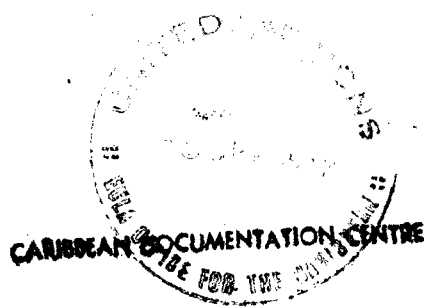


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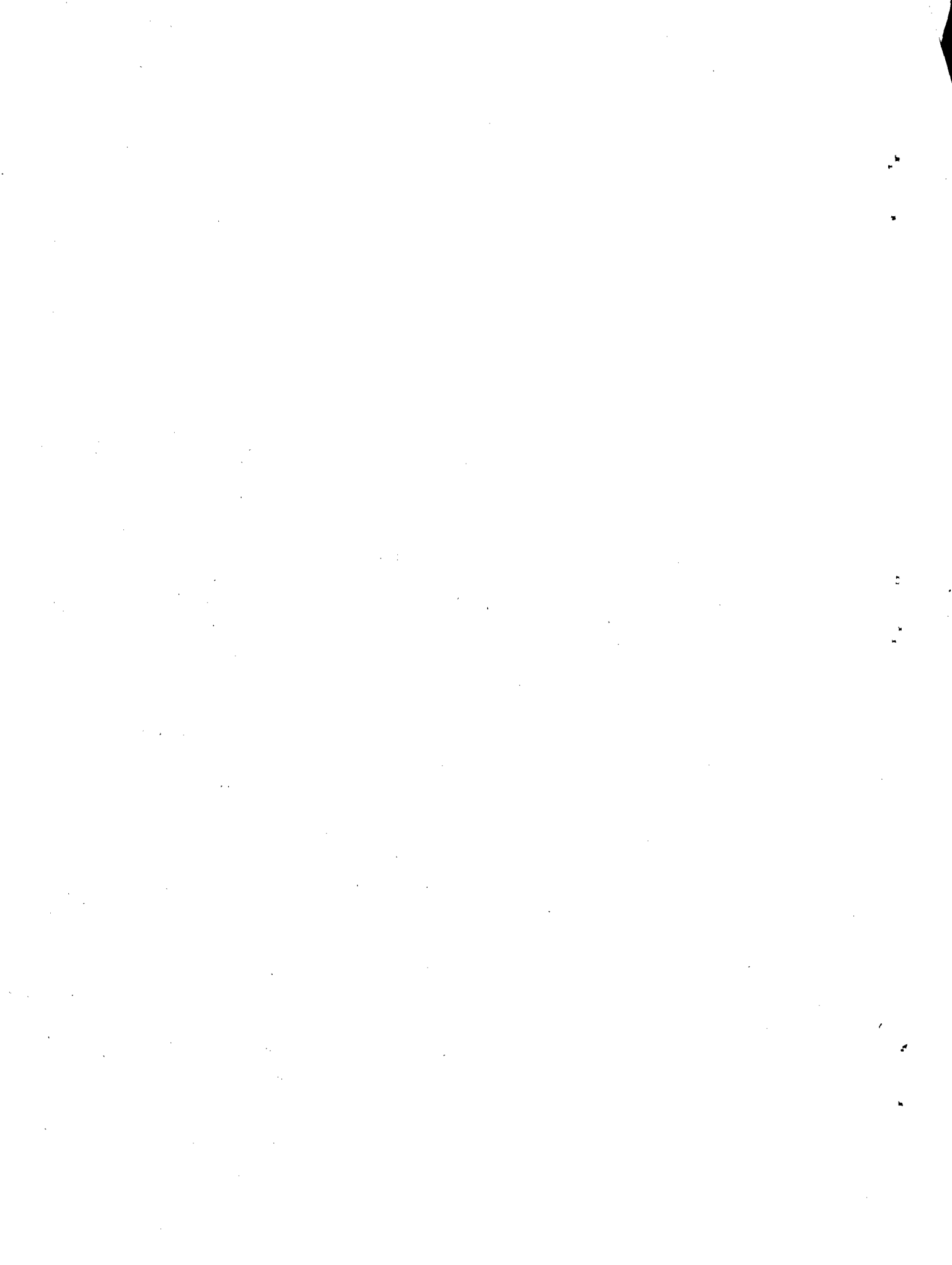
REPORT ON THE DAMAGE CAUSED IN  
ANTIGUA AND BARBUDA  
BY THE EARTHQUAKE OF 8 OCTOBER 1974  
AND ITS REPERCUSSIONS

Prepared by  
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REPRODUCTION OF DOCUMENTS

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## F O R E W O R D

Antigua and Barbuda experienced its earthquake disaster on 8 October 1974. The mission for making the evaluation contained in this report covered the period 27 November to 2 December 1974, some seven weeks after the phenomenon. A further visit 16-17 December was necessary, to consolidate the factual information. This mission was in direct response to the request in Resolution 345 (AC.67) of the Committee of the Whole of the Economic Commission for Latin America.<sup>1/</sup>

In the interim period, the Government assisted by local voluntary organizations, through a series of stop-gap measures had endeavoured to deal with the emergency aspects of the situation. The voluntary organizations, primarily the local Red Cross Association and the Christian Association for Development in the Caribbean (CADEC), provided food and clothing assistance; and with the assistance of the Hurricane Disaster Committee arranged minimal temporary accommodation for the homeless. Up to the time of the mission, little tangible assistance had been received from sympathetic governments. There were in fact few specific offers of assistance, perhaps in part attributable to the attention then focused on the devastation in Honduras by hurricane Fifi, and in part to the nature of the phenomenon at Antigua and the particular needs deriving from it. Actually, at the time of the earthquake Antigua and Barbuda itself had been organizing some relief assistance for Honduras.

The purpose of the mission was to evaluate the damage done in Antigua and Barbuda, and to submit appropriate proposals to assist in overcoming the effects of the disaster. Emphasis is therefore placed on specifying the scope and characteristics of the effects of the earthquake, and the nature of the co-operation which should

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<sup>1/</sup> The text of the Resolution is attached as Annex 1. The mission was carried out by the Director, ECLA Office for the Caribbean. Very valuable support was provided by the UNDP Physical Planning Unit at Antigua in assessing the main damage to Government buildings.

be provided to Antigua and Barbuda to enable the Government to deal with the situation. This document contains a preliminary assessment in summary form, of the nature and scope of the disaster and an initial evaluation of its major economic consequences in the coming months. The intention is not so much to present a detailed quantification of the damage, as to provide information indicating the order of magnitude, identifying the major activities, groups and sectors affected, and indicating the main courses of action that could be followed to assist Antigua and Barbuda in meeting the very crucial problems resulting from the disaster.

It should be noted that up to the time when this paper was being prepared, Antigua and Barbuda continued to experience milder earth tremors. The view of the seismologists was that tremors of varying intensity would continue to be felt for some months.

## THE PHENOMENON AND INITIAL ACTION

### The Earthquake of 8 October 1974

The archipelago formed by the islands of the West Indies is exposed to a variety of natural phenomena - hurricanes, earthquakes, and on occasion moderate volcanic activity. For Antigua and Barbuda the primary risk is that they lie in the hurricane belt - these islands not being normally regarded as being in the main earthquake zone. The last earthquake of comparable intensity was experienced in 1843, over 130 years ago.<sup>2/</sup> The immediate reports described the earthquake as a major one which was strongly felt throughout the Leeward Islands, the Virgin Islands, and in Puerto Rico. In addition to causing landslides and structural damage to buildings, telephone and to other conventional forms of communication, electricity and water supply mains were cut in several islands including the French territories of Guadeloupe and Martinique to the south, and north to St. Kitts-Nevis-Anguilla.

The Seismic Research Unit of the University of the West Indies, St. Augustine, placed the centre of the earthquake approximately 20 miles to the north of Antigua, and at a depth of about 50 miles. It occurred at 5.50 AM and was reported as recording in excess of seven on the open-ended Richter scale; for example, the National Earthquake Information Service at Golden, Colorado, is said to have reported a measurement of 7.7.

An explanation offered is that along the line of fracture (running from north to south) between the Atlantic Ocean bed and the Caribbean Sea bed, the whole of the Atlantic west ridge is pushing down under the floor of the Caribbean.

