CHAPTER III

Reducing Iodine Deficiency Disorders by Improving Salt Consumption Practices through the "School Teachers Training" in Rautbesi, Nuwakot, Nepal

3.1 Background Introduction :

Due to lack of iodine in the diet, 100,000 cretins are born every year in the world and approximately 50 million children's lose their physical and mental development. Lack of iodine in the body causes various health abnormalities, collectively known as Iodine Deficiency Disorders (IDD). "An area is arbitrarily defined as endemic with respect to goiter if more than 10 % of the population or of the children aged 6 - 12 years are found to be goitrous" (Hetzel, 1988).

In Asia alone about 710 million people are at risk of Iodine Deficiency Disorders with 486 million people in South - East Asia and 175 million people in the South East Asia region suffer from goiter. Iodine Deficiency Disorder also persists in parts of the developed country, including Eastern Europe and Germany, where 10 % of school children suffered from goiter and 10 million Germans are at risk of IDD. Italy has a total goiter rate of 20% and Croatia, 25 % (UNICEF, 1995).

In Nepal IDD problem was noticed from first national goiter survey conducted in 1965 - 1967 which showed an overall total goiter rate of 55%. After that 2nd and recent national IDD prevalence survey (1985/86) showed overall total goiter rate of 39.6 % in the country and in Nuwakot district total goiter rate was 32.2%. No other national IDD survey was conducted in the country.

However, MOH and UNICEF conducted two districts goiter survey in Nuwakot and Ilam in 1992 which showed 23 - 46 % goiter prevalence respectively in aged 6 - 12 yr. school children among the total 1800 samples. Similarly a 1994 Nutritional status of adolescent girls survey in Dang district showed 75 - 77 % goiter rates in Satbaria and 97 % in Thabang village which is in Terai and Hill areas respectively (NPC /HMG of Nepal / UNICEF, 1996).

"Nepal is one of the iodine deficient areas where iodine levels falls below 2 microgram per liter. The levels of iodine in drinking water indicates the level of iodine in the soil which in turn determines the levels of iodine in the crops, and animals in the area. Iodine levels of water in iodine deficient areas are usually below 2 microgram per liter (2 PPM)" (Hetzel, 1988).

Most of the mothers prepare food in their households in Nepal, but the majority of them was used iodized crystal salt only after washing, due to its appearance of dusty, dirty, and black, before use. This information was obtained by the Nepal Multiple Indicator Surveillance in 1996, which also reported that 50% of the salt in the markets contained at least 30 parts per million (PPM) of iodine, while

an additional 38 % of samples contained marginal iodine (below than 30 PPM) and 12 % of the salt samples were found to contain no iodine. Therefore iodine deficiency is the serious problem in Nepal because 40 % of the people are at risk of IDD.

There are several factors influencing IDD problem in the country. They are bio - chemical, geo - physical, socio - cultural, econo - political, and informational - technological factors which may be described in detail below:

A. Bio - chemical factors :

In water, presence of micro - organism, like E. coli may destroy the iodine from the water and people who use E.coli contaminated water for their drinking purpose may not get iodine in their body. Similarly due to the presence of organic chemicals in water, like sulphur, may also cause goitregenic effects in the body, in which the people may lose their iodine from their body and developed goiter.

Due to the presence of goitregenic substances in staple foods like, cassava, maize, bamboo shoots, sweet potatoes, millets, and cauliflower, cabbage, broccoli, consumers of these foods may lose their iodine from their body (Stanbury, 1987). Those food items are the major food consumption by the hilly and mountainous districts people in the country (Statistical pocket book, 1996).

At the same time, Iodine riched foods like, kelp, shrimp, fish, lobster, clams, oysters, some other animals (thyroid gland) are not found in those high endemic goiter districts in the country. Those presence of goitregenic substances in staple food

and unavailability of iodine rich foods together result in people not getting sufficient iodine in their diet and in their body.

B. Geo - physical factors :

Nepal is ecologically divided into Terai (the plain) in the south, Hilly and Mountainous areas in the north, where 77 % land area occupied by 53.3 % people in the country. Maximum chances of iodine loss in the soil occurs mostly in hilly and mountainous districts, which is due to the glaciers, heavy rainfall, deforestation or erosion and in Terai due to the floods.

In Nepal 60 - 80 % annual rainfall falls during the monsoon season (June to September). The highest mean annual rainfall was 4216.9 mm in Pokhara in 1993 (Statistical pocket book, 1996).

