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FOREWORD

Nicaragua has once again suffered from the aftermath of a natural disaster which imposed losses of life and material damages which will adversely affect the living conditions of the population.

Within the past ten years, the country has been struck by three disasters which have attracted world-wide attention. The earthquake that destroyed Managua in 1972, whose damages were never fully repaired, was followed by the internal armed conflict that ended in mid-1979 with the victory of the revolutionary movement. This civil war imposed a virtual standstill of economic activity, an unprecedented flight of capital, and heavy losses in human life and infrastructure. The new Government which came to power in mid-1979 formulated a development plan based on policies aimed at creating a more egalitarian society, and the adoption of a series of measures designed to improve the efficiency of production, within the context of a mixed economy to be consolidated in due time.

The recovery after the 1978-1979 civil war has been extremely difficult. The high cost of repairing material damage has coincided with an increasingly unfavorable international situation for Nicaragua's export products. In addition, many tensions had been created by the re-orientation of the previous regime's economic policy in the present development programme of the National Reconstruction Government Junta. Such state of affairs is felt internally by the reluctance of important private groups to continue with their normal activities - let alone expanding them - and, in the international arena, an increasing restriction of credit from Nicaragua's traditional sources, which could be noticed during the past twelve months.

The previously described situation was further aggravated at the end of May 1982 by the occurrence of a meteorological phenomenon of special and abnormal characteristics. Intensive and persistent rainfall which lasted for a period of 10 days, killed approximately 80 people - the death toll could have been higher were it not for the timely and efficient action taken by the Government - and produced very high material damages, especially referred to agricultural resources and to social and

physical infrastructure. Taking into account both the immediate damage and the indirect effects on economic activities in the near future, the losses would amount to 357 million U.S. Dollars. This figure may be divided into three components: material damage (220 million), loss or damage of land resources (55 million) and indirect losses (82 million). In addition, it is expected that these losses will be largely responsible for the reduction of the 5 per cent economic growth which was anticipated for 1982 before the disaster.

The magnitude of the damages imposed by the rains and the ensuing floods can be understood when considering the extensive total and agricultural area which they covered, the type of losses suffered which have very slow recovery periods, the fact that they affected a key sector - the one which generates foreign exchange - of the economy and, above all, that they occurred when the country was striving to recover from the effects of the two previous disasters and to overcome the many problems which its development entails.

This document - prepared at the request of the Nicaraguan Government - describes the effects which this new disaster has had on the social and economic development of the country. CEPAL sent a special field mission which during a 10-day period collected and analyzed the necessary information. The CEPAL mission received full support from the United Nations Development Programme (UNDP) and many governmental organizations, especially from the General Directorate of State Information (DIGE), the International Reconstruction Fund (FIR), the Ministry of Planning (MIPLAN), and the National Committee for Disasters. The mission received some basic data on direct material damage, collected by several ministries and organizations coordinated by the General Directorate of State Information of the Government Junta.

The mission verified the expediency and efficiency of the Government and popular organizations to face the problems imposed by the disaster. Within a short period of time, part of the 70 000 people who had been moved to temporary shelters, was returning to normal life. Had not the popular organizations been available, there is no doubt that the human loss would have been much higher.

/In spite of

In spite of its internal efforts, Nicaragua requires international assistance to efficiently attend the long-term effects of this disaster which - as stated before - are superimposed on the situation previously described. This document - in addition to describing the characteristics of the natural phenomenon, the direct damages it caused and estimations of the short and medium term effects on the economy - outlines the additional requirements of technical and financial international assistance.

