriculture and Rural Development. Meanwhile, the salt import volume increased due to falling global prices. As a result, farmers sold salt at record lows of between USD 10.5 - 26.3 per tonne in mid-March and the trend will continue.

Le Xuan, director of the Department of Processing and Trade for Agro-forestry-fishery Products and Salt Production, said during the last months of 2009, salt prices on the global market decreased sharply and many enterprises took advantage of the situation to import large volumes, which they are now using in production or trying to sell in the open market.

Under World Trade Organization (WTO) commitments, salt is one of the goods that have an import quota. Firms can import salt subject to quotas with permission from the Ministry of Industry and Trade (MoIT) and pay a tax rate of 5.0 – 10.0 per cent. Alternatively, they can import as much as they wish at a tax rate of up to 50 per cent for refined salt and 60 per cent for industrial salt, without permission from MoIT.

Companies use the second method to import salt, so it is not easy for MoIT to calculate the total volume of salt imported. Salt imports are usually calculated according to the market demand of manufacturers, producers and consumers. The salt import quota this year is around 260,000 tonnes, 180,000 tonnes of which will be used by manufacturers, while consumers will use the remainder. These statistics were announced early this year so that enterprises could plan how much to import.

To deal with the over capacity problem, in March the Government decided to temporarily stop granting salt import quotas. MoIT recently asked relevant ministries to work out ways to limit salt imports. It also asked producers to shift to using locally produced salt. According to the department, total demand for salt will be 1.34 million tonnes for 2010. Local farmers, however, will be able to produce only around 1.0 million tonnes due to favorable weather conditions.

Source: Vietnam News 2010

Box 8 Improving Standards in Salt Production

The Prime Minister has assigned the Ministry of Agriculture and Rural Development and the Ministry of Finance to work on quality, safety and hygiene standards for imported salt. He also asked the above ministries to curb cheating on the importation of salt, and to propose ways of adjusting import taxes on salt that is imported beyond the legal set quota.

The Ministry of Agriculture and Rural Development, the Ministry of Finance, and the Ministry of Industry and Trade set the 2010 national customs quota for salt imports at 260,000 tonnes. To date, the Ministry of Finance has allocated quotas of 140,000 tonnes to various companies.

Source: Vietnam News 2010

Box 9 Supporting Prices in Salt

An official has suggested that the government support locally-produced salt prices in order to prevent farmers from quitting due to plummeting prices. "The government has had policies to keep rice and coffee prices stable by asking relevant agencies to buy produce from farmers at certain prices and stockpile them, so why doesn't the government have such plans for the salt industry?" said Doan Xuan Hoa, deputy director of the Department of Agriculture, Forestry and Fisheries Products Processing and Salt Industry.

Local salt prices are currently USD 0.030 per Kg, not much higher than the lowest price in mid-March of USD 0.015 – 0.020. Last year, 2009, salt sold at USD 0.080 – 0.100 per Kg. The current low prices are discouraging many farmers from harvesting. Experts, including Hoa, said salt prices have plummeted this year as bumper crops and the presence of imported salt on the local market formed an oversupply.

In February, the Ministry of Industry and Trade allowed local companies to import 170,000 tons of salt. But Deputy Minister Nguyen Thanh Bien said in early March that the imports were for industrial use and would not affect farmers.

But Hoa said due to low prices farmers would quit their jobs in the coming months and the targeted output of one million tons would not be realized. To prevent the situation from becoming worse, the government should plan to support salt farmers in terms of prices. It should set up a committee to calculate the rate of support or the lowest price that businesses must pay for a kilogram of salt.

Source: Vietnam News 2010

Box 10 Vietnam Demand and Supply of Salt

The Ministry of Industry and Trade (MoIT) has recently announced that in 2011 the country's demand for salt will be about 1.35 million tonnes. Meanwhile, the domestic production will be about 1.0 million tonnes. Together with the salt stockpile in 2010, this year, Vietnam will have to import about 182,000 tonnes of salt. According to the statistics, in 2010, the country's salt output was estimated at 1.18 million tonnes, up 48 percent against 2009.

Currently, the salt stockpile in salt workers and salt producers is about 263,489 tonnes, mainly black salt.

Source: Vietnam News 2010

Box 11 Imports of Salt for Processing

Many enterprises have asked for permission to import salt, which worries salt workers. Firms want to import salt, mainly for use in food processing. HCM City Chemicals and Electric Materials have asked for permission to import 10,000 tonnes; the Green Energy Technology Company 50 tonnes. Other companies, including Ajinomoto Vietnam in Dong Nai province, Hoan Vu Vietnam in HCM City and Viet Tien Food Technology in HCM City have also asked for the permission to import salt.

The news immediately concerned salt workers and producers, who cannot sell their products. In fact, since Vietnam joined WTO, the country has not prohibited salt imports and can only install technical barriers to restrict them, based on specifications and quality. Under current regulations, salt imports must obey Circular No. 23 (May 20, 2010), under which the Ministry of Industry and Trade, after estimating the volume of salt needed to be imported each year, will grant quotas to enterprises.

However, cooperation between relevant ministries in calculating the import volume has not gone smoothly. For example, in 2010, the Ministry of Agriculture and Rural Development (MARD) forecast that the domestic output of 1.1 million tons could meet domestic demand, but the Ministry of Industry and Trade (MOIT) still allowed the import of 260,000 tons of salt. Only when the salt price dropped dramatically, newspapers raised alarms over the price decline, and the Government ordered enterprises to buy salt to go to storage from domestic producers, did MOIT put an end to the imports.

According to Ngo Tri Dung, under current regulations, not all kinds of salt are allowed. Mainly raw NaCl used in medical treatment, experiments, chemical industry and food processing is allowed and must meet technical requirements stipulated in legal documents.

Prior to June 2010, many enterprises wanted to import cheap salt products at USD 20 - 30 per tonne that contained impurities. However, since new legal documents stipulating the minimum quality were issued, very

few have asked for permission. In the last three months, only one company met customs requirements. With the new laws, it will be impossible to import salt on a massive scale and only high quality salt, priced at USD 80 - 90 per tonne, can meet the new technical requirements.

However, the legal documents stipulating the quality of imports only set temporary regulations and will become invalid after December 31, 2010. Industry experts want to prolong the technical barriers to protect domestic production and prevent massive imports.

Pham Thanh Bang, Deputy General Director of the Northern Food Corporation, commented that, though the salt imports would be inconsiderable, imports would still badly affect salt workers and plans to push salt prices up to ensure their profits. "If we can produce industrial salt, we should not allow industrial salt to be imported any more, except special kinds used in medical treatment and food processing," he asserted.

Source: Vietnam News 2010

Box 12 Stockpiling Salt to Ease Price Falls

The government has been asked to buy 200,000 tonnes of salt to help salt producers cope with the falling prices. The Vietnam Northern Food Company (Vinafood) will buy the salt from domestic farmers, ensuring that farmers receive profits of 30 - 40 percent, according to the director of the Ministry of Agriculture and Rural Development's Department of Agro-forestry and Fisheries Product Processing and Trade and Salt Industry, Le Xuan.

A survey from Vinafood reports that salt prices have dropped by 33 percent since last year. Salt is currently priced at USD 0.03 - 0.04 per Kg in the northern region of the country and USD 0.015 - 0.020 per Kg in central Vietnam.

This year's lengthy hot season, which brought in a bumper crop for farmers, along with an increase in salt imports has caused prices to fall.

The Department of Agriculture and Rural Development in southern Bac Lieu province reported that salt production in the province set a record for production this year, with an output of more than 200,000 tonnes. However, only 30 percent of the province's salt has been sold because farmers are waiting for prices to rise, said Tran Thanh Son from the department's rural development office.

"While waiting for prices to increase, farmers are having a difficult time protecting their products from the rain and humidity," he said. Salt produced by local farmers is often used to process and store seafood and make fish sauce.

Some sources estimate that between 500,000-600,000 tonnes of salt have been imported into Vietnam over the past year, which is equal to 70 percent of the country's annual salt output. According to experts, most manufacturing facilities prefer imported salt because of its cleanliness and whiteness.

Xuan explained that the ministry allows salt to be imported because the country' needs 1.3 million tonnes of salt a year, but Vietnam only produces 1.0 - 1.1 million tonnes a year depending on weather. "Apart from buying salt for farmers, the ministry will also suggest implementing other policies including providing salt makers with industrial technology for production," he said.

Source: Vietnam News 2010

Box 13 Interest Free Loans to Salt Producers

Ho Chi Minh City's agricultural and trade departments have proposed that the municipal administration provides zero-interest loans to salt producers and trading companies badly hurt by falling prices. The departments said the city's People's Committee should use its price stabilization fund to offer zero-interest loans to help state-run businesses buy 68,000 tons of salt from fields in Can Gio District, the city's salt-making area.

They said salt farmers and cooperatives should also be allowed to access such loans so that they can build warehouses to store their produce, and wait for more favorable prices.

Source: Vietnam News 2010

3.2 Observations on the Vietnam Sector and its Impact on Cambodia

40. As illustrated with the reference reports above in Box 1 to Box 13, there are influential market dynamics afoot in Vietnam. These will necessarily have an impact on the Cambodian market. As the Cambodian salt producers respond to all challenges of the competitiveness of its sector, it would be important to investigate the opportunities to trade with Vietnam, based upon sub-markets for specific quality grades. If the Cambodian producers form collaborative alliances with Vietnamese producers, specifically those in Bac Lieu, there is the possibility of mutually beneficial exchange of grades of solar salt for certain end uses. Given the recent interventions by ministries in Vietnam, it would also be important for NSCIDD members to communicate with their counterparts in Vietnam to more fully understand the decisions taken and the outcomes of those policies and regulations.

41. Given the importance of Vietnam as a supplier of many and various manufactured goods and food items, it is not surprising that Vietnamese traders are placing bags of salt on trucks that are already headed for Cambodia. It would be in the best interests of all parties in the salt industry to formalize this trade and make it open and transparent.

42. The key observations made on the Vietnamese Salt Sector and its impact on Cambodia are the following:

1. Vietnam's level of industrialization and its significant international trade activities have resulted in an annual volume in the salt sector that is a multiple of Cambodia's.
2. There are several key Vietnamese ministries with a vested interest in the salt industry.
3. The Vietnamese Ministry of Agriculture and Rural Development has initiated certain policies and regulations to protect the livelihoods of its rural poor salt producers and has established a floor for the domestic market by negotiating purchase agreements with large Vietnamese companies to hold and store salt and has further established access to finance for smallholders.
4. Vietnam's Ministry of Industry and Trade has also initiated certain policies and regulations to allow its commercial constituents engaged in manufacturing and exporting a more competitive business environment and have established import quotas for high quality salt for specific applications.
5. The Vietnamese government at the level of Prime Minister has intervened to harmonize the overall objectives in the salt industry and to issue mandates to stakeholders regarding their 1.3 million tonne per year salt sector.
6. The Vietnamese province of Bac Lieu is of similar capacity and orientation to the Kampot and Kep regions in Cambodia and can be used as a comparative model for the SPCKK in terms of responses to market issues.
7. NSCIDD must increase its efforts in the salt industry and expand its mandate in order to prepare Cambodia for a competitive role in the sector as the country's manufacturing sector grows in the coming years.

4 Current Situation in the Salt Industry in Cambodia

4.1 Overview

43. As has been previously stated in this report, Cambodia's salt industry is small in comparison to that of Vietnam, its neighbor to the east and it is by no means a mature sector. It consistently produces enough salt to meet its own domestic consumption needs (80,000 to 90,000 metric tonnes per year), and industrial needs (estimated to be 20,000 to 30,000 metric tonnes per year) yet due to a lack of a coordinated national distribution channel iodized salt fails to reach all Cambodians. The industrial consumption is considerably lower than neighboring Thailand and Vietnam due to the relatively small production base and the industrial volume in Cambodia. The salt industry as it stands, lacks most, if not all of the key elements required to successfully and sustainably support it.

44. The solar salt sector faces many constraints including outdated technology and harvest practices, inadequate marketing and distribution, poor workforce development services and a lack of credit facilities among others. The potential SMEs in the sector have additional issues regarding direct access to markets, poor negotiating skills and a lack of organized long-term purchase and sale agreements. The salt industry, in general, is hampered by a lack of (i) expertise and organizational structure to engage in regional market dynamics (trade association); (ii) product development and quality certification; (iii) human resource development and capacity building at provincial level; (iv) sales, marketing, logistics and financial planning; (v) strategic planning and business development; and (vi) manufacturing and process integration ensuring USI program compliance.

45. The RGC agreed to bolster the salt industry and meet the demands of the USI program which has as its core objective the elimination of Iodine Deficiency Disorders. The RGC's only effort to intervene in the salt industry to date was with the passing in October 2003 of Sub-Decree No. 69. The Sub-Decree, while providing a catalyst for change within the industry has not proven to provide enough impetus for the continued development of a sector which is in much need of governance, access to credit, the creation of and adherence to international quality standards, sales and marketing strategy and a reliable distribution network.

46. The Salt Producers Community of Kampot and Kep (SPCKK) which was established in 2004 to coordinate and manage the production of iodized salt including its marketing and sales has limited capacity to deal with the current situation the Cambodian salt industry finds itself in. Section 4.3 describes SPCKK, its operation and its capacity.

