

# **FINAL REPORT**

## **HOUSING DAMAGE ASSESSMENT FROM FLOODS IN ASUNCION**

**Prepared for**

**U.S. Agency for International Development  
Regional Housing Urban Development Office  
Paraguay**

**September 1993**

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**Prepared by**

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## ABSTRACT

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The periodic flooding of the Paraguay River causes millions of dollars of damage and untold suffering for thousands of families living in the flood plain of Asunción. Most of the families who are affected by these floods live in squatter settlements spread out along the river front. Efforts to mitigate the damage from this frequent disaster have included the piecemeal relocation of some families to housing on higher ground. However, these efforts have generally failed to resolve the problem because other families move into the vacated lots and houses.

The City of Asunción has prepared a Pre-Feasibility Study which would attack the flooding problem on a comprehensive basis, through a variety of actions, including relocation, upgrading, and land infill. If implemented successfully, this plan would resolve the flooding problem and prevent the disaster from recurring.

In October of 1993, the City will present the plan to the Inter-American Development Bank, which has expressed an interest in financing a part of the development plan. It is expected that the remainder of the plan will be financed by a combination of public and private financing, including financing from other international agencies.

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## EXECUTIVE SUMMARY

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Periodic flooding of the Paraguay River causes widespread damage throughout Paraguay. One of the areas hit hardest by the flooding is the capital city of Asunción, where some 50,000 people live in squatter settlements along the low lying areas of the waterfront. When the waters rise above flood levels, many of these families are forced to leave their homes, often for months at a time. During the last flood in 1992, it was estimated that 13,400 families were forced to evacuate their homes. As expected, many of these homes had been built with flimsy materials, which are little able to withstand the ravages of a flood. However, many other homes in the flooded areas were built of more substantial materials, and while the damage may have been less, nearly every home in the flood plain suffered some losses.

After the 1992 flood, the Municipality of Asunción carried out the only flood damage assessment. The city estimated that the total losses were in the \$25 million range, although this assessment did not estimate losses from non-tangible damages, such as the cost of lost wages, inaccessibility of business places, etc. The out-of-pocket costs covered damages to homes and other such structures in the flooded areas; infrastructure damages were negligible since the infrastructure in these areas is sorely lacking. Nearly all the damage occurred in the squatter settlements in the flood plain.

Efforts to rehouse squatter settlement families affected by these floods have been sporadic. For a number of years, some NGOs, usually affiliated with a religious group, have moved a number of families to higher land, frequently to areas on the outskirts of Asunción, where land is available at reasonable costs. While this relocation was very beneficial to those families, it did not resolve the problem of housing in the flood plain, since other families simply reoccupied the vacated areas. Moreover, given the population growth of greater Asunción, and the lack of housing opportunities for poor people, squatter settlements in the flood plain continue to grow unabated. The availability of land above the flood plain is not an issue, rather the issue is the availability of land at affordable prices that is convenient to services, including employment, for poor people.

The only way to tackle the housing problem in squatter settlements subject to floods is to develop a comprehensive plan for the entire waterfront area so that the benefits from removal of affected families will not be thwarted by other families simply replacing the few who leave. Fortunately, the Municipality of Asunción is in the process of developing a plan which will resolve the housing problem. As a first step, the City prepared a Pre-feasibility Study or Plan which calls for the design and implementation of a series of action programs which would provide a combination of housing solutions through upgrading, removal and infill, while at the same time, leave the lowest areas in either a natural state or as parks.

While the Inter-American Bank Development will provide some financing, it is anticipated

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that other international agencies will contribute, as well as the private sector, both in Paraguay and from other countries. This laudable proposal will be presented to the IDB the first week in October, 1993, and if it is accepted and finally implemented, it will be the eventual solution to the housing problem in the Paraguay River's flood plain. It is expected that the National Emergency Committee (CEN) will be influential in ensuring that the Plan will lead to the mitigation of the housing problem, as well as be helpful in the development of educational and other programs to ensure that the overall Plan is successful.

The principal conclusion to be derived from this assignment is that the housing problem of families living in the flood plain cannot be resolved simply by moving a few fortunate families to better housing in other areas. Instead, the housing problem must be attacked in a comprehensive way by developing and implementing a program to resolve the problem of whole communities living on the flood plain. The plan now being developed by the city of Asunción is but the first step in this direction, and, as such, it is recommended that it must be supported strongly if the housing problem in Asunción's flood plain is ever to be resolved.

# Housing Damage Assessment from Floods in Asunción

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## 1 Introduction

The purpose of this assignment was to assist the Committee for National Emergencies (Comite de Emergencia Nacional or CEN) to assess the damage resulting from the 1992 Paraguay River flooding in the Asunción area and to make recommendations on how and where to house the flood victims. This assignment took place over a ten day period in Asunción beginning in September, 1993, about 8 months after the river waters receded to normal levels. Since then, the damage has essentially been repaired and, in fact it is virtually impossible to identify any remaining damage, other than water marks on some buildings which indicated the height the flood waters reached. For that reason, it was impossible to make a damage assessment of the 1992 floods during this mission; simply stated, too much time has elapsed since the event occurred. Instead, most of the damage assessment covered in this report was taken from an assessment prepared by the City of Asunción, which appears to be the only one undertaken by any institution or individual, as well as discussions with people who witnessed or suffered from the floods.