There are total 75 districts in the country, among them 40 districts have been high endemic districts, of which 25 districts have access to iodized salt supply by the Salt Trading Corporation and 15 districts have not. In Northern Tibetan border areas where people may buy non iodized crystal salt due to the unavailability of iodized salt in those 15 districts where iodized salt is distributed by Chief District Officer only in one kilogram per one family in a month. So that those areas people are suffered from iodine deficiency due to the unavailability of iodized salt and difficult geographical situation.

C. Socio - cultural factors :

In some districts some areas people belief that goiter is not a disease but a god gift, which nobody can eliminate it. In other areas people belief that small goiter in neck is a sign of beauty in the girls. Shah, (1986) mentioned that people in Jumla district reply at the time of neck examination in district hospital, that their swelling are from God and can not be free from it as their parents and grand parents had that type of swellings.

"In some parts of Nepal, goiter is so widespread that it is considered a beauty mark" (UNICEF, 1995). In other side, "people prefer cleaner looking uncrossed Tibetan and smuggled non iodized Indian salt to the less clean looking iodized salt from India" (Stanbury, 1985).

Traditionally most of the people in the country used Crystal (Phoda / Bargara) salt due to their grand parents and parents were using those type of salt before.

Estimated 70 % of the women smoked in hilly and mountainous areas in Nepal (Ministry of Health, 1994). Due to the smoking habits those who smoked have a high goiter prevalence than the non smokers (Foo, 1994). Those cultural, traditional, and smoking habits of people influence the iodine deficiency disorders.

D. Econo - political factors :

Due to poverty of which 49 % of Nepal population falls below poverty line, people can not afford to buy costly iodized salt and are not able to afford other iodine riched foods.

Table 3.1. Cost of Iodized salt in Nepal :

Types of salt	Brand name	Price (per kilogram)
Phoda salt	Dhike (loose)	3 - 4 Rupees (7 US Cents)
Crushed salt	Shakti (non subsidized)	4 - 5 Rupees
Crushed salt	Bhanu (subsidized)	5 - 15 Rupees (only remote districts)
Refined salt	Ayonoon, Tata (Indian brand)	7 Rupees (13 US Cents)

One US $ = 57.30 Rupees.

Source : Gorstein & Houston (1996).

Due to the high cost of iodized refined packed salt than the crystal salt people do not buy iodized refined salt. Because crystal salt is cheaper than the refined iodized salt.

Due to the open border with India and from Tibetan border where non iodized salt were illegally entered into the country then people may buy non iodized salt for the livestock purpose as well as for their own purpose due to the cheaper and clean than the iodized salt. There is still no legislation to control non iodized salt. Legislation is on the way of process.

Therefore poor people can not afford to buy iodized salt and they are not distinguished iodized and non iodized salt which is illegally entered into the country due to the lack of legislation.

E. Informational - technological factors :

Women prepare foods in every household in the country. Among them majority are illiterate, total illiteracy rate is 60%, and female literacy is only 21% (NMIS, 1995). Due to lack of knowledge women use crystal salt after washing it until the black portion of iodine is washed away from the salt. NMIS, 1995 survey also showed most of mothers in focus group discussion told that they were washing salt before using in foods. Additionally, many people in the country keep their salt near and over the oven (Chulo and Ageno), and due to the heat almost iodine from the salt is escaped out and people did not get iodine in their diet. Only a few people keep their salt in wooden, bamboo, or clay pot to prevent moisturizing.

Similarly due to the lack of knowledge of iodine and its importance people do not take iodine riched foods, in coastal urban areas like in Hongkong, and Mongolia, where iodine riched foods is easily available (Kung et al., 1996). Then people take no iodine in their diet and their body.

Therefore their exist immediate need to improve the people salt consumption behavior. This study proposed a strategy to increase IDD knowledge and creating awareness about IDD by utilizing their own children as educators who have in turn been trained by their teachers.

3.2. Purpose statement of the proposed study :

The purpose of this study is to develop and implement teachers training program in Rautbesi village of Nuwakot district to provide IDD knowledge to the children who, in turn, can relay all information to their parents, in order, to improve the salt consumption behavior in that community. The study attempts to identify the teachers existing knowledge, their attitude about iodine and its importance and their salt consumption behavior and incorporate their ideas to develop training curriculum to them.

