ASSESSMENT OF THE BOLIVIAN NATIONAL PROGRAM AGAINST GOITER AND OTHER IODINE DEFICIENCY DISORDERS (PRONALCOBO):

Report of an External Evaluation Team

May, 1987
ASSESSMENT OF THE BOLIVIAN NATIONAL PROGRAM AGAINST GOITER AND OTHER IODINE DEFICIENCY DISORDERS (PRONALCOBO):

Report of an External Evaluation Team

May, 1987

COMMUNITY SYSTEMS FOUNDATION
1130 Hill Street Ann Arbor, Michigan 48104 U.S.A.
ASSESSMENT OF THE BOLIVIAN NATIONAL PROGRAM AGAINST
GOITER AND OTHER IODINE DEFICIENCY DISORDERS (PRONALCOBO):

Report of an External Evaluation Team

May, 1987

Evaluation Team:

Dr. John T. Dunn, MD (Team Leader)
Dr. Barton R. Burkhalter, PhD
Ing. Aurelio Pezo

This report was prepared for the Joint WHO/UNICEF Nutrition Support Programme (JNSP) as input to the consideration of the PRONALCOBO proposal for funding of Phase Two. A draft of the report was prepared by the Evaluation Team during and following a visit to Bolivia April 19 - 30, 1987, and written in final form by Dr. Burkhalter under a WHO/PAHO contract to Community Systems Foundation, Ann Arbor, Michigan.
TABLE OF CONTENTS

1. Introduction

   2.1 Market Penetration of Iodated Salt.
   2.2 Reduced Price of Iodated Salt to Consumers.
   2.3 Development of Cooperatives.
   2.4 Increased Public Awareness through Education Program.
   2.5 Successful Application of Iodized Oil.
   2.6 PRONALCOBO: A Model for other Development Projects in Bolivia.

3. Major Recommendation: Support PRONALCOBO Second Phase to MaximumExtent Possible
   3.1 Success of First Phase.
   3.2 Phase Two Plan and Budget.
   3.3 Potential Benefits to Bolivians.

4. Other Conclusions and Recommendations
   4.1 Laboratory/Surveillance/Evaluation.
      4.1(a) Urinary iodines
      4.1(b) Monitoring of iodine levels in salt
      4.1(c) Epidemiologic surveillance
      4.1(d) Evaluation of additional benefits from iodine supplementation
      4.1(e) Develop internal capacity in evaluation and epidemiology
   4.2 ENCOSAL - National Salt Commercialization.
      4.2(a) Financial plans and management
      4.2(b) Corporate form
      4.2(c) Multiple and conflicting objectives
   4.3 Massive Oral Iodized Oil Program.
   4.4 Iodine Supplementation for Animals.
   4.5 Plastic Bag Production.
   4.6 Extraction and Production of Iodated Salt.
      4.6(a) Technical improvements in extraction
      4.6(b) Technical improvements in production
      4.6(c) Immersion method for iodating block and rock salt
   4.7 Fortification of Iodated Salt with Fluoride and/or Iron.
      4.7(a) Fluoridation of salt
      4.7(b) Adding iron to salt

Annexes (A -- F)
1. INTRODUCTION

The Bolivian National Programme to combat Goiter and Iodine Deficiency Disorders ("PRONALCOBO") received financial support from the Joint WHO/UNICEF Nutrition Support Programme ("JNSP") during its first phase (1984-86). In response to a PRONALCOBO request for additional JNSP funding to support a second phase of the project (1987-89), the JNSP Global Steering Committee approved an external evaluation of PRONALCOBO and its proposed second phase.

The external evaluation team, which included Dr. John Dunn (Team Leader), Dr. Barton Burkhalter, and Mr. Aurelio Pezo, visited Bolivia April 19-30, 1987, to perform the evaluation. The visit was coordinated by the Bolivian offices of PAHO/WHO and UNICEF.

The purpose of the external evaluation was to: (1) identify the political, financial, technical and administrative achievements of PRONALCOBO during its first phase; (2) specify priority actions needed in order to consolidate these achievements in a second phase; (3) identify priority actions required to assure that the project could sustain itself after the second phase when external funding would end; and (4) advise JNSP Global Management in what circumstances an extension of the PRONALCOBO project to a second phase could be recommended.
In order to achieve its purpose, the evaluation team did the following: (1) interviewed authorities from the Bolivian Ministry of Health, PRONALCOBO, PAHO, UNICEF, and other Bolivian organizations involved in the project (a list of persons interviewed is given in Annex A); (2) visited centers for the production, iodination, and marketing of iodated salt, laboratories responsible for quality control, nutritional chemistry and nuclear medicine, and communities that have been or should be the recipients of iodated salt, or iodized oil; (3) analyzed past expenditures and the proposed second phase budget and financial plan; (4) analyzed the achievements and constraints of various project components, including cooperativism, salt iodination, commercialization, quality control, iodized oil administration, communication and public education, and epidemiological surveillance in relation to project objectives; (5) analyzed the economic implications of the project in relation to the sustainability of the project objectives; (6) at the conclusion of the visit to Bolivia briefed national authorities and local representatives of PAHO/WHO and UNICEF on its findings; and (7) prepared and submitted this report to JNSP in Geneva.

