CIVIL

DEFENCE

IN

BRAZIL

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No	INDEX	PAGE
	Chapters:	
I	Brazil General Information	01
II	The development of Civil Defence in Brazil	05
III	Civil Defence Phases	09
IV	Evolution of Civil Defence	13
V	Disasters in Brazil	14
VI	The most important disasters in Brazil	15
VII	Our disaster and their causes	18
VIII	The big earthquakes in Brazil	21
IX	The most environment destruction	22
X	Rio de Janeiro Fire Department - Emergency vehycles	23
	Graphics	24

I

BRAZIL - GENERAL INFORMATION

Official Name: Federative Republic of Brazil

Capital: Brasilia

Nationality: Brazillian

Religion: Christianity (catolics 93%; protestant 1%; african cults)

Area: 8.511.965. km2

Population: 145.564.395 hab. (1985)

Physical Characteristes: Brazil was named after the country's first exported product, the "pau brasil" (brasil wood) which was used for lumber by the portuguese colonizers at the beginning of the 16 th century.
Brazil occupies half of South American's central eastern region, it is the largest nation in Latin America and the fifth largest in the world after the Soviet Union, The United States, Canada, and China.

Climate: Most of Brazil is located between the Equator and the Tropic of Capricorn which means that average temperatures, on a yearly basis, are not extreme. On average, the highest temperature is 27.5 dregrees centrigrades (aproximately 81 degrees fahrenheit). Depending on the time of year the climate in Brazil ranges from the tropical weather of the amazon region with it's heavy rainfalls, to snowfalls in the south.

Political Division: The Federative Republic of Brasil is divided into 25 states, one federal territory and one federal district. (Brasilia, the Capital).
Brazil is divided into five geographic regions:

North (N): with the states of Amazonas(AM), Para(PA), Acre(AC), Rondonia(RO), Roraima(RR) and Amapa(AP).

Northeast (NE): with nine states - Maranhao(MA), Piaui(PI), Ceara(CE), Rio Grande do Norte(RN), Paraiba(PB), Pernambuco (PE), Alagoas(AL), Sergipe(SE), Bahia(BA) and one federal territory, Fernando de Noronha Island.

Southeast (SO): made up of the states of Minas Gerais(MG) , Espirito Santo(ES), Rio de Janeiro(RJ) and Sao Paulo(SP).

South (S): with the states of Rio Grande do Sul(RS), Santa Catarina(SC) and Parana(PR).

Central West (CW): with the states of Goias(GO), Mato Grosso(MT), Tocantins(TO), Mato Grosso do Sul(MS) and the Federal District(DF).

River System: Some of the world's largest rivers are found in Brazil: Amazonas, Parana, Madeira, Purus, Jurua, Sao Francisco and Araguaia are some examples. The world's largest river in terms of volume is the Amazonas which has a water flow of 12.5 milion liters per minute.

Highest point: Pico da Neblina (3.014 m)

Principal Cities and Population:

- Sao Paulo 10.977.472
- Rio de Janeiro 6.011.181
- Belo Horizonte 2.339.039
- Salvador 2.000.387

Ethnic Composition

- whites, Europeans descendents 54,77%;
- mullatos 38,45%;
- Blacks 5.89%.

Demographic Growth: 2,1%.

Density (hab/km2): 17,3.

Education: (Public and private)

- Illiteracy 18,8%;
- Schools (primary and secundary) 216.947;
- Universities 902 instituitions;
- Budget applied in education 6,6%.

Economy:

- inflation 475,11% a year (1990);
- minimun wage US$ 100 (may 1991);
- unemployed tax 3,7%;

- exportations: 31,41 billion of dollars;
- importations: 20,42 billion of dollars;
- extern Debt: 100,40 billion of dollars:
- Goss National Product (G.N.P): 375,146 Billion of dollars;
- rent per capita: US$ 2.550,00.

Transports:

- highways: 1.673.733 km;
- vehicles: 18.272.088.

Communications:

- radio stations, 2.892
- TV stations, 234
- telephonic lines, 9.737.538
- newspapers, 279 diary

Health:

- natality: 28 per 100 (1985-1990)
- mortality: 7.9 per 1000
- childhood mortality: 61 per 1000
- medium life (years): man: 62,3 and woman: 67.6
- hospital beds: 1 per 281 hab.
- doctor: 1 per 684 hab

Obits cases - 4-14 years:

- traffic accidentes: 9,5%
- other accidents:18,1%
- cancer and neoplasys: 10,8%
- acute respiratory infections: 7.2%
- others: 4.4%

Obits cases - 15-49 years:

- murders:12.4%
- cancer and neoplasys: 10.7%
- traffic Accidents 10.0%
- other Accidents 10.0%
- brain and Blood vessels diseases 7.3%

Obits cases - 50 and more years:

- cancer and neoplasys: 17.3%
- heart Diseases: 17.1

- brain and blood vessels diseases: 16.6%
- other pulmonary and heart diseases: 10.2%
- acute respiratory infections: 4,0

Positions in a world:

- *5th* biggest
- *5th* in population
- *1st* in deforestation (22.325 km2 in 1982-1987)
- *6th* in University Students
- *10th* in world economy
- *3rd* in inflation tax
- *1st* in extern debt
- *2nd* in cattle (pecuary)
- *6th* in steel production
- *5th* in ship construction
- *2nd* in highways

II

THE DEVELOPMENT OF CIVIL DEFENCE IN BRAZIL

In Brazil the development of efective measures in field of the prevention of disasters starts in 1968 with the creation of Civil Defence of Guanabara State (actually Rio de Janeiro State), the experience of floods and landslides ocurred in this state in January 11, 12, 13 of 1966 where the determinant points of failures were the followings:

a. ausence of warning devices
b. lack of Civil Defence Organizations
c. rivers and chanels obstructed
d. houses in improper localisations
e. deforestation

Before this time the existence of Civil Defence Concepts was directioned only in the situations of war in according with the War Superior School's (E.S.G.) doctrines.