The remarkable feature was the low level of human casualties, due no doubt to the time at which the phenomenon occurred. As it was dawn, most persons would just have risen to commence the day's activities, so that all places of work, public buildings and centres

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<sup>2/</sup> 8 February 1843.

of congregation or commerce were unoccupied. Also, because the centre of the earthquake was at some depth underground, the surface earth movement was less intense than would have been the case had it been shallower.

#### Initial Response by the Government

The Government of Antigua and Barbuda immediately took whatever measures it could in the wake of the damage caused by the earthquake. The Hurricane Disaster Committee was put in charge of co-ordinating the initial rescue and relief efforts, and co-ordinating with the Antigua Red Cross for providing emergency assistance. Recognising that the Hurricane Disaster Committee was not oriented to dealing with situations deriving from an earthquake, the Government promptly appointed a ten-man committee to identify and to take action on the priority needs of Antigua and Barbuda.<sup>3/</sup>

Designated the Earthquake Action Committee, it was specifically charged with preparing a preliminary assessment of the damage and proposing and implementing interim measures. This Action Committee under the leadership of a Minister of Government, Senator J. Oliver Davis, comprised top civil servants, representatives of the commercial sector, the trade unions, the Red Cross, the Commissioner of Police, the Public Utilities Authority, and Social Welfare services.

During the early days following the earthquake, the Action Committee was engaged in undertaking as detailed an analysis as possible of the magnitude of the damage and its effects on the country. For this purpose the assistance of the Caribbean Community (CARICOM) Secretariat and the Caribbean Development Bank (CDB) was sought, and an initial report was drafted one week after the phenomenon had occurred. The report prepared by the Action Committee not only provided a first assessment of damage, but also identified the range of actions in the three stages: (a) Emergency action (temporary lodging, food, medical services, clothing); (b) Rehabilitation efforts; and

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<sup>3/</sup> The Earthquake Action Committee was established on 9 October 1974.



(c) Reconstruction activities. Representation was also made at the ECLA Committee of the Whole with the object of mobilising the assistance of the United Nations bodies in the task of rehabilitation and reconstruction.

#### Emergency Action

During the succeeding weeks, priority attention was given to implementing the steps outlined in the Action Committee's Report. Most immediate was the provision of temporary shelter for the homeless, for which there was no alternative but to accommodate them in school buildings or overcrowding other families, friends and neighbours.<sup>4/</sup> In addition, food, medical services and clothing had to be provided, and these matters were handled mainly by the local Red Cross, CADEC and the Salvation Army.

Many public offices and buildings were rendered dangerous and had to be abandoned, so some minimum alternative accommodation had to be found urgently. This necessitated emergency measures like moving the Government Printery into one of the warehouses at the port; putting the Public Health Nursing services at the new fish market; shifting the Supreme Court and Registry to the Magistrate's Court, and the Magistrate's Court to the Police Barracks. Even some temporary rental of accommodation has been necessary to ensure a minimum level of functioning of Ministries and the East Caribbean Common Market (ECCM) Secretariat. A summary of various temporary relocations that were effected is shown at Annex II.

The evaluation mission was conducted when attention was shifting to the initiation of planning for rehabilitation and reconstruction. Inevitably the focus of this report is oriented to these considerations.

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<sup>4/</sup> At the time of writing, this condition still persists. These are small wooden dwellings with two or three families now crowded into each of them.

## NATURE AND SCOPE OF THE DAMAGE

Some indications of the damage caused by the earthquake are given below. They do not comprise an exhaustive list, the emphasis being mainly on ascertaining the orders of magnitude. The estimates, duly examined by the appropriate department of Government for the purpose of verifying their accuracy, are based on a number of evaluations carried out on the scene of the events. Altogether the damage has been said to be in excess of \$20 million. Omitting damage to private sector insured property for which estimates had not yet been received, and damage to places of historical and cultural interest which present some special problems of estimation, Table 1 reveals an estimate for the rest of the country of some \$14 million. Of this \$14 million about 58% is in the public sector of the economy, roughly equally divided between public utilities infrastructure and other public sector infrastructure.

### Public Utilities Infrastructure

Provisional estimates made in the field, and information from the statutory bodies made it possible to indicate an order of magnitude for the damage caused by the earthquake to the public utilities infrastructure of the country. They refer to road transport, ports, electricity, telephones, water supply systems, and other services.<sup>5/</sup> The resulting figures amounted to approximately \$3<sup>1</sup>/<sub>2</sub> million, over 90% of which would involve construction works.

Water supply was one of the special sectors that required immediate attention because of its direct influence on the health and well-being of the population. The earthquake caused damage to the dams that supply the drinking water and to water-mains. Prompt attention by the Utilities Authority in making emergency repairs to water-mains was directly responsible for minimising the level of water contamination. As an essential safeguard a system of boiling

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<sup>5/</sup> Water supplies, electricity supplies, and telephone services are administered by the Antigua Public Utilities Authority. The deep-water harbour is administered by the Port Authority.

Table 1

Antigua: Provisional Estimates of damage to Infrastructure

	(at 1974 prices)	
	Cost of repair or replacement	Percentage of total
	(EC\$)	%
<u>Public Sector</u>		
Roads and Bridges	(200,000)	1.5
Dams	200,000	1.5
Water Supply	344,033	2.5
Ports	(3,000,000)	21.8
Telephones	20,000	0.2
Electrification	212,870	1.5
Government Buildings <sup>1/</sup>	3,999,510	29.0
<u>Private Sector</u>		
Oil refining	3,000,000	21.8
Dwellings:		
(i) Totally destroyed	555,000	4.0
(ii) Damaged/uninsured	2,229,000	16.2
(iii) Damaged/underinsured	n.a.	
Other <sup>2/</sup>	n.a.	
<b>TOTAL:</b>	<b>13,760,413</b>	<b>100.0</b>

<sup>1/</sup> These are detailed at Table 2.

<sup>2/</sup> Mainly places of cultural and historical interest some of which are listed at Table 3, and small businesses.

drinking water was immediately instituted. The cost of repairing this damage has been estimated at \$344,000, including the cost of emergency work.

Emergency action was taken also in restoring electricity supplies and telephone services. It is estimated that complete repair of the damage to telephone poles and equipment will cost approximately \$20,000 and would take some months to effect after the supplies and finance become available. With electricity supplies, the main damage suffered

was by posts, transmission lines and transformers. The electricity supply has been restored, though full repairs have not been effected. It is estimated that the total cost will be approximately \$213,000.

As regards the deep water port at St. John's, surveys of the damage done by the earthquake are being carried out by the engineers who provisionally estimate the repair cost at about (\$3 million). These surveys are not yet concluded. The displacement caused to internal transport mainly affected the road and bridge linking the main urban centre of St. John's to the primary agriculture area to the south-west of the island of Antigua. Some temporary re-routing has been done, but this is impassable after heavy rain. The cost of replacing the bridge is provisionally estimated at (\$200,000).<sup>6/</sup> It is worth noting too, that a road improvement programme had just been completed, under which all the major roads had been resurfaced. The cracks opened by the earthquake are now rapidly being eroded by unusually heavy rains. A comprehensive estimate for the additional unprogrammed maintenance that will need to be undertaken has not so far been made.

#### Other Public Sector Infrastructure

The destruction and damage to Government buildings was severe. These included the buildings housing the Parliament, the Judiciary, the Treasury, the Central Registry, two Ministries of Government, the Secretariat of the East Caribbean Common Market, the Public Health Services complex, the Public Library, the Printery and the Prison. In all these cases the buildings have been rendered uninhabitable. In total it amounts to probably one half of the total accommodation that was being utilised for operations of the Central Government. The cost of repair and replacements of these buildings have been estimated to be of the order of \$4 million. The orders of magnitude shown in Table 2 do not take into account the recovery and replacement of registers, records and books (including legal and medical libraries) required for the day-to-day

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<sup>6/</sup> This includes the related portion of road.

Table 2

Antigua: Damage to Government Sector Infrastructure  
(EC\$)

(at 1974 prices)

	Repair or Replacement Cost <sup>2/</sup>	Sum Insured	Recommendation
1. Parliament } <sup>1/</sup> Supreme Court } Registry }	400,000	120,000	Restoration
2. Treasury } Public Library }	350,000	100,000	Demolition
3. Ministry of National Security } Ministry of Legal Affairs and } Labour } East Caribbean Common Market } Secretariat }	400,000	150,000	Demolition
4. Health Centre Complex: Public Health (Nursing Services) } Public Health (Inspectorate) } Offices (Senior Medical Officer) } Dispensary }	650,000	130,000	Repair and Rehabilitation
5. Prison	800,000 <sup>3/</sup>	140,000	Demolition
6. Government Printery	350,000	45,000	Demolition
7. Other Government Buildings <sup>4/</sup>	1,049,510	754,800	Repair
TOTAL:	3,999,510	1,439,800	

<sup>1/</sup> Even if permanent alternative accommodation were found for these Departments of Government, the building is a major historical monument meriting restoration.