To develop and implement teachers training program I have discussed here Health Belief Model and Cummunication / Behavior Change Framework. The Health Belilef Model describes how the people perceive seriousness of diseases and how they changed their behavior. The CBC Framework is the comnbination of communication / persuasion matrix and behavior change framwork. Which describes how the message convey to the target population effectively and how the people believe the given message. For this purpose the CBC framework describes seven elements to improve the people's health behavior. The CBC framework is useful to implement the TCP approach.

Teacher's -Child - to Parents Approach is used widely in the world. Mainly I have discussed here only Indonesia, Philippines, Thailand and China's experience. I have found successful results in those countries. So, I adopt this strategy to improve salt consumption practices in Nepal.

3.5. Objectives of the proposed study :

3.5.1. Overall Goal :

To increase iodized salt consumption by changing storing practices and salt washing behavior in Rautbesi village of Nuwakot district.

3.5.2. Objectives :

To test the strategy of teachers training to educating people through the school child - to - parents channel in Rautbesi village of Nuwakot district.

3.5.3. Specific objectives :

1. To develop the training curriculum.
2. To prepare training guidelines.
3. To test the training curriculum and guidelines in Rautbesi village of Nuwakot district.
4. To pre test the teachers knowledge before the training.
5. To post test the teachers knowledge at the end of training.
6. To develop the curriculum to the children.
7. To supervise the program at school.
8. To monitor the program at home.
9. To evaluate the impact of teachers training in Rautbesi village of Nuwakot district.

3.6. Proposed Program :

The study will be for one year period from the February 1998 to January 1999. The study activity will be initiated by the Nutrition section, district health office and district education office of Nuwakot district with mutual cooperation. The management responsibility will be with the Nutrition section, district health office and supervision and monitoring will be conducted by the district education office usual process with specific attention to that particular program which is usually followed by primary school's and secondary school's supervisors as well as District Health Officer, IDD Program Chief, STC / GCP Section Chief.

To know the teachers present IDD knowledge, attitude and their salt consumption behavior, the focus group discussion will be held in first week of February 1998. By this focus group discussions the training curriculum will be developed. The focus group discussion will be held after collecting essential information from the school's, district education office and district health office of Nuwakot district.

The curriculum development will initiate from the second week of February 1998, and the curriculum will be developed by the seven members team. Among them one is the Nutrition section chief, second one is IDD program chief (researcher) , third one is Salt Trading Corporation / Goiter Control Project section chief, fourth one is the Nutritionist, and fifth one is Psysician from the Nuwakot district health office, and Primary and Secondary school supevisors from district education office Nuwakot.

The training program will be started on third week of February 1998 in district health office in Trishuli of Nuwakot district. Then teachers will start the class on every Friday among the students in secondary and primary schools.

Those schedule will be formed due to the some limitations. In our country all schools have a winter vacation in whole January month in hilly districts and summer vacation in whole June month in Terai district. Similarly it will take some time for budget allocation from the possible sponsors.

The proposed program will be in three phases . First phase will be for the teachers training and second phase will be teachers activity in the class and students activity at their home. The third phase will be impact evaluation. The schedule of the training program will be given in the appendix.

First phase : Teacher's Training :

3.6.1. Teachers training : Teachers training will be held in district health office, Trishuli of Nuwakot district on given schedules. For this program three learning objectives will be included.

1. Content (what is taught), 2. Methods (teaching methods), 3. Assessment (examinations / tests).

3.6.2. Teacher's Training objectives :

After the teacher training following objectives will be achieved.

1. At the end of training teacher will be able to :

a) define iodine deficiency disorders.

b) list the major consequences of iodine deficiency.

c) illustrate symbiotic effects of smoking, goitregenic food, and malnourished and other related factors.

d) name the major natural sources of iodine.

e) explain the socio - economic impact of IDD.

f) demonstrate the salt test skills.

g) findout the goiter by palpation and inspection method.

h) list the type of salt found in the market.

I) list the recommended level of iodine intake by age.

To achieve above objectives following content will be included.

3.6.3. Content of the topic:

1. Definition of IDD.
2. Description of causes and consequences of iodine deficiency.
3. Prevalence of IDD.
4. Importance of iodine
5. Required amount of iodine intake.
6. Types of salt.
7. Natural sources of iodine.

8. Symbiotic effects of goitregenic foods, smoking, malnourished and other related factors, such as geo - physical, bio - chemical, socio - cultural, econo - political, informational - technological.

9. Socio - economic effects on community.

10. Demonstration skills of salt test.

11. Demonstration skills of goiter palpation and inspection method.

3.6.4. Trainees : All the 20 teachers from primary and secondary school of Rautbesi village will be included for the proposed training program. The table 3.3 show the school 's name and numbers of teachers and students of Rautbesi village.