After the situation the Brasilian Government understands the importance to change concepts and criate new departaments able to administrate emergencies, fast as possible, promote local disaster preventive plans, preventive measures and recovery.

Today in Brazil we can see that the majority of the municipalities have in the prefectures one division called Municipal Civil Defence Co-ordination (C.O.M.D.E.C.). For this reason in which the municipalities is the basic cell of the nation and the measures of protection of the population should be best as possible.

URBANIZATION AND DISASTERS

The rapid population growth generally occurs with desordenation, before the authorities have sufficient time for planning of new settlements. This is the true fact with poor com-

munities increasing day by day. Due to high prices of land and in continuous growth in contrast with the real difficult of purchasing power of the population with a lower income.

In Brazil more the 50% of population will be living in urban areas by the year 2000, and the country doubles it's urban population in the next 25 year increasing more and more. The urban poor living in slums, flood plain and squatter settlements, there is often a doubling population every seven years or less. The sheer magnitude of the human problem in disaster prone areas, especially the rapid expansion of these settlements and the concentration of human indicates today that relief measures and post disaster action are by themselves not sufficient.

Now the government tries to aplicate of city planning laws and zoning regulations based on vulnerability analysis. The key to ensure this situation, now developed in data processing centres in universities in (Rio de Janeiro, Sao Paulo, Parana and Minas Gerais Universities) giving one part of the solution to the problem with the apropriate development project as vulnerability of the region in question.

WARNING SYSTEM IN CIVIL DEFENCE

The early warning system for citizens in Brazil uses principally television and radio broadcasts to warn the public in emergencies, based on principle of the degree of reability, wich accorded to the source of information and instruction is known to be a major factor in determining the quality and speed of the public response. Especially this is so in emergencies in which the individual cannot perceive the danger through his own senses for example where impeding industrial, or even radiation, accident can be foreseen by competent authorities. The credibility of the sources of public warning about emergency today is protected if mutual undestanding, and confidence was to be achieved to avoid social confusion, this is not, what we thinks, only a matter of positive action, plus a matter of avoidance of certain actions, such as the issuing of demonstrably innaccurate information, or issuing accurate information too slow, which tend to diminish the credibility.

DISASTER PREVENTION EDUCATION

With the finality to cope with disasters affectively, the government, prefectures and the municipalities established the disaster prevention system and the population should have special participation.

In the southeast region, the most developed of the country, approximate 20% of citizens have some information how to prevent disasters. However in consideration with this number. small in principle, many volunteers Disaster Prevention Organizations were created and trained furthermore the act such as a "Multiplier Element" by difusion of knowledgment on disaster prevent to others persons.

In public schools the Disaster Prevention Education should be increased in this year curriculum of students because of the importance today.

One project also was developed in some fire Departments, the "Small Fireman" (Bombeiro Mirim), this project has great acceptance and consideration by the society, the group composed of boys aged 10-16 years have been formed, so they will have knowledge about fire prevention at homes and in communities. After three years the Rio de Janeiro Fire Dept. was 1500 members.

VOLUNTEERS AND NON-GOVERNAMENTAL ORGANIZATIONS

Unhappily in Brazil people still do not have totally one great vision of investment in disaster measures of prevention because of two essential reasons:

a. the disaster, in special the natural disaster not occurs with great frequence and their impacts over the persons and economy is not big.

b. the economic situation puts conditions for application in other plans of development such as health and education.

However little by little Civil Defence enlightened the public giving to the community the importance of "Think in Safety" and the local authorities have as theirs priorities in the aplication of Disaster Countermeasures, this fact if reinforced essentialy by the technical formation of personel and interchanges with others Civil Defence Organizations.

Some great enterprises also give their colaboration for the formation of teams of Volunteers Corps with it's employees and the citizens of proximidity in the "Work Accidents Preventions Week" called SIPAT and in cases of bigger accident the activities and actions of this teams are subordinated and coordenated by Municipal or State Civil Defence Organizations, all the organizations with this characteristic to belong the "Non-Governmental Entility Council" (C.E.N.G).

WAYS OF PREVENTION OF DISASTERS

Unfortunately in Brazil we have one special problem in great centers relationed with the dual phenomena of rapid urbanization and the high rates of population growth, particularly in our case of one developing country.

We suppose that many disasters considered as a distinct from the natural phenomena wich cause them can be avoided. Virtually all natural phenomena liable to cause disasters share one common feature: although it may be not possible at the present stage of scientific knowledge to forecast when they are going to happen (except a few hours beforehand in some cases). It is often possible to predict with a reasonable high degree of accuracy where they are most likely to occur, for example in our situation in flood plains and slums.