47. According to the UN Millennium Development Goal the USI program in Cambodia will be deemed successful once 90 percent of Cambodian households consume iodized salt which contains standard iodine content by 2015. Currently only 73 percent of households consume iodized salt and UNICEF states that the primary reasons the intake of iodized salt has been particularly slow to progress in the past three years is high cost and low quality when compared with salt from neighboring Vietnam. UNICEF does not work directly in promoting salt; however they provide financial and technical support to NSCIDDD to carry out this task.

48. One of the most pressing and immediate concerns for Cambodia's salt trade is the inherent lack of adoption of solar salt production best practices. Section 4.4 describes in

detail the practices currently utilized in Cambodia's salt producing areas of Kampot and Kep.

49. Due to the limited capacity of the Cambodian salt sector in terms of investment, production, quality control, marketing and distribution and external factors such as climate change and the surplus in neighboring Vietnam, Cambodia and its citizens are vulnerable to IDD brought about through limited access to affordable iodized salt but also to the effects that market saturation, through the importation of foreign salt will have on those people whose livelihoods depend on salt production. These constraints if attended to effectively and efficiently in the near future can be mitigated, however left unattended and given the growth of Cambodia's industrial sector the demand for salt will only serve to increase and once a foothold has been established and trade arrangements have been made, whether legal or illegal the plight of Cambodia's salt industry and the livelihoods that depend on it will only worsen.

4.2 Governance

50. The National Sub-Committee for the Control of IDD (NSCIDDD) was formed in 1996 under the guidance and leadership of the Inter-Ministerial Quality assurance (IMTC) of the National Council for Nutrition (NCN). Its mandate; to increase the intake of iodine by Cambodians through the increased production of iodized salt, education and communication on the importance of iodine for the diet and on strategies to address IDD, and monitoring and quality control of nationwide iodized salt production, import, distribution and sale.

51. NSCIDDD is comprised of about 15 members from eight government ministries and some concerned NGOs/IOs. These include:

- Ministry of Industry, Mines and Energy (MoIME)
- Ministry of Health (MoH)
- Ministry of Planning (MoP)
- Ministry of Information (MoIF)
- Ministry of Education, Youth and Sport (MoEYS)
- Ministry of Rural Development (MRD)
- Ministry of Commerce (MoC)
- Ministry of Women's Affairs (MoWA)
- United Nations Children's Fund (UNICEF)
- German Technical Cooperation (GTZ)

52. To support the committee, further sub-committees have been established at the provincial level however many of these activities are not yet active. Only 4 of the ministries which comprise NSCIDDD play an active role;

- Ministry of Industry, Mines and Energy (MoIME)
- Ministry of Rural Development (MRD)
- Ministry of Planning (MoP)
- Ministry of Education, Youth and Sport (MoEYS)

53. The RGC does not provide any budget for the operation of NSCIDDD, rather all of their funding is sourced from the likes of USAID and UNICEF. CamControl under MoC is becoming more active in monitoring markets for iodized salt even though there is no testing and enforcement of penalties.

54. In October 2003 the RGC decided to intervene in the salt trade by passing Sub-Decree No. 69. The purpose of the Sub-Decree was to achieve the IDD elimination objective and to provide technical guidelines and regulatory parameters that would set out a platform for iodized salt to become readily available to all Cambodian citizens. This provided the impetus the NSCIDD needed to formalize Cambodia's salt production. The body they established to cater to this need was the Salt Producers Community of Kampot and Kep (SPCKK).

55. NSCIDD realizes that the fundamental factors hampering its efforts to decrease IDD in Cambodia are:

- Lack of awareness surrounding iodized salt and its health benefits
- No organized and effective national distribution network
- Inefficient quality control and quality assurance processes
- No control over the price of iodized salt
- Illegal importation of non-iodized salt

Given the limited funding NSCIDD receives its capacity to put into place effective strategies to mitigate the constraints stated above is very limited. Quality control is essentially non-existent and emphasis is placed on ensuring salt is iodized but not on ensuring it is iodized with the correct level of potassium iodate required to eradicate IDD.

56. With the exception of the passing of Sub-Decree No. 69 and the establishment of NSCIDD which receives no RGC budget, the RGC plays no role in Cambodia's salt trade even though the successful production and distribution of iodized salt would contribute towards a healthier population. Food processors' in Cambodia are not required by law to use iodized salt, however the introduction of such a law would provide another means by which to increase the intake of iodine in the Cambodian diet and would only to serve to increase the demand for iodized salt and create additional revenue.

4.3 Salt Producers Community of Kampot and Kep (SPCKK)

57. SPCKK is an association of 188 salt producers in Kampot and Kep which was established in 2004 with the support of NSCID and UNICEF following the passing of Sub-Decree No. 69 by the RGC. The SPCKK organizational model comprises 15 directors who serve as the BoD and 9 executive committee members. The directors and executive committee members are themselves all salt producers who produce salt for SPCKK. Every 5 years an election is held to elect a new Chairman for the BoD. Currently the position is shared by two individuals. SPCKK comprises various departments and business units each responsible for different areas of operation. Below is an organizational chart depicting the structure of SPCKK.

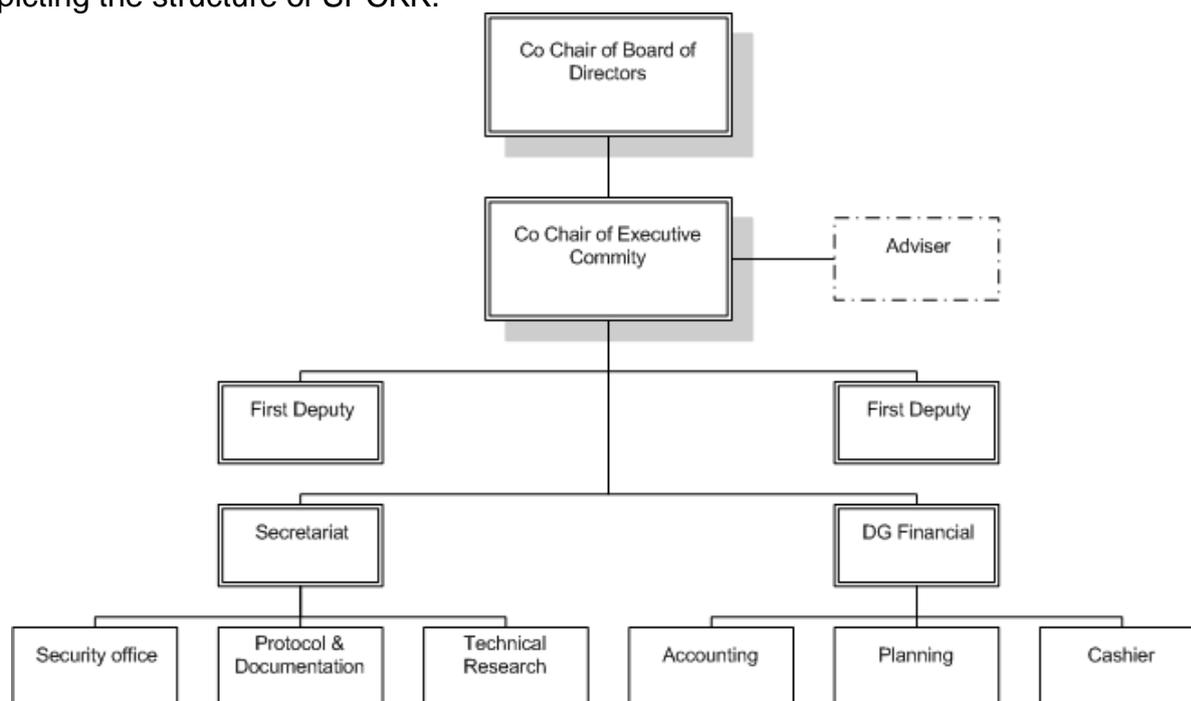


Figure 2 SPCKK Organizational Chart

58. SPCKK purchases salt from its members for 100 riel/kg (50 riel prior to production and 50 riel upon collection of the salt) and sells it on their behalf. While SPCKK maintains that profits are used on 1) SPCKK operations and 2) interest free loans for its members for salt production purposes; current investment is offering few tangible benefits to improve the quality of salt production.

59. SPCKK has an absolute monopoly on Cambodia's salt production industry. A benefit of this is that the iodization process is able to be more easily monitored however the negative impact is that they alone determine the cost of purchase and the cost of sale. The cost of SPCKK salt is higher and of a lesser quality than that of informally imported non-iodized salt which serves as one of the key issues facing Cambodia's salt sector.



Picture 1 SPCKK administration offices.

60. SPCKK plays no role in the distribution of salt. The sales and distribution process is simply to receive an order, collect payment for that order up front to fund the iodization of the purchased salt and the purchaser arrives to collect their order. SPCKK appears reluctant to play any role other than the role just described which highlights the need for the introduction of an effective and efficient marketing, sales and distribution network. Only by doing so will iodized salt be truly available to all Cambodians.

4.4 Solar Salt Production

61. Cambodia's salt sector operates within the confines of a small stretch of coastline between Kampot and Kep on the south eastern coast of Cambodia near Vietnam. The weather in Kapmpot and Kep in addition to their close proximity to the South China Sea provides the ideal environment for solar salt production. The weather plays a crucial role in the successful production of solar salt, yet the threat that global climate change poses on the production of salt is more serious now than ever before. In addition to the threat that erratic weather holds, Cambodia's monsoon season restricts the efficient production of salt from November to April. Consequently, the need for financial and technical intervention is more critical to the long term success and sustainability of Cambodia's salt sector than ever before.

62. Cambodia's iodized salt production is in essence similar to that of other solar salt producing nations in terms of the process used to produce it. A fundamental difference however is the lack of best practice adopted by Cambodian salt producers beginning with the sourcing of salt water, the dams and dykes used to channel the water into the salt pans, the quality of the salt pans themselves, the harvest process, post harvest storage facilities and practices, and the iodization of the salt itself.

63. This section is going to detail the current practices adopted in Cambodia for the purposes of salt production then present a case study highlighting best practice before drawing a comparison between the two to identify areas for intervention aimed at improving Cambodia's salt production.

4.4.1 Cambodia's Current Salt Production Process

4.4.1.1 Inbound Raw Material Sea Water

64. The raw material sea water used for Cambodia's solar salt production is sourced slightly upstream of minor tributaries feeding into the South China Sea. This is not ideal due to the confluence of the fresh water river mouth, reducing the salinity of the water and increasing the water's susceptibility to contamination by soluble and insoluble impurities carried downstream from Kampot Town. It is channeled via dams or pumped into reservoirs ready to be carried through a series of canals into the salt pans. The reservoirs collect organic and inorganic waste either through rubbish being disposed of or collected in the reservoirs or through silt and clay being disturbed from the bottom of the reservoirs. Below are images of reservoirs from the Kampot and Kep regions with varying degrees of turbidity.



Picture 2 A reservoir showing sea water which is not clear and has a brown clay color.



Picture 3 This reservoir is further away from the confluence of the inlet with the Kampot River and therefore the raw material sea water is cleaner.

65. The dams used to allow water in and out the reservoirs vary in terms of quality as is shown in the images below.



Picture 4 A good example of one of a few concrete structures for inbound sea water to salt pans.



Picture 5 A more typical entry point for inbound seawater

4.4.1.2 Irrigation

66. The water from the reservoirs is pumped into canals using pumps owned by the individual producers. Of note in the images below the set up and/or the quality of some pumps poses a contamination threat to the quality of the sea water used in the salt production.

67. Effective irrigation is critical to the running of salt production as it serves to effectively provide and remove sea water from the salt pans. During the 2009 floods when the water was reaching between 3cm to 2m, irrigation would have helped mitigate the risk posed to salt production. Consequently, the harvest of 2009 proved to only produce a yield of 25,000 tonnes, well below the average.



Picture 6 There is significant contamination from machinery and operations such as this.



Picture 7 this is a good example of a pumping system and its canals which picks up less clay and other insoluble components.

68. The canals used to carry the water from the reservoirs to the salt pans are exposed to windborne contaminants, are made of clay and often are made using poor workmanship. These factors in addition to the quality of the raw material sea water further add to the prospect of producing poor quality salt.



Picture 8 this concrete control system offers delivery of sea water to several locations. The canals are unfinished and muddy.



Picture 9 Secondary canal which is fed by the southern reservoir. The water is turbid and has solid waste such as plastic packaging and other debris in the water.



Picture 10 Contamination of inbound sea water is caused by exposed unfinished surfaces as well as wind born particulates.

4.4.1.3 The Salt Pans

69. The salt pans used to produce the salt have their surface made of manually compressed clay given the absence of adequate funding for alternative technology such as heavy duty plastic lining³. The use of clay as the surface for the salt pan decreases the rate of evaporation that the introduction of alternative technologies would otherwise provide. The quality of the salt pans and the risk of contamination vary between producers. The worse the workmanship of the pan construction and its surrounding walls and the more exposed the pan is to loose gravel, the more likely the risk of contamination.