Table 3.3. Rautbesi village's school's name and numbers of teachers and students:

School's name	Total teachers	Total students
Phaukeswori proposed secondary school	11	198
Kalleri primary school	2	41 (19 = M, 22 = F)
Bhagawan primary school	1	27 (18 = M, 9 = F)
Chandeshwori primary school	2	33 (16 = M, 17 = F)
	2	42 (25 = M, 17 =F)
Yashoda primary school	2	42 (23 = M, 19 = F)
Total	20	383

Source : District education office, Trishuli, Nuwakot (1997).

3.6.5. Trainers : Seven members of a team will be a trainers. They will be a Nutrition section chief, IDD program chief, STC / GCP Section chief, Nutritionist, Physician Primary and Secondary School Supervisors. The Nutrition section chief from the Nutrition section, Child Health Division, IDD program chief from the Nutrition section, STC / GCP Section chief from the Salt Trading Corporation's Goiter Control Project, Nutritionist from the Central Regional Health Directorate Office, Physician from the District Health Office, Trishuli, Nuwakot, Primary and Secondary School Supervisors from the District Education Office, Nuwakot.

3.6.6. Curriculum development : Base line information will be collected by the focus group discussion to develop the curriculum for the teachers. The focus group discussion will be conducted among them to know the existing knowledge of IDD, their attitude towards the IDD and their salt consumption practices. After the focus group discussion the valuable suggestions will be included for the curriculum development by the above mentioned seven members team.

3.6.7. Focus group discussion : Focus group discussion can be simply defined as a discussion in which a small number (usually 6 - 12) of respondents, under the guidance of a moderator, talk about topics that are believed to be important to the investigation.

Russell B. H.(1995), "defined and described focus group is a small group typically have 6 - 12 members, plus a moderator, 8 people is a popular size. If a group is too small, it can be dominated by 1 or 2 loud mouths, and if it gets beyond 10 or 12, it

gets tough to manage. The focus group discussion are less expensive to conduct than questionnaire survey and they yield insights on why people feels as they do about a particular issue or behavior. If one hour period focus group discussion, this helped to ensure that the discussion would produce useful information. The focus group discussion method is now widely used in basic and in applied research."

Focus group discussion method is used in this study for obtaining information about IDD knowledge, attitude and their salt consumption practices from the teachers. Two focus group discussion will be organized. Each group consists of 10 members. The teachers will be selected those who are teaching in primary and secondary schools to avoid dominance and discrimination similar background teachers will be select and grouped in one. The two session will be conducted on Friday afternoon, the school will be closed on every Friday at 1.30 PM in the country.

The venue of the focus group discussion will be in secondary school's class room with two group separately. The discussion will be in Nepali language which is easy to be spoken and easy to understand by the group members. Discussion will be taped by the help of assistance. This focus group discussion will be conducted with the help of moderator , who will be Health assistance or Senior Auxiliary Health Worker, or Staff Nurse from the district health office of Nuwakot district. Who's role is not to lead the discussion but to ensure the smooth running of the group's discussion.

One Health assistant will be a note taker for this group discussion. Administrative assistance from the Nuwakot district health office will assist the focus group discussion,

researcher as observer, will be sit back of the group member. All the helping members will be trained by the researcher. The question guides for this focus group discussions are the same for both groups. The questions covered all the teacher's knowledge, attitude and their behavior about IDD and salt consumption practices. The questionnaire is given in the appendix.

Focus group discussion will be conducted in following orders. The discussion will be started with introduction of participants, introduction of objectives, and get permission to use taperecorders. Time will be not more than one hour. First moderator will create a non - threatening environment, there is no right and wrong answers, encourage participants to use their own terms and expressions, general questions will be ask to the participants first, like, what type of salt found in your community and what type of salt you are using now, is it crystal, semigrain or refined packed. Moderator also observe the members eye, palm, and hand to face and body gestures and manage this type of gestures reaction and results. Assistance will assist for the tape recording and resetting , as well as helped to surve the snacks to the participants. Note taker will take note by giving number to the participants for the easy to remember when they talked or discussed. Because all the participants name is some time difficult to remember. At the end of session moderator will thanks to the session and play the recorded conversation.

3.6.8. Training guidelines and Learning material preparation : To develop learning materials the seven members team will discussed and developed what they need for their own specific subject to the teachers training program. For this purpose budget will be

sanctioned to the whole members. Those materials will be provided to the teachers after the training program for their further development to the children.

