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INTRODUCTION

Nicaragua has once again experienced the after effects of a natural disaster which has resulted in considerable loss of life and material damage, and will have a highly unfavourable effect on the living conditions of the population.

Over a period of ten years, the country has suffered the impact of three disasters, including the present one, which have justifiably attracted world attention. The violent earthquake at the end of 1972, whose destruction was never wholly repaired, was followed by a period of political upheaval which culminated in the triumph of the revolutionary movement in mid-1979, not before it had caused the virtual paralyzation of production activities, an unprecedented decapitalization and flight of capital, and considerable losses in human lives and infrastructure. The authorities who assumed power at that time formulated a government programme centred on policies basically oriented towards the establishment of a more egalitarian society and on the adoption of a number of measures designed to improve the efficiency of production activities, all within the framework of a mixed economy which would gradually be consolidated.

Recovery from the conflict which ended in the middle of 1979 has in itself been difficult. Added to the high cost of reconstruction of the material damage have been the increasingly unfavourable international position for Nicaraguan exports and the pressures originating from the reorientation of the past economic policy within the programme which the Government Junta for National Reconstruction has been promoting. The main manifestations of this climate of tension includes, at the national level, the reluctance of important strata of private enterprise to carry on their activities normally -no longer to expand them- and, at the world level, a progressive restriction of Nicaragua's access to credit from its traditional sources, at least over the past year.

In addition to the aforementioned disasters, at the end of May a meteorological phenomenon of exceptional characteristics took place mainly because of the time of year in which it occurred. The torrential rainfall over about 10 days left approximately 80 dead -which might have numbered many more had the Government not acted with speed and foresight- and a great deal of material damage, mainly in agricultural natural resources and the economic and social infrastructure. If the immediate destruction is taken into account, as well as its effects on production activities in the remainder of the year, the total losses could amount to about 357 million dollars, including material losses (220 million), damage to the soil (55 million) and indirect losses (82 million). Moreover, this damage probably did a great deal to counteract the country's economic growth of about 5% which was expected for 1982.

The considerable extent of the damage caused by the rain and the consequent floods was due to the wide geographical area they covered -in terms of the number of departments and cities- and the area of cultivated land affected; to the nature of the damage, almost all entailing a slow recovery; to the fact that they more seriously affected a key sector of the economy -which generates foreign exchange- and above all to the circumstance that the phenomenon concerned should have occurred in a period in which the country was making great efforts to recover from the two previous disasters and solve their many development problems.

The present note, prepared at the request of the Government of Nicaragua, examines the repercussions of the phenomenon referred to on the economic and social development of the country. For its preparation, CEPAL sent a mission to

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Nicaragua which remained there for 10 days in order to collect and analyse the necessary information. In the performance of this work, the group received extensive co-operation from the United Nations Development Programme (UNDP) and many institutions of the Government of Reconstruction, notably the Department of Information and State Operations (DIGE), the International Reconstruction Fund (FIR), the Planning Ministry (MIPLAN) and the National Disaster Committee. It also had timely access to a mass of information on the damage and other immediate effects of the disaster, which was collected and tabulated by the various ministries and government departments, with the co-ordination of the Department of Information and State Operations of the Office of the Government Junta.

The mission was able to determine the efficiency and speed with which the Government and popular organizations faced the problems arising from the disaster. In a very short time, some of the 70 000 persons who had taken refuge in emergency centres, were already resuming their normal lives. If the above-mentioned organization had not acted as it did, the loss of life would undoubtedly have been considerably greater.

In spite of the efforts made, the country needs international co-operation in order to deal efficiently with the longer-range repercussions of the disaster, which, it must be stressed, are additional to the accumulation of obstacles already mentioned. For this reason, in addition to describing the natural disaster, estimating the extent of the damage and formulating some observations concerning its effects on the immediate-, medium- and long-term development of the economy, this document presents some considerations on the additional technical and financial co-operation which Nicaragua requires from the international community.