The way to prevent the potential hazards in effective countermeasures in Brazil are:

a. various professions and persons should be alerted for the real situation, your risks and trained in prevention techniques;

b. the community should be educated on disasters;

c. the population should always as possible be informed about all precautions taken and the result of measures to be applied.

III

CIVIL DEFENCE PHASES

a.) **PREVENTIVE PHASE** - consist of two types of actions in distinction.

Actions of Communitary Activities	Actions of Protecting
☐ Increase the conscience of population. ☐ Public orientation programs. ☐ Spread Civil Defence philosophy and communitary associations.	☐ Give informations to public about the correct procedures. ☐ Selection of local for shelters. ☐ Analyse evotuation, planning. ☐ Inspection of critical points. ☐ Works of preventive caracteristics. ☐ Register of resources. ☐ Observation, warning, mobilization.

b) **PHASE OF HELP** - divided into two procedures forms:

Actions of help.	**Actions of Suport.**
☐ Rescue of affected population. ☐ Evacuation of population in immediate danger. ☐ To ensure exit conditions. ☐ Give of medical emergency help. ☐ Catastrophe medicin. ☐ Vaccination of population due threat of infection.	☐ Shelter of diseabled population. ☐ Initial evoluation of dammage and risks. ☐ Adotion of protecting measures. ☐ Support to organizations directly exert in help actions.

c) **PHASES OF ASSISTANCE** - give a correct evoluation about the fact and their consequences. Same as previous she also give two different aspects.

Actions of Community Assistance	Actions of Local Assistance
☐ Selection and Register. ☐ Localization of disapeared persons. ☐ Identification of deads and injureds ☐ To gather of goods and possessions loosed. ☐ Post of public attendance. ☐ Medical assistance in hospitalar units. ☐ Conservation of medicines. ☐ Give best condition of shelter and food. ☐ Guard of donative, material resources and goods of diseableds.	☐ Re-establishment of essential public services. ☐ Desobstruction and remotion of debris in affected area. ☐ Evoluation of dammage. ☐ Progressive return to normality.

d) PHASES OF RECUPERATION - the more extensive and expensive than others give the return to normality. Have two types of actions:

Actions of Recuperation	Actions of Prevention
☐ Recover the plenitude of public and private services. ☐ Re-establishment of society moral. ☐ Recuparation of houses. ☐ Slope containment measures.	☐ Establishment of preventive measures, after the fact analisys in affected region. ☐ Avoid the repetition and new consequences caused by disaster. ☐ Evoluation all operation with objective of improve the future actions of Civil Defence System.

IV

EVOLUTION OF CIVIL DEFENCE LAWS IN BRAZIL

After the II World War, the armed forces, by your organs of planning and his military schools developed many projects with objective to give estructure to Civil Defence in Brazil:

— 1949 - Giving the responsabilitie of Civil Defence to Ministry of Aeronautics (not aproved).

— 1950 - War Superior School - giving the first structure.

— 1958 - Establishment of Civil Defence with advisory of staff of armed forces.

— April 4, 1960 - Law 3.742 - Federal aid for natural disasters.

— After the revolution of March 31, 1964 - giving authoritie in Civil Defence structure to fire departments in your states.

— Magna Chart of January 24, 1967 - Union duty for countermeasures in floods and drought.

— Decret-Law 200 of February 25, 1967 - give responsabilitie to Home Office giving assistance to population in case of disasters.

— Decret-Law 95 of Octuber, 1969 - establishment of Public Calamities Special Found (FUNCAP).

— Decret 66.204 of February 13, 1970 - Regulamentation of FUNCAP and their applications for medicines foods, dresses, etc.

— Decret 67.347 of Octuber 5, 1970 - Creation of special group for matters in public disasters (GEACAP) where is designated the importance of the municipality in one first aid.

— Law Project of 1991 - (new Constituition of Brazil) establishment of national system of Civil Defence.

V

DISASTERS IN BRAZIL

TYPE	FREQ. year	TYPE	FREQ. year
I. *Geological*:		IV. Plagues	
Earthquakes	0.01	Animal	0.01
Tsunamis	0.1	Vegetal	0,01
Vulcanic eruptions	0		
Landslides	~5	V. *Human Disasters*	
II. *Meteorological*		War	0
		Transports	~3000
Hurricane	0	Fires	~60
Tornado	0	Epidemies and endemies	~2
Cloud burst	1	Ground depredation	*1
Avalanche	0	Destruction of environment	*2
Floods	~10	Social disasters	*3
Drought	~23	Explosions	~35
Hail	~2	Contamination	~2
Gale	4	Poluition	*4
Lightnings	3	Energy crisis	0
Forest fires	10	Lack of water	*5
		Technique failures	~5
III. *Sideral Disasters*		Lack of combustibles	0
		Growth density	*6
Meteor	0		
Satellit falls	0		

*1 - Constant.
*2 - Constant, but decreasing.
*3 - Criminality in increasing.
*4 - Maritime and cities increasing.
*5 - Only in drought regions.
*6 - Increasing rapidly.