Throughout its mission the External Evaluation Team received extraordinary cooperation from PRONALCOBO and superb logistical support from the local offices of PAHO/WHO and UNICEF, and as a result was able to carry out its mission in an unusually efficient, cordial and frank manner.

PRONALCOBO was extremely successful in achieving its first phase objectives with relatively minimal funding. Its major achievements include:

2.1 Market Penetration of Iodated Salt. PRONALCOBO adopted a dual strategy aimed both at stopping the sale of common (non-iodated) salt and stimulating the production and sale of iodated salt. A wide variety of different actions were taken to implement this dual strategy, adjusted to fit the conditions in different regions of the country. (The first phase focused only on human consumption of iodated salt, while the second phase proposes to phase in animal consumption as well.)

The success that PRONALCOBO has had in replacing common salt with iodated salt can be seen in the graph in Annex B, which shows the production of iodated salt increased from 9.9% of that needed for human consumption in 1984 to 46.5% in 1986.

2.2 Reduced Price of Iodated Salt to Consumers. PRONALCOBO's strategy of introducing iodated salt into major regional markets at prices well below the market price appears to have succeeded in dramatically reducing the retail price of iodated salt in those markets. In 1984, the small amount of iodated salt available sold for about $.50 U.S. per kilogram, or about 3 to 4 times more than common salt. In 1985, PRONALCOBO offered iodated salt at $.25 U.S. per kilogram, and by 1986 had lowered it to $.18 U.S. in some markets. Other producers followed, and now iodated salt is generally sold at $.25 U.S. or less in the major markets. This reduction is graphically illustrated in Annex C.
2.3 Development of Cooperatives. PRONALCOBO has successfully helped to develop five iodated salt production cooperatives. This achievement guarantees an increasing supply of high-quality iodated salt for ENCOSAL (PRONALCOBO's national salt company), and also has increased the income and standard of living for members of the cooperatives.

2.4 Increased Public Awareness through Education Program. The Evaluation Team found widespread awareness of the relationship between elimination of goiter, iodated salt and the importance of buying and using iodated salt. Much of the credit for this awareness is probably due to the extensive and high quality public multi-media education campaign carried out by PRONALCOBO. The high quality and apparent success of this campaign suggests that it can serve as a model for other public education campaigns in Bolivia.

2.5 Successful Application of Iodized Oil. In order to eliminate iodine deficiency in remote populations not likely to be reached by iodated salt, PRONALCOBO has administered iodized oil injections and Lugol's iodine solution to about 330,000 persons during the first phase of the project. A study in Chuquisaca found that goiter prevalence in the sample communities was decreased by approximately one-half. (See Annex D.)

2.6 PRONALCOBO: A Model for other Development Projects in Bolivia. The unique and successful combination of components in the PRONALCOBO project, including public education, cooperative development, and commercialization, can serve as a model for other development projects in Bolivia.
3. **Major Recommendation: Support PRONALCOBO Second Phase to the Maximum Extent Possible**

In light of the success of phase one, the well-conceived plan for phase two, and the potential benefits to the people of Bolivia, JNSP should support the second phase of PRONALCOBO to the maximum extent possible. The proposed budget reviewed by the Evaluation Team requests $469,000 over three years from JNSP and the Evaluation Team recommends that this amount be funded. If additional funds over this amount can be found, they could be used wisely to expand the coverage of the iodized oil program and to provide for contingencies.

3.1 **Success of First Phase.** The success of the first phase was described above in section 2, and demonstrates the capability of PRONALCOBO to plan and execute the project. This success reflects the commitment of the Bolivian government to the solution of this problem and especially the capability and long-term commitment of the PRONALCOBO staff, most of whom will continue with the project through the second phase.

3.2 **Phase Two Plan and Budget.** The strategy in phase two would continue and develop the successful strategy of phase one. The four major components of the strategy are: (1) iodated salt for most of the population; (2) iodized oil (injected and oral) for remote populations not reached by the iodated salt; (3) multi-media public education campaign; and (4) epidemiologic surveillance and evaluation. The iodated salt component includes both the elimination of common (non-iodated) salt from the market (through national and local regulations and aggressive follow-up), and the stimulation of the production and sale of iodated
salt by providing technical assistance, iodating machinery and supplies to all salt producers (including the five cooperatives) and by aggressive cost reduction and selling of iodated salt produced by the cooperatives in all regional markets. The projected results of this strategy are diagrammed in Annex B.