I. DESCRIPTION OF DISASTER AND IMMEDIATE ACTION TAKEN

1. Origin and description of the disaster

The floods occurring in Nicaragua -and on a much lesser scale in Honduras- at the end of May 1982 were due to the intensive rainfall produced by the combined presence of two meteorological phenomena. In the first place, around 20 May an area of low atmospheric pressure formed near Punta Cosiguina which remained almost stationary and then slowly moved towards the Caribbean. Secondly, one end of the Intertropical Convergence Zone (ITCZ) -which is the equatorial band in which the main winds from the northern and southern hemispheres converge and which move in a north/south direction throughout the year- was over Central American territory and fed and stimulated the aforementioned depression.^{1/}

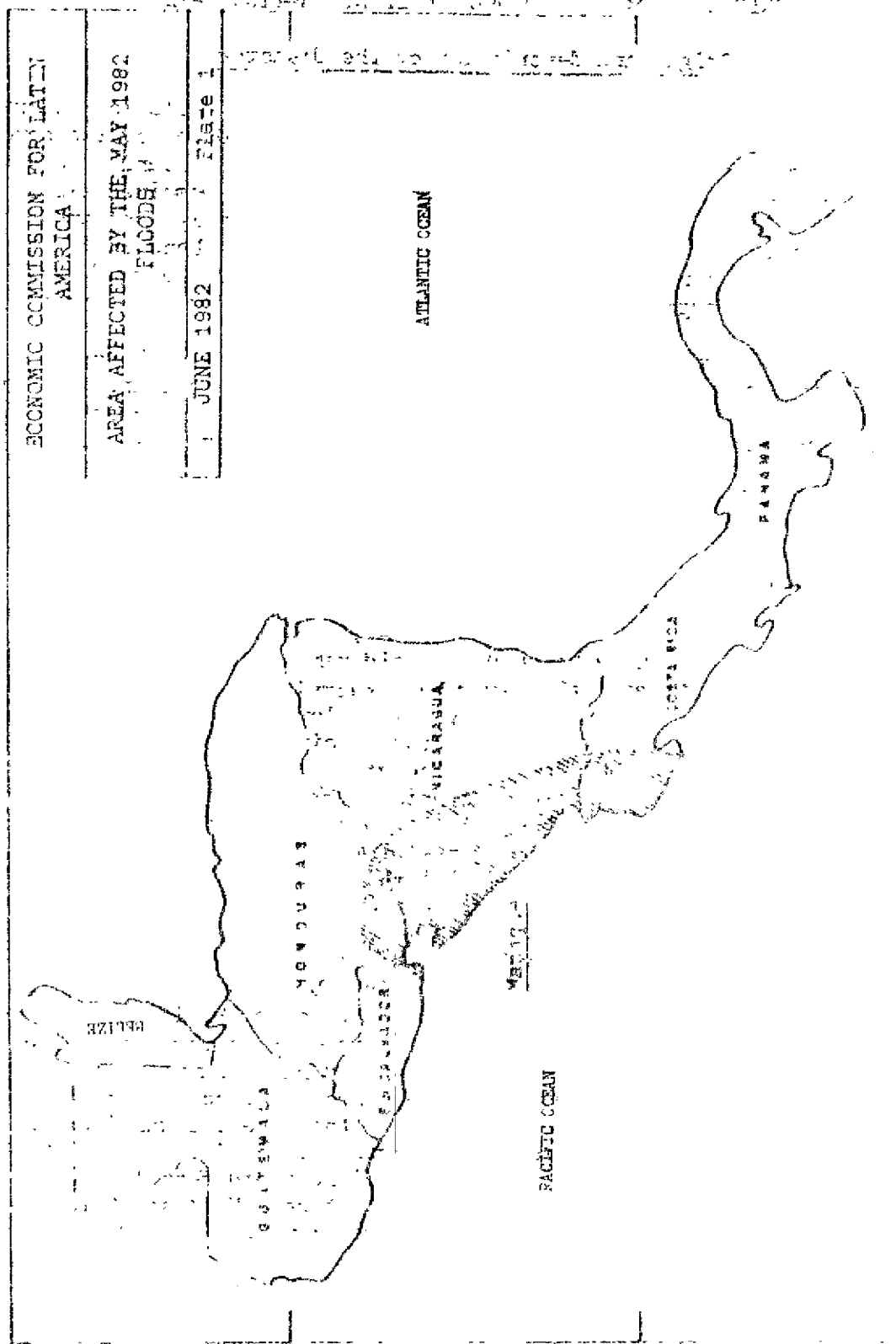
The simultaneous occurrence of these two phenomena, each of which has a high potential for generating heavy rainfall, originated the persistent and intensive rains which covered a wide area of the Central American Pacific seaboard, extending from the Nicoya peninsula in Costa Rica to the Fonseca Gulf, and also covering the basin of the big lakes in Nicaragua (see attached map).