VI

THE MOST IMPORTANT DISASTERS IN BRAZIL

DATE	LOCAL	DISASTER	STATE	DIED	IN-JURED	DISE-ABLED
JUL/09/43	Park Royal Bldg.	Fire	RJ	01 Fire fighter	15	
MAY/06/54	Braco Forte Island	Explosion	RJ	23 Fire fighter	-	
MAY/08/58	Mangueira, Train Station	Train Crash	RJ	~90	~100	
(?) 1960	Niteroi Circus	Fire	RJ	~400	~200	
JUL/02/63	Astoria Bldg.	Fire	RJ	4	30	
JAN/02/66	Santo Amaro, Shan-tytown	Landslide	RJ	60	100	
JAN/1967	Laranjeiras, many buildings	Landslide	RJ	200	300	20.000
JUL/20/70	Recife City	Flood	PE	194	-	74.000
NOV/20/71	Paulo de Frontin. viaduct	Viaduct fall	RJ	20	22	
FEB/24/72	Andraus, Bldg.	Fire	SP	16	400	
FEB/01/74	Joelma, Bldg.	Fire	SP	188	-	
AUG/18/72	Campos do Jordao, City	Landslides	SP	40	-	
NOV/1981	Teresopolis, high-way	Landslides	RJ	20	-	
MAR/13/82	Sao Sebastiao, food market	Contamination with HAZ MAT	RJ	3	-	

FEB/25/84	Vila Soco, Shantytown	Leak of 700.000 lts of gasoline	SP	90	?	
AUG/16/84	Enchova, petroleum plataform	Explosion	RJ	37	25	
JAN/24/85	Angra dos Reis & Paraty city	Floods	RJ	19	50	15.000
FEB/17/86	Andorinhas Bldg.	Fire	RJ	20		
JAN/27/87	Sao Paulo city	Torrential Rain and floods	SP	95		
FEB/26/87	Petropolis, Teresopolis & Rio de Janeiro city	Flood	RJ	292		10.000
SEP/30/87	Goiania city	Radioactive leak of Cesium 137	GO	5	16	5.000
FEB/01/88	Petropolis, Nova Iguacu & S.J. Meriti city	Floods	RJ	277		2.000
FEB/12/88	Santa Marta, shantytown	Landslides	RJ	06	40	300
FEB/19/88	Santa Genoveva Hospital	Landslides	RJ	18		
JUN/11/88	Pau Bandeira, Shantytown	Landslides	RJ	6	7	
OCT/12/88	Bank of Brazil Bldg.	Fire	RJ	01	10	
DEZ/31/88	Bateau Mouche Boat	Shipwreck	RJ	53		
APR/1989	Northeast Region	Floods	NE	39		
JUN/11/89	Rio de Janeiro city	Floods	RJ	9		200
OCT/24/89	Nova Republica, Shantytown	Landslides	SP	14		
JAN/03/90	Tocantins River	Floods	PA			50.000

JUL/31/90	Recife city	Floods	PE	31		23.000
OCT/14/90	Santa Catarina State	Floods	SC	20		5.000
JAN/1991	Minas Gerais State	Floods	MG	24		25.000
JAN/1991	Rio de Janeiro city	Floods	RJ	25	8	
FEB/09/91	Jaguaribe River	Bus Accident	CE	37		
MAR/19/91	Sao Paulo city	Floods	SP	19		
MAR/27/91	Sao Paulo city	Floods	SP	5		
MAY/12/91	Feira de Santana city	Truck Accident	BA	33	18	
MAY/14/91	Cachoeira do Sul city	Bus Accident	RS	19	19	
JUN/21/91	Niteroi city, fireworks fabric	Explosion	RJ	25	65	
AUG/09/91	Canoinha & Tres Barras city	Ciclone	SC		50	300
SEP/12/91	Dracena city	Bus Accident	SP	14	05	
SEP/18/91	Nova Lima city	Chloridric Acid leak - 6.000 lts	MG			600
OCT/01/91	Itu city	Gale	SP	15	200	
0CT/05/91	Sao Paulo city, viaduct	Bus accident	SP	20	45	
NOV/06/91	Igaracu city	Cloro con-tamination	PE		110	
NOV/09/91	Limeira city	Bus accident	SP	16	40	
NOV/11/91	Recife city	Air crash	PE	17		
NOV/15/91	Parana & Santa Catarina State	Heavy rains	PR/SC	11		20.000

VII

OUR DISASTERS AND THEIR CAUSES

I - LAND SLIDES	- Bad situation of estability and construction of houses in shantytowns - Deforestation in river sides ans slopes - Accumulation of trash in shantytowns - Construction nearly slopes in dangerous situations - Seasonal heavy rain falls (summer season) and the consecquent sudden colapse of ground due to thermal shock
II - CLOUD BURST	- Sudden change in climate conditions
III - FLOODS	- Occupation of pluvial planes - Deforestation of side of rivers - Accumulation of trash in rivers - change of river's courses
IV - DROUGHT	- lack of rain - bad use of land - unsuitable farming
V - HAIL	- sudden change in climate conditions
VI - GALE	- change in climate conditions
VII - LIGHTININGS	- change in climate conditions
VIII - FOREST FIRES	- small humidity in air - burning with farmer finalities

	- intentional actions with many objectives -carelessness - lightnings -expontaneous combustion
IX - TRANSPORTS	- bad condition of some vehicles - bad condition of some roads - bad condition of driver - unsafe acts in driving - dificulty of efficient fiscalization in cars, roads and drivers
X - FIRES	- non-existence of prevention system - intentional fires - unsafe acts - non-existence of trained personel in fire fighting -natural causes
XI - GROUND DEPREDATION	- bad use of land -weather conditions
XII - DESTRUCTION OF ENVIROMENT	- lack of conscience in future - economic interest - accumulation of trash - forest fires - poluition - deforestation - hunting actions -carelessness
XIII - SOCIAL DISASTERS	- lack of severity in judicial system - economy situation -urban growth
XIV - POLUITION	- lack of conscience in future - economic interests