Events have overtaken some of the terms of reference that were prepared nearly a year ago for this assignment. Six months ago, the City of Asunción began the preparation of a pre-feasibility study to redevelop the entire waterfront of Asunción, which essentially consists of the squatter settlement areas abutting the Paraguay River where about 50,000 people live, of which more than one-half live in the flood plain. As will be explained later in this report, this pre-feasibility study is but the first step in a long-awaited solution to the problem of periodic floods in that part of Asunción along the Paraguay River. It should also be pointed out that while the Paraguay River flood also affected smaller cities, such as Pilar and Alberti, as well as rural areas, the terms of reference for this assignment did not cover these equally critical populated areas. Nevertheless, efforts to resolve the overall flooding problems outside should continue, including continued consideration of the recommendations in the OAS report prepared in November, 1992.

## 2 Background and Description

About 50,000 people live along the Paraguay River waterfront in what are called squatter or illegal settlements. These people have chosen to build their homes on land on which they have no title, although many have tacit permission to live in these areas. Most of this occupied land is publicly owned, either by the city or the national government, and for the most part the government agencies which control the land have not forced the occupants to leave nor have they granted them legal title to the land. Some of these families have received a certificate of permission to occupy a particular piece of land, and this was done essentially to give the families some security from other who might wish to eject them from the settlement. Most basic urban services in these settlements are lacking, but, electricity is almost universally available, usually through illegal taps for which the user makes no payment. Communal water taps have been provided in many of the settlements, and again,



fees for the use of this service are not charged. For the most part, the homes are not connected to a sewer service line, and instead pit latrines are the most common form for disposal of human waste. Solid waste collection is also not generally available.

The 1992 Census revealed some interesting statistics about the squatter settlements. In Chacarita, which is the oldest and most densely populated of these squatter settlements, it showed that 97 percent of the homes had electricity, 96 percent had access to running water (usually a communal tap), 29 percent had a connection to a sewer line, and 21 percent had their garbage collected. On the other hand, Bañado, one of the newest and least densely populated squatter settlements, still 97 percent had electricity, however access to the other three services was much less: 63% water, 1% sewer and zero percent garbage pick-up. In more well-to-do neighborhoods like General José E. Diaz, the coverage figures are very high. Overall figures in Asunción, for comparative purposes, showed that 99 percent had electricity, 92 percent water, 52 percent sewer, and 79 percent garbage pick-up.

Public services in Asunción and two selected neighborhoods

Area	Electricity	Potable Water	Sewer Connection	Garbage Pick-up
Asunción	99.4	92.1	51.5	78.8
General Diaz	100.0	99.9	89.2	99.9
Chacarita	97.3	96.0	29.2	21.4
Bañado	97.1	63.0	1.0	0.0

Source: Censo Nacional de Poblacion y Viviendas, Asunción, Paraguay, August, 1993

Housing conditions vary considerably in the squatter settlement areas. In some of the older settlements, in particular those just below the central downtown area of Asunción where Chacarita is located, some of the housing is quite substantial, having masonry walls and floors and a tiled roofs. Very flimsy constructions of cardboard and other temporary materials still exist in this area, but much of the housing lies somewhere in between the two extremes. In other waterfront neighborhoods, especially those to the north and south of central Asunción, overall construction is less substantial with wooden structures predominating.

As a result of the recent floods, more housing is being built on wooden stilts, which are able not only to withstand any flood damage, but permit the family to remain in their home safely during the flood. Some experimentation to improve the construction of this type of housing is now taking place, with the idea that fisherman may have to remain in the flood plain in order to pursue their livelihood. Since they have boats, living through but above the flood, would be feasible. In other cases, families are building houses of two stories, where

the family can at least keep furniture and other belongings safe from the flood waters, but only if they stay at home.

The recent census also provided some good information on densities by neighborhood or "barrio" and since most barrios generally have common characteristics, the density figures are considered indicative of the crowding conditions. In the barrios housing the squatter settlements, like the oft-mentioned Chacarita, the density of 16,300 persons/kilometer is the highest in all of Asunción's barrios. Moreover, when viewed from the park above the settlement, it is clear that the density is high, given the crowding together of structures, the preponderance of footpaths rather than roads, etc. In the newer squatter settlements along the waterfront to the north and south of the central areas, the structures are spaced farther apart, indicating that the density is probably lower. In fact, the density in newer settlement of Bañado is less than 2,000 persons/kilometer. The very low density is due not only to the fact that some marsh or swampy areas still remain unoccupied, but also to the fact that the plots are larger. In fact, there are more farm animals, like horses, pigs and cows on view in the newer areas than the older, since raising farm animals requires more open space.

The people who live in the flood plains are poor people, generally earning less than the monthly minimum wage. Most are not wage earners, instead they work as street merchants, day laborers, and in other types of manual labor work. They are part of the large informal sector that exists in Asunción and their daily income is anything but stable. Many were born in rural areas, and came to Asunción when work on farms petered out. They generally came without any resources, and therefore had to settle in areas where no one was living or even wanted to live. In Asunción, this turned out to be in the flood plains along the Paraguay River.

The reasons why these poor people opt to live in the squatter areas are many and varied. However one of the most common is economic. Housing in the squatter areas of Asunción do not require any kind of payments, either for rent or purchase. Moreover, the land use is free. Utility payments for the few services that are available are most often not charged or collected. A second overpowering reason is convenience. Particularly in the centrally located areas, many of the residents live within walking distance of employment. Other families live within a short ride of their place of employment and other service centers. This convenience factor is also an economic factor in that transportation costs are nil or minimal.