I. CHARACTERISTICS OF THE DISASTER AND ACTIONS IMPLEMENTED
IMMEDIATELY THEREAFTER

1. Origin and Characteristics of the Disaster

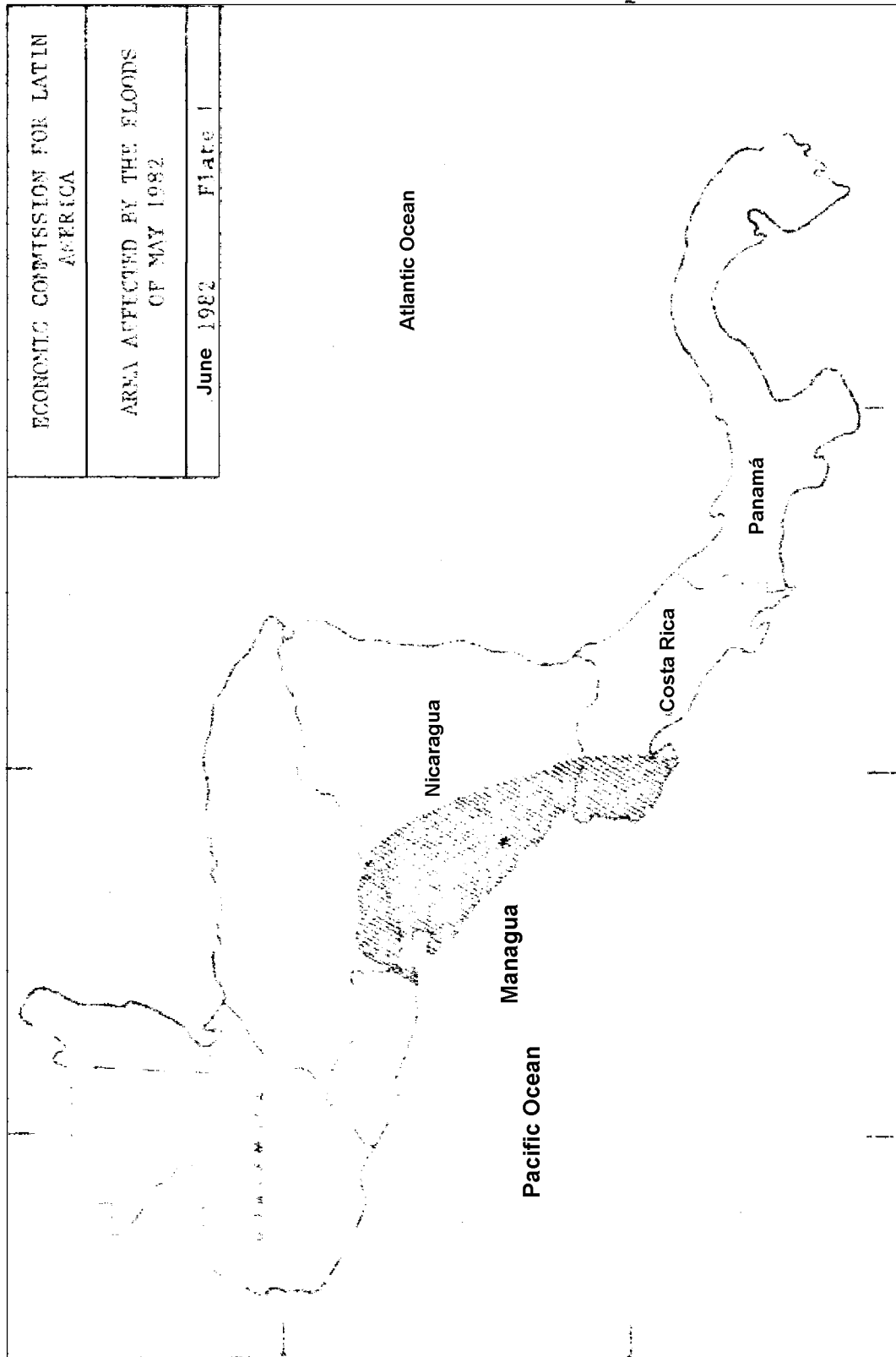
The floods which occurred in Nicaragua - and to a lesser degree in Honduras - at the end of May 1982, were caused by intensive precipitation produced by the simultaneous presence of two meteorological phenomena. The first one is a low atmospheric pressure zone which was born near Punta Cosigüina around May 20th; it nearly remained motionless until it slowly began to move North towards the Caribbean Sea. The second one is the presence of the Inter-Tropical Convergence Zone (ITCZ) - the equatorial band wherein the main windstreams of the Northern and Southern hemispheres converge, and which shifts along a North/South axis during the year - over the Central American mainland. The latter reinforced the tropical depression mentioned above.^{1/*}

The simultaneous presence and interaction of these two phenomena, each of which is capable of generating heavy precipitation, caused the intense and persistent rainfall which fell over a very extensive area of the Central American Pacific watershed - from the Nicoya Peninsula in Costa Rica to the Gulf of Fonseca in Honduras - and the great lakes basin in Nicaragua on the Caribbean Sea watershed. (See enclosed map.)

The areas most affected by the tropical depression were the North-West of Nicaragua and the Southern coast of Honduras. Precipitation in these areas exceeded not only the long-term average and maximum rates, but - in some cases like the City of Chinandega - produced more than 500 millimeters in a single day, and - during the period 20 to 31 May - about 70 per cent of the typical-year rainfall.

Rainfall was truly extraordinary. After the first days of precipitation - during which the soils absorbed a sizable fraction of the rainfall - practically all of it flowed toward the drainage system, carrying soil, rocks, trees and other materials. Runoff was so large that river discharge capacities were exceeded, especially at those points where the uplands join the coastal plains. The sudden decrease in slope and, in some cases,

* Please see notes on page 75.



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/the obstruction

the obstruction of bridges by trees and other materials carried by the water flow, originated river overflows which resulted in the flooding and erosion of adjacent lands and dwellings located in the upper areas of the plains, in the destruction of bridge structures and approaches, and in the deposition of the river solid load in lands located near the coastline, in estuaries and in open wells used by the peasants for drinking water purposes.

