

BIKINI RESETTLEMENT PROGRAM

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On August 12, 1968, President Johnson announced that certain islands in Bikini atoll in the Marshall Islands, Trust Territory of the Pacific, were no longer required for the nation's nuclear testing program and that they were safe for return to civilian uses. He called upon various interested government agencies to cooperate in the preparation and implementation of a redevelopment program.

This announcement culminated a prolonged period of radiological and biological surveys by the Atomic Energy Commission and a specific 1967 study to determine whether the islands in the atoll were safe for human habitation. The President's announcement was based upon a finding that exposure to radiation that would likely result from repatriation of the Bikini people does not offer a significant threat to their health and safety and that these exposures may and should be reduced by taking certain simple precautions.

Bikini was acquired by the U. S. Navy in 1946 and the persons then living on the atoll, about 150 people, were relocated ultimately on the island of Kili. The displaced Bikini people have been looking forward hopefully to the time when they could return to their home islands. The Bikini population now living on Kili amounts to about 350 persons and an additional 200 people claim land rights on Bikini. Kili lacks a lagoon and in other respects has not provided the Bikini people with the economic environment or resources they desire or to which they were accustomed when living on Bikini.

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Because of growing population pressures and a shortage of productively inhabitable land areas in the Marshalls, it is the policy of the United States to return to civilian uses any areas which are excess to its needs. The total land area of the Marshall Islands is approximately 70 square miles. With a 1967 population of approximately 19,000, the population per square mile ratio is 270. Kili has a land area of 0.36 square miles. On the other hand, Bikini atoll has a land area slightly in excess of two square miles. Its lagoon area is about 229 square miles.

Bikini atoll is greatly changed as a consequence of the tests which were conducted there in the late 1940's and the 1950's. Some islands have disappeared or the remnants are mere sand spits; still others have been diminished in size as a result of blast effects and/or wave action; and loss of topsoil for the islands of the atoll varies from zero to almost 100%. While it has been determined that the island complex from Bikini to Enyu is safe for continuous habitation, radiation levels in the other parts of the atoll preclude continuous use. These other islands and island complexes may be visited for purposes of food collection (birds, turtles, their eggs, etc.), but present conditions on these islands preclude substantial agricultural development at this time.

Bikini and Enyu are overgrown with a jungle-like stand of scrub vegetation which will sustain neither subsistence nor

commerce. This vegetation must be cleared and the two islands replanted with coconuts and other food crops. Additionally, most of the islands are littered with the structures and scrap metal remaining from the testing programs. These remains, some of which are dangerous because of deterioration alone, some because of residual radioactivity, and others because they would interfere with or preclude agricultural redevelopment, must be removed before the Bikini people can be permanently resettled on the atoll. Housing and community facilities are non-existent and need to be provided.

This paper presents a redevelopment and resettlement program for Bikini in compliance with the President's statement that "It is our goal to assist the people of Bikini to build on these once desolated islands a new and model community."

On August 12 the President requested the Secretary of Defense, the Chairman of the Atomic Energy Commission, and the Director of the Bureau of the Budget to cooperate and assist in effectuating a resettlement program. Bikini atoll will come under the administrative jurisdiction of the Trust Territory of the Pacific Islands and the Department of the Interior. The Atomic Energy Commission has an interest because the Commission, under the Atomic Energy Act of 1954 and its amendments, is given certain responsibilities to protect health and minimize danger to life or property from hazards that may be associated with activities in which AEC has a role. The Department of Defense is another

interested agency since the research and development work in the military application of atomic energy at Bikini atoll was jointly conducted by the Defense Department and AEC under direction of the highest levels of the United States Government. The Bikini atoll currently is under jurisdiction of the Department of Defense.

To determine the problems and develop estimates of redevelopment costs the Atomic Energy Commission, the Department of Defense, the Department of the Interior and the Trust Territory of the Pacific Islands conducted an on-site survey of Bikini in late August 1968. Until conditions on the islands had been inspected no reliable redevelopment cost estimates could be projected.

The habitable islands of Bikini and Enyu must be cleared of unusable and unsafe structures and debris which must be done before further redevelopment can proceed. Other islands of the atoll which are neither safe for continuous human occupation or which are no longer productive in an agricultural context will be cleared of all dangerous debris.