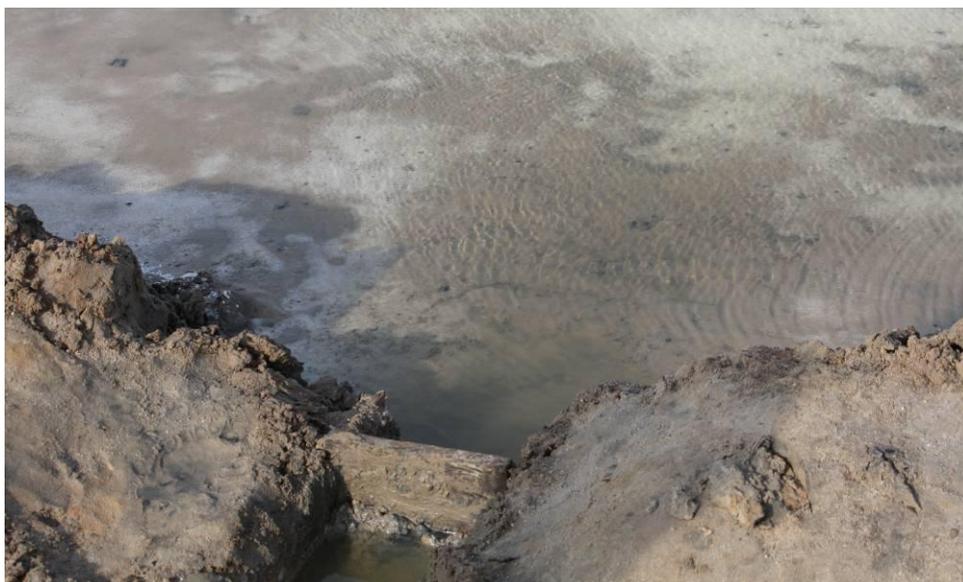
Picture 11: Surface of new clay is pounded firmly into place.



Picture 12: Newer salt pans have secondary canal systems around the perimeter. There has been a proactive effort to accomplish smoother surfaces than in most pans / dykes.

70. Dependant on the weather, between 2cm to 6cm of sea water is fed into the salt pans through either wooden gates or pipes. Recently, efforts have been made to increase the use of pipes with plastic caps by several producers reducing the risk of contaminants entering the salt pan.

³ While it may not be economical to cover all salt pans in the industry, or affordable by the smaller producers, SPCKK has indicated its willingness to assist in providing lines of credit to those producers willing to upgrade.



Picture 13: Crude wooden gating system for flooding the salt pans. The inbound sea water picks up clay at this entrance since the soil is loose.



Picture 14: Many salt pans are being converted to capped pipes for feeding of salt pans, which reduces impurity pick up from opening the dykes that have wooden gates.

71. Some producers have designed and built more sophisticated pans which implies they understand the best practice concept of sequential brine concentration however the practice hasn't been adopted. Instead all sequential pans are being flooded simultaneously to produce more salt rather than to produce salt of a higher quality.



Picture 15: The irrigation system of newer pans is more sophisticated with an apparent design for sequential brine concentration; however, this was not being practiced.



Picture 16: New pans interconnected unlike most other salt pans observed, however, the intent was for simultaneous flooding of three pans rather than sequential brine concentration.

4.4.1.4 Harvesting

72. The ideal salt production cycle for producing finer quality salt is between 7-10 days although salt is also harvested between 2-5 days. The difference in cycles is weather dependant. Salt production capacity is between 20-40 tonnes per hectare per year depending on the location and quality of the salt pan and the weather. This is in comparison with industries such as Sri Lanka, which can produce up to 90-100 tonnes per hectare per year.



Picture 17: This is a typical series of salt pans, measuring 30 M X 15 M. The owner has 50 such pans in contiguous order. The workers harvest salt on a three day cycle and harvest 20 salt pans per cycle in one day.

73. One of the areas of the production process which causes the most contamination of the salt is the harvest process. This occurs primarily through clay being scraped from the salt pan while collecting the salt as is evident in the images below.



Picture 18: This figure illustrates that the collection of black contaminants is a regular occurrence.

74. Salt is gathered into piles called pies. Ideally pies will be gathered to a foot in height and left to stand for a period of time to allow maximum drainage and drying however in most cases the salt is immediately transported to nearby storage sheds and the salt pans

are prepared for the next production cycle. This indicates that many producers are not aware of harvesting best practice and don't understand the implications of immediate salt pie removal. The method of preparing the salt pans for re-flooding involves scraping and agitating the surface of the salt pan, draining the residual sea water and brine and pounding the clay surface until it is smooth.



Picture 19: The piles of salt are not formed in a manner to cause good drainage and he workers take significant amounts of water along with the salt in their baskets.



Picture 20: The surface is scraped and agitated, then the salt pan is drained and the clay pounded and packed.

75. SPCKK iodizes the salt at the producer's storage sheds prior to removing the salt for sale to traders or boilers. The current storage capacity is between 300 – 4000 tonnes depending on the size of the salt pan production area.

76. The poor state of many producers storage sheds means the salt is susceptible to the absorption of climatic and surface moisture. This negatively impacts the iodization

process. Additionally the salt is also more prone to the collection of contaminants, for example wood scrapings from the interior of the sheds.



Picture 21: An older storage shed, shored up by clay embankment as well as wooden braces. A new, larger storage shed under construction in the background.

4.4.2 Solar Salt Production Best Practice

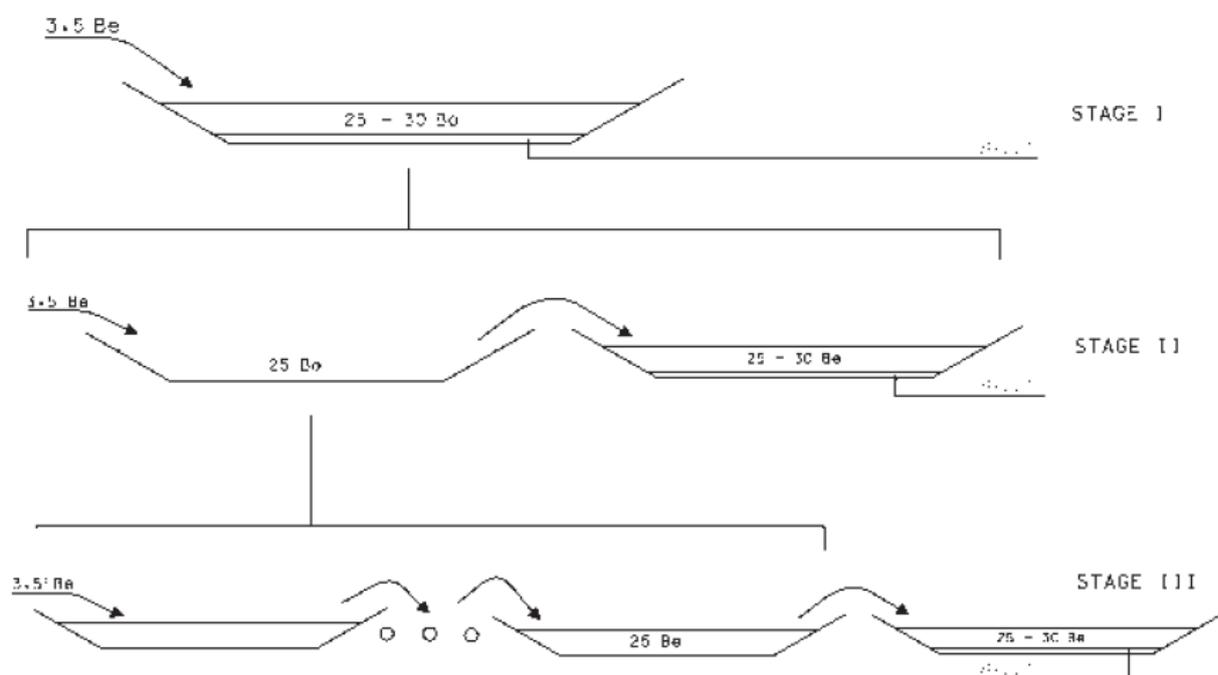
77. The Box 14, Box 15 and Box 16 describe best practice methods to achieve the production of high quality solar salt. To understand the implications of best practice methods it is useful to outline the evolution of solar salt production and the current practices of the Cambodian salt industry. The first form (pre-historical method) of solar salt production concentrates the salt in a single pan in a one-step process; see Stage I, Figure 3. This is the method currently used in Cambodia.

78. This method has certain disadvantages since the salt produced contains all the ingredients of seawater and it is very difficult to produce relatively pure salt (in fact it requires great experience). Moreover, this method of salt production is a batch process with limited production rates.

79. The second form is the process of salt recovery using a two stage process; see Stage II, Figure 3. The first pond, usually called the nurse pond, was used for the production of saturated brine, which was fed into the second basin, usually called a crystallizer. In the two-stage process it is now possible to achieve a continuous salt production process and to unbind the salt production rate. More importantly, it enables the elimination of salts with less solubility than sodium chloride (i.e. Calcium Carbonate and Calcium Sulphide since these crystallize in the first basin and remain there).

80. The third form (and currently best practice) uses a three stage process; see Stage III, Figure 3. This divides the nurse pond into several interconnected basins. With this design the seawater enters the first basin and as it flows through the next ponds and evaporates in the sun its concentration increases. Thus by the time it reaches the last basin, which has now become the nursing pond, it has a concentration of 25.7° Be, corresponding to the saturation level where sodium chloride precipitates out. This production method ensures greater control over the concentrations and quantities of the brine fed through the system, thus resulting in the unobstructed production of much better quality salt, increases dramatically the quantity of salt produced as the average brine concentration in the system of ponds decreases drastically (there is an inverse proportion between evaporation levels

and concentration of brine), and creates a more environmentally sustainable living ecosystem for wetland conservation.



Source: Korovessis and Lekkas (2000) Solar Saltworks Production Process Evolution – Wetland Function.

Figure 3 Basic Stages in Solar Salt Production Processes

Box 14 Production of High Quality Solar Salt

The solar salt production process has relatively few parameters by which the quality of the salt and the production yield are determined.

The first point is the purity of the inbound raw material sea water and brine pre-concentration area. During evaporation the increase in the concentration of salts of the sea water progresses from the starting density of 3.85 °Bè to 26 °Bè, when the NaCl begins to precipitate. During this process there are several requirements:

- The sea water should increase its concentration gradually, without back-mixing
- The sea water should be retained without volume lost due to seepage
- The bottom of the salt pans should be impervious and dark to facilitate maximum absorption of solar radiation
- The sea water should remain clear, allowing solar radiation to reach the bottom of the salt pans
- Calcium carbonate and calcium sulphate, should crystallize prior to the brine reaching density of 26°Bè when NaCl begins to precipitate and the brine should be transferred after this crystallization
- Nutrients and biological material present in the raw material sea water should be consumed fully by succession of species whose life is supported by the respective salinity of the brine
- The brine entering the salt pans should be free of excessive organic material that would negatively influence the salt crystallization

The second point is the salt crystallization area or salt pan where the NaCl precipitates from brine as the density increases from 26 °Bè to 28.5 °Bè. The salt pans require the following:

- The sea water should be retained without volume lost due to seepage
- The brine should support the existence of Halobacterium which colours the brine red and increases the absorption of solar radiation. Halobacterium also oxidises organic matter that is detrimental to salt quality. Organic matter causes formation of fine, impure crystals and agglomerates with impurities

trapped inside. Brine free of organic matter allows growth of large, clear and pure salt crystals

- The coloured brine layer should be thick enough to avoid reflection of solar radiation from the white salt crystals back to the atmosphere
- The brine should proceed through a series of salt pans without back-mixing and the 28.5°Bè brine is drained, facilitating faster evaporation and avoiding contamination of salt with impurities, such as magnesium, sulphate, etc.
- Salt pan dike construction should prevent contamination of brine and salt with insoluble clay and other components
- The harvesting method should recover maximum portion of crystallized salt but avoiding contamination with insoluble material from the surface of the salt pans

The third point is the solar salt processing that purifies the salt prior to delivery. This purification process should fulfill the following requirements:

- Remove mother liquor (spent brine after 28.5°Bè) from the salt crystals so that the salt crystal surface will be free of magnesium and sulphate impurities
- Remove gypsum crystals and insoluble impurities from the salt so that the salt crystal surface will be free of calcium sulphate and insolubles and the salt will be white in colour
- Remove excess moisture from the salt so that no brine will drain from the salt during handling and storage, causing additional losses

Source: Environmental Balance of Salt Production Speaks in Favour of Solar Saltworks, 1st International Conference on the Ecological Importance of Solar Saltworks (CEISSA 06) Santorini Island, Greece, 20-22 October 2006

Box 15 Optimal Solar Salt Production Design and Operation

The requirements described above can be satisfied by:

- Appropriate solar salt pan design, taking into account the climatic and geological conditions, as well as sea water quality and the mechanical and hydrological design and operation of the entire production area
- Solar salt operations, as an open environmental system having its own biological balance and metabolism of nutrients, must be understood and correctly managed to achieve the goals of production capacity and the quality of the salt crystals (large, hard, clear and pure)
- A salt purification process should be employed that rinses and purifies the salt crystal surface fully with minimum consumption of utilities and minimum of losses

Source: Environmental Balance of Salt Production Speaks in Favour of Solar Saltworks, 1st International Conference on the Ecological Importance of Solar Saltworks (CEISSA 06) Santorini Island, Greece, 20-22 October 2006

Box 16 Solar Salt Upgrading

Simple washing of solar salt crystals will remove the surface impurities. The more washing that is required, the more loss of salt production. Experts have devoted much time and effort to this subject (Sedivy, 1988; 1996). As a result, they have developed processes that remove more impurities from salt, use less water and recover the dissolved salt to reduce the production losses. If the salt is of poor quality and contains impurities inside the crystals, certain processes also remove these by selectively cracking the crystals to free the enclosed impurities.

