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Environmental Sanitation Project

A.A. BESA

World Health Organization

Assignment Report

Gilbert and Ellice Islands

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14 August 1967*

ENGLISH ONLY

ASSIGNMENT REPORT

3 - 26 March 1967

by

A. A. Besa¹

Title of project : Environmental Sanitation Project
Geographical location : South Pacific Area
Participating agencies : Government of the Gilbert and Ellice Islands
United Nations Children's Fund
World Health Organization
Form and type of assistance : Technical advice from WHO
Material assistance from UNICEF
Source of funds : UNICEF-assisted
Duration : 3 - 26 March 1967

¹
WHO Sanitary Engineer

*Revised text

1. PURPOSE OF VISIT

(a) To assist the Government in the initiation of a water supply and sanitation scheme at Bonriki Village in Tarawa.

(b) To train personnel in the construction of a water supply and the manufacture and proper installation of water-seal latrine bowls.

(c) To assist in the preparation of a draft plan of operation for an environmental sanitation project.

(d) To discuss with the Government the draft of a proposed sanitation programme for the six villages of Nikunau Island, to review the engineering plans and to prepare a list of supplies necessary to carry out the work.

2. BACKGROUND INFORMATION

For background information, reference is made to the reports submitted by Mr. B.L. Adan, dated 8 November 1965 and 30 December 1966.

3. OBSERVATIONS AND DISCUSSIONS

The Medical Department has at present three assistant health inspectors carrying out sanitation work in Tarawa. One will eventually be assigned to Funafuti in the Ellice Group.

3.1 Bonriki water supply

Bonriki is on one of the fifty or so islets of Tarawa. It contains the international airport. It has a present population of about 250. The total number of household units is forty-five.

Like the rest of the islets in Tarawa, it is low-lying and flat, the highest point being only ten feet above Mean Sea Level.

The present state of sanitation in the area is very poor. The source of drinking water is from twelve unprotected shallow dug wells, all located in the village area. Withdrawal of the water is by means of buckets and ropes. There are no latrines of any kind, individual or public, in the entire village.

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The proposed sanitation programme in this village will include the provision of a piped water supply, each household to have one tap, and the installation of a water-seal latrine for each family. It is also planned to carry out improvements in other sanitary aspects of the village.

The water supply scheme proposed the construction of two infiltration galleries, each with a windmill-driven pump which will lift the water and discharge it into two 2000-gallon elevated tanks, from where it will gravitate into the village. Both tanks are to be connected so that each will feed the other. Storage capacity will be sufficient to provide water requirements for three days of anticipated calm weather. Taps will be installed as closely as possible to the kitchens, baths, and latrines. For design purposes, the number of household units was considered to be 59, taking into account possible increases in the number of households in the next few years.

During this visit, assistance was given in the construction of the two infiltration galleries and the installation of a hand-pump in the nearer gallery to the village as a temporary means of drawing water. In each gallery, the centre well was dug and a water-tight concrete basin constructed in such a way that the top is 6" above Mean Sea Level. The water-tight basin will allow for greater depth of water at pump intake and will prevent the possible intrusion of saline water, if the rate of pumped water withdrawal should exceed the yield of the infiltration gallery.

The top of the basin determined the lowest point of the bottom of the infiltration galleries. The galleries have about 40 feet of pipes at the two opposite sides of the centre well. Only the last third of each run of pipe was perforated. This arrangement should induce more water to be drawn from the aquifer at the ends of the galleries. Use was made of available pipes for the galleries. Gallery No. 1 has two rows of 4" AC pipes, while No. 2 has a row of 6" earthenware pipes. The necessary openings on the walls of the centre wells were provided.

A hand pump was installed in the nearer gallery to provide safe water for drinking and to demonstrate a sanitary method of drawing water from wells.

The construction of the water distribution system awaits the arrival of the required materials from overseas.

Observations made in the centre wells of the galleries indicated a tidal influence on the water-level, of 16" on the well nearer the village, and 8" on the other. The influence of the tide lags about 2 hours 30 minutes in both wells after each change. The chloride content of the water sample taken at low tide in both wells was about 31 ppm as NaCl (sodium chloride).

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3.2 Water-seal latrines

Two water-seal latrine moulds of the Fiji squatting type had been received from Fiji by the Medical Department but had not been put to use. The writer was able to train seven staff members of the Departments of Works and Health in the manufacture of seats and moulds. Nineteen water-seal squatting plates were manufactured and one mould made during this visit.