<sup>2/</sup> Replacement cost has been estimated on identical square footage as the damaged building. Items 2 and 5 in the table above are buildings of historical and architectural interest; therefore if demolition is decided owing to the lack of adequate funds for rehabilitation (which would be in excess of the floor space replacement cost) it is recommended that an architectural survey i.e. measured drawings and photographs, be carried out before demolition.

<sup>3/</sup> This figure relates to replacement of the main building only. Relocation to a new site which would seem advisable is estimated would cost EC\$1.3 million.

<sup>4/</sup> This includes Residences, Institutions (excluding Prison), various offices, police stations and headquarters, schools, clinics and dispensaries etc. distributed throughout Antigua and Barbuda.

executive and administrative operations. Up to the time of writing there was not yet a final judgement as to what this latter aspect would involve.

The emergency arrangements so far implemented, mainly have the effect of further increasing the density in the remaining public buildings, which were in fact already crowded, prior to the earthquake. Even so, there are key functions of Government that have so far not been able to resume operations.<sup>7/</sup> The loss to public office buildings and its consequences, is the cause for most grave concern, as taking into account the necessity for new constructions, permanent solution of this problem can be effected only over an extended period. In addition the services of public health and detention of prisoners present special problems, particularly the latter. While it has been possible to allocate the most essential parts of the public health services over a variety of temporary sites, the same is not true for the prison services. For this latter, whatever temporary arrangements are made, need to be within the security compound, and this has the failing that the perimeter walls themselves were damaged in the earthquake. The only satisfactory solution is removal to a new site, as continued occupancy of the premises is itself a hazard.

#### Agriculture and Tourism

The immediate impact on the agriculture sector was the isolation of the main food producing areas from the main urban centre, St. John's, because of substantial damage to the bridge at Big Creek. The immediate diversion over the temporary bridge (a minimum facility) which though impassable at times of heavy rain and flooding, has served in some measure to alleviate the immediate situation.

As regards the tourist sector, major damage was not suffered by the main hotels, at least not of such magnitude as to reduce accommodation below the normal level of occupancy. In keeping with the general pattern throughout the country some immediate repairs

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<sup>7/</sup> At the time of writing temporary arrangements to permit the reconvening of Parliament were still being worked out.

were straightway initiated in the effort to restore as quickly as possible the usual pattern of operations.

### Industrial Sector

The main impact on the manufacturing sector has been dislocation of the activities of the West Indies Oil Company. The main damage at the installation, showed up as ruptures in the storage tanks and pipe lines. Refining had to be immediately suspended. Output which normally runs at 18,000 barrels/day was reduced to nil, and entailed the laying off of between one-quarter to one-third of the work-force. This has to be seen in the context that the oil refinery is the largest single employer of labour in the private sector. The best estimates are that some production may begin again by March or April 1975. This repair is estimated to cost in excess of EC\$3 million.

Aside from this the damage to fixed assets and stock in other manufacturing enterprises was not serious and as a result the temporary employment in the sector should be re-absorbed within a short time. As regards supplies for domestic consumption, it had been possible so far for gasoline requirements to be met from stocks. However, substantial quantities of other items like kerosene and aviation fuel have had to be imported by the Company as an interim measure. There also will need to be some replacement of stocks in the other manufacturing enterprises which can be effected only through additional imports.

### Housing

There are three areas of concern:

- (i) households made homeless by complete or near-complete demolition of the premises;
- (ii) dwelling units damaged, still partly habitable in the event there is no further serious earth tremor, where there is no insurance coverage, and family earnings are at a level where proper repairs cannot be effected without substantial assistance;

- (iii) dwellings damaged which had some insurance coverage, but where the compensation against claim would offset only about one-quarter the cost of repairs.

According to the provisional estimates, the earthquake destroyed completely a total of at least 40 dwellings (category (i)), and seriously damaged some 800 others (category (ii)). Those who suffered losses, mainly in rural areas, lost all or part of their dwellings and household goods, so that in addition to the structural loss, the furnishings were totally or partially destroyed. The figures given represent a minimum replacement in the low income and lower middle income sectors. The most seriously affected areas were St. John's, Piggotts, Seatons, Freetown, All Saints, and Urlins. The most seriously affected dwellings were in general those of traditional construction belonging to the social strata of the population having the lowest income. It is calculated that the cost of replacing the dwellings at category (i) will amount to \$1/2 million, and repairing those at category (ii) about \$2.2 million. No estimate has been made of replacing household furnishings. There was still no estimate for those at category (iii).

#### Other Private Sector

There is scarcely an area of activity that was not affected. Reference therefore can only be made to some instances to illustrate the general picture. One immediate effect of the earthquake was to induce a bread shortage in both Antigua and Barbuda, despite the existence of flour supplies. This derived from the destruction in some cases and heavy damage in others, suffered by bakeries, particularly in and around St. John's, Antigua.

In Barbuda, which is famous for its lobster trade to Antigua, Puerto Rico and the American Virgin Islands, fishermen immediately faced the problem of being unable to locate lobsters in the usual fishing grounds. It would seem that fertile lobster reefs were buried in the earthquake, and underwater caves closed.



Table 3

Antigua and Barbuda: Damage to Places of Historical  
and Cultural Interest (Mainly Churches)

(at 1974 prices)

	Repair or <u>Replacement</u> Cost (EC\$)	Remarks
St. John's Cathedral	(1,000,000)	Restoration
Parliament/Supreme Court Building <sup>1/</sup>	400,000	Restoration
All Saints Anglican Church	(500,000)	Restoration
Holy Trinity (Barbuda)	(150,000)	Rehabilitation
St. Joseph's Catholic Cathedral	(200,000)	Rehabilitation
Lebanon Moravian Church	(200,000)	Rehabilitation
Bolams Methodist Church	n.a.	Repair
St. James' Anglican Church	(50,000)	Repair
Ebenezer (Methodist) Church	(50,000)	Repair

<sup>1/</sup> See footnote on Table 2.

Places of Historical and Cultural Interest

Among these, primary concern centres on the St. John's Cathedral and the Supreme Court building. The majority of the remainder are churches; however, the list at Table 3 is not exhaustive. In addition to being essential elements in the history of the country, some are important sites for the tourism industry, and they nearly all form part of the social fabric of the country. For this group the financial impact is particularly severe because in many cases large expenditures had recently been undertaken for restoration of the structures. In the case of St. John's Cathedral, some EC\$200,000 had been expended and the planned restoration had been nearing completion. Those funds that were provided by private donations over an extended period of years, are exhausted. This situation is also true for several of the other churches.

Aside from this, there is the social impact that some of these churches as places of worship are no longer functional, as it is dangerous even to enter the premises. In others, portions of the building continue to be used, although this may not be strictly

advisable. There is of course not an acceptable method of quantifying the social impact, which reaches beyond the crude cost estimates for rehabilitation suggested in Table 3. Similarly, quantitative estimates of the value to tourism cannot be made, although it is very evident that if these assets are not restored and allowed to fall into decay, there would be an adverse impact on the tourist sector. It has to be borne in mind that tourism is the largest single contributor to the economy, accounting for some 40% of Gross Domestic Product.

### Insurance Aspects

Antigua and Barbuda being generally more susceptible to hurricanes, the bulk of insurance coverage carried by its nationals is in respect of hurricane and fire. The net result is that many persons and establishments were not covered for earthquake damage, and even those who were it is revealed, were substantially under-insured. Government buildings also were generally under-insured, which is revealed in Table 2, and the Government is therefore not expected to receive substantial compensation from insurance. Even so, preliminary reports on the level of insurance claims set the figure at something like EC\$20 million. Inevitably in the majority of cases the payments against claims will not be adequate to offset the costs of repairs, the more substantial part of which in the private sector, will have to be borne by the entrepreneur and the home-owner. There seems to be a probability that repairs at the deep-water harbour and at the oil refinery can be effected against their insurance coverage. The rehabilitation or replacement of public sector assets however, will necessarily devolve on the Central Government.