Prediction of the salt purity achievable with these processes cannot be transformed into a quantitative standard. Calculating salt purity is only possible by testing the salt in the laboratory, using a sequence of unit operations identical to the sequence employed in the production process. Experts have developed and standardized such procedures to investigate salt samples as an integral part of quality control and quality assurance.

- Edible salt can be iodised by spraying it with a potassium iodate solution
- 60 ml of potassium iodate, costing about USD1.15 – 1.30 are required to iodise a ton of salt
- Salt is an effective vehicle for distributing iodine to the public because it does not spoil and is consumed by everyone in the population in fairly predictable amounts
- Salt that is iodised with potassium iodate may slowly lose its iodine content by exposure to excess air over long periods

- the alkali metal iodide over time and exposure to excess oxygen and carbon dioxide slowly oxidizes to metal carbonate and elemental iodine
- the elemental iodine then evaporates

Source: Environmental Balance of Salt Production Speaks in Favour of Solar Saltworks, 1st International Conference on the Ecological Importance of Solar Saltworks (CEISSA 06)
Santorini Island, Greece, 20-22 October 2006

4.4.3 Intervention Recommendations to Improve Salt Production Quality

81. The consultants concluded after conducting a comparative analysis between current solar salt production practices used in Cambodia and those recognized as 'best practice' that the following interventions would significantly improve the quality of solar salt produced in Cambodia. The geographic constraints of Cambodia's salt production were also taken into account.

Action	Objective	Validation
Provide extension services to salt producers to impart salt production best practice knowledge	To raise awareness on solar salt production best practice	Producers adopt best practice in their salt production
Promote best practice set up and use of pumps	Reduces sea water contamination	Quality of sea water used in salt production is improved
Upgrade canals to adhere to best practice standards	Reduces seepage and reduces the risk sea water contamination	Quality of sea water used in salt production is improved
Rebuild salt pans to support the best practice of sequential salt pan feeding	To reduce levels of impurities in their solar salt	Salt quality improves
Replace wooden dams with concrete dams and wooden dykes with plastic	Improves the quality of the sea water used in the salt pans	Quality of sea water used in salt production is improved
Resurface salt pans with dark, durable plastic liners	Reduces seepage, decreases evaporation time and mitigates the risk of scraping contaminants into the salt when harvesting	Yield increases and salt quality improves
Build adequate storage facilities	To mitigate the risk of post harvest moisture absorption and exposure to contaminants	Salt quality improves

Table 2 Salt Production Interventions

4.5 Post Production

82. There is currently no salt boilers association in Cambodia although there is a tentative plan for the NSCIDD to establish one in the near future. Boilers and Traders determine the cost they wish to sell salt for. Prior to 2011 salt boilers received support from UNICEF for the iodization of salt however now that this support has ceased boilers will need to cover the cost of iodization.

83. Boilers have no formal relationship with SPCKK other than to purchase salt. Salt is purchased from SPCKK for between 220-230 riels/kg in three grades ranging from 1-3 with grade one being the salt of the best quality and highest price. Boilers prefer to purchase

grades two and three as it increases their profit margins. Boilers sell their salt to wholesalers and/or retailers in 3 gram, 6 gram or 1kg packages.

84. The inputs used to for boilers to refine the salt are rice husk as fuel as firewood and charcoal are too expensive and iodine which until recently was subsidized by UNICEF. Potassium iodate itself is not expensive (in 2006 60 ml of potassium iodate cost approximately USD\$1.15 and was used to iodize a tonne of salt).

85. Salt is retailed in two types; pulverized and pebbly. All pulverized salt is iodized and the packaging either has no labeling at all or the labeling is of a brand which is not SPCKK's but most likely the boilers or traders it was purchased from. Pebbly salt is sold as iodized and non-iodized and contains no branding at all. Non-iodized pebbly salt is often used to cure meat as a preference to iodized salt as it was noted that iodized salt creates a bad smell.

86. Most of the salt sold is to the markets or local residents. Retailers have no tools with which to measure the level of iodization in their product however they are told when they purchase the salt from the trader or boiler which packages are iodized or un-iodized⁴. While there is much salt retail competition, prices remain consistent between them. Typical buy/sell prices per kg at the time of writing are:

Type of Salt:	Buy in Price:	Sale Price:
Pulverized salt	900 riel/kg	1500 riel/kg
Iodized pebbly salt	800 riel/kg	1000 riel/kg
Un-iodized pebbly salt	600 riel/kg	800 riel/kg

Table 3 Retail buy/sell prices as at February 2011

⁴ Rapid test kits can only determine whether potassium iodate is present within the salt sample, not the concentration of iodine.

5 SWOT Analysis

5.1 Overview

87. At the core of a successful business plan is a logical strategy. A strategy helps an industry determine where to improve, what to achieve, and how to achieve it. As a planned response to marketplace challenges, it is based on an analysis of an industry's internal and external competitive environment. This section of the report briefly describes the strengths, weaknesses, opportunities, and threats presented by the competitive environment of Cambodia's salt industry.

88. In recent times the global economy has changed significantly and likely irreversibly. The latest figures indicate that China has now surpassed Japan as the second largest economy after the United States. The global financial crisis, coupled with the responses in the energy and food sectors, have had profound impacts on many countries. The strategies and actions of other countries and global corporations in many sectors have contributed to excess supply and weak prices for many commodities. Cambodia, which has approximately 200,000 metric tonnes of annual salt production in a good season, cannot affect the global salt market and prices. Moreover, the salt industry in Cambodia appears to be in market isolation due to recent decisions by the RGC and other stakeholders, dealing only with internal matters rather than global economic impacts.

89. Some results are:

1. The salt producers' operations are inefficient with low productivity and quality;
2. The production season for the salt industry is short, inconsistent and uncertain;
3. Certain trader operations are engaged in the illegal import of non-iodized salt;
4. Smallholders within the SPCKK are not selling their full allotments of recent production through official channels and there is evidence that non-iodized salt consumption in Kampot and Kep is relatively high compared to other provinces;
5. The domestic salt market and domestic salt production have been in a balance of supply and demand until recent events of the 2009 flood, coupled with the 2010 price drops; and
6. Complacency with traditional favorable financial returns for the senior members of the SPCKK has left the domestic market in Cambodia open to competition from neighboring countries due to relatively lax border control and a steady flow of inbound goods.

90. Government policies and activities coupled with little to no interest on the part of the private sector in the salt industry has had an adverse affect on the growth and development of Cambodia's salt industry. The only exception being the small scale boiler operations that have emerged to refine the coarse discolored SPCKK salt into fine grain white table salt. The government is fully supportive of the SPCKK and although the RGC has itself passed Sub-Decree No. 69, there appears to very little else that the RGC is proactively doing to ensure that the objectives within the Sub-Decree are met.

91. Within the RGC there is a National Council for Nutrition (NCN), chaired by the Minister of Planning. Within the NCN, there are the NSCIDDD and NSCFF. The multitude of donor agencies and government departments, including the Council of Ministers, the Ministry of Planning, Ministry of Women's Affairs, Ministry of Agriculture Forestry and Fisheries, Ministry of Industry Mines and Energy, Ministry of Health, Ministry of Commerce, Ministry of Rural Development, Ministry of Economy and Finance, Ministry of Youth Education and Sports, Ministry of Interior, and the institutions connected to them, have a direct and indirect interest in, and certain influence on the salt industry but collectively do not have a common strategy for supporting it. Moreover, the iodine subsidy program and the expiry of that subsidy in January 2011 have affected market dynamics significantly. Of further significance, the stakeholders have limited their investigations to consumption surveys respecting iodized salt and have not collected the technical data and commercial information necessary for informed business planning and related policymaking.

92. As noted above, Cambodia has a short salt production season and a limited number of hectares with conditions appropriate for solar salt production. Therefore Cambodia has no comparative advantage for its salt industry. Further, the current situation offers no competitive advantage because there has been no incentive to upgrade productivity and quality until recent events opened the market to higher quality imports at lower prices.

93. Performance improvements are constrained by the lack of investment capital and the high interest rates and short terms for working capital or other credits. The industry stakeholders are not making concerted efforts to formulate long term investment plans and to secure external financial alliances under favorable terms and conditions. Industry members, as represented by the SPCKK, do not organize or control activities along the value chain and there are inefficiencies due to the current business environment and the informal relationships among stakeholders. Linkages among stakeholders are weak and immaterial, thereby limiting the benefits and effectiveness of the SPCKK and support service companies or agencies. Two key shortcomings in the business enabling environment is access to finance and distribution.

94. In the following paragraphs we analyze the strengths and weaknesses, opportunities, and threats of various aspects of Cambodia's salt industry: manufacturing, productivity and quality; marketing, distribution and supporting industries; investment planning; supply and demand fluctuations; public sector support and national interest; and the salt industry trade association.

5.2 Manufacturing, Productivity and Quality

5.2.1 Strengths and Weaknesses

95. There has been no recent investment in new technology in the salt industry in Cambodia, other than the mounting of the headquarters of the SPCKK. There are mobile iodizing units that were donor supplied and these are in various states of operating effectiveness. The members of SPCKK have no standards of operations regarding the size and shape of the individual producer's salt pans. There are no specifications or standards regarding the design and materials for the boundaries of the salt pans, the irrigation systems feeding the salt pans and the methodologies for harvesting the salt. There are no design parameters or metrics regarding the surface of the salt pans and there is evidence that there is a high rate of diffusion and pick up of impurities into the salt as it crystallizes. There are no product specification requirements among producers and no certification

standards in order to qualify them as being able to supply salt to the SPCKK system. The inbound seawater is taken from the inlets directly adjacent to the production areas and this water is a blend of seawater and fresh water due to the confluence of the tidal waters and the Kampot River and other fresh water runoff. This inbound raw material is variable in its turbidity and other aspects of composition. There are seven major production areas within the Kampot and Kep region and SPCKK has no production plan among the individual producers in these areas.

5.2.2 Opportunities

96. As has been reported previously to UNICEF, countries such as Sri Lanka and India follow specific production processes and methodologies, in order to achieve high yields and low levels of impurities in their solar salt. The basic concept is to achieve three levels of brine concentration as the seawater evaporates. As these levels of concentration are achieved the workers move the brine to consecutive salt ponds. The result is that certain undesirable salts are left behind in the first pan, the clean NaCl salt is left behind in the second pan and the high concentration brine still containing heavier undesirable salts is moved to a third pan and ultimately discharged. Further the workers are very careful to not disturb or agitate the salt pan surface and this precludes undesirable mixture of the salt pan surface materials, either clay or sand or both, into the NaCl salt from the second pan. These production practices will greatly enhance production performance.

97. Many salt production areas in other countries have a consistently higher quality of seawater with lower total soluble and insoluble components and a higher NaCl content on a percentage basis. A proper investigation, through water sampling, surveying and analysis would confirm the optimal source point(s) for inbound seawater for all seven production areas. The results of this investigation could indicate that one or more irrigation systems need to be installed in order to improve the raw material stream(s) for the salt production areas. The consultants have noted that the turbidity of the raw material seawater varied considerably from one production area to another. In all cases this was a result of a combination of better design and better maintenance of water canals and reservoirs as well as the source point for the inbound seawater.

98. There are many solar salt producers that have the comparative advantage of massive salterns and salt plains. There is a salt plain in Bolivia that has a diameter of 160 Km, whereas the Boeng Rung 1 & 2 production areas have a diameter of only 5 Km. With the limited production area available for solar salt production, Cambodia must ensure that these production areas are enhanced in order to yield the highest possible quality salt. In this regard the Board of Trustees and the Executive Committee have investigated the opportunity to line the salt pans with thick black plastic film. This feasibility study must be completed and SPCKK must determine the best option for surface treatment of salt pans, since there are various techniques. Further, this study must include the impact of salt pan surface treatment in isolation versus coupling this upgrade with new irrigation systems and higher quality inbound seawater.

99. In the past three years in Sri Lanka, Lanka Salt Ltd. has invested in a 15 metric tonnes per day salt refinery that produces high quality iodized salt. Lanka Salt Ltd. produces 70 percent of Sri Lanka's domestic market salt and this investment has increased the profits of the company considerably. A cost / benefit analysis should be completed for the installation of a 200,000 metric tonnes per year salt refinery, in order to determine if this would be appropriate to meet the future market demand in Cambodia.

5.2.3 Threats

100. In 2009 there was significant flooding in Kampot and Kep. These floods reduced the season's production to a mere 25,000 metric tonnes. In 2010 the weather was considerably drier and SPCKK members produced 210,000 metric tonnes. Various international agencies, such as UNDP and others are intensely concerned about climate change and the impact this will have on traditional activities and the livelihoods of the poor in vulnerable regions. The consultants have observed that climate change resilience and adaptation will be necessary in the near future for SPCKK and its members. In this regard, the salt industry in Cambodia must collaborate with a vested interest donor agency in order to fully understand the potential impacts of changing weather patterns.

101. Because of shortages in 2009, Cambodia opened the salt market to imports from China. Other imports found their way to Cambodia as well. During 2010, notwithstanding large volumes of domestic production, the imports of salt continued. Due to downward pressure on the global price of salt and other commodities as well as the dynamics in the Vietnamese market described above, the volume of imports grew. The salt industry in Cambodia must be responsive to the market in terms of quality and price in order to remain the leader in domestic market share.