XV - LACK OF WATER	- carelessness - inexistent antipolution system in industries and cities
XVI - TECHNIQUE FAILURES	- commontly in drought regions
XVII - DENSITY GROWTH	- lack of conscience in safety - bad conditions of buildings - bad use of materials in construction - non safety projects - increasing of population - migration to great cities

VIII
THE BIG EARTHQUAKES IN BRAZIL

DATE	LOCAL	STATE	VIC-TIMS	MAG-NITUDE
JAN/27/192	Mogi Guacu	SP	None	5.1
JUN/28/1939	Tubarao	SC	None	5.5
JAN/31/1955	Serra do Trombador	MT	None	6.6
FEB/28/1955	Atlantic Ocean	ES	None	6.3
FEB/13/1955	NW of Mato Grosso do Sul	MS	None	5.4
NOV/07/1969	Atlantic Ocean	RS	None	5.0
NOV/20/1980	Pacajus	CE	None	5.2
AUG/05/1983	Codajas	AM	None	5.5
NOV/30/1986	Joao Camara	RN	None	5.1
FEB/12/1990	Atlantic Ocean	RS	None	5.2

IX

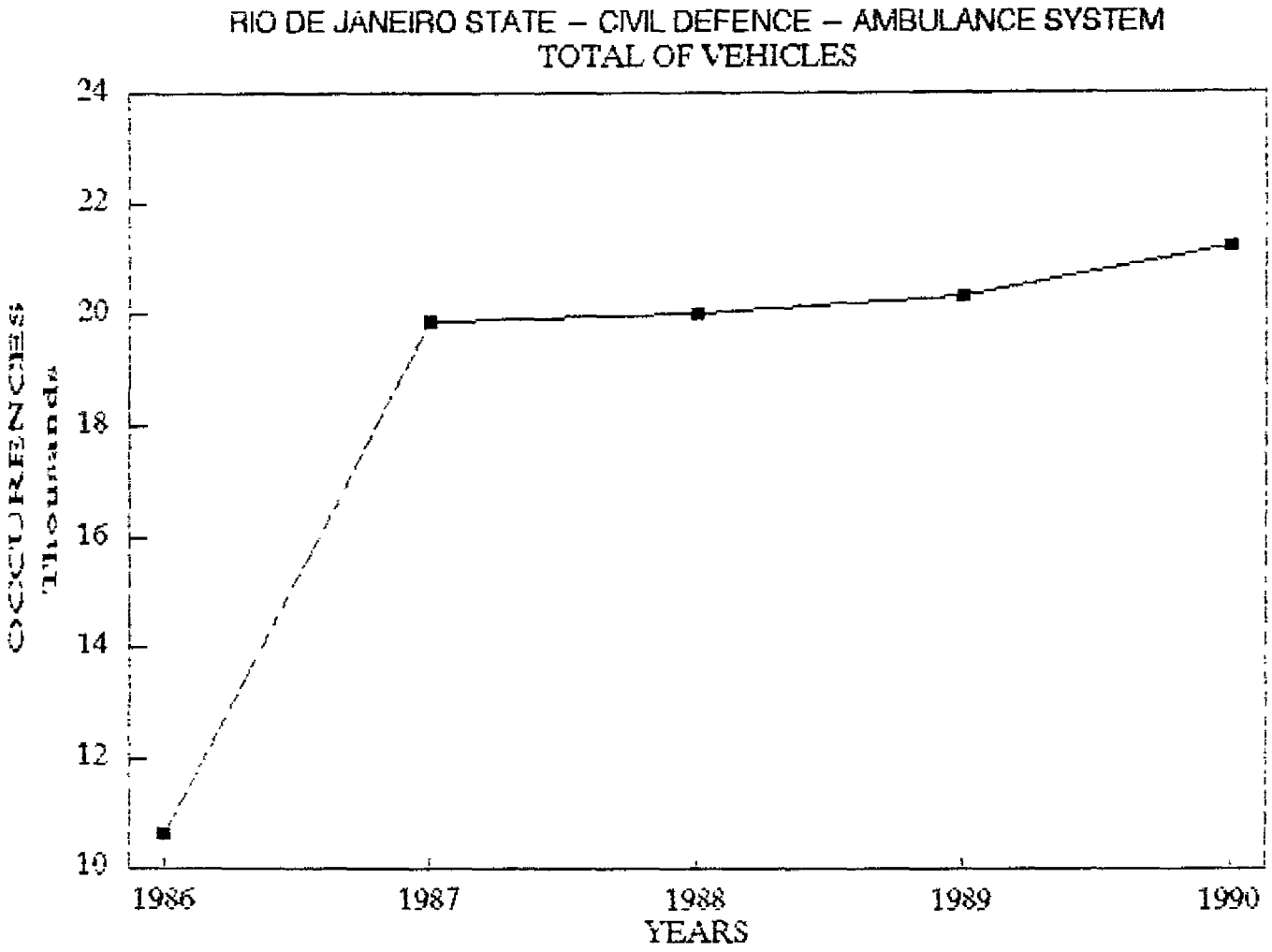
THE MOST ENVIRONMENT DESTRUCTION IN BRAZIL