Comment: If the judgement is valid that the level of insurance claims is of the order of \$20 million, then after deductions for public utilities (including port), government-owned property and the oil refinery, there would be an indicated \$10 million claim for damages for the remainder of the economy. This would put the total infrastructure damage to the economy somewhere between \$25 million and \$30 million at October 1974 prices. An accurate estimate cannot however be made until the insurance claims figure is available.

## EVALUATION

### Relevant Economic Background

It is estimated in very rough terms that the overall cost of the damage, in terms of capital alone, is of the order of \$20 million. In this, a most critical aspect is the impairment of the Government infrastructure and the serious damage suffered by historical and cultural sites. In a fundamental sense the administrative and organizational dislocation of Government directly attributable to the earthquake are no less far-reaching. For example, the virtual fifty per cent loss of Central Government accommodation capacity, together with the lack of access to essential records much of which was not yet recovered from condemned buildings, has caused serious restrictions in the administrative services. Inevitably this results in a considerable reduction in the efficiency of various activities due to the interruption in the proper functioning of key departments of Government.

The nature and extent of the damage has to be set in the context of the size of the country, the scale and nature of its economic operations, and the limits of its financial capability both in the public sector, and in the private sector. Bearing in mind that Antigua and Barbuda presently has: a population of 70,000 persons comprising some 17,000 households and dwelling units, a public sector with a total budget of \$38 million that up to 1973 had been running in deficit on recurrent expenditures, an economy highly oriented to the external sector with considerable dependence on tourism, it is evident the extent of damage and the costs for rehabilitation and reconstruction constitute an enormous burden.

To gain a more complete picture of the extent of the damage suffered by Antigua and Barbuda, reference must be made to the circumstances that determine the potential for economic development. It must be borne in mind too that Antigua and Barbuda comprises one of the relatively less developed countries of the Caribbean Community with a per capita income of barely US\$380. In addition the imbalance in the distribution of income means that a large section of the population lives below the national norm. The tourism sector on which

the economy mainly depends is responsible for approximately 40 % of the gross product, and of this some 90% is in the hands of trans-national corporations.<sup>8/</sup>

Table 4  
Antigua & Barbuda: Gross Domestic Product  
at current factor cost  
(EC\$M)

	ANTIGUA And BARBUDA				
	1967	1968 <sup>P</sup>	1971 <sup>P</sup>	1972 <sup>E</sup>	1973
Export Agriculture	0.2	0.2	2.0	0.5	n.a.
Other Agriculture, Livestock & Fishing	0.8	0.9	1.1	1.2	n.a.
Mining & Manufacturing	1.2	1.4	1.5	1.6	n.a.
Construction	9.0	9.7	10.5	11.5	n.a.
Distribution	4.4	4.9	7.3	8.8	n.a.
Government	7.3	6.5	6.0	7.2	n.a.
Others	11.4	13.8	20.6	22.4	n.a.
(Hotels)	(4.5)	(5.6)	(9.5)	(10.3)	n.a.
<b>TOTAL:</b>	<b>34.1</b>	<b>37.3</b>	<b>49.2</b>	<b>53.2</b>	<b>(60.00)</b>

Note: Totals may not agree because of rounding.

P - Provisional.

E - ECLA's estimates.

Source: 1967: Economic Survey and Projections, July 1969  
British Development Division in the Caribbean,  
Ministry of Overseas Development (UK);  
1968, 1971 & 1972: ECLA's estimates.

Dependence on the external sector has had a decisive influence on economic development in recent years. Over the period 1970 to 1974, the rate of growth has depended mainly on the fortunes of the tourist

<sup>8/</sup> Calculated on the basis of bed-space in locally owned hotels as proportion of the total. In terms of percentage of investment in hotels, the foreign owned percentage would be higher - most probably in excess of 95%.

Table 5

Antigua & Barbuda: Selected Data on Tourism

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u> <sup>E</sup>
Tourist Accommodation (Number of beds)	2,182	2,130	2,334	n.a.	n.a.
Number of Tourists (of which: by length of stay)	<u>65,369</u>	<u>67,637</u>	<u>72,328</u>	<u>72,786</u>	<u>(73,100)</u>
Overnight	14,530	17,283	17,040	17,266	n.a.
Under 1 week	22,808	22,535	22,036	20,728	n.a.
Over 1 week	26,257	26,249	31,064	33,071	n.a.
Estimated Expendi- ture (EC\$M)	31.2	n.a.	n.a.	n.a.	(45.0)
Rate of growth in tourists visits (%)	6.7	3.5	6.9	0.6	(0.004)

E: Arrivals figure for 1974 up to 10 December.  
Estimated expenditure 1974 prepared by ECLA.

n.a.: Not available.

Table 6

Antigua & Barbuda: Recurrent Revenue<sup>1/</sup>  
(Duties, Taxes and Fees) \$'000

	<u>1972</u>	<u>1973</u>	<u>1974</u>
Import Duties	5,405	6,150	7,000
Export Duties	4	5	-
Consumption Taxes	2,694	2,640	3,350
Income Taxes	4,745	4,500	5,400
Other taxes, fees, etc.	10,252	14,451	8,570
TOTAL:	23,100	27,866	24,320

<sup>1/</sup> Revised Estimates.

trade. As the figures in Table 5 show, tourism growth was already halted by the monetary situation in 1973. In the overall view the recent growth rate in GDP of 8% at current prices, may be difficult to maintain against the background of the international situation, particularly increases in prices, availability of imported food-stuffs for the tourist sector, and restrictions on international air transport as a result of the fuel crises. As regards the latter, the rescheduling of flights has resulted in some over-flights for Antigua, and consequently affects the inflow of visitors.

Even before the damage caused by the earthquake, the balance of payments situation was a serious problem for the Antigua and Barbuda economy. This is revealed in Table 10. On the trade side, increased demand for capital goods and inputs, generated by the growth in tourism, has been accompanied by the decline in the sugar industry, and consequently loss of sugar earnings. In addition, there was substantial increase in imports for domestic consumption partly resulting from the drought that lasted from 1972 through to 1974. For these reasons although there have been increases in the level of tourism expenditures (evident in the increased number of tourists and increase in average length of stay), there still remained a deficit in the country's current account. The balance of payments situation will deteriorate still further during 1974. The very preliminary figures for 1974 point to an increase in imports of more than \$10 million in current dollar values, while the increase in exports will barely exceed \$2 million.

On the fiscal side it must be noted that the estimated budgetary deficit had been steadily increasing each year to reach roughly \$11 million in a total budget of \$39 million by 1973. This situation has been held in check mainly through increased economies by the Central Government; even so it has to be remembered that it was necessary to have recourse to foreign loans to cover a significant part of developmental expenditures, against the background of National Debt running at \$22 million. Then there is the further consideration that the increases in the prices of imported goods and the rigidity in the supply of prime necessities further

aggravated inflationary pressures in 1974, and resulted in an estimated increase in the cost of living index for the first half of the year by more than 10 per cent compared with the same period in the previous year.

Table 7

Antigua & Barbuda: Government Revenue & Expenditure  
1970-1973 (Actual)

(to the nearest thousand EC\$)

<u>Year</u>	<u>Recurrent Revenue</u>	<u>Recurrent Expenditure</u>	<u>Recurrent Balance</u>	<u>Capital Expenditure</u>	<u>Total Expenditure</u>
1970	19,990	20,833	- 845	1,200	22,265
1971	21,632	22,248	- 616	750	23,048
1972	23,161	22,854	+ 307	878	23,732
1973	24,848	23,718	+ 1,130	1,111	24,829

Source: Government Statistics Division

Table 8

Antigua & Barbuda: Movement in Cost of Living Index

	<u>All Items</u>	<u>Food &amp; Beverages</u>	<u>Housing &amp; Utilities</u>	<u>Clothing &amp; Accessories</u>	<u>Transportation</u>	<u>Household Operations &amp; Misc.</u>
1969 1 Jan.	100	100	100	100	100	100
1970 "	106	107	106	112	100	103
1971 "	116	118	114	120	107	115
1972 "	126	129	122	141	113	122
1973 "	141	154	128	156	120	127
1974 1 Jan.	172	196	147	175	150	148
" 1 April	178	206	148	180	150	158
" 1 July	183	206	151	186	173	179

Source: Cost of Living Index, 1969-1974, Statistical Division, Ministry of Planning, Development & External Affairs, Antigua.