### **3 The Floods**

Over the past eleven years, the Paraguay River at Asunción has risen above normal levels in four separate years, with the impact varying from year to year, depending on the height to which the water rises. In normal times, the Paraguay River fluctuates between four and five meters above the lowest point in the river bed just off the Port of Asunción. When the waters exceed five meters, flooding begins to occur in inhabited areas. At between five and seven meters, the flooding affects only the illegal settlements that lie along the Asunción waterfront. However when the flood waters exceed seven meters, flooding also begins to affect the

legal or formal neighborhoods of Asunción. The four most recent floods, and the maximum height of the flood waters, are as following:

<u>Year</u>	<u>Height</u>
1983	9.0 meters
1987	5.9
1988	7.8
1992	8.7

The 1983 flood was clearly the worst of the four, since it reached the greatest height. In that year, the waters begin to rise in late May, reaching a peak in early July. Areas above the seven meter mark stayed flooded for about four months, while the areas above five meters remained under water for an additional three months. In early 1992, prior to the flood of that same year, the Red Cross carried out a survey of the flood victims of the earlier floods. This survey identified some 5,750 families, i.e. homes, comprising 26,700 people that were affected by the 1983 flood. These homes were in some 17 identifiable neighborhoods or barrios, located along the entire stretch of the Paraguay River fronting Asunción as well as areas slightly to the north and the south of the city. Extrapolations from this survey indicate that of the 5,750 homes, 3,540 were clearly located in areas below seven meters, and thereby certainly inhabited by families living in the illegal or informal settlements.

The other two floods of 1987 and 1988 which were covered under the Red Cross Survey were less damaging in that in neither case were the flood waters as high. Nevertheless, it would appear that at least 4,350 families were affected by the 1988 flood, which reached a height of 7.8 meters, while a smaller figure suffered from the previous years' flood which attained a level of only 5.9 meters. Flood waters from the latter may have reached some 3,500 families, all of which lived in illegal settlements; none of the families in the formal settlements were affected by the 1987 flood.

Asunción proper has a population of 501,000, as counted in the 1992 National Census. Data for the Metropolitan Area of Asunción is not yet available, however estimates are that the total should reach about 1.2 million souls, depending on where the limits are drawn. The illegal settlements along the waterfront house about 50,000 persons, meaning that about 4 percent of the population of Greater Asunción live on or near to the flood plain. As a percentage of Asunción proper, about 10 percent live in squatter settlements. According to the 1992 Census, the average number of persons per housing unit in Asunción was 4.6 persons, meaning that the 50,000 squatter settlement dwellers would translate into slightly more than 10,000 dwelling units.

One thing should be made very clear. Not all the housing located in the squatter settlements along the Paraguay River is subject to flooding; some housing is located in areas above the flood plain. On the other hand, some of the housing subject to flooding are not in the squatter settlements, rather they are in formal neighborhoods, where the owners have full title to their lot and house, and where services are the norm. Therefore any solutions to the

flooding program must include the formal housing, while any solutions to the overall squatter settlement problem in Asunción must include the squatter settlements located close to but not in the flood plain.

The 1992 Flood. This was the second most damaging flood over the past eleven year period, reaching a height 8.7 meters which was only 300cm lower the 1983 flood. The waters began to rise in April of 1992 and reached an apex in the month of July. After falling for a short period to five meters in September, it started to rise once more, regaining a height of about seven meters in November of that year. It was only in January of 1993 that the flood waters fell below five meters. In all, the flood waters exceeded seven meters for four months between June and September, while it exceeded five meters for a total of nine months. This means that some families living in the lowest part of the flood plain were unable to return to their homes for nine full months.

#### 4 Damage Assessment

The Municipality of Asunción collected data on the damage caused by the 1992 flood. First of all, the number of families affected increased dramatically, to 13,400. This included families who lived in the squatter settlements as well as families in some formal neighborhoods. It was estimated that the number of persons affected by the flooding that year may have reached as many as 65,000 people. The total tangible cost of this flood was estimated at \$25.1 million, as follows:

Cost Item	Milliones of Guaranís
1. Transportation	805
2. Food 10,070	
3. Medicine	1,678
4. Other Social Assistance	335
5. Infrastructure costs	
— ANDE (electricity)	470
— Corporsana (water/sewer)	671
— Temporary latrines	604
— Electricity reconnects	1,128
— Roads and streets	103
6. Temporary Housing	11,279
7. Home Repairs	10,070
<b>Total</b>	<b>37,213</b>
<b>Total in US Dollars:</b>	<b>\$25,144,000</b>

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The above damage estimates do not include intangible and certain tangible costs, such as lost work and school days, household furniture, goods and clothes that were not removed, animals, etc.

The extent of damage to the housing stock in the flooded areas was directly related to the type of materials used in the construction of each house. Minimal damage occurred in houses which were built of solid materials, that is, brick, concrete and tile. The degree to which a house was built of all or any combination of the three controlled the damage. Fortunately, the vast majority of homes in Asunción are of this type. The 1992 Census showed that only 4.8 percent of all the housing in Asunción were either temporary housing (vivienda improvisada), meaning they were built of cardboard, tin, used wood, etc or "ranchos" meaning they had adobe walls, straw roofs and dirt floors. There were only 3,375 temporary houses and 1,864 ranchos out of a total stock of 115,127 units. Given the number of squatter settlements in the 10,000 range, this means that a lot of housing in these areas are built of permanent materials. Nevertheless, the usual damage to this type of home is to the wood used in construction, which are usually doors and windows, including their frames. The temporary homes were often completely destroyed, while the ranchos were more often heavily damaged, particularly, if the waters remained for a long time against the adobe walls.

#### **4.1 Infrastructure Damage**

Basic infrastructure within the flood plain was basically undamaged during the 1992 flood, mostly because little infrastructure exists in the area. All roads in the squatter settlements are unimproved roads, meaning they have not been paved, and essentially are dirt roads. Once flood waters receded, the roads were reconditioned and put into operation again. Water is provided mostly through standpipes, which were put out of commission during the flood, but were turned on again once the waters receded. There are no water-borne sewage systems in any of the squatter settlements.