Following the August-September survey trip the Atomic Energy Commission prepared estimates of the cost of clearing the islands of debris and scrub vegetation and the Trust Territory developed estimates for replanting, redevelopment resettlement. Cleanup costs are estimated to be approximately \$1,200,000 and it is further estimated that the cleanup job could be completed within a six-month period after funds are made available. Redevelopment costs are currently estimated to total about \$2,881,800 over a

five-year period. An additional sum is required to provide improvements to the island of Kili and to Ujelang atoll where the former Eniwetok people were resettled. The bulk of the redevelopment expense is encountered in the first year of new construction. For program planning purposes the costs have been allocated to eight major categories:

Atoll cleanup.....	\$1,200,000
Transportation.....	100,000
Planning.....	15,000
Replanting.....	177,000
Grove Maintenance.....	112,000
Construction.....	815,000
Administration.....	245,000
Resettlement.....	<u>217,800</u>
	\$2,881,800.

Because the Bikini people will have to continue to live for the next several years on Kili and because there is some probability that some of them will elect to remain on Kili rather than relocate themselves on Bikini, some improvements to housing, community facilities, and agricultural resources are in order for that island. These costs are currently estimated at approximately \$100,000.

Similarly, the plight of the former Eniwetok people, who have been relocated on Ujelang, requires attention. These people were removed from Eniwetok shortly after the removal of the people from Bikini. The Eniwetok people were resettled on the much smaller Ujelang atoll. The Defense Department has concluded that national security requirements for Eniwetok are such that return of these

people is not foreseeable. The Ujelangese are in urgent need of improved housing, community facilities, and agricultural resources, all of which are today beyond their means. Their near desperate situation is highlighted by the impending end of the Bikini odyssey. Improvements to the Ujelang community are currently estimated to require \$80,000.

The over-all resettlement program for Bikini, including clearing, redevelopment over a five-year period, and essential improvements to the Kili and Ujelang communities, is estimated on the basis of current information to amount to \$3,000,000, phased over a six-year period.

An alternative is to let a few islanders return and re-establish residence on Bikini in its present condition. This is rejected because of the moral responsibility as well as the political, sociological and economic need to rehabilitate the islanders. Survival would be difficult and the redevelopment of Bikini, without support of modern equipment and methods, would be a painfully slow process covering generations. Such approach would be inconsistent with the goal of assisting the Bikinians to build a new and model community.

Another approach to resettlement would be to clean up and redevelop facilities to accommodate only the few returning islanders who could subsist in Bikini's present environment. This is rejected because of the need to resettle and provide as suitable an environment for all of the displaced islanders

who have rights to Bikini and who desire to return, not just the few who might be disposed to attempt to survive under Bikini's present conditions.

Yet another possibility would be to undertake a replanting and reconstruction program to accommodate all those who desire to return to Bikini now. This is not recommended because newly planted coconut trees require six to ten years of growth before they are sufficiently productive to provide subsistence and an export crop of copra. If all islanders desiring to return were resettled on Bikini at the outset of the replanting program, they would have to be subsidized for several years. This is not regarded as socially or economically desirable.

The recommended approach is to replant the island; limit the number of resettled families in the first increment to those who can be employed in construction, planting and orchard maintenance. In subsequent years, other families will be phased in.

The main islands of Bikini and Enyu, which are those designated by the Atomic Energy Commission consultants as being suitable for return and redevelopment, shall be cleared of test activity debris and cleared of scrub vegetation so as to permit the replanting of the coconut groves and other food crops. Planting of pandanus trees on Bikini will be accomplished according to the AEC recommendation for removal of two inches of topsoil from each site over an area covered by the crown of mature trees. No

radiological precautions will be needed on Enyu. The 4,500 foot airstrip on Enyu will be rehabilitated and the few salvageable buildings will be used in the cleanup and early redevelopment work. Clearing of vegetation will be done with mulched material stockpiled or windrowed so as to permit the planting of seedlings with some intervening strips of existing vegetation left to control erosion. As the seedlings develop the erosion control strips will gradually be cleared. Replanting, estimated to require 100,000 nuts, should follow on the heels of debris and vegetation clearing on Bikini and Enyu.

Clearing of other islands of test related debris should follow the cleanup of Bikini and Enyu. The other islands of the atoll will not be cultivated or used for residences for the foreseeable future. Clearing will consist of removal of test related debris, particularly radioactive material. It is planned to leave the massive bunkers which are located on several of these islands. The Bikini and Enyu bunkers will also be left to provide storm shelter or other community use.

Resurveys and follow-up studies of environmental radiation and radioactivity levels on Bikini atoll will be conducted periodically by the AEC. These activities, which will include the reduction of the land crab population because of their radioactivity content, will provide a continual check on the radiation status of the people and environment. Such studies will help form a basis for decision as to the time of rehabilitation of islands outside of the Bikini-Enyu complex.