Thus at the third quarter of 1974 the Antigua and Barbuda economy needed to:

- (i) accelerate the growth of production and stimulate a better redistribution of income that would benefit in particular the poorest sector;
- (ii) to improve the structural shortcomings in the external sector characteristic of a developing Caribbean country but aggravated by factors determined by the international situation. An increase in the balance of payments deficit was anticipated because of the sluggishness of the export sector and the general increase in the prices of imported goods;
- (iii) correct the Central Government financial deficit which continues to be the cause for concern despite the measures taken to reduce it;
- (iv) find ways of preventing an acceleration of inflation caused mainly by external factors.

#### Overall Appraisal

It is not easy to assess the direct effects of the earthquake on the country's economy, and a simple quantification of its impact on the growth rate in no way reflects all the ways in which it affects the potential future growth of the economy. Account has to be taken of such factors as the extent of loss in the country's stock of dwellings, the immediate impact on employment, and the need to earmark a substantial part of domestic savings and foreign capital flows to replenish the capital assets lost through the earthquake. All this inevitably will result in readjustment in the development programme, particularly a slower implementation of projects oriented to stimulating production.

Any measurement of loss involves various concepts. Firstly, the best estimates of total loss of assets places it above \$20 million; secondly, the disaster caused a sharp drop in production particularly of oil refining, which has meant a substantial reduction in product



growth in comparison with what would have been obtained if the disaster had not occurred. The growth shortfall will be felt in both 1974 and 1975. The loss of refining production will also cause reductions in the public sector due to cessation of royalties payments by the oil company, at the rate of \$1.8 million per annum. Accompanying this is the increase in the import bill to maintain supplies of some petroleum products. It is not merely a matter of submitting a rigorous evaluation of the overall effects of the phenomenon on the Antigua and Barbuda economy in the immediate future, but rather of presenting an analysis which gives an idea of the relative magnitude of its effects, and of the country's needs in terms of investment and financial assistance.

The effect of the earthquake becomes clear when it is realized that the public sector which was particularly hard hit, has been providing an important dynamic for economic activity in Antigua and Barbuda, which is brought out in the purpose classification of recurrent expenditures at Table 9. This is even more serious in view of Government's role in coping with the growing external imbalance which was moreover aggravated by inflationary pressures that had been already relatively high the previous year. Then there is the lower real growth in the various services sectors which is already forecast for 1974, stemming from the partial shut-down of some industry and commercial activities, together with the loss of stocks and materials attributable to the earthquake. The diversion to rehabilitation by both the public and the private sectors, will necessarily affect the expected level of development that was anticipated might be achieved in 1975.

The estimated losses far exceed the annual level of total gross domestic investment of the economy. In fact the GDP indicators available suggest that the loss in capital assets directly attributable to the earthquake would be about equivalent to three years domestic fixed investment at current factor cost in 1974 prices. In terms of loss sustained in the government sector, the replacement approximates to five times the annual rate of new public fixed investment. These qualitative comparisons give a better idea of the

magnitude of the country's losses. Apart from the fact that the values so far discussed represent the losses sustained, other problems concerning national assets would affect the future development of the economy; for example, the severe impact of real damage suffered will have a particular effect on the financial structure of various categories of economic agents. Banks and companies to which sums of money are owed by earthquake victims will need to programme collections over a longer period. Similarly, entrepreneurs will have to face the problem, that expenditures for repairs and rehabilitation will make inroads into their working capital, and restrict the level of their operations in 1975. All the sectors of the economy have been affected to a greater or lesser degree, and it is difficult to envisage some real domestic economic growth in 1974 and 1975, as compared with 1973.

Table 9

Antigua & Barbuda: Government Recurrent Expenditure  
Purpose Classification  
 (EC\$'000)

	<u>Actual</u> <u>1969</u>	<u>Actual</u> <u>1970</u>	<u>Actual</u> <u>1971</u>	<u>Actual</u> <u>1972</u>	<u>Actual</u> <u>1973</u>
Economic Services	8,186	9,776	11,463	11,812	10,943
General Public Services and Defence	5,382	5,840	5,301	5,168	5,954
Education	1,724	2,151	2,280	2,483	3,005
Health	1,496	1,854	1,916	2,009	2,335
Social Security and Welfare Services	200	226	176	246	255
Housing and Community Services	667	986	1,112	1,136	1,226
<b>TOTAL:</b>	<b>17,655</b>	<b>20,833</b>	<b>22,248</b>	<b>22,854</b>	<b>23,718</b>

Source: Government Statistics Division.

### External Sector

Prior to the earthquake, the economy was already in a worsening balance of payments position owing to the general increases in the prices of merchandise imports, the costs of imported services and the rise in the price of crude oil. Furthermore, despite the small increase that was anticipated in the tourism sector,<sup>9/</sup> a debit balance of the order of \$10 million in current account would have been predicted for 1974. The current account deficit would produce a drop in the country's cash reserves position even allowing for a net inflow of foreign capital. The effects of the earthquake have made the balance of payments prospects worse both for 1974 and 1975. Exports of goods and services will be lower in the fourth quarter of 1974 and at least the first two quarters of 1975, compared to the fourth quarter of 1973 and the first two quarters of 1974. On the other hand increases in imports of goods and services are already evident, even without taking into account what will be generated by the replacement of capital goods, which will begin to be apparent in 1975.

The containment of the increase in imports may necessitate adoption of measures to conserve available foreign exchange for the purchase of the most essential goods for the population, for development and for reconstruction needs. It will be necessary to limit the purchase of non-essential foreign goods. The greatest impact of the earthquake on the balance of payments would be felt in 1975 and 1976 when it is estimated that imports will further increase in order to satisfy requirements for essential inputs and capital goods, which will ultimately increase the additional requirements for external financial resources of both the public and the private sectors.

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<sup>9/</sup> This takes into account the adverse impact of the failure of Court Line which affects its hotel and airline operations at Antigua.

Table 10  
Antigua & Barbuda: Balance of Payments  
(EC\$M)

	<u>Provisional</u>				
	<u>Current Account</u>				
	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
<b>1. Receipts</b>					
(a) Merchandise					
Export f.o.b.	17.9	26.0	34.7	36.3	41.0
(b) Goods & Services purchased locally by non-residents	33.0	39.5	42.5	49.0	55.0
(c) Net Current trans- fers from abroad	3.5	5.5	9.0	7.8	8.5
Total current receipts	54.4	71.0	86.2	93.1	104.5
<b>2. Payments</b>					
(a) Merchandise					
Imports c.i.f.	57.2	72.6	83.0	99.3	109.2
(b) Residents' Expendi- ture abroad	3.0	3.7	3.8	3.9	4.0
Total payments	60.2	76.3	86.8	103.2	113.2
<b>3. Surplus(+) Deficit(-) on Current Account</b>					
(a) Visible (1a-2a)	(-)39.3	(-)46.6	(-)55.3	(-)63.0	(-)68.2
(b) Invisible(1b+1c-2b)	(+)36.9	(+)41.3	(+)45.7	(+)52.9	(+)59.5
(c) Net (3a+3b)	(-) 2.4	(-) 5.3	(-) 9.6	(-)10.1	(-) 8.7

Source: Government Statistics Division.

Public Sector

A major improvement had been achieved in the financial position of the public sector through the Government's efforts to rationalize public spending and placing greater emphasis on capital expenditures. The steps taken resulted in steadily reducing the overall fiscal deficit to bring the Central Government budget into balance in 1973,

which is evident from the figures at Table 7.<sup>10/</sup> One major consideration behind this policy was the high level of debt payments charges against the annual budget.<sup>11/</sup> An essential part of the mechanism for reducing these charges, was to transfer to the Public Utilities Authority and the Port Authority prime liability for loans related to their operations, to be reimbursed from their incomes. Against this background the need to make special appropriations for current and capital expenditures to deal with the immediate problems caused by the earthquake, will be a step back towards the previous budgetary situation.

The revised estimates for 1974 of the Central Government which was being prepared at time of writing, showed revenue from taxes and fees at \$24.5 million to be below the 1973 level, and substantially lower than what was forecast in the approved estimates. In the current expenditures total figures were not yet available for the extent to which the Central Government has already since the earthquake made disbursements for higher maintenance of buildings, rental of premises, and renovations to temporary alternative accommodation. However, the dimension of the problem was revealed in that the emergency appropriations for urgent maintenance by the Department of Public Works in November and December 1974, at \$200,000 was already half the normal annual rate of maintenance of government buildings.