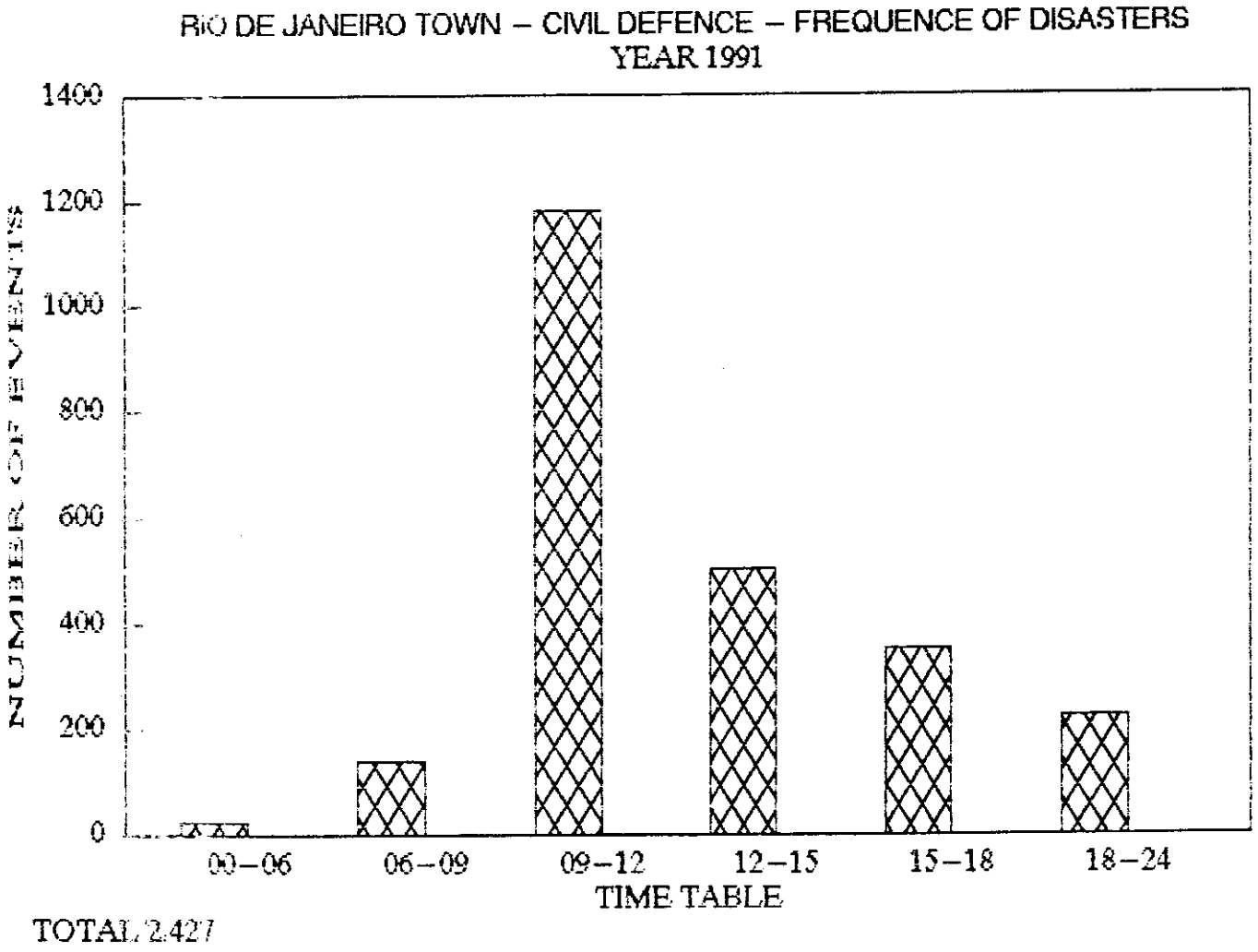
DATE	LOCAL	DISASTER	STATE	AFFECTED AREA
AUG 08/1988	National Park of Emas	Forest fire	GO	70..000 ha
SEP 15/1988	Itatiaia	Forest fire	RJ	1.200 bushels
SEP 16/1988	National Park of Caparao	Forest fire	ES	2.500 ha
SEP 28/1988	Canastra National Park	Forest fire	MG	9.000 ha
FEB 02/1990	Biological Reserve of Poco das Antas	Forest fire	RJ	2.600 ha
MAR 05/1990	Petrobras Oli Tanker (ship), Angra dos Reis City	Oil Spill	RJ	40 ton. of oil spill
JUL 03/1991	Cubatao City	Poluition - state of emer gency	SP	Poluition level above 2.000 mg/m3
SEP 03/1991	Oil tanker (ship), Campos Sea	Oli spill	RJ	2.000 ton of oil spill