The areas most affected by the tropical depression were undoubtedly the north-western part of Nicaragua and the southern coast of Honduras. In that area the rainfall not only exceeded the average and maximum ever recorded, but -in some cases like Chinandega- amounted to over 500 millimetres in a single day, and 70% of the rainfall in a normal year fell between 20 and 31 May.

The amount of rainfall was truly extraordinary. After the first few days of this situation, when the soil had absorbed a considerable proportion of the rain, virtually all of it flowed towards the river beds carrying with them soil, trees, stones and everything they found in their way. The flow was so great that the river beds were insufficient, particularly at those points where the mountains come down to the coastal plain. The abrupt reduction of the slope and in some cases the obstruction of bridges by trees and other material carried along by the waters caused the rivers to overflow their banks, flooding and denuding the land and adjacent population centres on the higher parts of the plain, destroying bridge structures or heads and depositing the material they carried on the land near the coast, in the estuaries, and even in the open wells used by the rural population.

The loss of vegetable cover and soil erosion on the mountain slopes were very severe, as also were the artificial widening of river beds in the upper stretches of the rivers and ravines, and the depositing of sand and rocks in the river beds and the land situated in the lower areas. Thus a large proportion of the vegetable cover of extensive areas and considerable tracts of arable land were lost owing to the considerable widening of the river beds, and large stretches of arable land in the lower areas were buried or partially covered by the material carried by the torrents. Furthermore, the ground water was affected by the inflow through the flooded wells not only of sediment but also of pesticides and fertilizers, which could make it unsuitable for human and animal consumption. No less serious were the effects on Lake Managua whose level rose considerably with the rain and the

^{1/} Newspaper versions attribute the persistent rainfall to the tropical storm Aleta. Information obtained by means of photographs from meteorological satellites and data from radiosonde stations indicate, however, that Aleta was already far away from Central American territory at the time of the disaster.



The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

torrents it received, flooding the dwellings on its banks, filling up with sediment and preventing the natural and artificial disposal of waste from the capital. In short, in only a few days the ecological balance of the region was significantly altered.

When the rivers overflowed their banks the agricultural, physical and social infrastructure was damaged in varying degrees, as also was agricultural production and the stock of cattle. Terraces and other soil conservation works in agricultural areas devoted mainly to cotton-growing were destroyed or damaged; road and railway bridges and many sewers were carried away completely or the ends and bases were damaged; many dwellings in low-lying areas adjacent to the rivers were flooded and in some cases swept away, and, finally, crops which were already sown or about to be harvested were destroyed, land which had been prepared for sowing was flooded and many animals were drowned.

In the cities -especially Chinandega and Managua- natural or artificial sewerage proved insufficient to dispose of the waters. Many dwellings, shops, industries and public service buildings situated in the low-lying parts near river beds and Lake Managua were completely inundated. The aqueduct and sewerage systems, and telephone and electricity networks suffered considerable damage.

The road network was severely affected since the asphalt layer of extensive tracts of paved highway was carried away and secondary roads and access roads to the interior were flooded and covered with sediment. Electric light and telephone communications were interrupted because of fallen posts and broken lines.