During the early months of 1975 the major costs incurred will be those of temporary rehabilitation for relocation of offices; and

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<sup>10/</sup> The net deficit derived by offsetting capital expenditures against the balances on recurrent budget, shown in Table 7, is (\$'000):

<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
- 2,045	- 1,366	- 571	- 19

<sup>11/</sup> The magnitude of the National Debt (mainly foreign borrowings) reflected in the budgets were (\$'000):

<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
16,803	20,241	22,489	22,038	19,114

thereafter the main focus would shift to permanent rehabilitation and reconstruction. Expenditures for rehabilitation, the development programme, and the non-postponeable requirements of overall Government administration, make it impossible to avoid an increase in expenditures in 1975 and 1976; superimposed on which will be the additional funds required to meet price increases. At the same time there still will be some loss in revenue as a result of the earthquake. Aside from lower royalties revenues, there is the strong likelihood of other shortfalls in collections, since for autonomous enterprises and agencies, the financial difficulties resulting from the earthquake will mean slower operations and less income. In short, on present evidence the outlook is that the recurrent fiscal budget will run into deficits in 1975 and 1976.

In addition to larger expenditures for maintenance of public buildings and reconstruction of government offices, there will be expenditures relating to the rehousing of low-income households. A rehabilitation and reconstruction programme containing only these elements, spread over 1975 to 1977, and assuming 20% annual increases in prices would mean a doubling of the spending under the capital budget. It must be appreciated that on this assumption no commitments would be made on Central Government budget in respect of rehabilitation of the Port, Public Utilities, or places of historic or cultural interest;<sup>12/</sup> neither would there be any assistance from Government for rehabilitation or reconstruction of community property (e.g. churches) and under-insured households; and that commercial and business enterprises would need to find their own solutions.

Even with such a minimal programme, given the unlikelihood of large expansions of tax revenues in 1975 and 1976, it is unavoidable that heavy reliance will need to be placed on loan financing for earthquake reconstruction. This situation would be eased to a greater or lesser extent by whatever foreign donations and soft

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<sup>12/</sup> Excepting the Supreme Court building.

loans are received. To the extent that Government has to take recourse to loan financing, in view of the already heavy debt burden, care would need to be taken with the programming of repayments so that they do not constitute an intolerable burden in any single financial year.

#### Monetary and Financial Sector

Several elements of the monetary picture that will confront Antigua and Barbuda in 1975 are already evident. First, the external sector will continue to be a factor of absorption in view of the expected global deficit on balance of payments, and this will be attenuated only to the extent that a greater inflow of funds from abroad can be obtained. Secondly, with regard to internal sources, the task of earthquake rehabilitation will increase credit needs, which will be determined by immediate requirements arising from the repair and reconstruction of destroyed or damaged physical capital. However, these internal credit requirements have to be reviewed in the light of the current level of interest rates. At November 1974, the commercial banks were paying 11% interest on fixed deposits, and charging 14% on loans; the prime lending rate then being about 12%. In this tight monetary situation the local entrepreneur will have great difficulty in mobilising the liquidity to effect repairs to his establishment and to replace stocks lost in the earthquake. This problem would be less severe for firms that can obtain finance from parent companies abroad. Thirdly, as was pointed out, inflationary pressures in Antigua and Barbuda increased in 1973 especially because of the rapid rise in the prices of imported goods and services and inelasticity in the internal supplies of certain products. The factors which caused the rise in prices in 1973 were stronger in 1974, and the rapid acceleration in prices shown in Table 8, can be expected to continue through 1975, so some steps will be needed to combat the inflationary pressures.

From all the available evidence, the inescapable conclusion is that even if it could act with optimum efficiency and speed, and had the means of doing so, Antigua and Barbuda would need a minimum of some years to be able to fully repair the damage caused by the earthquake and to restore the essential administrative organization.

## CO-OPERATION OF THE INTERNATIONAL COMMUNITY

### The Indicated Action

As pointed out, the earthquake caused heavy material damage and also temporarily disrupted the productive capacity of Antigua and Barbuda. Its most serious effects are concentrated precisely in the areas that have been providing the dynamic for the country's economic activities. This phenomenon will force the country to make unforeseen expenditures to replenish and rehabilitate, instead of increasing, existing capital goods whose replacement cost in several cases far exceeds the original value of the property destroyed or damaged. Moreover, the capacity of the economy to finance such expenditures, both from domestic savings and earnings from the external sector, will be seriously restricted at the very least for the next two or three years. In addition, unless a broad programme of public reconstruction and development financing is adopted there will be the danger of continued dislocation.

At the global level there is thus first of all an urgent need to obtain substantial support for the country's balance of payments position and financial support for the public sector. Secondly, the response of the country in rehabilitation of the earthquake damage must not hamper the economic development effort the country had been making. In other words, it is necessary for Antigua and Barbuda to co-ordinate its reconstruction needs and development plans and programmes, although such co-ordination should not necessarily require basic changes in the development strategy. For the international community this means that additional assistance, not assistance to take place of that designed to promote the development plan, would be needed to cope with the situation.

The Government has decided that there will be several phases of activity according to specific sector requirements, i.e. the approach for rehabilitation and reconstruction of low cost housing will require different activities from those to be employed for public utilities and the public sector. All these activities, however, will need to take place simultaneously and complement each other.



During the permanent rehabilitation and reconstruction phase the financing system will require external funds on soft terms. Several lines of credit may be needed for the repair and reconstruction of utilities, housing, public buildings; essentially those segments of the economy for the repair of which the public sector has some direct responsibility. This includes the urgent need to re-establish the health infrastructure that existed prior to the earthquake. As far as housing is concerned, external soft loan funds would need to be employed for repair and construction of rural and urban housing, particularly for the low income and low-middle income groups that were uninsured.

The volume of funds required together with the levels of net capital input the country has been mobilising in recent years, would add considerably to the already serious debt servicing problem unless the new financing is granted on terms that are truly favourable from the point of view of repayment period of grace and rate of interest. This condition is inherent in the very nature of the situation. The difficulties which will be faced by the public sector, and in particular the Central Government, as a result of the earthquake, amply justify the devising of some kind of direct financial assistance scheme and in any case the elimination of conventional requirements for local counterpart contributions to external loans where these would normally apply. In other words, it is considered that any loans which it is decided to grant to Antigua and Barbuda in the next few years should be granted on soft terms and should cover the total cost of the projects or programmes to be financed.

It would be difficult to exaggerate the urgency of the Antigua and Barbuda need for an increased flow of external financial assistance. Not only is it imperative that rehabilitation work should commence immediately, but the weakening of the external sector will be critical for some time. In keeping with this conclusion the following specific recommendations are submitted:

- (i) Resources from some loans already agreed upon before the earthquake, should be re-channelled so as to become available to the country immediately. This

would include project loans already negotiated with the British Development Division, CIDA and the CDB.

- (ii) Financing agencies ought to grant special terms to Antigua and Barbuda, in keeping with the nature of the phenomenon which will require them to modify procedures and the normal machinery for the evaluation and approval of requests for loans. It would be regrettable if in view of the financial burden on the Government, aid donors considered it essential to require the Government of Antigua and Barbuda to go through the prolonged procedures normally involved in the negotiation and conclusion of a loan operation.
- (iii) It is suggested that, to the extent possible, the financial agencies should conclude programme loans with Antigua and Barbuda primarily in order to avoid the delays usually involved in the preparation and approval of specific projects.

It should also be pointed out that the mobilization of financial assistance of a volume, and under conditions commensurate with the needs of the Antigua and Barbuda economy as a result of the earthquake of October 1974, might also require some special machinery to co-ordinate activities for the mobilization, channelling and absorption of external resources. It would be of course the responsibility of the Government to decide on the machinery it considers most appropriate for the purpose.

There is no need to wait until some overall reconstruction plan has been drawn up in which projects and programmes are assigned priorities or ranked in order of importance. Inevitably the Government has ultimate responsibility for selecting and combining the individual sources of external assistance. Among the rehabilitation efforts, there is the strong need for re-establishing and strengthening the administrative capacity of the Government services which have been most seriously affected by the earthquake.