In addition to human consumption, the second phase strategy would also stimulate the production and sale of iodated salt for animals, but after adequate supply of iodated salt for human consumption was achieved. Finally, PRONALCOBO is planned to be financially self-supporting by 1990 using the profits generated from the sale of iodated salt by ENCOSAL, the proposed national salt marketing company.

The Evaluation Team reviewed the proposed budget for the second phase, including the financial projections for ENCOSAL, and believes it is realistic. The four year financial plan (1987-90) includes funding from the following sources: JNSP (U.S. $469,800), ENCOSAL (U.S. $2,260,500), Bolivian Government (U.S. $262,000), other sources (U.S. $188,300). Most of the ENCOSAL funds are from the sale of salt. No JNSP funds are requested for the fourth year (1990). Approximately U.S. $200,000 of ENCOSAL profits are planned to be transferred to PRONALCOBO to support other components of the goiter/IDD program over the four years.

The proposed budget attempts to identify types of expenses paid for by each source of funds, although this is not entirely possible because the project is integral. Roughly, the JNSP contribution of U.S. $469,800 would pay for: public education (U.S. $55,000), iodized oil campaign (U.S. $73,000), development
of cooperatives and salt production (U.S. $49,000), ENCOSAL national salt commercialization (U.S. $140,000), laboratory/surveillance/evaluation (U.S. $112,000), and administration and consultants (U.S. $41,000).

3.3 Potential Benefits to Bolivians. The benefits of this project extend beyond the elimination of iodine deficiency disorders. They also include: (1) development of producer cooperatives and the corresponding increase in living standard, (2) decreased animal goiter and resulting increase in agricultural production in such foods as milk and eggs, (3) demonstration of a successful development model which can be used to solve other problems in Bolivia. Some potential benefits may also come about as a result of the project. These include: (4) increased technology in production of plastic bags which could decrease costs and increase quality in other important programs and products, (5) potential use of salt as a carrier for fluoride and iron.

4. Other Conclusions and Recommendations

4.1 Laboratory/Surveillance/Evaluation.

4.1(a) Urinary iodines -- This measure is essential to the assessment and biological surveillance of iodine deficiency. A manual technique is available and has been successfully applied in many countries. It is not clear why it has not worked in Bolivia. The Evaluation Team recommends that a consultant with practical experience with this method visit La Paz as soon as possible to get it working.
4.1(b) **Monitoring of iodine levels in salt** -- Each salt iodinating plant should have a small laboratory in which the iodine levels are analyzed at least several times a day and recorded. The technique for this requires no elaborate equipment and is quick and simple. Salt samples should also be analyzed in the central lab of the Ministry of Health; they should be collected at the production site, the market, and in the consumers' home. The Orion electrode already purchased for this program may be quicker and more efficient than the spectrophotometric method currently in use.

4.1(c) **Epidemiologic surveillance** -- PRONALCOBO has proposed surveillance in the following ways:

(i) *a national survey of approximately 4,000 schoolchildren in 1988, to measure program impact since the last survey in 1983; this will include goiter prevalence and a sub-sample of urinary iodine determinations.*

(ii) *selection of 20-30 communities to be followed after the administration of oral iodized oil. Measures will include goiter prevalence and urinary iodine levels, to be determined before the oil administration and every 6 months thereafter. These data will indicate whether adequate iodination is being achieved, either from the oil or the introduction of iodinated salt, and provide a basis for deciding whether a second round of oral iodized oil should be given, and when.*
The Evaluation Team believes that both the above are significant studies and should be done. The Team strongly recommends that very careful consideration be given to the selection of the communities in both studies, to make sure they give the best indices of iodine status for the entire population. Expert epidemiological and biostatistical advice should be obtained for this selection.

4.1(d) Evaluation of additional benefits from iodine supplementation -- PRONALCOBO has proposed a detailed study of 1-3 communities to assess the effects of iodination. Data would be obtained both before and after iodine administration, would include goiter prevalence and urinary iodines, and in addition, socioeconomic measures such as agricultural productivity and school performance. Farm animals would also be given iodinated salt and assessed by such parameters as production of milk, meat, eggs, and calves.

The Evaluation Team supports such a study; it should provide a realistic assessment of the total value of iodination to the community, and will help the government to fix the place of iodine supplementation within its overall priorities for development. Again, such a study needs to be carefully planned with expert advice to get the most reliable results. This study could be carried out with funding either from within the JNSP proposal or from outside sources.