#### **4.2 Environmental Damage**

The squatter settlements in themselves have a significant negative impact on the Paraguay River. As noted previously, sewer connections are not available generally in the squatter settlements, nor is garbage collection common. In both cases, the waste eventually ends up in the River, and while contamination of the Paraguay River is not yet acute, given the continuing growth and prosperity of Asunción, it is bound to become worse.<sup>1</sup> During flooding, one of the most damaging occurrences is to the city dump, which is located on the flood plain. During the 1992 flood as well as others, this dump was completely submerged, littering the waterfront -- and for miles downstream -- with waste products and materials.

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<sup>1</sup>The fact that untreated sewage flows into the Paraguay River at some five points is not discussed in this paper. Nevertheless it is a critical element in any plan to improve the waterfront.



## 5 Flood Mitigation Efforts

The Asunción River will continue to rise and fall, and in some years, it will reach flood proportions. Based on history, a flood will occur on the average about once every three years. Whether anything can be done to regulate the river waters so as to prevent or at least mitigate the rise is not the subject of this report.<sup>2</sup> But as long as nothing is done to keep the Paraguay River waters at normal levels, then flooding will continue to occur in Asunción, and something will have to be done about families living in the flood plain.

The flood problem in Asunción would be mostly irrelevant if people did not live on the Paraguay River flood plain. Most of Asunción is located on high land, where flooding is not nor has it ever been a problem. Nevertheless there are low-lying areas which were never intended for habitation, so when the river waters rise, people who live there are adversely affected, meaning they are flooded out. It is probable, however, that some people and/or activities need to be on the flood plain, for example, fishing activities and fisherman have to locate on river banks. But as long as the number of people is kept low, and those who remain have adapted to the floods so that the resources of the state or others do not have to be called on, then this may generally be permissible.

The solution to flooding as it affects housing and people can be stated plainly. The people who live in housing on the flood plain can either be protected from rising waters or the people can be moved to housing in areas not subject to flooding. If they remain on the flood plain, then they can be protected in a number of ways, such as building housing on stilts for people who have boats, building walls or dikes around entire areas, raising land levels above the flood heights, etc. Some of these remedies have been implemented in Asunción over the years, usually in piece meal form, but they have neither resolved the problem nor prevented the growth of housing and population in the flood plain.

### 5.1 NGO Relocation Efforts

The other remedy is to relocate entire families, and over the past decade or so, there have been a number of projects in this aspect. Usually this has occurred through the efforts of an NGO, most often an NGO associated with a religious group. Some of the most important of these groups are:

- Equipo Nacional de Pastoral Social
- Equipo Arquidiocesano de Pastoral Social
- Comité de Iglesias de Ayuda para Emergencias
- Obras Sociales Salesianas

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<sup>2</sup> See the Organization of American States report entitled "Proyecto de Reconstrucción y Desarrollo Integrado del Área Metropolitana de Asunción y de las Ciudades de Concepción, Alberdi y Pilar Afectadas por las Inundaciones" which covers some of this aspect of the flooding.

- Municipalidad de Asunción/CONARAS
- Entidades de Beneficiencia

The overall intention of these groups is to provide housing solutions for very low income families, which would include the squatter families living in the flood plain. Over the past twelve years or so, NGOs have constructed approximately 3,500 housing units. All these projects have many things in common. First of all, there was usually a fairly large subsidy element, such as free land, free technical assistance, below market interest rates, etc., which the church groups were able to finance from donations received both locally and from abroad. Also common was that there was a self-help or mutual self-help element in the development which helped to keep costs low. This self-help element stressed education, something that was constantly brought up in the many conversations with people who participated in the development of these projects. The groups all felt that without a comprehensive educational program directed to the beneficiaries to the point where they became active participants in the development of the project, then the projects would have failed.

These groups also tried, and to some degree succeeded, in tying employment opportunities for the beneficiaries to the development of the project. This was particularly important for families formerly living in the center of Asunción, who, in many cases, would have to find new jobs since they would be too far from previous income sources. And as importantly, it was necessary for the family to have a relatively stable income since in nearly all cases, the families had to make monthly payments to purchase their homes, even though the costs of the housing were subsidized.

One of the most ambitious and successful was the "Programa de Solidaridad Cristiana," which was carried out by Pastoral Social of the Archdiocese of Asunción. Under this project, some 600 families living mostly in the flood plain agreed to move to a site about 23 kms from the center of Asunción. Initiated in 1985, a whole new community called "Manos Abiertas" was created. It included most of the common elements, such as free land, mutual self-help, technical assistance. Donations were received, both locally and externally, which were used to buy the land and to pay the salaries of experts in various fields. A number of different types of units were built, from sites and services to small one and two room units, all of which are expandable at the owner's option. Community facilities were also built by the families as well as the installation of certain infrastructure.

Another less ambitious, albeit important, project was the Chaco-i Resettlement Project, where 74 (out of 454 who lived in the settlement) very poor semi-rural families living on the flood plain on the outskirts of Asunción were relocated to higher land within a mile of their previous housing. To give some idea of the poverty of all 454 families who lived in the settlement, the monthly family income was only 76 percent of the minimum salary. Again, a key element of this effort was mutual self-help, which helped reduce costs. Indeed, in several cases, the construction skills learned by the participants permitted them to continue to earn a living as construction workers. It should be mentioned that the Inter-American Foundation

provided some technical assistance, while local contributors, including the Oga Rapé Savings & Loan Association also helped meet costs.