### Internal Self-help

It should not be assumed that Antigua and Barbuda has just been passively awaiting the arrival of assistance. The first surveys of the disaster relief revealed a willingness among the victims to participate in repair and rehabilitation efforts. The bulk of the clearance of rubble has already been effected, though the task of demolition of some dangerous structures is still to be undertaken. At the level of the Earthquake Action Committee a special issue of stamps was promoted that has so far yielded \$60,000, and which has been earmarked for rehousing the homeless.<sup>13/</sup> This initial effort has commenced with concentration on replacement of dwellings valued at less than \$10,000, and so far takes the form of providing two-bedroom and three-bedroom wooden structures. Essentially these are on loan terms to the householders, the terms being worked out in each case according to capacity to pay. In addition, CADEC has utilised its available funds to purchase building materials and encouraged skilled builders, working as teams, to lend their services at substantially reduced rates, to construct three similar wooden dwellings. Despite these efforts there is still the need for a further thirty units to overcome the problem of the homeless.<sup>14/</sup>

### External Assistance Already Identified

The British were among the first to express a willingness to help the Antigua and Barbuda Government. The focus of these discussions has been on the provision of steel scaffolding, and the erection of an office building for the purpose of re-housing some of the departments of Government that were forced to evacuate their premises. There was not yet clear indication of the total floor area the building would provide and the extent to which it would meet the need for office space created by the earthquake.

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<sup>13/</sup> Category (i) of Table 1. The Action Committee has also been responsible for other initiatives including establishment of the Earthquake Relief Fund in the commercial banks.

<sup>14/</sup> In appeals made by the Government for assistance it had been indicated that provision of building materials and some prefabricated houses would help to relieve the situation.

At the level of the Caribbean inter-governmental organizations, the Caribbean Development Bank at its twenty-eighth meeting of the Board of Directors approved a Housing Rehabilitation Loan of \$1 million for Antigua and Barbuda.<sup>15/</sup> This loan establishes a line of credit for the Antigua and Barbuda Development Bank (ABDB) to facilitate sub-loans to home owners for the repair of houses damaged in the earthquake. This CDB loan provision, based on a list of 368 cases reviewed by the Bank, covers just under half the damaged dwellings in this category.<sup>16/</sup>

#### Other Possible Sources

It is evident from the above, that though some start towards rehabilitation has been made in housing, there is still a considerable gap to be closed which the Antigua and Barbuda Government cannot tackle alone, in the face of the financial stringencies. Other sources that should provide prospects, is the probability of aid donors granting approval for the use of technical assistance funds earmarked for projects that were previously negotiated. As mentioned above, such approvals should be accompanied by commitments of replenishment, so that the developmental projects are not hindered. Such assistance would inevitably be geared to public sector requirements.

As regards the private sector,<sup>17/</sup> there is obviously the need for small entrepreneurs to have access to soft loan funds, which could appropriately be channelled through the Antigua and Barbuda

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<sup>15/</sup> 22 November 1974.

<sup>16/</sup> Category (ii) of Table 1. The loan provided, directed towards householders earning less than \$65 per week, is in two parts: \$1/2 million @ 4% and \$1/2 million @ 7 1/4%, to be reloaned at 6% and 9 1/4% respectively. The lower interest rated portion of the loan is to be directed to houses valued up to \$10,000 with a ceiling on reloans to individuals of \$500. For the higher interest rated portion of the loan no house value ceiling has been set, but reloans to individuals would not exceed \$1,500 in each case.

<sup>17/</sup> The absence of firm data on insurance claims prevented formulation of estimates for the private sector, similar to those made for low income housing and the public sector.

Development Bank. This is an area in which sympathetic Governments and financial institutions could provide valuable support. Such action should also take into account the needs for housing repair loans in the middle income category where insurance compensation will not cover the costs. The Insurance Companies themselves could play a most useful role by retaining a larger proportion of their funds for investment in Antigua and Barbuda.

The financing for rehabilitation and reconstruction of community property presents even greater difficulties. There is in Antigua and Barbuda no National Trust for the preservation of historical and cultural sites. While some support should be forthcoming for churches from their denominational affiliates abroad, it cannot be assumed that this would be of an order of magnitude to effect the needed restorations. Recourse may need to be made to international Foundations that are interested in the preservation of historical sites.

### A FINAL COMMENT

It would seem appropriate in concluding this report, that some comment should be made on preventative measures. Mention was made earlier that a large proportion of the buildings in Antigua and Barbuda, particularly public buildings, are of a type of construction where limestone block walls are raised with mortar (often lime) without internal structural reinforcement. This is particularly the case for structures erected during the last century. The stability of such buildings depends on their remaining "in-plumb". Where the effect of the earthquake on such structures has been to put the vertical sections out of perpendicular, the task of rehabilitation will be essentially one of reconstruction. It is most probable that in such cases new engineering techniques will need to be employed, even if the appearance and facade is to be preserved.

The majority of the large structures that were damaged by the earthquake were of the traditional limestone block structure;<sup>18/</sup> and this is true also for the private dwellings that were demolished. In addition, most of the dwellings that were damaged might be regarded as not conforming to some standards of building codes commonly applied in other countries. It is not without significance that a popular reaction during the tremors in the succeeding weeks, was for people to leave stone buildings, and to crowd into wooden buildings. The primary factor is that the buildings suffering most damage were those with no earthquake reinforcement.

It has to be noted that no Building Code has ever been legislated in Antigua and Barbuda. Given a possible likely greater incidence of earthquakes, there is the clear need for a building code to ensure higher standards of building, as an essential preventative measure.

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<sup>18/</sup> The St. John's Cathedral, the Prison, the Supreme Court building, the Treasury Building, the Ministry of National Security and ECCM Secretariat building, and the majority of the churches are typical examples.

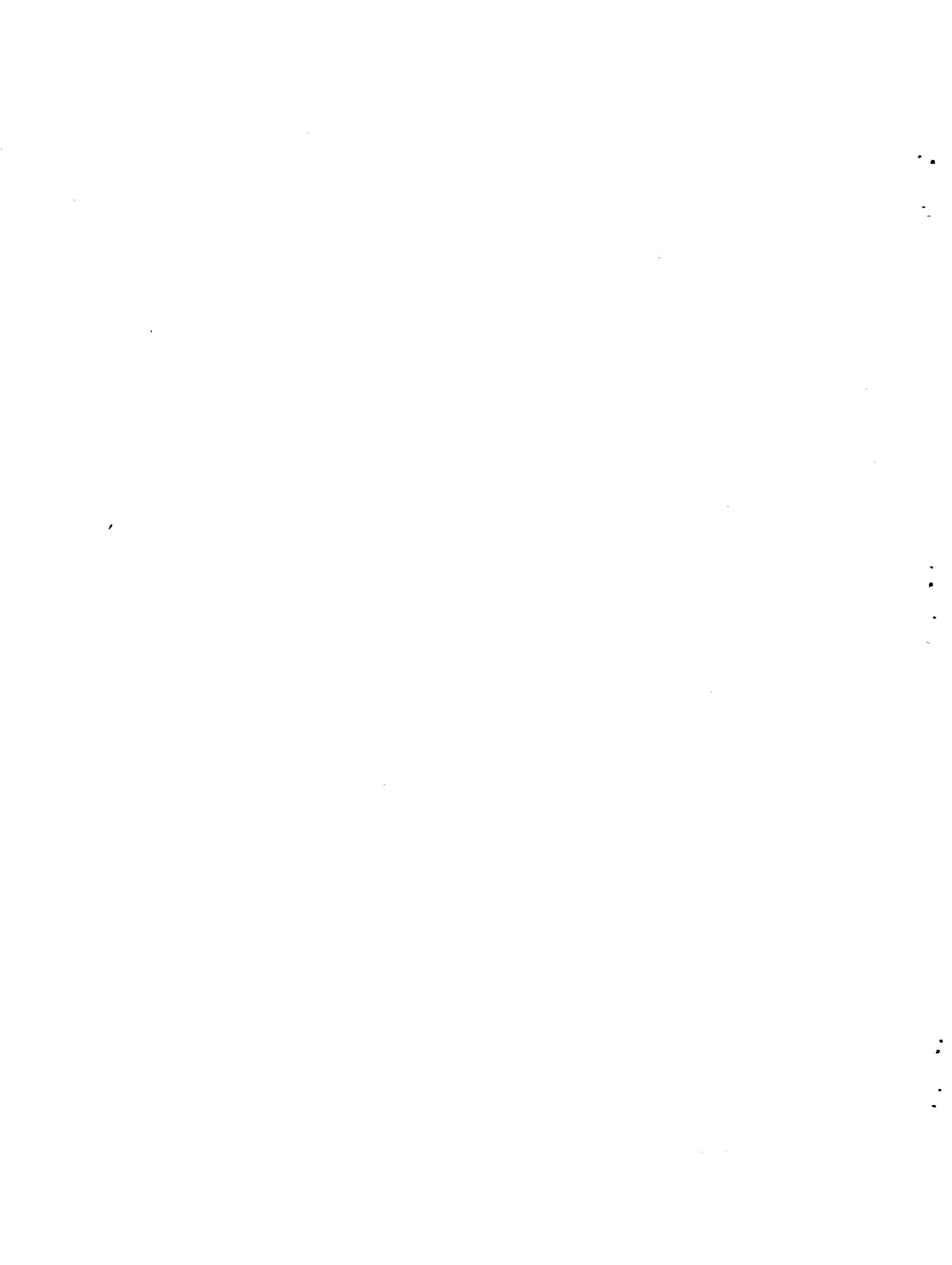
This however should not be interpreted simply as abandonment of the use of limestone blocks in construction, to be substituted by cement blocks, or timber. The limestone materials constitute the only indigenous building material of Antigua and Barbuda. There are no forests to provide timber, neither is there a factory manufacturing cement;<sup>19/</sup> these materials need to be imported and expansion in their use makes for greater dependence on the external sector.