3.6.9. Teaching methods: For the teachers training following teaching methods will be included.

1. Lecture with discussion.

2. Demonstration (Posters, Salt test, others).

3. Practical (Palpation and inspection of goiter).

4. Video show about iodine deficiency disorders.

The training program will be initiated with applying those teaching methods by the above mentioned five members team.

3.6.10. Teacher's training schedules :

Table 3.4. 15 Th. February 1998.

S. No.	Activity	Time	Resource person
1	Registration	9 -10 AM	Administrative assistance
2	Introductory session and welcome speech	10 - 11 AM	Chief of district health office, Trishuli, Nuwakot
3	Coffee break	11 - 11.15 AM	---------
4	Introduction of training programs activity and socio - economic impacts on community	11. 15 - 12 Noon	IDD program chief
5	Lunch break	12 - 1 PM	---------
6	Introduction of IDD program in Nepal and symbiotic effects of goitregenic foods, smoking, malnourished.	1 - 2 PM	Nutrition section chief
7	Introduction of iodine	2 - 3 PM	IDD program chief
8	Coffee break	3 - 3. 15 PM	--------
9	Introduction of iodine deficiency disorders from global to Nepal	3. 15 - 4 PM	Nutritionist

Table 3.5. 16 Th. February 1998.

S. No.	Activity	Time	Resource person
1	Introduction of Salt Trading Corporation, and Goiter Control Projects activity	10 - 11 AM	STC / GCP section chief
2	Coffee break	11 - 11. 15 AM	----------
3	Consequences of iodine deficiency	11. 15 - 12 Noon	Physician
4	Lunch break	12 - 1 PM	----------
5	Importance of iodine	1 - 2 PM	IDD program chief
6	Natural and artificial sources of iodine	2 - 3 PM	Nutritionist
7	Coffee break	3 - 3. 15 PM	----------
8	Demonstration of goiter palpation and inspection method	3. 15 - 4 PM	Physician

Table 3.6. 17 Th. February 1998.

S. No.	Activity	Time	Resource person
1	Preventive measures of IDD in global to Nepal	10 - 11 AM	IDD program chief
2	Coffee break	11. - 11. 15 AM	----------
3	Demonstration of salt testing	11. 15 - 12 Noon	STC / GCP section chief
4	Lunch break	12 - 1 PM	- ----------
5	Introduction of district IDD situation	1 - 1.30 PM	Chief of District Health Office, Trishuli, Nuwakot
6	Video show about IDD	1.30 - 2.30 PM	----------
7	Coffee break	2. 30 - 2. 45 PM	----------
8	Post test examination	2. 45 - 3. 45 PM	IDD program chief
9	Closing remarks	3. 45 - 4 PM	Nutrition section chief

3.6.11. Post test : After the teachers training evaluation will be done by the post test. The post test examination will be done by using following models. If the score is more than 80 % gained by the participants then the teacher's training will be successful. If the score is below than 80 % then the training is not successful and I will rearrange the program by improving curriculum, content, methods, and techniques simultaneousely for the better performance.

Table 3.7. Scoring model :

Scoring model	Total marks
a) Multiple choice questions	25 x 1 = 25 total score
b) Short answer questions	6 x 5 = 30 total score.
c) Long answer questions	1 x 15 = 15 total score.
d) Skills of salt test demonstration	= 10 total score.
e) Skills of goiter palpation and inspection	= 20 total score.

Those questionnaire will be given in the appendix.

Phase two : Teacher's activitiy in class and students activitiy at home :

3.6.12. Teacher's activity in class :

Teachers activity in class of primary and secondary school of Rautbesi village and students activity at their home will be included in this phase.

Teacher will take class on every Friday by their own scheduled routine. At the class every teacher will start asking some questions from the students which is related to goiter, cretin and salt.

First, teacher will ask the students which salt are using at your home Is it crystal salt or refined packed iodized salt ? Then teacher will ask to the students have you seen any goiter people in the community, in the neighboring family, or at their home.

After that teacher will teach the students about iodine, its importance, natural sources of iodine, consequences of iodine deficiency, etc. Like, if lack of iodine in the body of any children then they will be suffered from cretins, mental retardation, loss of hearing and speech then will lost opportunity to go to school, to go to work, etc. Like wise, teacher will examined the students by palpation and inspection method whether they have goiter or not and then they will fillup the provided form and send it to the district health office. Similarly teacher will ask the children to bring their salt from their home a day before the class (Thursday) and teacher will demonstrate the salt test by the provided test kit in the class to show the changing color of iodine from the salt. Teacher will take total of four classes in a month with his or her own schedule routine.