In one of the ports near the place where the tropical depression had formed, the simultaneous action of a relatively high tide, strong winds -of up to 48 knots- and copious rainfall eroded the beach which sank several metres, dragging with it many dwellings and threatening to cut off the highway and railway.

To aggravate this situation, the danger has not yet disappeared. Further intensive rainfall may occur and, owing to soil erosion in the high lands, could cause new landfalls which would considerably increase the already substantial damage. It should be taken into account, moreover, that the rainy season is just beginning, the soil has reached saturation point and statistics show that similar phenomena with grave consequences may still take place, particularly if they occur simultaneously with the highest tides of the year which, together with storm conditions, are expected in September and October.

It is therefore a matter of urgency to proceed with the immediate reconstruction of terraces in agricultural areas and the removal of obstructions in the river beds. Another pressing matter is to reinforce the meteorological and hydrological forecasting facilities in order to detect this type of phenomenon sufficiently in advance and reduce future damage.

2. Action taken vis-à-vis the emergency

As distinct from what normally happens in other places and at other times, at the end of May 1982 Nicaragua had an extensive and efficient organization for mobilizing its people. That civilian organization, in close co-operation with the Army, made it possible rapidly to evacuate the inhabitants of the affected areas, and provide lodging and care for the flood victims in the improvised refuges. This circumstance explains the low number of deaths recorded during the disaster.

The Government Junta for National Reconstruction, after realizing the magnitude of the damage caused by the floods, declared the region affected a disaster area and established a National Disaster Committee. This Committee is responsible for

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looking after the flood victims, determining the most urgent needs, and receiving and distributing the aid sent from abroad, which it has done fairly and efficiently.

The Government Junta prepared a very provisional evaluation of the damage suffered as a result of the rains, and on 27 May it sent out an urgent appeal for aid from the international community.^{2/} In view of the urgency with which the document containing this appeal was prepared and the fact that some population centres were still isolated, the Junta's report reflects only the order of magnitude of the direct damage and indicates priorities for the assistance required.

The appeal -reinforced by another made by the United Nations Co-ordination Office for aid in cases of disaster- was answered by some countries and international institutions and organizations and assistance began to flow into Nicaragua, although on a somewhat small scale if the immediate needs are considered.

The National Disaster Committee distributed the aid as it was received, at one moment having met the requirements of about 12 000 families. Other government departments and civil and popular organizations devoted themselves to satisfying various urgent needs.

A start was made on the resettlement of the inhabitants of marginal areas of the cities who had lost their dwellings and belongings in safer places. Work went ahead actively on the re-establishment of communications, electricity and the water supply service. The temporary repair of partially damaged bridges was begun and also the construction of fords which made it possible to cross rivers where the bridges had been destroyed.

School activities were suspended in order to use the premises as temporary refuges for the flood victims, and school children were included in cleaning and reconditioning brigades. In the interior of the country a food programme was established for work which enabled some operations for clearing river beds and local roads to be initiated.

Although there were no water supply or waste disposal services for a relatively long period -a situation that still prevails in some population centres which are still isolated- the immunity levels of the population were fairly satisfactory thanks to the recent health campaign, and no epidemics have been recorded so far. This does not mean, however, that they may not occur in the future owing to crowding in the temporary shelters.

In spite of the activities described above, and the fact that food and medicines as well as doctors and reconstruction personnel have been received from abroad, Nicaragua still needs a great deal of assistance to cover the flood victims' basic needs and, as will be seen later, to devote its efforts to the tasks of rehabilitation and reconstruction.

The additional emergency aid most urgently required is food to alleviate the shortage due to the loss of crops which were about to be harvested, and heavy machinery and equipment to reopen access to production areas in time to be able to sow.

^{2/} See Secretaría General de la Junta de Gobierno de Reconstrucción Nacional, Informe preliminar de la cuantificación de los daños ocasionados por el desastre, 27 May 1982.