As piped water is not yet available, only three latrines were installed, one of the type to be installed near a well water source; and two, farther away.

The type installed close to the gallery consists of a water-tight concrete box. The sewage effluent drains into a sub-surface drainage trench. About fifteen feet of the drainage pipe is water-tight and the rest is open-jointed.

Farther from the water sources, the latrine installed is only lined with stones. The bottom of the pit was dug so as not to reach the highest ground water level in the area.

3. General cleanliness

The area was observed to be quite dirty. Remnants of the last world war were seen scattered and rusting in and near the village. There was no proper disposal of empty tins and other household refuse. Flies were abundant.

Some of the scrap iron was loaded into the truck after unloading stones, gravel, sand and other materials required, and disposed of in an area far from the village.

4. MEETINGS AND CONFERENCES

Several meetings were held with the Acting Assistant Resident Commissioner and the Chief Medical Officer. The plans of Bonriki Village community water supply and a programme of work were discussed. In one of these meetings a request for assistance from UNICEF was mentioned. This resulted in a formal letter being sent by the Government to UNICEF enquiring if material assistance for a sanitation project, similar to that being given to Tonga, Fiji and Samoa, could be extended to the country.

The preliminary plan for the Nikunau project, the preparation of a draft plan of operation and a detailed list of materials needed for the project were considered. The various responsibilities and shares in the costs of the project, if assistance is obtained from UNICEF, were also discussed.

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Frequent informal meetings with the Clerk of Works of the Public Works Department were necessary to review cost estimates for the Nikunau project, as well as to obtain the materials required for the Bonriki pilot project.

It was also found necessary for the writer, the Chief Medical Officer and the District Commissioner, to meet the villagers prior to the commencement of work in Bonriki Village. This meeting, held in the "Maneaba", fully explained the work to be done as well as the role expected from the villagers. The importance of self-help was emphasized. It was agreed in this meeting that all unskilled labour required for the realization of this project would be provided by the people - including the hauling of the necessary local materials such as stones, gravel and sand. Transport would be provided by the Government.

On several occasions, informal discussions were held with the Chief Medical Officer, particularly in connection with the sanitation aspect of the work at Bonriki village. Some comments and suggestions were also made to the Chief Medical Officer relating to improvement of the present water supply for the headquarters areas of Betio, Bairiki and Bikenibeu.

5. CONCLUSIONS AND RECOMMENDATIONS

The pilot project in Bonriki village is to demonstrate a method of developing the fresh water lens in coral atolls to obtain water in sufficient quantity for a village supply without upsetting the lens. It will also demonstrate the advantages of a reticulated water supply over individual wells in preserving water quality, and its accessibility, especially if water-borne methods of excreta disposal are used. It will serve also as a training ground for personnel to be assigned to the bigger project on Nikunau Island and subsequent sanitation projects.

In the initiation of this project at Bonriki, the Government has taken definite steps to provide a water supply and improve sanitation in the country.

The people of Bonriki village, after showing half-hearted interest, finally gave their whole-hearted support and assistance in constructing the two infiltration galleries - even to the extent of working late in the evenings and beginning work early in the mornings, as well as coming to work on Saturdays and Sundays. For this portion of the work a total of 2329 man-hours were contributed by the villagers over a period of sixteen working days.

In the case of the pilot project at Bonriki village, the following is recommended:

- 5.1 The collection of statistical data to serve as a basis for future evaluation. This might include health statistics such as the incidence of water-borne diseases, infant mortality rates, etc.

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- 5.2 The personnel who will undertake the supervisory and construction work proposed for Nikunau Island should be given all the necessary experience in the pilot sanitation project of Bonriki village, especially in the proper construction of infiltration galleries, the installation of water-seal latrines, and the handling and installation of PVC pipes and fittings.
- 5.3 Health education activities on general sanitation should go hand-in-hand with the water scheme. In the meantime, until the water system becomes a reality, the villagers should be advised to obtain their drinking water from the gallery, with a hand-pump, or to boil their drinking water if obtained from existing unprotected wells.
- 5.4 The procedures, including the assignment of responsibilities, should be closely observed by all concerned so that they may be followed later in the Nikunau projects.

The writer would also recommend that the Government refers again to the recommendations contained in the previous reports of the WHO sanitary engineer.

6. ACKNOWLEDGEMENTS

The writer wishes to express his sincere appreciation to all government officials who contributed, in one way or another, towards making his visit pleasant and profitable.

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