4.1(e) Develop internal capacity in evaluation and epidemiology -- To the extent possible within the constraints of the project and the Ministry of Health, PRONALCOBO should find or help to develop a group dedicated to applied evaluation and
epidemiology. This group should work with PRONALCOBO in evaluation and surveillance.

4.2 ENCOSAL - National Salt Commercialization.

4.2(a) Financial plans and management -- Income, expense and cash flow plans for ENCOSAL for the four-year period 1987-90 have been carefully prepared and, in the opinion of the Evaluation Team, are realistic. The plans show income (primarily from the sale of iodated salt) growing from U.S. $252,000 in 1987 to U.S. $868,000 in 1990, and total gross profits over the four years (before distribution to PRONALCOBO) of U.S. $226,000. Cash flow is positive. Furthermore, the plan is flexible in the sense that profits and positive cash flow are achievable at income levels well below the amount programmed. (Annex E contains the plans.)

In the opinion of the Evaluation Team, the managers of ENCOSAL are very competent in terms of professional background and personal qualities to successfully build and operate ENCOSAL, and in addition, are strongly committed to the goals of the PRONALCOBO project. Therefore, the Evaluation Team believes that ENCOSAL can achieve its objectives.

4.2(b) Corporate form -- Two general corporate forms have been proposed for ENCOSAL: (1) a mixed (public/private) corporation, or (2) a private corporation under contract to the Ministry of Health. Both forms have advantages and disadvantages.

The mixed corporate form faces a major disadvantage. Available data indicates that it is unlikely that a mixed corporation will be able to operate at a profit. First, public
and mixed corporations must operate under many legal restrictions that reduce flexibility and efficiency (for example, restrictions related to ownership of assets such as trucks; restrictions regarding procurement of salt from the cooperatives; restrictions regarding incentive payments for managers; restrictions regarding cash management and banking; and restrictions regarding credit arrangements and contracts). Second, most public and mixed corporations in Bolivia operate at a substantial deficit. Third, the present Bolivian government has begun selling public and mixed corporations in order to reduce the deficit. Therefore the Evaluation Team believes that it is unlikely that the mixed corporate form will be able to achieve the objective of financing the PRONALCOBO project or even the more limited objective of self-financing of ENCOSAL. It is important, therefore, that careful consideration be given before selecting the mixed corporate form.

If the private corporate form is chosen, a thorough legal contract should be developed and agreed to by the Ministry of Health and the private corporation that clearly specifies the responsibilities of each party, and which contains adequate safeguards for both parties.

4.2(c) Multiple and conflicting objectives -- ENCOSAL is being asked to achieve multiple objectives, including: (1) increased market coverage; (2) reduced prices; (3) increased production of iodated salt by its cooperatives through technical assistance and financial support; (4) sale of all iodated salt produced by its cooperatives; (5) increased production of iodated salt by all other salt producers in Bolivia through technical
assistance and supply of iodating machinery and supplies to other producers; (6) increased quality of iodated salt on the market; (7) generation of profits for PRONALCOBO; and (8) long-term self-financing. Many of these objectives are in conflict with one another; for example, objective 4 (sell all salt produced by the cooperatives) conflicts with objective 5 (help the competition produce more salt), and objectives 7 and 8 (generate profits) can conflict with objectives 1 and 2 (increased coverage, lower prices).

These conflicting objectives should be clarified and rationalized so that the conflict is minimized. One way to do this would be to give priority to certain objectives for a limited time period (say two years) and to other objectives after that time. For example, the objectives of increased coverage, lower prices and assistance to competition might have priority initially, while the production and sale of cooperative produced salt and generation of profits might have priority in the long run.

4.3 Massive Oral Iodized Oil Program. The iodated salt program has progressed well, but large numbers of Bolivians, particularly in rural areas, will probably not be covered for one or two years at least. To meet this need, PRONALCOBO has proposed a massive oral iodized oil program, to begin as soon as possible. A single administration of oral iodized oil, 1 ml., should give adequate iodine for 1 1/2 to 2 years, perhaps longer. The oral administration can be carried out by community health personnel and teachers much more cheaply, simply, and rapidly than the intramuscular route. The Evaluation Team strongly
endorse this proposal as outlined in Annex F. It offers the best opportunity to correct iodine deficiency in the shortest possible time for the most Bolivians.

4.4 Iodine Supplementation for Animals. Iodine deficiency affects animals as well as people, and lessens agricultural productivity. Supplementation for Animals. Iodine deficiency affects animals as well as people, and lessens agricultural productivity. Iodine is apparently used routinely in cattle feeds in parts of Bolivia, but this usage and presumed benefits are not common knowledge. We endorse the plans of PRONALCOBO to document and publicize the value of correcting iodine deficiency in animals, and to stimulate the production of iodated salt for animal use.