5.3 Marketing, Distribution and Supporting Industries

5.3.1 Strengths and Weaknesses

102. As stated above, there is a multitude of players invested in the outcome of the USI and IDD programs in Cambodia. The consultants recognize that UNICEF has a MDG objective and this report does not lose sight of this. However the report deals with the salt industry as any other industrial sector with respect to best practices and competitiveness. In this regard, the consultants have observed that the SPCKK has a limited commercial mandate, whether self-imposed or otherwise. There are significant gaps in the business practices of the SPCKK. Among other constraints, there is no marketing plan, even though there is a logo and a brand name that are underutilized. The average citizen in Cambodia should be seeking the SPCKK brand by default and this brand name should impart consumer confidence for quality and ICCIDD compliance.

103. Iodized table salt for household consumption is by definition a consumer product and should be considered in the category of fast moving consumer goods (FMCG), since it is purchased in small packages and with high frequency. As with other FMCG items table salt must be readily available throughout the distribution channels in order to be restocked at retail continuously. SPCKK must develop a distribution strategy and ensure that inventories are held in each province at key geographic locations. Further, the quality of SPCKK production falls short of standard specifications for household table salt and must be refined by boilers. Currently the boilers in Cambodia are an unorganized number of entrepreneurs attending to market demand through a series of preferred wholesalers on a city to city basis. This informal system falls short of effective market penetration at the district and village levels.

104. SPCKK has no formal contractual alliances with supporting companies for sales, marketing and distribution. Further it has no capacity to manufacture a consumer grade

product and places 50 Kg bags of low grade salt into the market as a semi-finished product with respect to household consumers.

5.3.2 Opportunities

105. As mentioned previously, there are many interested parties connected to the salt industry. There are various ministries which currently have significant international donor projects underway. In many cases these projects have logical connection to the stated objectives of the USI and IDD programs. It is therefore reasonable to predict that there are potential strategic partners in Cambodia that could join the SPCKK under the auspices of an expanded salt trade association (SITAC). One such potential alliance is with the Cambodian Women for Peace and Development (CWPD). This NGO has significant reach and its mandate is clearly aligned with the objectives of USI and IDD. A feasibility study should be completed to determine the optimal structure and practical relations, obligations and responsible parties respecting sales promotion, marketing campaigns and distribution channels for iodized household table salt with the CWPD organization as the core partner.

106. As the food processing industry grows in Cambodia, so too will national brand names. There are many nationally distributed brand name food products in Cambodia today. There are other national brand non-food consumer goods that are widely distributed. SPCKK / SITAC should investigate the options available to form an alliance with a national or an international firm that is currently distributing products to key central locations in each province. This could become the initial phase of collaboration with CWPD or an alternative approach. Collaboration with a recognized brand name operation would achieve brand loyalty and consumer confidence.

5.3.3 Threats

107. If the salt industry in Cambodia continues to underperform in the areas of marketing and distribution and continues with its premium price regime, then competitors will gain more market share over time. Such competitors could be international or national. It is in the best interests of Cambodian citizens that the RGC and all stakeholders associated with the National Council for Nutrition support an open market for iodized salt products, thereby assuring Cambodian citizens the highest quality for the lowest possible cost. If the salt industry in Cambodia under its current configuration (SPCKK) fails to provide competitively priced salt new entrants will arrive in the market.

5.4 Investment Planning

5.4.1 Strengths and Weaknesses

108. The salt industry in Cambodia is confined to a relatively small geographic territory. The total number of production areas is small and readily manageable as a total of 4,500 hectares. To date there has been no exhaustive investigation into the optimum applications for capital investments in order to bring the salt industry in Cambodia into a globally competitive situation. The parameters which must be validated are raw material inputs and the manufacturing processes. These parameters must then be applied to the desired outputs of quality and capacity.

5.4.2 Opportunities

109. It is reasonable to predict that in the near term, given the resources being applied to the agriculture sector in Cambodia its farmers will diversify their crops, expand their outputs and drive growth in the food processing sector. With this assumption comes the linkage to an increase in the demand for industrial salt. The salt industry in Cambodia must be prepared to provide salt for both household consumption and for manufacturing applications.

110. In order to come forward with an appropriate and well-informed investment plan, the salt industry must take a holistic approach and investigate the influences of future economic development on the domestic market, determine the impact of climate change on the salt production areas, analyze the interplay between the Kampot River and other fresh water runoff and the seawater intended to be the raw material for the salt producers,, examine all options to upgrade dams and dikes and canals and reservoirs and salt pan surfaces in order to invest in a systemic change throughout all stages of salt production, and then finally assimilate all this data and information into an optimal investment plan for the growth and sustainability of the salt industry.

111. These investigations will bring forward recommendations for an optimized set of conditions for the salt industry and will illustrate anticipated returns on each individual investment along with the impacts on productivity and quality. These would be presented in a prioritized manner, assuming an upper limit on capital investment for the production of 200,000 to 400,000 metric tonnes per season.

5.4.3 Threats

112. The variables within such investigations are considerable. If the major premise of industrial growth is compelling, then the investigations must be commissioned. However, the findings may illustrate unacceptable levels of investment required to achieve an optimized set of conditions for salt production in Kampot and Kep to achieve desired quality specifications and standards.

5.5 Supply and Demand Fluctuations

5.5.1 Strengths and Weaknesses

113. Cambodia's salt industry produced 210,000 metric tonnes in 2010 through the members of the SPCKK. In 2009 however these salt producers were limited to 25,000 metric tonnes due to severe flooding and damage to salt pans and seawater supply canals. The salt industry has no control over weather systems and these are not predictable. The domestic market demand is relatively stable and will likely grow on a birthrate basis as well as a manufacturing basis. The salt industry currently has no production planning system. Sales of salt in 2010 were approximately 100,000 metric tonnes which is within the anticipated range. However, the 2010 production figures and sales figures imply that SPCKK and its members are holding in excess of 100,000 metric tonnes of inventory. The SPCKK members have very few options regarding the 2011 production season, given that there is no formal production plan and no alternative sales channel. SPCKK members are making individual decisions to continue to produce salt and fill their storage sheds, sell salt unofficially into the market, or stop production.

5.5.2 Opportunities

114. It is a reasonable response by SPCKK to produce as much salt as possible in 2010, given the events of 2009. However, with this decision there must be contingency plans for increased inventories. These contingencies should include possible export options and long term trade agreements with neighboring countries to buy and sell various grades of salt under certain conditions. This would result in cash reserves rather than salt reserves if there is an unexpected natural calamity or other negative impact on production or sales. It is also important for SPCKK to develop an inventory system which has reach beyond the production areas of Kampot and Kep. As stated previously there are valid reasons in terms of marketing and distribution for such an expanded inventory base, however this would resolve the current dilemma of having to stop production in a good harvest season due to lack of storage.

115. There are alternative strategies to deal with impacts of crises on production or fluctuations in the market demand. These are generally established as buy and sell agreements with friendly competitors. In the case of the Cambodian salt industry, such a plan would put a cap on production or would have a trigger point for the sale of significant volumes of salt to an offshore partner.

5.5.3 Threats

116. If SPCKK continues to be completely reactive in these matters, there will likely be imbalance among supply and demand, inventory and production capacity. This will have a negative impact on smallholders within SPCKK and their respective workers, since these constituents are solely dependent upon the sale of their production for their livelihoods.

5.6 Public Sector Support and National Interest

5.6.1 Strengths and Weaknesses

117. The RGC has committed itself to the high level objectives of the National Council for Nutrition (NCN). The related Sub Committees are Food Fortification and Iodine Deficiency Disorders. The RGC has also promulgated Sub-Decree No. 69 which declares that iodized salt exploitation would be critical in eradicating IDD. The Sub-Decree however does not nominate a particular entity as the responsible party to implement the terms and conditions and simply issues a general comment that all parties must enforce the Sub-Decree. The SPCKK has been registered with a mandate to produce salt and in association with UNICEF and the Ministry of Planning has participated in a subsidy program whereby potassium iodate was supplied free of charge to SPCKK in order to increase the consumption of iodized salt by Cambodian citizens. According to NSCIDD representatives the SPCKK has been left to its own management without accountability to NCN or any other RGC entity.

5.6.2 Opportunities

118. The SPCKK has a limited mandate and has suggested that it is narrowly focused on solar salt production. SPCKK recognizes its issues of quality and has stated that it wishes to upgrade its members' salt pan surfaces with plastic liners. It has also stated that it has no interest in mounting a refinery, developing a distribution and inventory system, or promoting itself as the national brand for iodized table salt. Further, SPCKK has no capacity to regulate quality standards and specifications. The RGC has an opportunity to elevate the salt industry to a sector of national interest, since the NCN has a mandate to eradicate IDD and otherwise promote food fortification and micro-nutrients. Given the constraints within the current business environment of the salt sector and given the limited mandate of the SPCKK, the RGC has an opportunity to establish an entity that would address the long term sustainability of the salt industry and ensure the self sufficiency of Cambodia respecting the production and consumption of iodized salt.

5.6.3 Threats

119. Even though there are many international donor organizations working with the various ministries attached to the NCN, the NSCIDDD and the NSCFF, it may be difficult to establish a champion for the cause. Departments and Ministers may be otherwise occupied and budgets may be set. If the RGC is complacent with respect to the current constraints and shortcomings within the salt industry, market forces will continue to drive the outcomes and these outcomes may or may not be aligned with the stated objectives of the NCN and the donor community, nor be in the best interest of Cambodian citizens.

6 Key Factors Affecting the Sustainability of the Salt Industry

6.1 Introduction

120. The Cambodian solar salt industry is unlikely to ever become competitive in large volume exports into the global market due to capacity and logistical constraints. Within the medium to long term, however, it can become more competitive by improving productivity and quality and enhancing other aspects of the business environment. The sustainability strategy recognizes that the survival of Cambodia's salt industry depends on shared long-term obligations, responsibilities, and commercial linkages between salt producers and other stakeholders which will improve the efficiency and efficacy of the entire industry. The objectives within the sustainability strategy include preparation for the anticipated growth in the food processing sector as the agriculture industry in Cambodia expands and becomes more diversified.

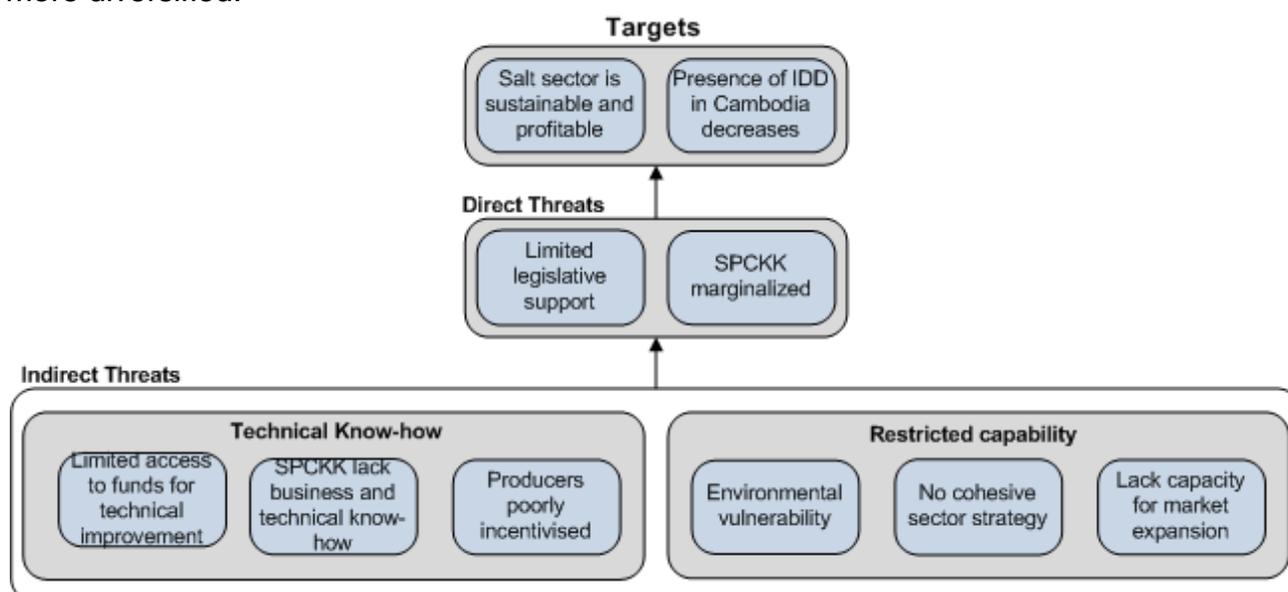


Figure 4 Salt Sector Threat Chain

6.2 Baseline Advantages

121. Cambodia's small land mass available for solar salt production constrains the expansion of the salt industry; therefore, local producers must position themselves to address the domestic market needs for the next five to ten years. SPCKK currently enjoys a preferred position and a majority market share. This is a significant advantage and the stakeholders in the salt industry must formulate plans to maintain this position in the market. As Cambodia's population base and industrial activities base increase its salt producers, through proper management practices, will be able to satisfy this domestic market with high quality salt products.

6.3 Salt Market

122. The salt market is global in scope and many countries import and export various grades of salt for specific applications. There are market leaders in terms of production and export and within these countries there are multi-national corporations participating in production and trade. The world's largest salt producing company is K+S. It recently acquired Morton Salt from Dow Chemical, one of the world's largest chemical companies.

K+S paid USD 1.68 billion to Dow for Morton. K+S is based in Germany and produces more than 30 million metric tonnes of salt annually with salt revenue of USD 1.36 billion.