The loss of vegetative cover and the soil erosion in the uplands were very significant. Equally important were the artificial widening of the upper river and stream reaches, and the deposition of sand and rocks in river beds and lands of the lower areas. Therefore, a sizable fraction of soil cover was lost in very large areas; large tracts of arable lands were also lost due both to river-bed widening and to sedimentation of low-lying areas near the coast. In addition, groundwater became polluted with sediments and pesticide and fertilizer residues which penetrated the water table through flooded wells, thus rendering it unusable for human and animal consumption. Also significant were the damages inflicted on Lake Managua; its level rose considerably due both to the direct rainfall and to the runoff received, which caused the flooding of dwellings located along its shoreline, the obstruction of sewerage and garbage discharge from the capital city, and additional silting of its already polluted water. In short, within a few days, the ecological equilibrium was significantly modified.

With the overflow of rivers, agricultural, physical and social infrastructure was damaged in varying degrees; the same happened to agricultural production and to cattle stock. Terraces and other soil conservation works in cotton-growing areas were destroyed or damaged as well. Road and railroad bridges and culverts were either carried away by the floods and/or damaged at their footings or approaches. Many dwellings located in adjacent low-lying areas were flooded and, in some areas, carried away. Finally, crops already planted and/or ready for harvest as well as lands prepared for sowing, were severely affected, and a large number of livestock drowned.

Natural and man-made drainage systems were insufficient to discharge the resulting runoff in the cities, especially in Managua and Chinandega. Many dwellings, commercial and industrial facilities and public sector buildings located in low areas near rivers and canals and Lake Managua were completely or partially flooded. Heavy damages were also imposed on water-supply, sewerage, telephone and electricity networks.

The road system was severely affected. The asphalt layer of long stretches of paved roads was washed away. Secondary and production roads were flooded and heavily silted. Electricity and telephone services were disrupted due to the falling of poles and the breaking of physical lines.

The danger, however, has not completely disappeared. In fact, there exists the distinct possibility that new intensive rains may occur which, coupled with the significant soil erosion in the uplands, may generate new floods and mud flows. In this connection, it should be borne in mind that the rainy season has only just started and that soils are at their field capacity. According to available statistical data, similar flooding may occur in the future, particularly when the highest tides coincide with the usually persistent rains which take place during September and October.

It is therefore of utmost importance to immediately rebuild the terracing in agricultural areas and to desilt river beds. The strengthening of meteorological forecasting facilities to timely detect these phenomena, thus diminishing possible damages, is also considered of high priority.

2. Actions Undertaken to Face the Emergency

At the end of May 1982 - and in contrast with what usually occurs in other places and circumstances - Nicaragua had available an extensive and efficient system for mass mobilization. Such civil organization, in close cooperation with the Army, enabled the expedient evacuation of people from the areas affected by the floods, and the provision of shelter and assistance to refugees in special facilities improvised for the occasion. This fact explains the relatively low number of deaths caused by the extensive flooding.

/After determining

After determining the extent of the damages brought about by the floods, the National Reconstruction Government Junta declared the affected area a disaster zone, and created a National Committee for Disasters. This organization is entrusted with the tasks of assisting the refugees, determining their most pressing needs are, and receiving and distributing outside assistance. These tasks have been undertaken with efficiency and fairness.

The Government Junta made a very preliminary assessment of the flood damages and on May 27 made an urgent appeal for assistance to the international community.^{2/} Due to the urgency in preparing such assessment and to the fact that many towns and villages were still isolated, the Junta's report only provided an order-of-magnitude estimation of the direct damages and outlined priorities for the required assistance.

Such appeal - supported by a similar one made by the United Nations Disaster Relief Office (UNDRO) - was accepted by some countries and international organizations. Aid began to flow to Nicaragua, even though on an insufficient scale when compared to the magnitude of the disaster.

The National Committee for Disasters distributed all the aid it was receiving, assisting up to 12 000 families. Other Government and civil and mass organizations directed their efforts to attend other urgent requirements.

The relocation in safe places of the inhabitants of city slums - who had lost their dwellings and household effects - was initiated. The re-establishing of communications, electricity and water-supply basic services was also started efficiently. The temporary repairs of partially-damaged bridges and the construction of river fords to enable traffic through rivers where bridges had been washed away, was undertaken as well.

School activities were suspended. Their buildings were used as temporary shelters for refugees; students were incorporated in cleansing and rehabilitation squads. A food-for-work programme was established in some areas to allow the undertaking of desilting operations in river beds and roads.

/While drinking

While drinking water and sanitary disposal of excreta services were unavailable during a relatively long period of time - and this situation prevails in some still-isolated towns and villages - immunity levels of the population were very satisfactory due to the recently-undertaken sanitation campaign, and no epidemics have been detected up to now. This does not mean, however, that there will be no epidemics in the future since refugee centres are very crowded.

In spite of the above-described activities, and the arrival of food and medicines from abroad, as well as medical and reconstruction personnel, Nicaragua still requires considerable assistance in order to fulfill the basic needs of the refugees and to undertake rehabilitation and reconstruction of the works and facilities destroyed or damaged.

The additional assistance most urgently required strives in foodstuffs in order to alleviate its present scarcity due to the loss of crops which were ready for harvesting, as well as heavy equipment for re-opening access to production areas in time to initiate sowing activities.