4.5 Plastic Bag Production. It has been suggested that higher quality plastic bags could reduce the loss of iodine and reduce the deterioration of the product. The Evaluation Team endorses the feasibility study for plastic bag production proposed in the phase two budget. If the outcome of the feasibility were positive, funding for capital machinery would be sought from outside sources (not necessarily JNSP).

4.6 Extraction and Production of Iodated Salt.

4.6(a) Technical improvements in extraction -- There are three principal methods of salt extraction used in Bolivia: (1) crystallization by means of evaporation in the Altiplano, (2) surface collection from the extensive deposits near Uyuni, and (3) mining near Tarija. Different technologies are required for each method. A program for improving the extraction process should focus separately on each of the three methods, and should
review and incorporate useful technologies from other Andean countries.

4.6(b) Technical improvements in production -- The production process for iodated salt includes the sub-processes of drying, milling, adding and mixing iodate, and packaging. Technological improvements in these different sub-processes may be possible in varying ways at the different production facilities in Bolivia. Technology transfer from other Latin American countries may be helpful.

4.6(c) Immersion method for iodating block and rock salt -- Block salt and rock salt are widely used for animal consumption in Bolivia, and in some areas are also used for human consumption. However, iodating block salt has proven difficult without first crushing the salt, adding iodate and then reforming it in blocks, as is being done in Tarquiamaya.

It is recommended that PRONALCOBO test the immersion method for iodating block salt and rock salt. This method involves immersing the blocks in a solution of saltwater and potassium iodate. The process is very inexpensive, although it does not produce as uniform and high quality a product as other methods. Nevertheless, it should prove adequate for animals. A proposal should be prepared and additional funding sought to carry out this test.

4.7 Fortification of Iodated Salt with Fluoride and/or Iron

4.7(a) Fluoridation of salt -- The technology for adding fluoride to salt is well-known. Since dental cavities are a major problem in Bolivia, PRONALCOBO should evaluate whether a
program should be initiated which would fluoridate salt at the same time that iodine is being added.

4.7(b) Adding iron to salt -- Double fortification of salt with iodine and iron has been developed in India, and field trials suggest that both supplements are stable for at least six months. Since iron deficiency anemia co-exists with iodine deficiency in many areas of Bolivia, such double fortification of salt may be worthwhile in future years.
MISION DE EVALUACION

PROGRAMA NACIONAL DE LUCHA CONTRA EL BOCIO
DEL 19 AL 30 DE ABRIL DE 1987 (PRONALCOBO)

Dr. Carlos Pérez Guzmán
Ministro de Previsión Social y Salud Pública

Dr. Gustavo A. Mora
Representante OPS/OMS-Bolivia

Sr. Giovanni Mingazzini
Embajador de Italia

Lic. José C. Cuentaz Zabala
Representante de UNICEF - Bolivia

PRONALCOBO

Dr. Gonzalo Fernández
Director Nal. de la Dirección de Alimentación y Nutrición.

Dra. María del C. Loroca
Asesora de PRONALCOBO

Lic. Enrique Cabezas
Jefe de la Empresa Nal. de la Sal (ENCOSAL)

Ing. Antonio Mariscal
Jefe del Programa de Yodación de la Sal.

Lic. Alfonso Coronado
Jefe del Programa de Cooperativismo

Dr. Carlos Arraya
Jefe del Programa de Epidemiología

Dr. Luis Barragán
Director Nal. de Medicina Nuclear

Dra. Juana Tejorina
Jefe del Programa de Laboratorios INLASA.

Ing. Alberto Segales
Consultor PRONALCOBO

Dr. Antonio Pardo Zubieta
Jefe de la Subregional del Sur de PRONALCOBO

Sra. Sonia Serruto
Traductora

Lic. Nazario Tirado
Consultor Comunicación Social

CONSULTORES INTERNACIONALES

Dr. John Dunn
Jefe de la Misión

Dr. Bartón Burkhalter
Consultor

Ing. Aurelio Pezo
Consultor

Dr. Enrique Abeja
J.N.S.P. Washington
Dr. Carlos Pérez Hidalgo
Lic. Magaly de Yale

**TARIJA**

Dr. Gustavo Ugarte
Lic. Gilberto Gómez
Lic. Oriel Sánchez
Dr. Armando Pérez J.
Jorge Sologuren

**SHERE**

Dr. Pastor Miranda Ch.
Dr. José Luis Hurtado Z.
Lic. René Cándida
Dr. Alberto de la G. Murillo
Dr. Daniel Cabezas
Dr. Michael Hasel

Coordinador del Programa J.N.S.P.
Consultora del Bocio de UNICEF

Director Unidad Sanitaria Tarija
Gerente Administrativo de la Empresa Entre Ríos (Tarija)
Representante de COBETAR *
Encargado del Programa de Bocio
Representante de CENALED

Director Unidad Sanitaria Chuquisaca
Coordinador Regional de Areas de Salud
Gerente General de la Camara de Comercio
Jefe del Programa de Lactancia Materna de la Dirección Nacional de Materno Infantil
Senador del área de Salud
Jefe del Area de Salud de A.I.U.