123. In Cambodia the market is at a level that has not attracted significant competition historically. However, as Cambodia's private sector evolves and enterprises emerge with production requirements similar to Vietnam, Thailand and Malaysia there will be demand for specific grades of salt. It will fall to the salt industry in Cambodia to respond to this demand or yield this volume to imports. In a related processing scenario, the cottage industry producers of prahok consume approximately 10,000 metric tonnes annually and SPCKK and SITAC must be proactive in this market segment to ensure that fish is fermented and the paste is made with iodized salt, thus enhancing iodine intake among Cambodia citizens.

6.4 Supporting Industries and Services

124. In its current configuration, the salt industry in Cambodia is centered on the salt producers in Kampot and Kep and the balance of the business enabling environment is left to chance. Orders placed with SPCKK are on a cash-in-advance basis, which triggers the iodizing of the volume of salt ordered and client then acquires the salt on ex-works terms, thereby taking responsibility for transportation. SPCKK appears to not have an active marketing campaign and many different brand names appear in the market. Since SPCKK grade of salt does not meet international standards for table salt, a number of secondary processors have emerged. These "boilers" convert SPCKK coarse, high moisture content, off-color salt to a finer grain, whiter color and low moisture content product intended for household consumption. The boilers have neither a formalized relationship among themselves, nor a standardized contractual relationship with SPCKK. In this respect there is a lost opportunity to organize production planning, distribution and satellite inventories which would enhance market penetration at the district and commune levels.

125. As described in this report, there must be further evaluation of the costs and benefits to re-configure the salt industry and organize SMEs, NGOs and provincial authorities to take on significant responsibilities as regards customer education and training, distribution and delivery, marketing and sales and secondary processing and packaging.

126. There are many factors that contribute to a successful industry sector. Much depends on the comparative advantages however; equally important is the behavior of the stakeholders within the sector, whether these firms are primary or secondary vendors or service providers. In successful industry sectors, members standardize production and packaging, environmental impact criteria, product specification coding, financial terms, joint procurement, and labor standards. Only a strong trade association consisting of members representing all sections of the industry can address such important issues and meet all demands appropriately in the market.

127. Within the proposed sustainable business model, the salt industry would be institutionalized as the Salt Industry Trade Association of Cambodia (SITAC), a legal entity recognized by all stakeholders, including the RGC and NCN as the apex organization representing the salt industry. SITAC would develop a detailed business plan to govern its functions, delegate standing committees to direct and monitor strategic initiatives, and work to implement action plans for near term and long term industry goals. Ultimately, SITAC would work with similar organizations in ASEAN member states to coordinate efforts and form regional strategies.

128. RGC has created the NCN and within this council the NSCIDDD and the NSCFF. The numerous ministries represented in the related government departments need to reallocate resources and redefine their mandates. If the public sector would support a single strategy and allocate resources according to prioritized strategic initiatives, the industry's competitive position will be strengthened. RGC would approach several international donors with a request for financial support to mount SITAC and utilize consultants to ensure that the strategic initiatives are properly implemented and efficiently financed. The salt industry would maintain a permanent dialogue with the government through SITAC and keep the government stakeholders informed of the changes in the marketplace.

6.5 Organization, Cooperation and Collaboration

129. To implement strategic initiatives, members must formalize long-term commercial relations according to clearly defined deliverables. This will standardize expectations, oblige various parties to meet specified terms and conditions, and strengthen the industry in general while encouraging vertical integration of operations. Old behavior must yield to a new organization and full cooperation, driven entirely by market and customer demands. Such cooperation, based on good faith and trust, means sharing risk as well as reward over the long term. Over time, each stakeholder will invest in resources and capacities to offer effective and efficient services in the market.

6.6 Adding Value in the Business Process

130. As in all industry sectors there are standards and specifications that need to be met in order to satisfy the market. The salt industry in Cambodia requires significant investments in various unit operations within the manufacturing process as well as marketing, sales, inventory and distribution.

131. SPCKK has indicated that it is aware of its issues respecting quality and productivity and it is investigating the option of lining its salt pans as a solution. There are other operational matters that will also need to be addressed in order to achieve ICCIDD standards and compliance.

132. Currently there are stakeholders engaged in the delivery of salt to the domestic market that function in an independent and disorganized manner. The salt industry must analyze all unit operations and determine the most cost effective configuration of the sector regarding the business model and process. All industry participants will benefit if each member accepts responsibilities and obligations and performs to higher standards. This does not imply that each stakeholder has only one option. Each must analyze long-term relationships and participate in several scenarios. The prevailing goal is to remain aware of and comply with the requirements of the end user, whether that is the village household or a manufacturing enterprise. Stakeholders must always satisfy their customers, whether internal or external in the business process. If diligently and effectively pursued, this strategy will improve each part of the value chain, from the sea to the market, and every stage of the business process; see Figure 5.

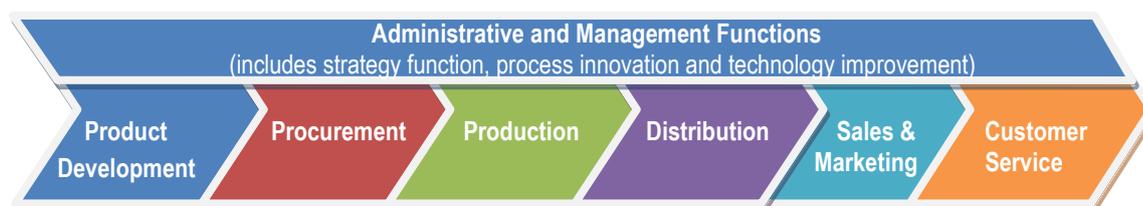


Figure 5 Salt Industry Business Process Value Chain

133. Each of the stages of the value chain are described in turn:

134. **Product Development.** Improvement of technological capabilities will have ramifications for salt producers. As the market grows and the private sector evolves, there will be demands in the market for additional grades of salt, both iodized and non-iodized.

135. **Procurement.** Best practices adapted from certain countries must be implemented and this implies joint procurement initiatives and other supply chain management recommendations.

136. **Production.** Currently SPCKK outputs low quality and upgrades in production are required. Further SPCKK salt is passed on to secondary process firms in order to meet market demands for household table salt. Vertical integration must be analyzed.

137. **Distribution.** The long term strategic initiatives will force salt producers to develop their own brand and to undertake their own distribution, or as an alternative a formal contractual relationship will emerge with a third party supplier. Direct connection to the marketplace and greater ownership of the distribution channels will improve margins and reduce the threat of having Cambodian salt lose market share to imports.

138. **Sales and Marketing.** SPCKK relies on customers' initiatives to order salt. Gathering market intelligence will benefit the salt producers who currently do not have access to real-time knowledge of the marketplace. Developing a long-term marketing plan will be an important step in allocating resources according to consumer needs, rather than production capabilities. A market intelligence database that tracks provincial consumption trends should be established.

139. **Customer Service.** The strategic initiatives proposed will require closer interaction with and knowledge of the ultimate end user's behaviors and preferences. The introduction of technical data specification sheets, material safety data sheets, and certification of compliance that are standard procedure in the international market will provide the means necessary to understand customer needs more efficiently and to react quickly to changes in the marketplace. Direct communication with consumers will promote long-term relationships and consumer confidence.

140. **Administrative and Management Functions.** Institutionalizing the salt industry under SITAC, improving corporate governance, ensuring transparency, developing human resources, and improving standards of raw materials and other resources will require proactive management as well as cost effective financing of investments. Education and training for business and finance managers, as well as skilled technicians, is imperative.

7 Strategic Initiatives for Improving the Cambodian Salt Industry

7.1 Introduction

141. Currently all salt producers whether large or small, are members of and shareholders of the Salt Producers Community of Kampot and Kep (SPCKK). This legal entity was organized in order to bring the many salt producing smallholders together and offer a platform from which the NSCIDD and other stakeholders could continue to pursue the objectives of the USI and IDD programs. As a result of a subsidy project whereby Kiwanis / USAID and UNICEF provided potassium iodate through the Ministry of Planning to the SPCKK there was a significant increase in the consumption of iodized salt at the household level across most provinces in Cambodia. Surveys and other investigations were conducted and several reports have been published illustrating such trends. Other consultancies were commissioned to advise the stakeholders in Cambodia about best practices and market development in other countries, since the UNICEF USI program is a global initiative.

142. In order to achieve sustainable outcomes for the USI and IDD programs, further steps must be taken to secure the commercial viability and competitiveness of the salt producers in Cambodia. As in all business analyses the investigation by IRL and ADI has indicated certain shortcomings and constraints in the salt industry operations as well as within the regulatory and institutional frameworks. These must be addressed concurrently and in the near term so that the salt industry in Cambodia can maintain a long term domestic market presence. In so doing, there will be a reliable domestic organization with the commercial autonomy and the social responsibility to meet the goals of the RGC and the Cambodia citizens. The consultants have observed that several key parameters in the salt industry must be addressed in the near term in order improve quality and productivity and thereby assure competitive conditions for Cambodia's salt producers in light of the global and regional influences at play.

143. The consultants recommend the implementation of the strategic initiatives described in this report in order for SPCKK and its members to meet the market demands in terms of quality and price and to earn profits under such market conditions. The consultants have not fully analyzed the cost of goods sold by SPCKK and its members, however the domestic market prices are relatively high and likely not sustainable in the near term due to readily available imported salt at lower prices. This market pressure is seen to be coming primarily from Vietnam today, however salt can be sourced as a global commodity and depending on the grade and quality, and it can arrive at the ports in Cambodia at a price of USD 40 per metric tonne from any number of suppliers. SPCKK is currently selling its production to wholesalers in 50 Kg poly bags at USD 62 per metric tonne. As noted above Vietnamese producers are selling in to the domestic market at USD 30 per metric tonne. Clearly the volumes of Vietnamese salt entering Cambodia will likely trend upwards with this price gap, depending on quality and delivery costs. Although the consultants did not have the time to research the market influences from Thailand it is highly probable that similar prices are available from salt producers in that country, since Thailand, even more so than Vietnam, is engaged in the consumption of large volumes of salt for primary and secondary manufacturing, along with a domestic consumer market based upon the population base of 70 million citizens.

144. The salt producers of Cambodia must develop a strategy that takes into consideration the terms and conditions of accession to the World Trade Organization as well as Cambodia's obligations under the ASEAN treaties and membership agreements. In the near term is not likely that a protectionist or isolationist strategy will be successful. Indeed it is not in the best interest of Cambodian citizens and the private sector to be paying a premium prices for salt products, whether these be iodized table salt for household consumption or industrial grade salt for primary processing.

145. Development and sustainability of the salt sector will likely depend on how successful the trade association becomes as it expands its mandate beyond the current activities of the SPCKK. Such development will also depend on RGC's readiness to implement the proper legal conditions and policies for doing business in an open market and enabling environment.

146. In Cambodia there are limited geographic areas for solar salt production, since Cambodia has a relatively small coast line as compared to its Southeast Asia neighbors. Further, of the few kilometers of shoreline, there is also only one stretch land that has low flat flood plains adjacent to the sea. Kampot and Kep currently have 4,500 Ha under salt pan production and there is not much land upon which to expand this. A second and equally significant constraint is the weather. Kampot and Kep have a relatively short production season, running for December until April and this further constrains the growth of the salt industry in the future. Cambodia must begin to raise its productivity by introduction of specialized production techniques and contemporary efficiency practices. These enhanced working conditions will require better educated workers and therefore, specific work force development through education and training must be pursued.

147. Effort should be devoted to improvements in marketing. SPCKK and other stakeholders have been content to move products into the market under favored conditions. Although SPCKK has a registered logo, it is not exploited to the degree possible in terms of promoting quality and compliance with RGC and UNICEF objectives. In the future, consistent high profile marketing campaigns, coupled with efficient distribution and readily available inventories on a national basis, will be required to maintain market share at the consumer retail level.