In every case, these families grasped an opportunity to escape their precarious existence of life in the flood plain and through the help of these social groups received assistance that permitted them to live in good, decent and acceptable housing, with most of the needed amenities. In itself this is a very good solution to a family's housing problem and for that matter, many of its economic and social problems as well. However, it does not resolve the problem of the squatter settlements in the flood plain, since what happens is that other poor families simply move into the vacated house and/or lot. As a result, the number of families living in the floor plain remains the same. This, in the opinion of the author, is the most important finding in this report. Not that it is new or astounding, but rather, that acceptance of this fact will rule out any suggestion that development of isolated housing projects for selected families living in the flood plain will resolve the housing issue there.

## 5.2 Technical Solutions

In general, there do not appear to be any new technical solutions that would have a significant impact on improving conditions for housing poor people in Asunción. The technical solutions currently being applied by the NGOs appear to be the most appropriate solutions at hand. For example, it is clear that for poor people to obtain decent housing, self-help techniques, mutual or otherwise, are required to keep costs down. It is also clear that basic, expandable housing is all that poor people can afford. Subsidies, to the degree they are necessary, must be kept down, in order to reach as many families as possible. Moreover, it has been shown that educating the people, i.e. involving the people in solving their own problems, including housing, is key to the technical development of successful solutions. All these solutions, and more, have been successfully implemented by the NGOs. What is needed is for the solutions to be applied on a much wider scale so that more housing for poor people can be provided.

More traditional technical solutions are also available. For example, one survey<sup>3</sup> of home-owners from among informal workers, indicated that a significant number of those surveyed has used Spanish tile for roofing because they assumed it was the cheapest material. A very basic review of construction costs in Asunción shows that Spanish tile is two and one-half times more expensive than asbestos cement roofing, because of the need to use more wooden supports for the heavier Spanish Tile as well as more qualified, and thereby more expensive, construction workers. While everyone would agree that Spanish tile is by far the most attractive roofing material, it is not the best material for poor people with limited budgets. Perhaps more information of this type would be useful in getting costs down.

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<sup>3</sup> A Housing Survey of 222 informal workers who had participated in the lending programs of the Fundacion Paraguaya de Cooperacion y Desarrollo, in 1988.

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### 5.3 Availability of Land

Land for the purpose of resettling families who wish (or must) relocate from the flood plain is available in Greater Asunción, that is, Asunción proper plus the surrounding and adjoining municipalities. However, little land is available in Asunción proper, other some small plots that might be used to settle a handful of families. Individual lots, with infrastructure, for single family homes or multi-story housing are available, however in all cases the costs of these lots are in excess of what a poor family could pay. Larger plots of land for the development of housing projects for flood victims are available at locations in adjoining municipalities from about 15 kms outward from the Asunción city center. The major factor in the availability of land, as is the case throughout the world, is cost. The farther away from the normal amenities of life, and especially employment, the cheaper the cost of land, and therefore the more affordable for poorer families. This is certainly the case in Asunción.

Larger plots of land with services already in place is not available in these outlying areas, unless the land has already been subdivided and put up for sale to individuals to build on or for the development and construction of a housing project. In this case, the land would not normally be available for families to relocate, since the cost would exceed the purchasing power of the families in question, unless subsidies were provided. Raw land is available for relocating families, however, in all cases, immediate relocation is not possible until the usual bureaucratic and legal procedures are complied with, which takes time. Infrastructure services, particularly water supply, have to be installed before relocation of the families can take place, and eventually the construction of some sort of shelter solution.

### 5.4 Role of CEN

This important organization was created in mid 1990 mainly to prevent or mitigate the consequences of natural and manmade disasters. However, its role is quite broad in that it is also able to direct and coordinate assistance to communities in a state of emergency. To carry out its objectives, it may seek out funds from a variety of sources, including international sources. One of its most important activities has been in the area of developing and carrying out educational and training programs to enable communities to confront disasters, and to communicate to the people and communities those ways and methods to reduce the dangers from disasters. In only a few years, CEN has had a major impact in reducing the costs of some disasters. For example, its successful cholera campaign was one of the reasons why this disease never reached Paraguay. Closer to home, its campaign about the probable consequences of the 1992 flood permitted ranchers to save several hundred thousand head of livestock from drowning.

While it is not directly involved in the provision of housing, except as emergency shelter, nor is it a redevelopment agency, its experience in mitigation of disasters should be applied to any program attempting to relocate families or prevent families from living in flood plains, which is a disaster bound to arrive. Moreover, its experience in education and publicity campaigns will be valuable once a major plan to redevelop the flood plain is implemented.

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One of CEN's major problems today is the lack of a steady source of funds so that it can carry out its assigned role properly. The supply of these necessary funds would go a long way to improving CEN's ability to reduce the impact of disasters as well as improve its immediate response capability.

### 5.5 CONAVI's Housing Programs

CONAVI has developed several programs to assist low-income families. The Social Interest Housing Program and the Economic Housing Program are two variations of its low-income housing programs. Both programs are directed to low-income families, with the Social Interest Housing Program reaching a slightly lower income group through the provision of direct subsidies. Loans are virtually free; only a three percent administrative fee is charged annually. CONAVI has also made loans to some of the NGOs mentioned in the previous section to develop their low-income housing projects. It makes loans to cooperative groups and other associations to build housing for their memberships. One of the more successful of these programs is the Credit Union Project, which is being undertaken with the assistance by the Cooperative Housing Foundation (with AID funding) and the Peace Corps.

One of the more interesting ways in which CONAVI is cooperating in the development of low-income housing was recounted by the Director of the Comité de Iglesias para Ayuda de Emergencias. From time to time, a group of poor families will invade a piece of privately owned land, usually owned by an absentee landlord. When the landowner attempts to remove the group or require that the group purchase the land, CONAVI will intervene and through negotiations with the landowner, the land occupiers and usually the NGO acting on behalf of the land occupiers, will purchase the land. CONAVI will then sell the land to the occupiers, thereby resolving the issue to everyone's satisfaction, normally.