* PRONALCOBO = Programa Nacional de Lucha contra el bocio
ENCOSAL = Empresa Comerciadora de Sal
COBETAR = Coorporación de Desarrollo de Tarija
CORDEPAZ = Coorporación de Desarrollo de La Paz
CORDECH = Coorporación de Desarrollo de Chuquisaca
ANNEX B

Production of Iodated Salt as a Percentage of Total Human Requirement for Salt in Bolivia: 1984-90

Approximately 5% of the population is too remote to reach with iodated salt.

This graph shows the amount of iodated salt produced in Bolivia relative to the country's total requirement for salt for human consumption, assuming salt requirement of 10 grams/person/day. Actual production is shown for 1984-86; estimated production and population are used for 1987-90, assuming PRONALCOBO Phase Two.
ANNEX C
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I NACIONALES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INGRESOS DE OPERACION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venta de Sal Yodada</td>
<td>150,000.00</td>
<td>380,000.00</td>
<td>600,000.00</td>
<td>750,000.00</td>
</tr>
<tr>
<td>Venta de Yodato de Potasio</td>
<td>21,341.00</td>
<td>38,400.00</td>
<td>42,240.00</td>
<td>46,464.00</td>
</tr>
<tr>
<td>Venta de Bolsas de 50 kg.</td>
<td>14,800.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venta de Bolsas de 1 kg.</td>
<td>5,372.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
</tr>
<tr>
<td>Venta de Activos</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTROS</td>
<td>59,422.00</td>
<td>35,000.00</td>
<td>70,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>Saldo Belloso Anterior</td>
<td>922.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varios (Cuotas por Cobrar)</td>
<td>56,520.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transporte</td>
<td></td>
<td>35,000.00</td>
<td>70,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>II EXTERNOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aportes Organismos Internacionales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.N.E.F. - UNICEF - OFICISS</td>
<td>90,000.00</td>
<td>5,000.00</td>
<td>5,000.00</td>
<td>5,000.00</td>
</tr>
<tr>
<td>OTROS</td>
<td>90,000.00</td>
<td>5,000.00</td>
<td>5,000.00</td>
<td>5,000.00</td>
</tr>
<tr>
<td>TOTALES</td>
<td>342,737.00</td>
<td>529,982.00</td>
<td>712,822.00</td>
<td>868,046.00</td>
</tr>
</tbody>
</table>
### IMPRESA NACIONAL DE COMPLEMENTACIÓN DE SAL YODADA
#### ANUAL
#### FLUIDO FIJARECIPIO PERIODO 1987-1990