X

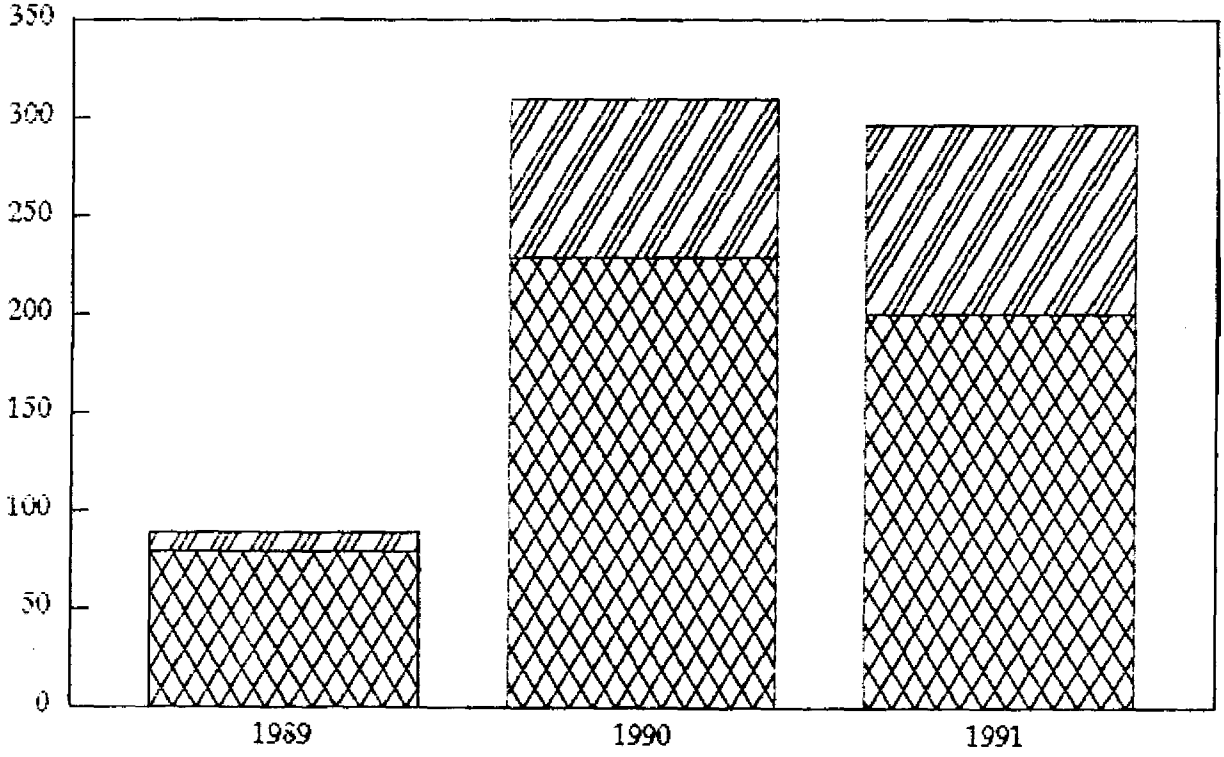
RIO DE JANEIRO FIRE DEPARTMENT EMERGENCY VEHICLES

- AERIAL	- Helicopter	01	
	- Ultra Lights	06	
	Total		07
- MARITIME	- Boats	17	
	Total		17
- LAND	- Dry Chemical	01	
	- Command Post	02	
	- Diving Rescue	01	
	- Pumper Tank	34	
	- Fire Command	26	
	- Corpse Remotion	19	
	- Screech	03	
	- Aerial Lader	10	
	- Tank	32	
	- High Rise Rescue	01	
	- Forest Search and Rescue	03	
	- Water Rescue	03	
	- Pumper	28	
	- Search and Rescue	46	
	- Ambulance	40	
	- Snorkel	03	
	- Crane 200 ton.	01	
	- Tractor	01	
	- Buldozer	01	
	- Debris Remotion	01	
	- Truck	01	
	Total		257


RIO DE JANEIRO STATE – CIVIL DEFENCE – AMBULANCE SYSTEM
TOTAL OF VEHICLES
OCCURENCES
Thousands
24
22
20
18
16
14
12
10
1986
1987
1988
1989
1990
YEARS