At the last Friday of the month, teacher will encourage to the children for drawing figures about cretin people or goitrous people. Similarly essay competition about iodine its importance will be conduct by the teacher, and role playing about cretin or goiter people also conducted. Teacher will ask the children to bring their salt in every last Friday for testing, to check whether or not their parents salt storing practices is changed.

To know it the salt washing behavior change, students may observe their mothers whether or not try washed salt.

This type of work will be done regularly by the teachers in his or her school. Among those students who will draw well picture, or compete the essay competition, then they will get prizes from the teachers, for examples, they will get small prizes, like pencil, pen, writing copy, etc.

For this study I propose all 20 teachers for the IDD training among the secondary, and primary school's. Because they all may teach in every subjects in every class about IDD.

1. Math teacher will ask to the students to draw the pictures of cretin people. Then students will know the drawing skills with knowing cretins.
2. Science teacher will ask to the students what the color of iodine is and how it can be changed from the salt, after demonstrating salt test in the class.
3. History teacher will teach students goiter will be known from the ancient time. Due to the cretin and goiter people, lack of proper brain development country will suffer from the various problems. Like economical, social, and others too.
4. Culture teacher will teach what type of belief exist in some part of the country about goiter and cretinism. Due to this belief what the benefits are to them and what the harmful effects will rises, teacher will discussed in the class.
5. Geography teacher will teach how iodine will be leached from the soil and how iodine can be destroyed from the water. Then teacher will teach what will happen.

6. Agriculture teacher will teach how goitregenic food loss iodine from the body, and what the major sources of iodine in food, how we can get it in our body.

7. Health teacher will teach about whole IDD subject and also specifically if lack of iodine in our diet or body then what type of consequences will develop in our body and what the results will come to our community. Teacher also teach to the students do not take goitregemic foods, because due to goitregenic substance iodine will lose from the body, and people may develop goiter. Similarly presence of micro - organism and organic chemicals in the water may destroy the iodine in the water and those who drink polluted water may developed goiter. Teacher will teach about smoking habits by which goiter may be developed. If those smoking habits, goitregenic food consumption, polluted water drinking avoided by the people then the Iodine Deficiency Disorders should be reduced.

8. Statistics teacher will teach how much goiter people indicate endemic to that community and how one can know the magnitude of the problem.

9. Economics teacher will teach if people may get a cretin then those who are not pull their weight and it is burden for the family and community, so that family's income will decreased and people's will then suffered from the poverty. Then what will reflect to the country's economy.

10. Political science teacher will teach if your family suffer from the goiter and cretin then your family will not get opportunity to go to school and do not have opportunities to educate. Lack of education, your family will not get any political post, any official post

then your family will be always dominated by the others. Never your family will rise in economic and social status, and etc.

3.6.13 Teacher's activity with mothers :

There are total 597 house holds in the Rautbesi village of Nuwakot district. Those total 383 students will covered the approximately 380 households and rest of the 217 households who have no children will included by the teachers itself.

For this purpose teacher will find out the non children households by their students. The students will know which house has no children in the community or neighbouring family. The 383 students will find out the 217 non children households in that village and teachers will discussed among themselves and decide who will be and in which households to go and give them IDD knowledge and create awareness about salt washing behaviour and salt storing practices in those households.

For this purpose one teacher will be responsible for 11 non children households in that village, then 20 teachers will covered the 220 non children households in that village. The teacher will discussed with 11 mothers in convenient time and place, which will be on Saturday evening. Because there is only one holiday in a week in the country which is on Saturday. For this purpose teacher will get some incentives per day to give them IDD knowledge and create awareness about salt washing and storing practices to those non children households in that village. The teacher will teach them by showing salt test demonstration and some posters and discussions among them. What they learned in the training, teachers will used those techniques and methods for those mothers groups.

3.6.14. Supervision : Supervision will be done to know the problem and constraints of the teacher and students at the time of teaching in the class and as much as possible to solve the problem in the spot. For this purpose following supervision schedule will be helpful. Which is given in the table below.

Table 3.8. Supervision schedules :

Months	Weeks	School's name	Secondary School Supervisors	Primary school supervisors	I D D Program Chief	District Health Officer	GCP / S T C Section Chief
March 1998							
April 1998							
May 1998							
June 1998							
July 1998							
August							

1998							
September 1998							
October 1998							
November 1998							
December 1998							
January 1999							
Total							

3.6.15. Supervision methods :

To conduct the supervision following checklist will be used by the supervisors. Which is given below.