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Impuestos Corrientes</td>
<td>195,295.00</td>
<td>489,992.00</td>
<td>642,822.00</td>
<td>798,046.00</td>
</tr>
<tr>
<td>Venta de Productos</td>
<td>195,295.00</td>
<td>489,992.00</td>
<td>642,822.00</td>
<td>798,046.00</td>
</tr>
<tr>
<td>Transferencias para Gastos Corrientes</td>
<td>20,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
</tr>
<tr>
<td>Otras Entidades Internacionales J.N.B.P.</td>
<td>25,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
</tr>
<tr>
<td>UNICEF-OPS/OMS</td>
<td>22,000.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>Min. Salud Dirección de Nutrición</td>
<td>23,000.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>Cooperativa Romero</td>
<td>12,000.00</td>
<td>20,000.00</td>
<td>20,000.00</td>
<td>20,000.00</td>
</tr>
<tr>
<td>Fondo de Previsión Disponible</td>
<td>208,295.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
</tr>
<tr>
<td>GASTOS CORRIENTES</td>
<td>191,454.00</td>
<td>398,102.30</td>
<td>522,802.41</td>
<td>692,114.09</td>
</tr>
<tr>
<td>Remuneraciones</td>
<td>10,019.00</td>
<td>12,022.00</td>
<td>14,427.36</td>
<td>17,312.93</td>
</tr>
<tr>
<td>Prestación de Servicios</td>
<td>620.00</td>
<td>756.00</td>
<td>907.20</td>
<td>1,068.20</td>
</tr>
<tr>
<td>Amortización de Activos</td>
<td>54,590.00</td>
<td>54,590.00</td>
<td>54,590.00</td>
<td>54,590.00</td>
</tr>
<tr>
<td>Compra de Bienes</td>
<td>65,120.00</td>
<td>231,430.00</td>
<td>399,645.00</td>
<td>559,467.50</td>
</tr>
<tr>
<td>Superavit (Deficit) Cuenta Corriente</td>
<td>26,681.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
<td>50,000.00</td>
</tr>
<tr>
<td>INGRESOS DE CAPITAL</td>
<td>1,582.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
</tr>
<tr>
<td>Venta de Activos</td>
<td>1,582.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
<td>1,582.00</td>
</tr>
<tr>
<td>Transferencia para Gastos de Capital</td>
<td>40,000.00</td>
<td>40,000.00</td>
<td>40,000.00</td>
<td>40,000.00</td>
</tr>
<tr>
<td>Otras Entidades Internacionales J.N.B.P.</td>
<td>25,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
</tr>
<tr>
<td>INGRESOS DE CAPITAL DISPONIBLE</td>
<td>40,000.00</td>
<td>40,000.00</td>
<td>40,000.00</td>
<td>40,000.00</td>
</tr>
<tr>
<td>GASTOS DE CAPITAL</td>
<td>87,442.00</td>
<td>52,951.80</td>
<td>65,517.92</td>
<td>80,000.00</td>
</tr>
<tr>
<td>Maquinaria, equipo de transporte y prod.</td>
<td>57,442.00</td>
<td>52,951.80</td>
<td>65,517.92</td>
<td>80,000.00</td>
</tr>
<tr>
<td>Superavit (Deficit) Cuenta de Capital</td>
<td>25,561.00</td>
<td>51,549.00</td>
<td>61,825.92</td>
<td>48,418.00</td>
</tr>
<tr>
<td>Superavit (Deficit) Total</td>
<td>780.00</td>
<td>15,200.10</td>
<td>22,802.47</td>
<td>(12,456.09)</td>
</tr>
<tr>
<td>Financiamiento Total</td>
<td>37,444.00</td>
<td>38,000.00</td>
<td>70,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>Salda Gestion Anterior y varios</td>
<td>732.00</td>
<td>32,000.00</td>
<td>70,000.00</td>
<td>70,000.00</td>
</tr>
<tr>
<td>Transferencias para deuda</td>
<td>50,000.00</td>
<td>50,000.00</td>
<td>102,000.10</td>
<td>102,000.10</td>
</tr>
<tr>
<td>Obligaciones Emisoras de Deuda</td>
<td>2,615.17</td>
<td>2,615.17</td>
<td>2,615.17</td>
<td>2,615.17</td>
</tr>
<tr>
<td>Deuda por Inflación o Superavit</td>
<td>5,615.17</td>
<td>5,615.17</td>
<td>5,615.17</td>
<td>5,615.17</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>1000</td>
<td>Reservas</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1010</td>
<td>Efectivo</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1020</td>
<td>Créditos del BNE</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1030</td>
<td>Créditos a largo plazo</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1040</td>
<td>Créditos a corto plazo</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1050</td>
<td>Inversiones en acciones</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1060</td>
<td>Inversiones en deuda</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
<tr>
<td>1070</td>
<td>Inversiones en bienes raíces</td>
<td>105,000</td>
<td>105,000</td>
<td>105,000</td>
</tr>
</tbody>
</table>

### Notas
- Las cifras corresponden a euros.
- La tabla muestra la distribución de ingresos y egresos en diferentes periodos.
- Los datos son ficticios y no representan la realidad actual.
ANNEX D

Results of the Administration of Lugol's Iodine in Bolivia
(Percent of Population with Goiter)

<table>
<thead>
<tr>
<th>Location</th>
<th>Pre</th>
<th>Post</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villa Serrano</td>
<td>77.0%</td>
<td>40.6%</td>
<td>10 months</td>
</tr>
<tr>
<td>Escuela Sucre</td>
<td>49.0%</td>
<td>11.9%</td>
<td>6 months</td>
</tr>
<tr>
<td>Sopachuy</td>
<td>77.4%</td>
<td>44.1%</td>
<td>12 months</td>
</tr>
<tr>
<td>San Pedro</td>
<td>93.5%</td>
<td>68.8%</td>
<td>12 months</td>
</tr>
</tbody>
</table>
ANNEX E
PRECIOS DE LA SAL YODADA POR PERIODOS Y DEPARTAMENTOS DONDE SE HA INICIADO LOS PLANES DE COMERCIALIZACIÓN DE "ENCOSAL"
PLAN DE APLICACION ACEITE YODADO

1. INTRODUCCION

Los éxitos obtenidos con la aplicación de aceite yodado en comunidades de alto riesgo y difícil accesibilidad, permitieron bajar las prevalencias de bocio endémico en un 30% aproximadamente, y cubrir a un 10% de la población rural del país por un plazo de tres años. Dentro del marco global de EPI, ALCOLOPOB y el programa de DSTA es una importante estrategia de corto plazo que para- lela a la yodación de la sal están permitiendo a Bolivia solucionar el pro- blema de la deficiencia de yodo.