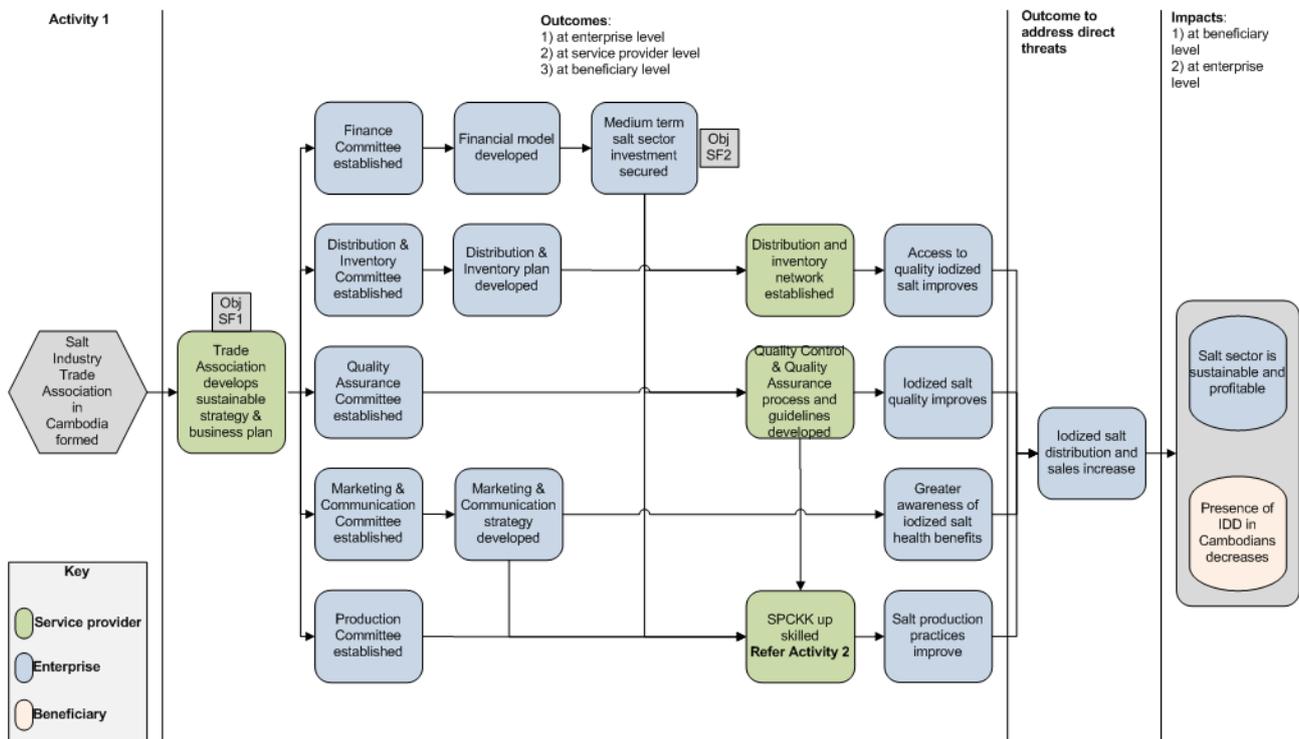
148. The consultants recommend the following seven strategic initiatives are pursued in order to reach salt industry sustainability targets:

1. **Capacity Building**
2. **Enhance Technological Capabilities**
3. **Enhance Supply and Distribution**
4. **Improve Quality Assurance**
5. **Improve Marketing and Communications**
6. **Attract and Retain Investments**
7. **Public / Private Partnership**

149. Components and action items for these initiatives, along with their objectives and success indicators, are presented in the tables below. Certain activities will develop the industrial infrastructure and the enabling environment crucial for implementation, while others address operational issues, policy issues and market opportunities. Stakeholders will mobilize the necessary resources, develop the action plans, and implement these initiatives over the next two years.

7.1.1 Capacity Building: Establishment of the Salt Industry Trade Association

150. This initiative would institutionalize the salt industry under the law and create the Salt Industry Trade Association of Cambodia (SITAC), a single-purpose, dedicated legal entity, that would consolidate and unify stakeholders, help the industry reach strategic goals, collaborate with the government, and monitor manufacturing issues, commercial interests, environmental issues, finance issues, market stabilization, product development, human resource development, procurement policies, import and export matters, trade and tax policies, research, and testing and certification standards. It also calls for establishing a strict code of performance for SITAC and industry members to ensure the accountability, reliability, and operational and financial performance acceptable in the global marketplace and to all investors and stakeholders in Cambodia’s salt industry.



151. SITAC would have a structure similar to the model below in Figure 7 and its functions are outlined below in Box 17.

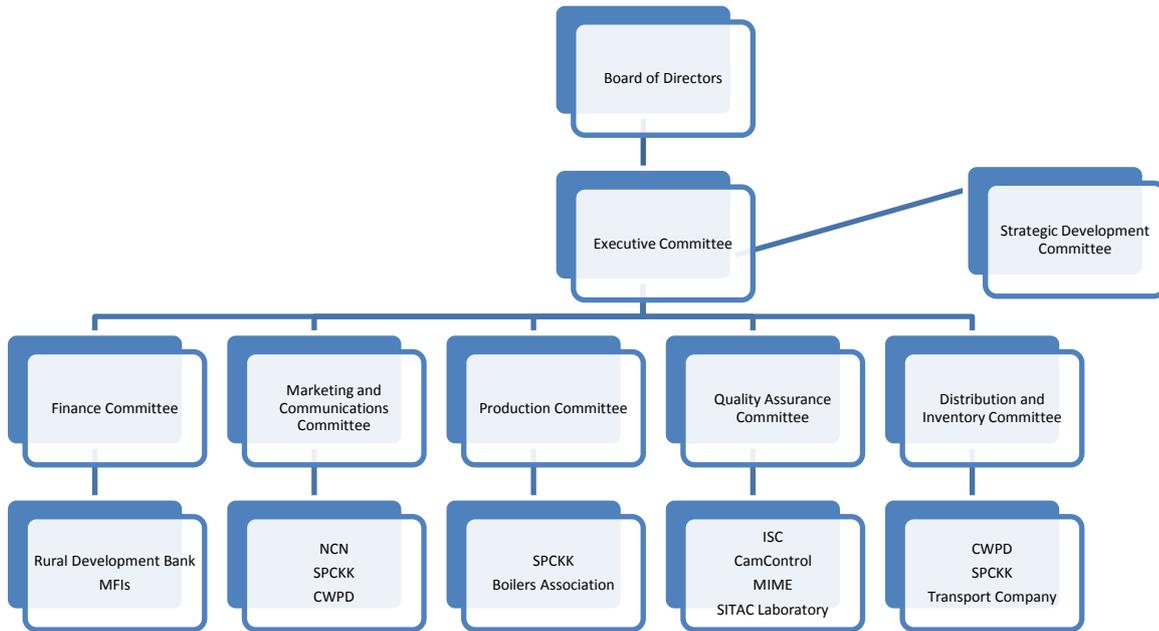


Figure 7 SITAC Management Structure

Box 17 Organization of the Salt Industry Trade Association of Cambodia

- As noted in section 3.1, the government of Vietnam is clearly engaged in the matters of the salt industry and since the RGC has established the NSCIDD and has issued Sub-Decree No. 69, there must be further steps taken to address the many issues facing the salt industry today and in the future
- The SPCKK as it is structured has limited authorities, budgets and capacities to deal with the commercial dynamics described above in Vietnam
- The SPCKK has its focus on manufacturing and the coordination of its 188 shareholder producers
- SPCKK has no mandate nor action plan for meeting international quality standards nor globally competitive pricing
- SPCKK has no specific mandate to implement Sub-Decree No. 69
- Sub-Decree No. 69 speaks only to the eradication of IDD and not the sustainability of the salt industry in Cambodia and with this long term strategy the objectives related to ID will remain at risk
- NSCIDD should approach RGC with a recommendation for a follow-on Sub-Decree
- The Sub-Decree would create the Salt Industry Trade Association of Cambodia (SITAC)
- SITAC will be formed under the law in Cambodia and will be given ultimate responsibility to implement Sub-Decree No. 69 as well as other matters respecting the salt industry
- A core founding member of SITAC will be SPCKK and SPCKK would be charged with production of solar salt and the enforcement of minimum quality standards and certification of all production units within its community
- ISC and CamControl would become members of SITAC and head up the quality assurance and would also institutionalize iodized salt for consumers
- An NGO such as the Cambodian Women for Peace and Development (CWPD) would join SITAC and work with SPCKK to develop an efficient and effective distribution system and inventory program, including establishing SPCKK depots in each province
- CWPD, with its extensive network and membership, would head the distribution and marketing committee which would monitor the domestic, regional and global dynamics of the salt market and would also supervise import and export activities of salt based upon market demand
- Micro finance institutions would join the finance committee and develop credit schemes for salt producers in cooperation with the Rural Development Bank
- SITAC would sign an alliance agreement with Bac Lieu Province Salt Producers to develop collaboration initiatives in favor of the smallholder producers
- The alliance with Bac Lieu would include procurement of potassium iodate, enforcement of quality standards for salt imports and exports between Cambodia and Vietnam and other commercial matters leading to mutual benefits and market stabilization
- SITAC would also form a strategic development committee that would investigate investment opportunities to enhance the salt industry in Cambodia, including feasibility studies for irrigation systems for the delivery of seawater and discharge of spent brine; for flood abatement; for resurfacing the salt pans with plastic liners or other technologies; and for salt refinery operations intended to process and upgrade SPCKK's solar salt production
- The salt boilers in Cambodia would join SITAC and would form a secondary processing committee enforcing specification standards and certification procedures

Table 4 Strategic Initiatives to Enhance Capacity Building

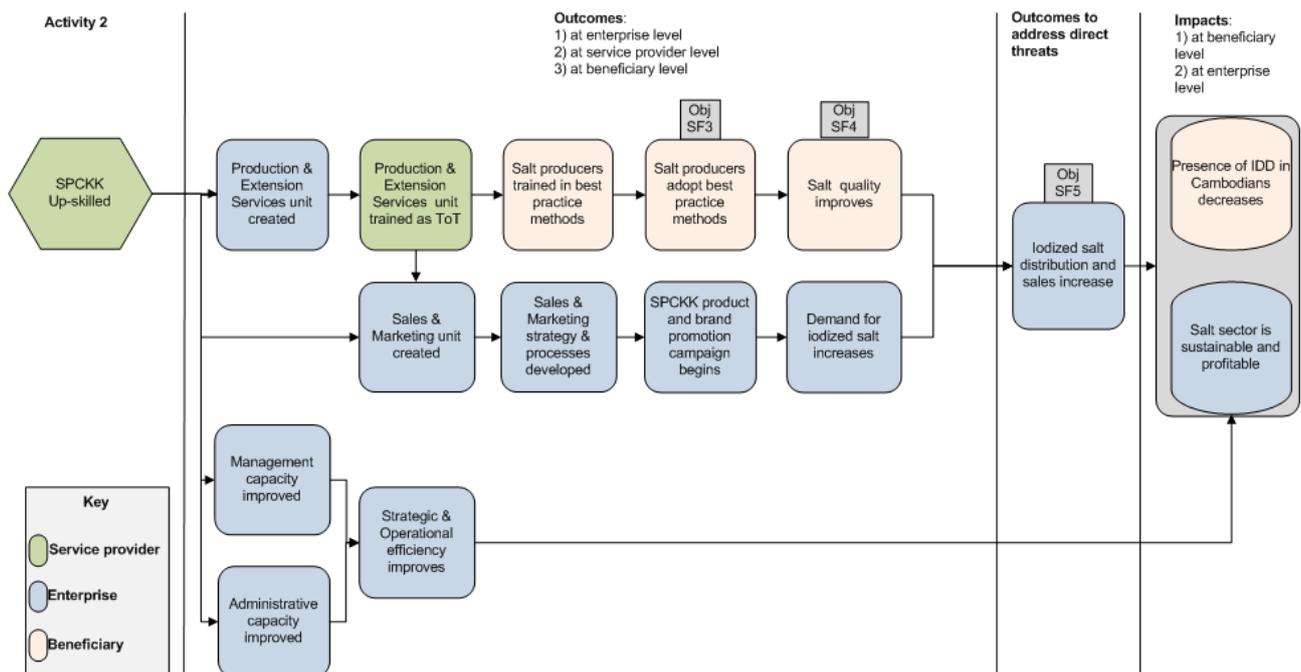
Actions	Objectives	Success Indicators
Engage consultants to mount SITAC as a legal entity and create its Articles of Association, establish its structure and membership and develop its operating budget for its inaugural year	To establish the framework and support system for collaborative action necessary for sustainable growth and competitiveness. To promote cooperative mutually beneficial behavior among stakeholders in the salt sector, in order to gain productivity increases and unit cost decreases, along with quality enhancement. To implement all other strategic initiatives.	Salt industry announces national strategy to be adopted and launches collaborative projects for common benefit. The government accepts industry's collective recommendations and offers support by way of policy reforms and dedicated resources among appropriate ministries. Industry receives support and assistance from donor agencies, including multilateral financial institutions. Individual firms and stakeholders benefit as industry value chain becomes effective.
Develop a business plan for SITAC that specifies vision, mission, objectives, and action plans including timelines, membership and management structures, and financing mechanisms.	To formalize and specify objectives and describe how these will be achieved, with a resource plan to ensure sustainability.	SITAC incorporated and sustainable with Articles of Association and Charter. Strategic objectives achieved efficiently over the term of engagement of consultants' consultancy project.
Define a code of ethics and establish guidelines and protocols for SITAC members to meet standards of financial return and social obligations.	To create concern for social and corporate responsibilities with respect to NCN, NSCIDDD and NSCFF. To comply with good corporate governance practices.	Competitive business environment for salt industry. Ability to attract and retain workers and professional staff, as well as strategic partners.
Create a shared vision and common objectives based on a new behavioral model for the salt industry.	To behave as a new industry and set objectives with shared benefits, beyond the gains of the current participants. To use proven best practices in manufacturing, sales and marketing, marketing intelligence, sales and distribution networks, linkages and strategic alliances to drive effective business decisions. To facilitate buy-in from government and workers alike.	More investment in the sector and better standard of living and work ethics, as industry meets social obligations and responsibilities. Industrial efficiency, stability, and improved market performance.
Use external resources and international donor assistance for advocacy and lobbying that unifies stakeholders in influencing the government on infrastructure, transportation, trade regulations and labor policies.	To use advocacy as a strategic tool of competitiveness. To develop internal expertise in creating a favorable and enabling business environment.	Better conditions for value chain and open market. The removal of existing commercial barriers and policy constraints.

7.2 Enhance Technological Capabilities

152. This initiative calls for improving the productivity of solar salt processing in Cambodia to reduce unit costs, improve product consistency and reliability while meeting international standards and improving customer service. As of this writing there are three specific aspects of production recommended for investigation: (i) improving supply of seawater raw material and develop discharge system for spent brine and flood water (sequential salt pans); (ii) improving configuration, design and surfaces of salt pans; (iii) mounting a state of the art integrated salt refinery.