In March of 1992, CONAVI and IDB signed a loan agreement in which IDB would provide \$54 million in loans which would offer housing solutions for about 12,500 low-income families. The implementation of this project has been delayed for a number of bureaucratic reasons, including the necessity of obtaining approval of the Paraguayan Senate and the requirement of the Government to allocate \$6 million in counterpart funding, which was not previously budgeted. These hurdles have now been overcome and it appears that the loan will go forward. The major elements of this program is that CONAVI will provide direct subsidies to qualified borrowers, the borrower must agree to participate in a saving program and the loan to the beneficiary will be made through a financial intermediary, not through CONAVI. Implementation of this program will help to redirect CONAVI from its direct involvement in lending, which is its normal operating procedure. Insofar as this program was designed mostly by a group of Chilean consultants, it is referred to the Chilean system. At least one of the Saving and Loan Associations, Oga Rapé, expects to participate in this innovative (for Paraguay) program.



## 6 The City of Asunción Plan

In May of 1993, the Asunción municipal government initiated the preparation of a pre-feasibility study or plan to develop the entire waterfront area, referred to generally as the Franja Costera or Coastal Strip Plan. The overall objective of this effort is to redevelop all the squatter settlements that lie within the flood plain as well as the squatter settlements that abut the same area, an area encompassing about 50,000 inhabitants. The first phase of the city's overall plan, which is now virtually complete, consisted of the following elements:

- Information gathering;
- A preliminary diagnosis of the problem;
- Development of alternative strategies for resolving the problem;
- The Pre-feasibility study itself, incorporating the above information and analysis; and
- Recommendations for priority projects.

This Pre-feasibility Plan is now virtually complete and certain elements of it have been revealed by the Urban Development Division of the Municipal Government, which is responsible for its development. First of all, the plan recognizes that there are a number of problems in the flood plain, all of which are to a large degree environmental problems that will have to be attacked on a comprehensive basis in order to resolve them. Further, the plan recognizes that there is not just one solution to the various problems. It has identified instead at least seven different types of programs that will have to be developed in the entire area. These seven programs are:

- Infrastructure works to protect the coastal area;
- Housing development projects;
- Relocation of families affected by floods;
- Upgrading of squatter settlements;
- Protection of natural resource areas;
- Employment opportunities; and
- Development of commercial activities.

It is clear that this will be a comprehensive and complex undertaking. It will involve the construction of major infrastructure works, including sewer treatment plants to prevent the flow of untreated sewage from throughout Asunción into the River. It will involve dredging sand from the River bed to raise the land in parts of the flood plain, thereby making these areas attractive for commercial development. It will involve the upgrading of the slums that are on higher ground, by providing the required infrastructure and by making these areas available to families that must be relocated. It will require providing educational, and thereby employment opportunities for families that may, by necessity, have to be relocated in areas away from their present place of employment.

The private and public sector are expected to be involved and external financing as well and local funds will be solicited. It is expected that external financing from one of the development agencies will be forthcoming for the coastal protection infrastructure program. For the relocation of families and the upgrading of the squatter settlements, contributions from local government institutions will be the main source of funds, although external funds are clearly an option here. For the other four programs, it is anticipated that the private sector will take the lead, including the use of concessions to private sector organizations for the development of parks and other natural resource areas along the riverfront.

The City Officials and Staff who prepared the Plan were assisted by the members of the Faculty for Environmental Sciences at the University of La Plata of Argentina. Rough estimates are that the cost of this project will be in the \$150 million range, although more detailed planning will provide better cost figures. As mentioned previously, these funds will be derived from the private as well as the public sectors. Also it has been designed so that the entire plan does not have to be implemented simultaneously. Instead, pieces of the Plan can be carved out and implemented, depending on the interest of the developers and city officials and the availability of funding. Nevertheless, once an area is developed, the comprehensive approach of the Plan's developers will ensure that families will not be permitted to resettle in the redeveloped areas.

Almost from the outset, it was anticipated that the Inter-American Development Bank would play a role in the undertaking of this project. During the preparation of the Plan, an IDB planner was extensively consulted during his five week stay in Asunción in July and August, 1993. The President of IDB, who was in Asunción in August of 1993 for the inauguration of the new Paraguayan President, was briefed on the Plan, and in fact, took a helicopter ride along the waterfront so that he could see for himself the problems squatter settlements and pollution were causing. He was accompanied on this ride by the new President of Paraguay and the Mayor of Asunción. It is generally understood that he confirmed IDB's continued support for this important project.

The Pre-feasibility Study now being completed by the City will be presented first to the Inter-American Development Bank as a part of the Government of Paraguay's request for financial assistance. If the IDB agrees to consider this request, then the IDB will prepare a project to incorporate and eventually finance selected parts of the Coastal Strip Plan. Since this is the first probable source of financing from the international lending community as such, it should be a harbinger for further international assistance.

Two official Paraguayan delegations to the IDB will leave shortly. At a meeting on September 17, 1993, between the President of Paraguay and his Ministers of Public Works and of the Interior (to which CEN reports) and the Mayor of Asunción and key staff, the President expressed his support of the Coastal Strip Plan. At this same meeting, it was revealed that the Minister of Public Works would travel to the IDB headquarters in Washington the following week to discuss the public works component of this project. It was also confirmed that the Municipality will send a three person delegation consisting of the Mayor

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of Asunción and two of his chief staff members to Washington on the 7th of October to present formally the Plan to the IDB.

It should be pointed out that all IDB loans to Paraguay require the guaranty of the National Government. For that reason, the City had previously sent a request to the Ministry of Interior requesting the support of the government. The meeting just held between the highest level of the National and City governments indicates that this guaranty will likely be given. This meeting further indicates a much improved relationship between these two levels of government, a relationship that must be a close and cohesive one if the Coastal Strip project is to be implemented successfully.