1. Delivered IDD knowledge High....., Moderate....., Low.....

2. Narrate the consequences of IDD High....., Moderate....., Low.....

3. Ability to prepare teaching learning material,

drawing pictures, using local made models, etc. High....., Moderate....., Low.....

4. Ability to motivate the students. High....., Moderate....., Low.....

5. Ability to identify the goiter by palpation and inspection. High....., Moderate...., Low....

By this check list supervisors will know the situation and what measures will be needed to improve the program they can advised to the teachers.

3.6.16. Student's activity at home :

Children gain knowledge about iodine, its importance and salt consumption practices from the teachers in the class. Then children will talk to their parents, grand parents, about what they learn from the school. Parents and grand parents will discuss about their salt consumption practices and they might be decided to change their existing behavior. Because children will enforce their mother to use iodized crystal salt without

washing it. Then they will request to their parents about the importance and consequences of iodine since they have knowledge about the causes of goitre and cretin.

3.6.17. Childrens guidelines at home :

- children talked to their parents and informed them not store salt in hot places (near and over the chulo, ageno (oven)) because iodine will be destroyed from the salt by the direct heat. Then they will not get iodine in their diet, and they will suffered from various iodine deficiency disorders, like goitre, cretin, mental retardation, abortions, still births, loss of hearing and speech and they will not have opportunity to go to school, will not have opportunity to learn new things and also they will not have better school performance they will learned today by their teachers in their class in school.
- to store salt in wooden, bamboo, or clay pot with air tight lid, so that iodine will preserve and they will get iodine in their diet. Then they will not suffered from those iodine deficiency disorders.
- not to leave salt in open space or without lid. Since iodine will escaped out by the moisture and also by the direct sun light.
- children will encourage and inforce their mother not to wash salt because if they washed the salt they will not get iodine in their diet. Then they may develop goitre, or cretin children, school performance will decreased or slow.
- children will participate in preparing food, then mother will be happy for their participation because mother have a lot of work to do at home and also at their field.

- children will inform their parents that their salt has no iodine by testing in school their test kit, so that they do not get iodine in their diet. Due to salt storing practices.
- children can convinced their parents by giving information what they learn and what they saw at the school and how iodized salt convert the color from the salt. Then parents will believe that they are using non iodized salt so that they might be change their behavior and buy iodized salt or not to store salt in hot places (chulo and ageno) and not to washed their salt.
- those children who have goiter, will talked to their parents that they have developed a goiter due to their parents salt washing and storing behavior, teacher will told children that they have a goiter, so that they have to eat iodized salt otherwise it will developed and increased in large shape. Children have not got opportunity to achieve the better school performance. After adult they do not get opportunity to do the job due to mental disorders also. So that parents should not wash the salt and store salt in open space or without lid.

Children will participate and helping mothers at the time of cooking or preparing food, and enforcing them to use iodized salt without washing. If children can not succeed to convince their mother or parents then teacher will come to their home and discussed with their parents about how to use iodised salt.

This type of conversation or message will be delivered from the school continued in a year. Then definitely mothers salt consumption behavior will be improved.

Similarly children will encouraged the mothers to keep salt in clay, bamboo, or wooden pot not to keep near and over the oven. Because due to heat iodine will be loss from the salt.

3.6.18. Monitoring at home : There are 597 households in the Rautbesi village of Nuwakot district. It is not possible to monitor all the households, so that I have proposed here from one wards (blocks) at least 5 households will be monitored by the Village Health Workers. The Village Health Workers are already got two days IDD orientation training by the Nutrition section about iodised capsules distribution procedures, knowledge of iodine, its consequences, treatment and prevention of IDD. The Village Health Workers are the government service holders no need to pay extra allowances. But I have proposed some allowances to incourage them for the effective supervision and monitoring.

Phase three : Evaluation :

3.7 EVALUATION : Evaluation will be done to know the results of the program. For this study I have discussed here mid term evaluation after the 6 month of the program and impact evaluation after the end of the program.

3.7.1 Mid term evaluation :

To know the progress of the program, after the 6 month, mid term evaluation will be done. For this purpose rapid survey will be done, by the structured quistionnaires. Sampling will be done by the systemic random sampling. The sample size will be 45 from the total 9 wards (blocks) in Rautbesi village, 5 from each wards (blocks).