153. The initiative would see SPCKK retain its role as the entity primarily responsible for the production of solar salt. Investment in SPCKK’s capability, both in terms of its technical capability and its business operations capability would see its capacity increase. SPCKK will only be in a position to produce higher quality salt, achieve market growth, absorb the cost of the potassium iodate and attain sustainability following financial and technical investment.

154. SPCKK’s 188 salt producers would receive salt production best practice training by SPCKK Trainers of Trainers (ToT’s). Through the adoption of best practice methods, and the development and application of SPCKK’s sales and marketing strategy and processes, the quality of salt will improve and the demand will increase.



155. To support the initiative, changes to the organizational structure of SPCKK are required. The following new business units need to be established and all three units need to be intrinsically linked to achieve maximum effect:

- Sales & Marketing
- Production & Extension Services
- Planning & Logistics

156. **Sales & Marketing:** a sales and marketing strategy and its supporting processes needs to be developed to provide a clear and manageable roadmap for SPCKK to strengthen its brand and diversify its sales channel.

157. **Production & Extension Services:** SPCKK requires investment to develop a production and extension services unit resourced with dedicated staff responsible for improving the technological capability of its 188 members. Provision of quality control and quality assurance training will be a vital offering of the production and extension services unit. A quality product is critical to the success of building a strong brand and generating increased sales.

158. **Planning & Logistics:** the development of strong and successful distribution and inventory partnerships will provide SPCKK with the foundation necessary to drive the expansion of its salt market and increase its sales leading to greater distribution and ease of access of iodized salt.

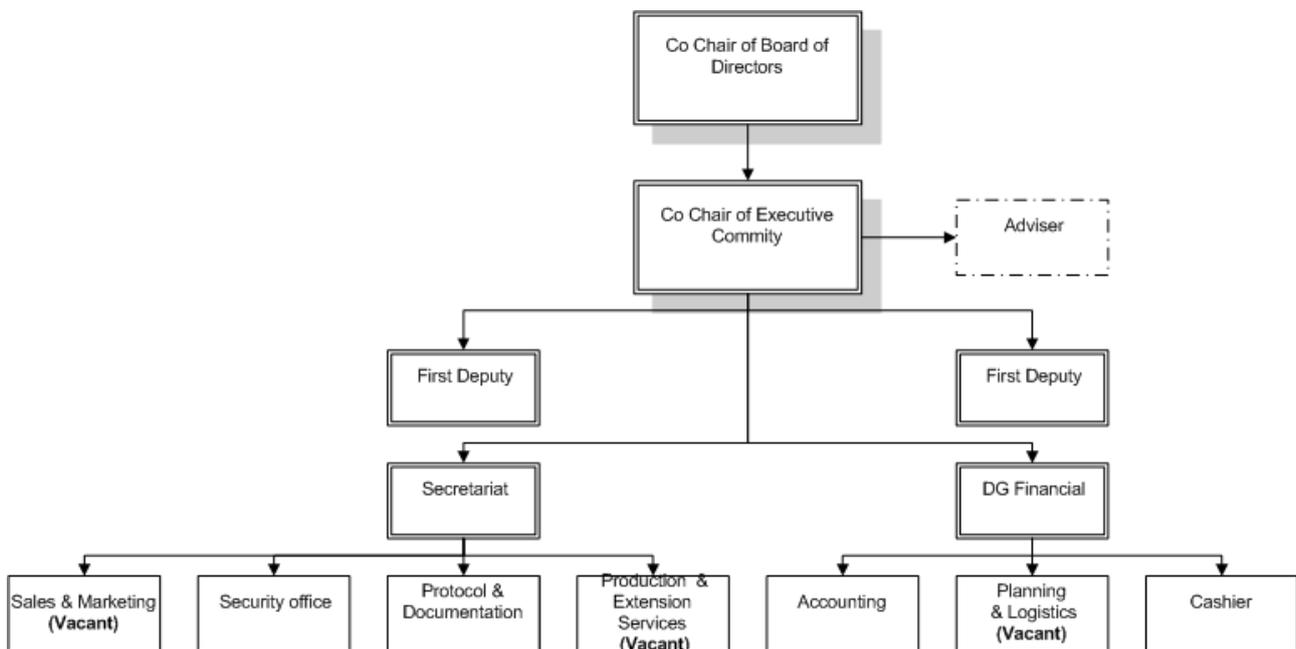


Figure 9 Proposed SPCKK Organization Chart

Table 5 Strategic Initiatives to Enhance Technological Capabilities

Actions	Objectives	Success Indicators
Engage consultants to complete feasibility study to design and mount a series of irrigation systems for all seven production areas.	<p>To determine optimal location points of intake for highest purity seawater</p> <p>To evaluate cost / benefit of installing irrigation systems to increase quality of seawater at source and to maintain such quality throughout the delivery system to the salt pans.</p> <p>To improve the quality of solar salt by providing higher purity seawater.</p> <p>To improve the quality of solar salt by establishing a discharge system which would allow for the removal of spent brine with its undesirable impurities.</p> <p>To establish a flood abatement system in order to afford Climate Change Resilience and preclude costly damage to salt pans.</p>	<p>Demonstrable improvement in the quality of solar salt anticipated by the increased purity of inbound seawater</p> <p>Costs of irrigation systems readily offset by projected sustainability of market share and related prices linked to higher quality salt.</p> <p>Costs of irrigation systems readily offset by the reduced impact of flooding on the physical structure of the salt production areas.</p>
Engage consultants to complete feasibility study to refurbish the salt pans in all seven production areas.	To reduce the level of impurities in the solar salt production attributable to pick up of soluble and insoluble components within the physical structure of the salt pans and the network of dikes and walkways in the production areas.	Costs of refurbishment readily offset by projected sustainability of market share and related prices linked to higher quality salt.
Engage consultants to complete feasibility study to mount a salt refinery with output capacity of 200,000 metric tonnes.	<p>To determine the costs and return on investment of a manufacturing facility meeting international standards.</p> <p>To achieve an integrated production configuration that would have the capacity to meet Cambodia market demand for household iodized table salt.</p>	Costs of mounting integrate refinery readily offset by projected unit costs of salt production, sustainability of market share and related prices linked to higher quality salt.

7.3 Enhance Supply and Distribution

159. This initiative calls for the establishment of a distribution and inventory system that would enhance the reach and penetration of SPCKK salt on a national basis in Cambodia. The system to be validated would include selection of optimal locations in each province, transport options, size and number of inventory warehouses, optimal education and training programs, structure and organizational capacities of best partner. The investigation would also define the relationship between SPCKK and the distribution partner with responsibilities and obligations of the parties and would further result in the establishment of a distribution committee within SITAC.

Table 6 Strategic Initiatives to Enhance Supply and Distribution

Actions	Objectives	Success Indicators
Engage consultants to complete a feasibility study and benchmarking study regarding best practices for maximum penetration of iodized salt in developing countries.	<p>To determine the cost effective modalities used effectively by other nations regarding the USI and IDD goals.</p> <p>To screen SMEs and NGOs to determine optimal skills and capacities for SITAC partner</p> <p>To ensure that the enhanced distribution system included a communications plan for household consumers and direct linkage to relevant ministries with NCN interests.</p>	<p>Selection of best practices for review within the feasibility study.</p> <p>Recommendation for potential partner(s).</p> <p>Alliance formed and distribution and inventory system established for national coverage in all provinces.</p>

7.4 Improve Quality Assurance

160. This initiative calls for the improvement of human capacity in all aspects of solar salt processing and specifications and standardization. It would ensure compliance with various international standards and would establish production parameters and guidelines for various salt grades as per applications and market demands. It would also result in the establishment of a quality assurance within SITAC and the quality assurance would form an alliance with the Ministry of Health and the Ministry of Commerce among other stakeholders within RGC. A final result of this initiative would be the mounting of an accredited quality control and quality assurance laboratory with strict protocols and procedures.

Table 7 Strategic Initiatives to Improve Quality Assurance

Actions	Objectives	Success Indicators
Establish a quality assurance committee within SITAC.	<p>To determine the level of training and the required human capacity to function properly as the QC and QA responsible party for solar salt production in Cambodia.</p> <p>To ensure that representatives from all sides of the NCN are engaged in standardization and compliance.</p> <p>To warrant and certify that household table salt meets international and RGC standards and specifications.</p> <p>To audit and authorize all producers and secondary processors, including boilers, wholesalers, traders and importers.</p>	<p>Established code of conduct with recognized best practices for slat industry QC and QA regimes.</p> <p>Representation on quality assurance committee from appropriate ministries.</p> <p>Mounting of QC and QA laboratory.</p> <p>Accreditation from international laboratory for quality assurance committee and its operations.</p> <p>Adequate human capacity to fulfill its mandate.</p>

7.5 Improve Marketing and Communications

161. This initiative calls for significant enhancement to the current brand awareness of SPCKK salt and its quality, specifications and attributes. A marketing campaign and a communications and education plan must be established and implemented to ensure consumer awareness and consumer confidence. Assuming CWPD is brought in for the distribution and inventory initiative, this organization is well placed to execute training and education as well. It is a strong fit for its overarching mandate of women's well being. The campaign would be designed to be inclusive of the objectives of NCN and the Ministry of Health. This initiative would establish the marketing and communications committee within SITAC and would ensure exploitation of certain synergy and leverage with donors and the RGC.

Table 8 Strategic Initiatives to Improve Marketing and Communications

Actions	Objectives	Success Indicators
Establish the marketing and communications committee within SITAC.	<p>To develop a marketing plan and a related campaign with an appropriate budget.</p> <p>To develop partnerships with the Ministry of Education Sports and Youth and the Ministry of Health to launch an education and training campaign.</p> <p>To fully exploit the significant network of members and offices of CWPD to implement the plans.</p> <p>To standardize messages and to promote health benefits.</p>	<p>CWPD engages its network in a national campaign.</p> <p>Monitoring and evaluation of brand awareness and health benefits awareness.</p> <p>Increased household consumption of high quality iodized table salt.</p>

7.6 Attract and Retain Investments

162. This initiative calls for the development of financial models and multi-year financial projections that would be built into a prospectus that would compel private sector investors, multilateral development agencies and the RGC to apply funds to achievement of the performance enhancements described and recommended in this report. The entire salt industry with all unit operations and ancillary activities must be built into a financial model that illustrates adequate rates of return for all proposed investment. Further, these financial projections must be presented to appropriate audiences in order to bring competitively priced debt and / or equity to the salt industry in Cambodia. This initiative would establish the finance committee within SITAC and would engage experts to fully develop the investment plans related to the strategic initiatives described herein.

Table 9 Strategic Initiatives to Attract and Retain Investments

Actions	Objectives	Success indicators
Establish the finance committee in SITAC.	<p>To bring representatives from other SITAC committees and other non-SITAC stakeholders to the development of business propositions that would validate significant investments.</p> <p>To oversee the financial well being of SITAC and the salt industry.</p>	A robust set of analyses and a creditworthy investment plan based on realistic financial projections.
Engage consultants to bring forward all results of related feasibility studies and cost / benefit analyses and assimilate these into an investment prospectus.	<p>To fully exhaust all options in all initiatives and bring forward optimal configurations, modalities and technologies.</p> <p>To match all performance enhancements against related costs in order to best suit the market today and in the near term.</p>	A compelling investment plan and creditworthy financial projections.

7.7 Public / Private Partnership

163. This initiative calls for a declaration by the RGC that the salt industry is of national interest and for tangible support from RGC through representation on the committees within SITAC. This initiative will also result in the on-going cooperation and collaboration between NCN, NSCIDD, NSCFF and certain ministries through a Sub-Decree or Memorandum of Understanding (MOU) with SITAC. As a result of this initiative certain ministerial members will become active on the SITAC Board of Directors and the Executive Committee, while other representatives of RGC will be standing members of other SITAC committees. This public / private partnership will become the platform for policy reform and will establish the regulatory framework for SITAC.

Table 10 Strategic Initiatives to Enhance Public/Private Relationships

Actions	Objectives	Success indicators
RGC promulgates a Sub-Decree or signs an MOU with SITAC.	<p>To establish a platform for advocacy.</p> <p>To ensure proper and meaningful representation of the interests of NCN within the salt industry.</p> <p>To conduct strategic studies and policy analysis, monitor industry performance, and make recommendations to the government.</p> <p>To have forum for participatory policy and strategy making that ensures efficient resource allocation and effective implementation.</p>	<p>Minimal conflicts in policymaking and decision making.</p> <p>Better understanding of industry issues and RGC objectives.</p>
<p>Investigate support opportunities and facilitate funding for industry development from donor agencies.</p> <p>Use short-term technical assistance to prepare proposals.</p>	To obtain funds for development programs and strategic initiatives.	Funds available for development.
Investigate and recommend policy reforms to accelerate industry development.	To have the government accept recommendations with confidence in the collective opinion of stakeholders	Effective and efficient policy reform and enhance business enabling environment.
Secure tax credits for expenses incurred for and contributions to SITAC activities.	To enable the private sector to manage and finance sector activities.	Private sector contributes more to collaborative activities that develop the salt industry.
Pursue tax credits for human resource development budgets, research and development consortia, and market promotion.	To provide incentive for development of human resources, research and development, and marketing.	Improved human resource base, more innovation, and sustainable market share.