## 7 Conclusions

1. Resolving the housing problem of families living in squatter settlements in the flood plain will not be resolved by moving small selected numbers of poor families to better housing on land above the flood plain. Those efforts, while good in themselves, cannot succeed in resolving the problem since other poor families simply move into the vacated units and/or plots. Nevertheless, these efforts should continue as long as there are people living in the flood plain, if for no other reason than that the lessons learned from the educational and community involvement programs must be applied to the Coastal Strip Plan if the latter's relocation efforts are to be successfully carried out. Also, as long as there are squatter settlements anywhere in Paraguay, the involvement of NGOs will be necessary to lead the way with new techniques and methods to resolve the problems of squatter settlements and the poor people living in them.
2. The squatter settlement problem in the flood plain is not just a housing problem, but rather it is a number of problems: employment, education, land tenancy, transportation, environmental, etc. Therefore, the squatter settlement problem in the flood plain and elsewhere must be attacked across a broad front if the problem is ever to be resolved. This comprehensive approach is one that the City of Asunción Plan appears to be taking.
3. The problems involved in relocating poor families from one area to another should never be underestimated. In spite of the danger of periodic flooding, the large majority of the families in the flood plain will probably prefer to stay where they are rather than move, particularly if the move is a far one, for reasons that were stated in this report. Therefore, all government agencies must be prepared to face a wave of opposition and criticism, and the onslaught of demagoguery once any removal plans are made public. This confirms the need to involve the people themselves in the planning efforts.
4. Given the low-incomes of the people living in the flood plain, affordability of housing solutions will be as important an issue as identifying and tapping sources of capital to carry out any large housing programs. The issue of subsidies and their costs will certainly hamper the development of housing relocation programs. The use of those old techniques of self-help and mutual self-help can help to reduce costs.

5. Any effort to resolve the problem of the flooding of housing must be a integrated effort by all levels of government and with the active involvement of the private sector. To the degree possible, funding from the private sector should be prioritized in order to reduce the drain on the Government's budget.

## **8 Recommendations**

1. The only foreseeable and possible solution to the resolution of the housing problem in the flood plain is the City of Asunción Plan as discussed in this report. Therefore, it is recommended that all interested participants, internal and external, must evince strong unadulterated support for this Plan.
2. The city officials involved in the development of the Plan indicated that the statistical base on which the Plan was prepared utilized only existing data and that other and more up-to-date information would be required, particularly information on the people living in the affected areas. Recognizing further that more comprehensive statistics will be necessary to do detailed planning, and that the IDB will require more information to prepare its financing package, it is recommended that the City immediately initiate gathering that information, including seeking out outside sources of financing to assist them in this effort.
3. Once the Plan is in the public domain, efforts should be initiated immediately to inform the general public of the benefits to be accrued from the Plan's implementation. Since the plan is sure to have its opponents, the only way it will be approved through the newly won democratic process is for the public to give its overall approval.
4. Efforts used by NGOs to relocate families in the past should be studied closely. The implementation of technical solutions currently being employed by the NGOs should be adopted and built on. Bringing in untried technical solutions, rather than sticking with tried and true in-country solutions, would be fruitless. Therefore, government agencies involved in the larger relocation efforts, assuming the Plan is implemented, should lean on the experience of the NGOs in this area.
5. The money hunt should begin once the Plan is in the open. City officials should be prepared to make professional presentations to interested developers and financiers. Moreover, the city must begin to identify and tap into the financial and technical resources that will be required to implement the City of Asunción Plan.
6. CEN has an important role to play in this relocating process. The sooner the families are relocated from the flood, there will one less disaster problem about which CEN will have to concern itself. Therefore, CEN's principal contribution to implementing the Coastal Strip Plan should consist of ensuring that the mitigation aspects of the project are taken into consideration and to help coordinate the input of the participating National Government agencies. Moreover, the experience CEN has in developing and carrying out

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educational and publicity programs should be applied to ensure that the relocation efforts go as smoothly as possible.

7. The fact that this report did not include a discussion of the flooding problems in other parts of Paraguay, does not negate the importance of finding ways to mitigate flooding by the Paraguay River. The recommendations contained in the OAS report should continue to be considered and ways to implement them explored.

**Appendix A:**

**Contacts**

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## Contacts

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### **Comite de Emergencia Nacional (CEN):**

Artemio R. Nunes, Director General

Carlos Victoria Pozzi, Coordinator General

Elvio R. Brizuela, Chief, Department of Programs and Operational Assistance

### **Consejo Nacional de Vivienda (CONAVI):**

Gustavo Adolfo Pedrozo, President

Francisco Knapps, Director of International Cooperation

Luis Silvio Rios Cabrera, Community Liaison Advisor

### **Ministry of Public Works and Communications:**

Hugo Enrique Gomez Miranda, Vice Minister

### **Municipality of Asunción:**

Gonzalo Garay, Director, Urban Development Division

Raul F. Monte Domerq, Director, Economic Planning Division and International Cooperation