The transition from the use of limestone to adoption of wood and cement for building construction, is therefore not only a cultural loss, but also a loss in some measure of self sufficiency. What is required is greater use of the indigenous material within the context of an appropriate building code. Obviously a higher level of technological application is required (than was evident during the last century), which would combine the building block technique with acceptable structural reinforcement. Alternatively there should be the break-through to applying the local building materials in another form.

It should also be noted that in very many cases the damage to recently constructed buildings was aggravated because of the practice of re-utilization of old foundations of traditional construction. In the application of a building code attention will also need to be given to this aspect.

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<sup>19/</sup> There is a cement plant constituting mainly bagging operations.





RESOLUTION 345 (AC.67)

The Committee of the Whole of the Economic Commission for Latin America,

Recalling General Assembly resolution 2816 (XXVI) and 2959 (XXVII) concerning assistance in cases of natural disaster,

Noting the statement by the representative of Antigua concerning the disastrous earthquake which struck that country on 8 October 1974,

Further noting the statement by member Governments of the Commission on this subject,

1. Invites member Governments of the Commission and the Disaster Relief Co-ordinator to render emergency assistance to the Government and people of Antigua;
2. Requests the Executive Secretary of ECLA in co-operation with UNDRO and UNDP to despatch immediately a mission to Antigua to evaluate the damage done to that country and to submit appropriate proposals to assist that country to overcome the effects of the disaster;
3. Further requests the Executive Secretary of ECLA to circulate the report of the evaluation mission to member Governments of the Commission and to the specialized agencies and other member organizations within the United Nations system;
4. Invites the Executive Secretary of ECLA to report to the sixteenth session of the Commission to be held in May 1975 on the implementation of this resolution.

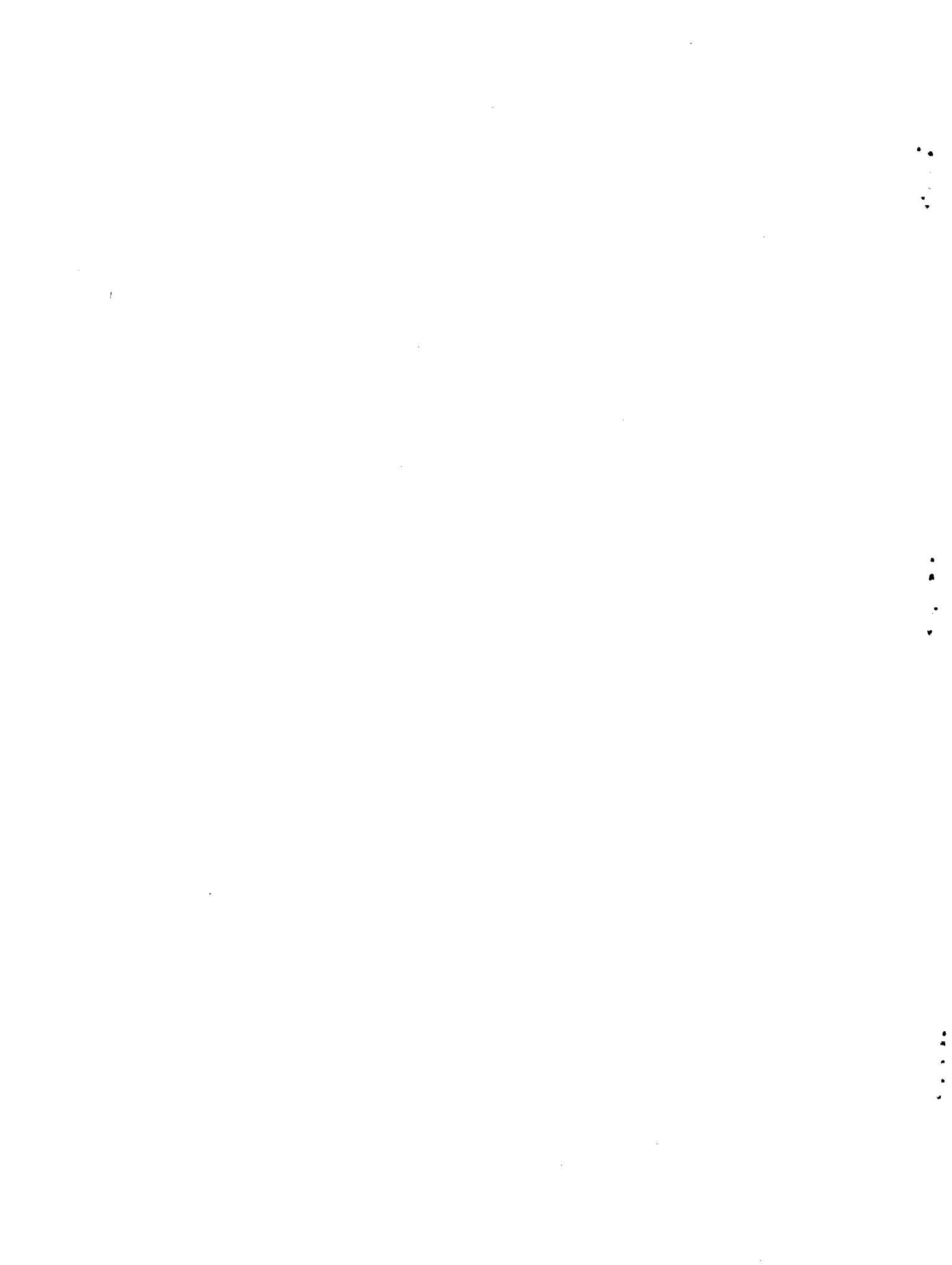


## EMERGENCY DEPARTMENTAL RELOCATIONS

<u>Department or Office</u>	<u>Temporary Location</u>	<u>Remarks</u>
Parliament	Conference Room, Michael's Mount Hotel	Attracts rental
Health Services:		
Public Health (Nursing)	New Fish Market	
Office of Senior Medical Officer	Ministry of Education	
Dispensary	Usable portion of Health Centre	
Public Health (Inspectorate)	Health Centre yard and sheds	
Ministry of National Security, Legal Affairs & Labour	Brown & Co. Building	Attracts rental
Treasury	Convent Hall	
ECCM Secretariat <sup>1/</sup>	Rooms at Michael's Mount Hotel	Attracts rental
Government Printery	Queen's Warehouse	
Supreme Court and Registry	Magistrates' Court	
Magistrates' Court	Police Barracks	
Public Library	(P.E. Hall)	
Prison	Temporary construct- ion on compound	

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<sup>1/</sup> Expected to move to Dutchman's Bay when immediate repairs necessary there have been effected.



## ANTIGUA &amp; BARBUDA

(Source: 1970 Census)

Number of persons 64,794

Mid-year population estimates:

<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
64,475	65,845	67,245	68,675	70,135]

Number of households/dwelling units 15,405

Average number of persons per household 4.2

## Dwellings according to year of construction:

	<u>No.</u>	<u>%</u>
Before 1940	2,131	13.9
1940 - 1949	1,487	9.7
1950 - 1954	2,776	18.0
1955 - 1959	2,068	13.4
1960 - 1964	2,868	18.6
1965 - Mar.1970	3,622	23.5
Not stated	453	2.9
	<u>15,405</u>	<u>100.0</u>

## Distribution of occupied dwellings by outer wall material:

	<u>April 1970</u>		<u>April 1960</u>
	<u>No.</u>	<u>%</u>	<u>%</u>
Concrete block	2,552	16.6	8.1
Wood	11,760	76.3	84.6
Stone	357	2.3	4.1
Brick	47	0.3	1.3
Not stated	689	4.5	1.9
	<u>15,405</u>	<u>100.0</u>	<u>100.0</u>