Teniendo en cuenta los alcances de la yodación de la sal y sus perspectivas para los próximos tres años, el Ministerio de Previsión Social y Salud Pública considera que una nueva aplicación de aceite yodado, que utilice la vía oral para abaratar costos, y se apoye en la movilización social para extender la cobertura, permitiría asegurar para los próximos dos años la provisión de yodo a un 30% de la población boliviana y un 50% de la pob- lación rural, que es la más afectada y que por las condiciones viales del país y sus rasgos culturales es la menos favorecida con la comerciali- zación de la sal yodada.

II. OBJETIVOS

Disminuir en un 50% la carencia de yodo en Bolivia.

Asentar la yodación de yodo a 50% de la población rural del país en tanto la sal yodada pueda ser comercializada en todo el territorio nacio- nal.

Administrar aceite yodado a toda la población rural en condiciones de ca- rencia de yodo y de difícil accesibilidad.

III. LIMITES DEL PLAN

De espacio : Área rural, todas las comunidades con preva- lencia de bocio, mayor de 10%.

De tiempo : Planificación - 2 meses

Ejecución - 2 meses.
Universo: Todos los habitantes de 0 a 40 años. 1,500,000 personas.

IV. UNIDAD EJECUTORA

Ministerio de Previsión Social y Salud Pública.

V. ESTRATEGIAS

1) Regionalización: adecuada a la estructura del Ministerio de Salud con los siguientes niveles:

- Nivel Central
- D.N.N.A (Planificación)
- Direc. técnica proyecto.
- Unidades Sanitarias
- Nivel Regional
- Nivel Local
- Distritos y áreas de salud.

2) Movilización social organizada: A nivel de áreas de salud, se identificarán las organizaciones comunales más idóneas, tales como: comités populares de salud, sindicatos agrarios, clubes de madres, juntas vecinales y otros para la distribución del aceite yodado.

3) Intersectorialidad:

a) Se coordinará con el Ministerio de Educación para la participación de Normales Rurales, Núcleos Escolares, Escuelas Seccionales y Maestros Rurales.

b) Se coordinará con las organizaciones no gubernamentales en salud (ONG).

c) Coordinación con entidades cívicas, políticas y religiosas del nivel provincial (sub prefecturas, corregidores, párrocos).

4) Comunicación educativa:

Se utilizará todos los medios de comunicación masivos (radio y T.V.)
así como la tradición en comunicación interpersonal (ferias, mercados y otros).

**Metodología de aplicación del aceite yodado**

<table>
<thead>
<tr>
<th>Producto</th>
<th>Lipiodol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forma presentación</td>
<td>Cápsulas</td>
</tr>
<tr>
<td></td>
<td>Gotas</td>
</tr>
<tr>
<td>Via de aplicación</td>
<td>Oral</td>
</tr>
<tr>
<td>Dosis</td>
<td>(1 ml. 1 cápsula cada 2 años)</td>
</tr>
</tbody>
</table>

Por la facilidad de aplicación, no se requiere de adiestramiento previo del personal encargado.

Los responsables de áreas de salud distribuirán a la organización que se identifique en la comunidad la cantidad de dosis necesarias de acuerdo al censo poblacional junto a una hoja de registro que deberá ser llenada por los responsables y entregada al área, la misma que por canal institucional será remitida al nivel central para consolidación de la información nacional.

**PRESUPUESTO**

<table>
<thead>
<tr>
<th>Descripción</th>
<th>Costo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aceite yodado 1.600.000 dosis</td>
<td>348.000.-</td>
</tr>
<tr>
<td>Fletes internos</td>
<td>15.000.-</td>
</tr>
<tr>
<td>Material escrito</td>
<td>3.000.-</td>
</tr>
<tr>
<td>Talleres de trabajo regionales</td>
<td>22.000.-</td>
</tr>
<tr>
<td>Publicidad</td>
<td>20.000.-</td>
</tr>
<tr>
<td>Supervisión</td>
<td>10.000.-</td>
</tr>
<tr>
<td>Imprevistos</td>
<td>4.000.-</td>
</tr>
</tbody>
</table>

**Total** 420.000.-

*Costo de aceite yodado calculado con precios "Lipiodol Extrafluid de Gubert (1986).*