Jorge Arturo Herreros, Urban Development Division

### **Oficina de Estadísticas y Censo:**

Victor Mora Martinez, Director

### **Oga Rapé Saving and Loan Association:**

Antonio E. Avalos, General Manager

Arnaldo Cabrera, Manager, Branch Office Network

### **Fundación Paraguaya de Cooperación y Desarrollo:**

Luis Fernando Sanabria, Chief of Programs and Resources

### **Centro Paraguayo de Estudios Sociológicos:**

Domingo M. Rivarola, Researcher

Luis A. Galeano, Researcher

### **Comite de Iglesias para Ayuda de Emergencias:**

Cristina Vila, Director

### **Equipo Arquidiocesano de Pastoral Social:**

Liz de Giangreco, Social Programs

Bruno Martinez, Engineer

**Cooperative Housing Foundation:**

Todd Sorenson, Resident Advisor/Paraguay

**Inter-American Development Bank:**

Agustín Riveros, Resident Representative/Asunción

Peter Smith, Operations Department/Washington

**Peace Corps/Paraguay:**

Kristine Bacon Vega, Country Director

**U.S. Embassy/Paraguay:**

Gerald McCulloch, DCM

**USAID/Paraguay:**

Richard Nelson, AID Representative

Oscar Carvalho, Program Officer

**USAID/RHUDO/SA:**

William Yeager, Director

Sonny Low, Deputy Director

Chris Milligan, Regional Housing Officer

**Appendix B:**  
**Statement of Work**

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## STATEMENT OF WORK

### PARAGUAY RIVER FLOODING TECHNICAL ASSISTANCE

#### 1. BACKGROUND

Due to flooding caused by the Paraguay River earlier this year, over 13,000 families have been displaced from their homes located on the marginal lowland areas along the Paraguay River. To assess the damage to Paraguay's basic infrastructure caused by the flooding, the GOP has requested technical assistance from the U.S. Government and the United Nations to help the GOP set its priorities and specific courses of action for future reconstruction. (See Asunción 002073 of June 22, 1992, attached for details).

#### 2. SCOPE OF WORK

Due to the importance of this GOP technical assistance request, RHUDO/SA responded by Quito 06621, of July 8, 1992, (see attached) to indicate its interest to collaborate with OFDA and UNDP/ECLAC to undertake a cost study of damages and identify near and long term solutions in the shelter sector in conjunction with the subject activity.

In addition to assisting in assessing the extent of damages in the shelter sector, RHUDO proposes that the Contractor designated to carry out the assignment should examine the following kinds of alternatives in dealing with the shelter needs of lower income families which have been occupying the marginal lowland areas along the Paraguay river.

For this purpose the Contractor shall:

Undertake a quick assessment of alternative locations for settlement, which are less vulnerable to flooding, but still provide adequate access to basic services (potable water and electricity), including transportation to areas where residents are currently employed or do business.

Identify alternative locations for settlement which lack basic services and transportation but, with minimal investment, could provide opportunities for lower income shelter development. (This option could involve the participation of municipal governments, NGOs, other private sector interests and/or specialized central agencies in undertaking rapid, low cost solutions for land servicing and shelter development). Jointly programming capital

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assistance from other donors would be part of this solution, if GOP resources are inadequate.

Identify options for how current AID-funded technical assistance to credit unions to expand shelter-related lending to lower income groups could be directed toward the flood victims to enhance affordability of shelter solutions in alternative locations.

Explore innovative building technologies in lowland areas of the river basin would also be undertaken.

### 3. REQUIREMENTS

#### 3.1. Actions

- A. The Contractor assessing the extent of damages in the shelter sector shall travel to Asunción, Paraguay, on the same dates agreed to by USAID/Paraguay, OFDA/San José, RHUDO/SA, and the GOP's National Emergency Committee (NEC) when the contractor/consultant team to be fielded by the OAS is sent to Paraguay within the next three to six months so that both parts of the damage assessment will be properly coordinated. That is, if USAID/Paraguay and the GOP agree that the Technical Assistance Mission should be planned in two phases - i.e. a preliminary and subsequent visit phases - OAS and PADCO contractors should work together on both phases.
- B. The Contractor jointly with RHUDO/SA and OFDA/San José officials shall hold the necessary meetings with the AID Representative in Paraguay and with GOP officials recommended by the Paraguay AID/Rep to become properly oriented to complete the technical assistance assignment.
- C. The Contractor shall prepare a draft written report of the analysis of the Paraguayan situation which fully addresses the SOW presented in section 2. above and includes conclusions and recommendations for full integration with the report to be prepared by the OAS part of the damage assessment team. Also, the Contractor shall incorporate RHUDO/SA's proposed changes (if any) to the draft report, especially regarding the shelter program considerations, and send to RHUDO/SA's assigned Project Officer a final report, per the schedule established by RHUDO/SA.
- D. Prior to starting this assignment and at the close of the field work phase, the Contractor responsible for the shelter sector part of the damage assessment is to plan a stop-over in Quito to receive proper RHUDO/SA guidance to start the assignment and to debrief RHUDO/SA following the completion of the field work portion related to shelter sector considerations.

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### 3.2. Reports / Products

The Contractor shall prepare a written report of his/her work, in accordance with the specifications cited in Sections 2 and 3.1 above.

A draft report shall be prepared in both English and Spanish within 5 work days after the conclusion of the field work. The Contractor shall deliver 6 copies of his report to the Project Officer.

The Contractor will receive from the Project Officer comments on the draft report. The Contractor shall then deliver to the Project Officer the final report, revised to respond to comments by no later than 14 working days after receipt of comments.

### 3.3. Relationships and Responsibilities

The Project Officer for this Purchase Order will be Sonny Low, RHUDO/SA, or his designate.

The Contractor will contact the AID Rep in Paraguay, Richard Nelson and those GOP officials recommended by the AID Representative who will provide the Contractor with the required background and orientation required to complete the technical assistance assignment.

USAID/Paraguay and RHUDO/SA will bear the primary responsibility to properly support the Contractor to perform the services contracted.

### 3.4. Period of Performance

The Contractor shall begin work on the date to be fixed by USAID/Paraguay, OFDA/San José, RHUDO/SA and the GOP within the next three to six months. The work shall be finished by no later than the date to be fixed by the same parties cited.

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