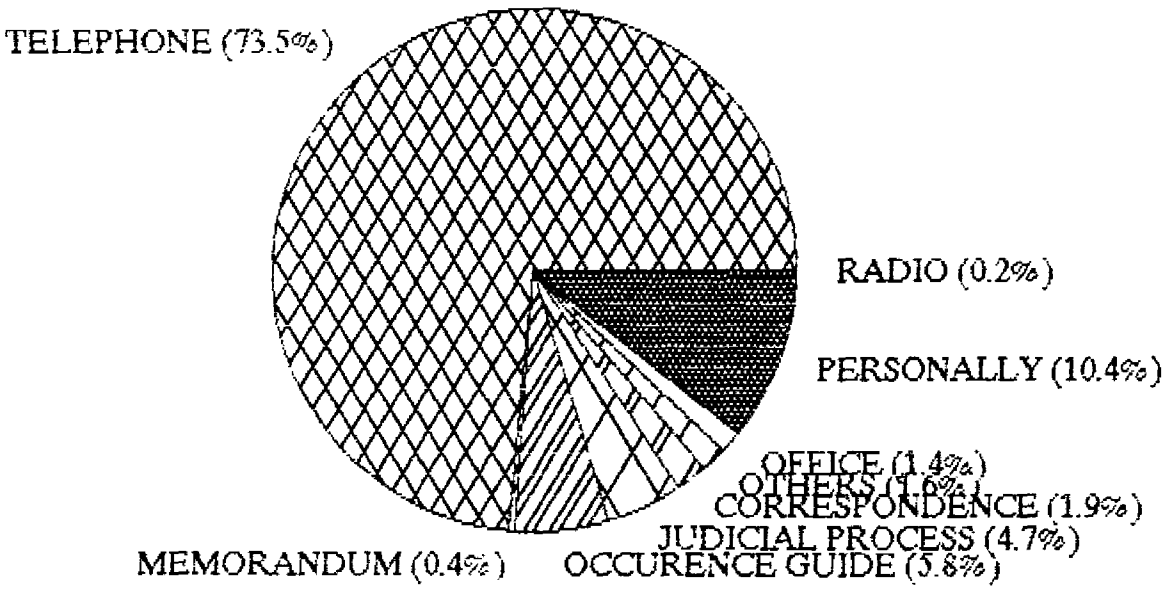

RIO DE JANEIRO TOWN – CIVIL DEFENCE – FREQUENCE OF DISASTERS
YEAR 1991
NUMBER OF EVENTS
1400
1200
1000
800
600
400
200
0
00–06
06–09
09–12
12–15
15–18
18–24
TIME TABLE
TOTAL 2.427

RIO DE JANEIRO STATE – CIVIL DEFENCE – ANUAL INTERVENTIONS
STATE AND MUNICIPALITIE



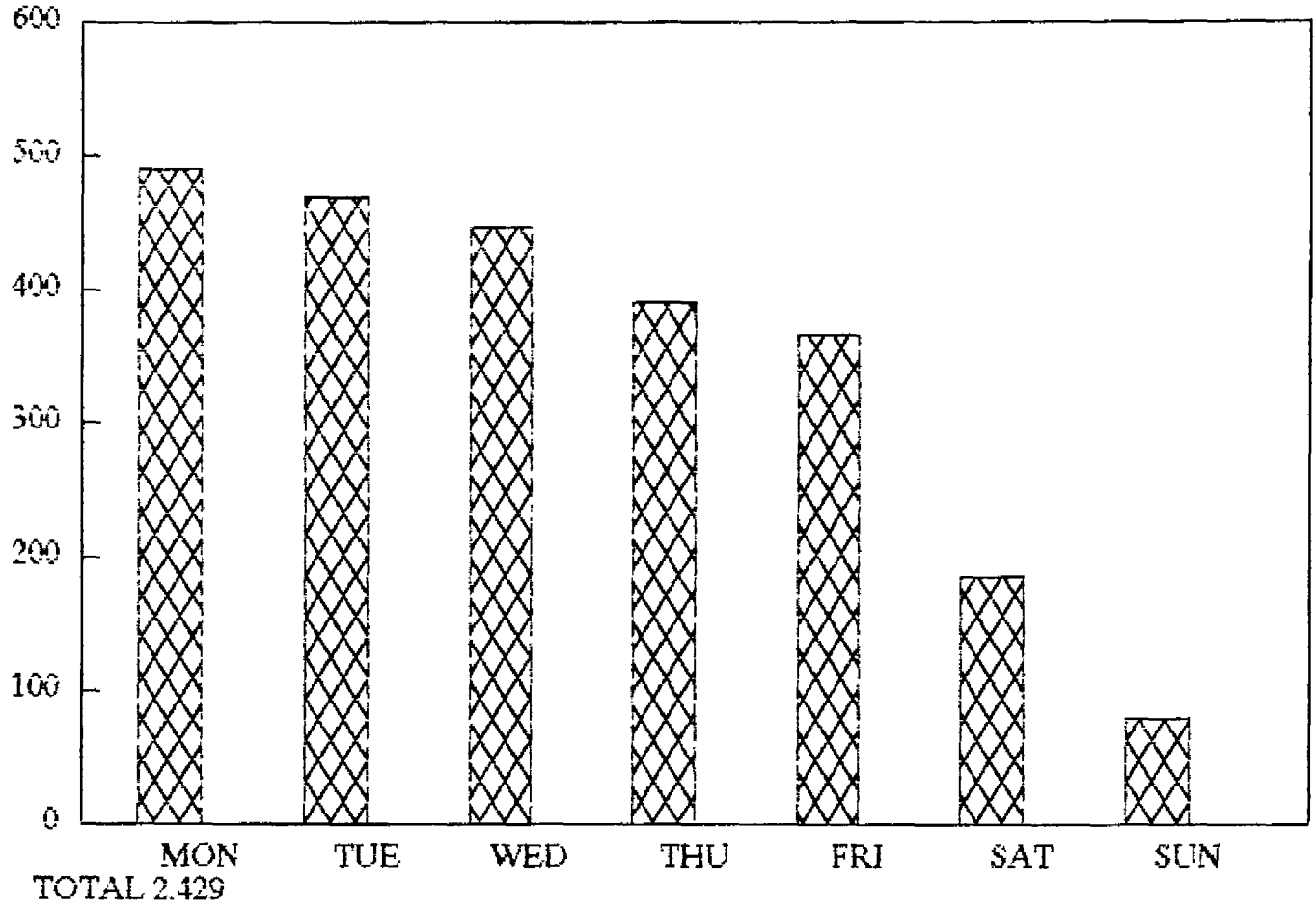
* IN COLABORATION WITH MUNICIPAL DEFENCE SYSTEMS

RIO DE JANEIRO TOWN – CIVIL DEFENCE – APPLY
YEAR 1991



TOTAL 2.427

RIO DE JANEIRO TOWN – CIVIL DEFENCE – SOLICITATION IN A WEEK
YEAR 1991



TOTAL 2.429