This rapid survey will be done in one day. Structured quistionnaires is used to know the people's existing behavior they change or not their behavior. The questionnaire will be given in the appendix. Total 5 interviewer will conduct the rapid survey. An analysis and interpretation will be done in the district health office of Nuwakot district. The results will be used to improve the situation or to solve the existing constraints and problems to meet the proposed objectives.

3.7. 2. Impact evaluation:

A. Methods of impact evaluation : After the one year implementation of teacher training program the impact evaluation will be done by the two focus group discussion, 24 hour urine collection and goiter examination.

B. Focus group discussion : The focus group discussion will be conducted from the lower caste and higher caste. Those who have higher economic status and lower economic status. Those caste can be influence and dominant at the time of focus group discussions.

C. 24 hour urine collection : The urine collection will be collected from the 100 students from the schools to compare the percentage with before the intervention. The students will be selected by the systemic random sampling by the school's records.

D. Goiter examination : The goiter examination will be conducted from the school's children's. For the comparative study with before intervention I will select 100 samples from the school's records by the systemic random sampling.

E. Study population : Among the total 597 households, the child bearing age mothers and below 15 years children will be included in the study population. There are total 3049 population in the Rautbesi village of Nuwakot district. Among them 1473 are female population. 383 children's are enrolled in the primary and secondary school's.

F. Sample size : For this purpose I have used following formula for the sample size by the Kish & Leslie, Survey sampling, John wiley & Sons, Ny, 1965.

$S = Z * Z (P (1 - P) / D * D$ for infinite population

S = Sample size, Z = percentile of the standard normal distribution determined by the specified confidence level, 1.96 for a 95 % confidence level, P = prevalence of goiter in Nuwakot district, D = one half of the width of the desired sample confidence interval (0.05).

For the finite population :

$S = S / 1 + (S / Popn.)$

$S = (1.96)2 (.23) (.77) / (0.05)2 = 273$

$Sample = 273 / 1+ 273 /283 = 159$

From the child bearing age mothers 18 mothers will be included for the two focus group discussions, one participants from one wards (block) each from lower and higher caste. 159 school children's included for 24 hour urine collection and goiter examination.

G. Sampling technique : The focus group members will be selected two each from the lower and higher caste in one wards (blocks) and total 18 from the nine wards (blocks). The focus group members will be selected by the list of the mothers which is provided

from the election commission office of Nuwakot district. Then by these list I will separated two list by the caste, lower and higher and I pick two sample purposively.

H. Data collection : Data will be collected from the official records, such as school's monthly goiter examination records, reports from the supervisors, 24 hour urine collection and goiter examination from the school children's.

I. Data collection procedures : After completing selection of sample, then I will select the moderator, note taker, and assistance for the two focus group discussions. As well as for the goiter examination I will select two expert, who may be a physician, and for the urine collection three assistance will be selected.

J. Data analysis / interpretation : The data will be gathered in nutrition section, and analysis and interpretation will be done. The data will be interpreted separately in each variables and compiled in one form.

K. Findings and recommendations : The findings and recommendations will be submitted to the Nutrition section, Child Health Division, Department of Health, Ministry of Health, Salt Trading Corporation, WHO, UNICEF, and other donor agencies.

3.8. Budget for the proposed study :

Table 3.9. Budget for the proposed study :

S. No.	Particulars	Days	Rupees	Total person	Total amount
1	Resource persons (3 days for training, 2 days for curriculum development)	5	1000.00	7	35,000.00
2	Moderator, Note taker, Assistance (for 6 focus group discussion)	6	400.00	3	7200.00
3	Administrative assistance	3	400.00	1	1200.00
4	Driver	3	200.00	1	600.00
5	Peon	3	100.00	1	300.00
6	Participants	3	400.00	20	24,000.00
7	Lunch and Snacks (for focus group discussions and training)	3	200.00 + 100.00	30 + 75	25,500.00
8	Fuel	5	300.00	1	1500.00
9	Stationary	3	150.00	30	13,500.00
10	Photocopy	3	3000.00		3000.00
11	Miscellaneous	3	5000.00		5000.00
12	For curriculum development and learning material preparation.		500.00	5	2500.00
13	Focus group discussions (researcher)	6	1000	1	6,000.00
14	Monitoring at home	36	200	1	72,00.00
15	supervision at school	2	1000	5	10,000.00
16	Total				142500.00

Note : One US $ = 57.30 Rupees. Approximately US $ 2486.91

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