The island of Bikini was the population center of the pre-war community and the Bikinians have indicated they want their new village center located at its former location adjacent to the cemetery. This will consist of a dispensary, school, meeting house, church, administrative facilities and some warehousing and equipment shelter. At the outset it is planned to construct village facilities (except for the school) which will be adequate for the total anticipated population of Bikini. An addition to the school is planned for 1973.

The Bikinians wish to live on their individual "wetos" (land parcels) rather than in a village complex. This decision on their part will preclude a central water supply and sewerage system although the relative dispersal will have other health benefits. The Bikinians have been living in a village situation since 1946 and appear to prefer the traditional Marshallese style of living on the land. Plans call for the construction of 30 housing units the first year and six additional units per year for the next five years. Each unit will consist of the dwelling itself, cistern, bath house, toilet, cook house, etc. The village center and housing unit construction on Bikini island will involve covering these sites with coral rock as recommended by the AEC. Cost estimates per unit include these facilities. The Bikini people have stated a preference for permanent--concrete--construction. Housing designs are being prepared to meet these requirements within a \$6,000 cost estimate for each unit.

Resettlement costs anticipate the relocation of 30 families as soon as housing is available with additional families being phased into the new community as additional housing and plantings permit. Estimates are based upon an average of six persons for each family, include a feeding subsidy of \$3 a day per family for its first year on Bikini, dropping to \$2 a day per family for the second and subsequent years. The employment of Bikinians in the clearing and redevelopment work will diminish the need for direct feeding subsidies pending the maturation of commercial and food crops. However, one of the important reasons for a feeding subsidy is to insure an adequate and properly balanced diet for the Bikini residents in order to minimize uptake of radionuclides as has been recommended by AEC. Employment is a basic assumption in the plans for Bikini and the cost estimates include wages at the prevailing scale.

The goal is to provide an attractive, healthful, liveable community fully and adequately meeting the needs of the people of the atoll; one which can serve as a model for community development in other Pacific islands.

The Trust Territory Government, working with the Bikini people, is now completing planning and prototype housing designs and preparing plans for other facilities in fiscal year 1969. It is also planning to establish a small administrative unit on Bikini in fiscal year 1969 to protect existing assets and facilities and to place the atoll under adequate police and administrative control. These efforts can be accomplished by the Trust Territory with funds currently available.

The over-all resettlement plan is phased over a six-year period beginning in fiscal year 1970 when clearing of the atoll of test related debris will have been completed. The planting program for coconuts and other crops is expected to require two years, fiscal years 1970 and 1971. The major element will be the planting of approximately 100,000 coconut seedlings in cleared strips across the main islands of Bikini and Enyu. Leaving some intervening strips of vegetation will reduce erosion of the topsoil and provide protection from wind and salt spray for the seedlings. Over the two years replanting costs are estimated to amount to approximately \$177,000.

Grove maintenance will begin in fiscal year 1971 and will spread over the subsequent four years. It will consist of brushing-out the cleared planting strips, fertilization and care of the seedlings, and, as the newly planted trees grow, the progressive clearing of the intervening strips of scrub vegetation. Over the five-year period of fiscal year 1971 through 1975, grove maintenance costs are currently estimated to total approximately \$112,000.

Construction costs for village facilities and for housing for the returned Bikinians are estimated to total \$815,000 for fiscal year 1970 through 1975. The bulk of the construction will be done at the outset of the resettlement program with, as noted above, community facilities and housing for about 30 families. Subsequent construction costs contemplate housing at the

rate of about six units a year, with an addition to the school being built in 1973 when the school-age population will overcrowd the facility first built.

Administrative and resettlement costs, the latter including transportation to and from Kili and a feeding subsidy for the returned people, are estimated to amount to approximately \$463,000 over the six-year period.

Economic Future

Some additional comments are in order with respect to the economic future of Bikini. The basic resettlement program is designed to provide, at the minimum, the coconut-based economy which existed during the pre-testing period. The coconut is virtually the only commercial crop which can be grown on a coral atoll and it is essential to life on such an atoll. The resettlement plans, however, do not preclude building upon this base for a more diversified economy for the returned Bikinians.

The islands and the remarkable lagoon provide a potential for tourism which might be developed to the benefit of the Bikinians. Access will be readily available because of the airstrip; the islands are potentially attractive if properly developed; they have an historic aura; some of the physical remains of the testing program are impressive and awe-inspiring; and there are existing recreational resources in the lagoon--shelling, sport fishing, snorkeling.

A third economic potential is research activity. Bikini has been the basis for considerable study in nuclear-related fields and the return of the people need not terminate such research. The establishment of a research center on Bikini by the Federal Government or by universities and private organizations would provide employment and income possibilities for the local people. The Weather Bureau is already planning a weather station on the atoll.

These opportunities will be given further exploration as the resettlement program progresses.

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